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2012 MED Report

# Toward Green Growth in Mediterranean Countries

## Implementing Policies to Enhance the Productivity of Natural Assets

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1818 H Street NW
Washington DC 20433
Telephone: +1 202-473-1000
Internet: www.worldbank.org

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# Contents

***A note concerning the geographic focus of the 2012 MED Report***

The primary focus of this report is on the countries of the southern rim of the Mediterranean from Morocco to Turkey, referred to as the Southern and Eastern Mediterranean Countries, or SEMCs. The countries are Algeria, Egypt, Jordan, Lebanon, Libya, Morocco, Syria, Tunisia, Turkey, and West Bank and Gaza. They do not necessarily have more environmental work to do than the European or Balkan countries, but their socioeconomic conditions may make adoption of a green agenda more challenging.

Some parts of the report apply equally to the SEMCs and wealthier countries in the Mediterranean region. Where this is so, the report may refer simply to Mediterranean countries, without distinguishing between the northern and southern rims. In some cases the report cites studies based on a smaller or larger sample of countries, which may be organised in groups different from those generally used in the report. For that reason, not all data presented in the report may be directly comparable.

# Foreword

Job creation and natural resources management are two of the most daunting challenges faced by Mediterranean countries. Since the Arab Spring began in February 2011, those issues have been compounded by swelling demand for greater social equity and relief from grinding poverty.

Green growth offers a way to achieve sustainable development by enhancing the productivity of natural assets while preventing the negative social consequences of environmental degradation. In other words, stopping environmental degradation can improve social welfare while helping to create employment opportunities. In so doing, green growth can generate co-benefits. This is true everywhere on the planet, but particularly so in the Mediterranean, where natural assets such as water and coastal areas have long been under intense pressure. Without prompt action, that pressure will grow, as climate change amplifies water scarcity and erodes biodiversity.

As a facilitator of dialogue between local and international stakeholders, the Center for Mediterranean Integration is well placed to contribute to a shift to green growth in the region by promoting studies that reveal where co-benefits have already been obtained and how best practices in promoting green growth can be replicated or adapted in neighbouring countries.

The *2012 MED Report: Toward Green Growth in Mediterranean Countries* is the product of a cooperative and consultative process in which national policy makers, partners, experts, and local private stakeholders were invited to share their experiences and expectations concerning the issues facing the region. The need to discuss those issues in a published report was confirmed by public and private decision makers in regional and local consultations. Tackling the multidimensional challenge of growth in the context of a vulnerable natural environment requires cooperation, coordination, and a comprehensive set of measures.

The objective of this report is to share sustainable economic options with decision makers and to present evidence from recent experiences in Mediterranean countries that green growth presents an outstanding opportunity to create good jobs and promote social cohesion. Starting with a few specific sectors, the *2012 MED Report* offers some promising pathways to sustainable economic growth in the region. The goal of the report team is to open the debate and issue a call for action on environmental problems. We have real opportunities to shape our future, but we must chart a different course from the one we have followed so far, and we must do it now.

*Mats Karlsson, Director*
*Center for Mediterranean Integration*

# Acknowledgments

The *2012 MED Report,* a publication of the Center for Mediterranean Integration (CMI), was produced by a consortium led by the World Bank in partnership with the Agence Française de Développement (AFD), the European Investment Bank (EIB), Plan Bleu (UNEP/MAP regional activity center), and the Forum Euro-Méditerranéen des Instituts de Sciences Economiques (FEMISE). In an effort to gather material for the report, the consortium organized a series of national and regional consultations to identify relevant case studies and stakeholder experiences with environmental and growth issues in the southern and eastern countries of the Mediterranean. The team benefited greatly from a wide range of comments and advice from about 300 policy makers, private individuals, and academics who participated in the consultations and joined an e-community created for the consultation process. Because it takes stock of local experiences, the report is rooted in Mediterranean good practices.

The preparation of the report was coordinated by a team led by Gilles Pipien, senior environment specialist (World Bank), with Jean-Pascal Bassino, senior economist (World Bank consultant), and Frédéric Blanc, senior economist (FEMISE). The process took place under the overall leadership of Mats Karlsson, director of CMI, Junaid Ahmad, sector director (WB/MNSSD), and Luis Constantino and Hoonae Kim, sector managers (WB/MNSSD). Contributions were received from Hala Abou-Ali, Slimane Bedrani, Julien Hanoteau (FEMISE consultants), and Kostas Tsakas (FEMISE); Sara Fernandez, Hugues Ravenel, Nathalie Rousset, and Didier Sauzade (Plan Bleu); Hynd Bouhia, Marion Dovis, Charlotte de Fontaubert, Yusuf Kocoglu, Thomas Lagoarde-Segot, Anil Markandya, and Jean-Louis Weber (World Bank consultants). The team is equally appreciative of the comments received from the following World Bank peer reviewers: Dan Biller, Milan Brahmbhatt, Hocine Chalal, Marianne Fay, Caroline Freund, Glenn-Marie Lange, and Michael Toman.The report was edited by Steven Kennedy (World Bank consultant).

The *2012 MED Report* team would like to acknowledge the valuable comments and inputs received from steering committee members and experts consulted at various stages of the process: Nathalie Abu-Ata (World Bank), Kulsum Ahmed (World Bank), Christian Averous (Plan Bleu), Peter Carter (EIB), Nathalie Girouard (OECD), Stéphane Hallegatte (World Bank), Kirk Hamilton (World Bank), Alexander Kremer (World Bank), Thierry Latreille (AFD), Myriam Linster (OECD), Sergio Margulis (World Bank), Daniel Ottolenghi (EIB), Valérie Reboud and Dominique Rojat (AFD), Armin Riess (EIB), Jocelyne Vauquelin (AFD), and Xavier Vincent (World Bank).

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## About the partners

Created in 2009, CMI is a World Bank–administered platform for multipartner programs designed to encourage forward thinking for the Mediterranean region. CMI strives to act as an honest broker among stakeholders in the region, contributing to a constructive dialogue in which knowledge, experience, and solutions related to common problems are identified and discussed. The *2012 MED Report* is an outcome of CMI's Environment and Water cluster. The report benefited from information received from World Bank experts and consultants involved in the Environment and Water cluster and other CMI programs. The team wishes specifically to acknowledge colleagues at CMI for their constant support and assistance, particularly Soumia Driouch, and Salomé Dufour.

The Agence Française de Développement (AFD) is France's development-assistance agency. Its missions are to reduce poverty and inequality, promote sustainable economic growth, and protect global public goods that benefit all humanity. The mission of protecting global public goods encompasses the fight against climate change and pandemics, the preservation of biodiversity, the promotion of social and environmental responsibility, and the provision of aid to countries weakened by strife, war, or natural disaster.

The European Investment Bank (EIB) is the European Union's financing institution. Its shareholders are the 27 member states of the Union, which provide its capital. The EIB's role is to provide long-term finance in support of investment projects. Outside the EU, the EIB is active in more than 150 countries, including the Mediterranean partner countries, working to implement the financial pillar of the EU's external cooperation and development policies (private sector development, infrastructure development, security of energy supply, and environmental sustainability).

Plan Bleu, a French nongovernmental organization, is a partner in regional environmental cooperation under the framework of the United Nations Environment Programme's Mediterranean Action Plan (UNEP/MAP). Plan Bleu produces information and knowledge to alert decision makers and other stakeholders of environmental risks and sustainable development issues in the Mediterranean, and to shape future scenarios to guide decision making.

FEMISE is a Euro-Mediterranean network operating since 1997 and formally established in 2005. Network members include more than 90 research centres in economics, representing the 37 partners of the Barcelona Declaration. FEMISE is jointly coordinated by the Institut de la Méditerranée (France), and the Economic Research Forum (Egypt). Its aim is to produce and disseminate research-based recommendations on economic and social issues in the Mediterranean.

overview

# Objectives, Messages and Chapter Summaries

*The environment-economy nexus is key to meeting the challenges facing Mediterranean countries. By mainstreaming the environment in economic policies and promoting a green growth agenda at the national and regional levels, countries can foster economic growth, job creation, social equity, and sustainable management of natural resources. But moving toward green growth requires a comprehensive set of policies and close partnerships between public and private stakeholders.*

**Policies designed to improve and protect the environment ("green policies") can generate widely shared social and economic gains ("co-benefits"), especially when combined with complementary actions that tackle other fundamental structural problems in the economy. Economic performance can be improved and social welfare boosted by incorporating environmental considerations into sectoral and cross-sectoral planning. Inevitably, however, any such process will create winners and losers. An equitable green growth agenda is one that emphasizes policies that bring benefits far in excess of their costs.**

**That is the message of the *2012 MED Report*, the product of (i) a consultative process involving experts and stakeholders from countries on the eastern, southern, and northern rims of the Mediterranean, and (ii) an extensive literature review.**

# Objectives

The report's aim is to examine success stories from the Mediterranean countries that highlight the social returns to be obtained by mainstreaming the environment in the development agenda in the region and to review trade-offs, with a view to identifying policies that yield the highest net benefit. The report also intends to advance the ongoing debate among policy makers on potential green growth policies and investments, and on the policy mix that offers the greatest chance of maximizing the benefits of green policies. The *2012 MED Report* includes an assessment of national strengths and priorities in environmental action.

In cooperation with beneficiary countries in the southern and eastern Mediterranean and key partners, CMI has implemented a comprehensive new framework program—the Environment and Water Program—of which the *2012 MED Report* is a component. The Environment and Water Program deals with issues related to natural resources, land degradation, solid and hazardous waste, and climate change. Its overall goal is to offer a common vision for mainstreaming environmental issues in the economic development agendas of Mediterranean countries.[1]

# Key messages and recommendations

## *The case for adopting a green growth agenda*

***1. In Southern and Eastern Mediterranean Countries (SEMCs), demand is growing for a new paradigm of growth and development (Galal 2011). Green growth provides an opportunity simultaneously to foster economic growth, job creation, and social equity.*** A policy agenda based on green growth could contribute to achieving development objectives in SEMCs by raising the productivity of natural assets and other production factors and reducing the negative effects of environmental degradation, which disproportionately affect the poorest households and most vulnerable segments of the region's population. Well-designed green policies have the potential to generate immediate co-benefits. In addition to long-term and direct gains from better environmental management, net job creation and productivity gains can be expected when implementing green policies. This is especially true if environmental policies are combined with complementary actions that tackle fundamental structural problems in the economy.

***2. Green growth policies aim at making growth processes more resource-efficient, cleaner, and more resilient—without necessarily slowing them (World Bank 2012).*** Environmental degradation reduces the quality of life in the region but also hampers economic efficiency, job creation, and growth prospects. By contrast, green growth policies aim to promote economic development, social equity, and inclusiveness —without compromising the environment (Hallegate et al. 2011). Green growth policies can be designed to maximize short-term gains so as to compensate as much as possible for the upfront costs associated with the transition. In other words, they can be designed to manage inevitable trade-offs. They can also raise resilience in the face of external shocks and can be made compatible with other important national policy objectives.

1 The Center for Mediterranean Integration (CMI) in Marseille, was created in 2009 by the governments of Egypt, France, Jordan, Lebanon, Morocco, and Tunisia, together with the European Investment Bank (EIB) and the World Bank. The aim of CMI is to support sustainable development through access to knowledge. A key objective of the Center is to explore green policies capable of maximizing both economic and environmental returns through multiple programs, including this *2012 MED Report*.

***3. Aligning environmental and economic policies is urgent, both to maintain the resilience of some of the most productive ecosystems in the region and to reverse the effects of current environmental degradation.*** The implications of unsustainable development are particularly severe in the Mediterranean region, where natural conditions (in particular a chronic water shortage) have a negative impact on welfare and economic activity. The region's unique but threatened ecosystem underpins the livelihoods of millions of people, not only through fisheries, agriculture, and forests, but also by attracting more international tourists than any other world region. Environmental degradation threatens key sectors such as tourism, upon which many countries of the region depend (Croitoru and Sarraf 2010; Larsen 2010). The tourism sector provides a good example of the economy-environment nexus. The sector is an essential component of the economies of the SEMCs, with receipts accounting for most of the region's $22 billion surplus in trade in services, thus making up for half of the overall trade deficit of the same set of countries (FEMISE 2007). But some of the most valuable natural assets of the Mediterranean region face a risk of irreversible degradation that could affect present and future economic prosperity and the welfare of local populations. In particular, pristine coastal areas that could support high-value-added and labour-intensive tourism activities are threatened by uncontrolled development.

## ***Issues*** *and opportunities*

***4. Decision makers can face hard choices and trade-offs between economic and environmental goals, but opportunities to reap co-benefits are also available.*** Sound environmental policies can help solve economic problems such as urban congestion, health conditions related to air and water pollution, and low agricultural productivity. But environmental policies also imply trade-offs, especially over time. Some of these trade-offs cannot be offset by co-benefits and will therefore require tough choices from policy makers. The *2012 MED Report* identifies several types of opportunities. Presently, natural resources such as water and energy are used inefficiently, imposing both economic and environmental costs. By using resources more efficiently it is possible to generate simultaneous environmental, economic, and employment benefits. Achieving greater efficiency entails overcoming significant institutional and political-economy obstacles, but some benefits are quickly achievable, as attested by the success stories presented in the report.

***5. Co-benefits can be substantial. Managing natural assets presents important opportunities to protect the environment, create jobs, and lower operating costs.*** For example, installing energy-efficient shells on new buildings (including insulated roofs, walls, and windows) by 2030 has the potential to reduce energy costs and CO2 emissions—but also to create an estimated 1.3 million jobs in building, construction, and maintenance in the SEMCs (Plan Bleu 2011). Reducing leakage from the water supply network to prevent overextraction from aquifers is also among the most effective management measures that emerge from case studies (Plan Bleu 2010). Improving access to water in urban areas that presently have the lowest access (less than 50 litres per capita per day) can result in sizable environmental and health benefits; in the case of Jordan the overall benefit/cost ratio is 2:1 (WHO/UNEP 2008). Lastly, policies to improve waste management and control air and water pollution can generate positive outcomes with minimum effort.

***6. In urban planning and in the management of coastal zones, significant trade-offs and distributional effects can be addressed.*** Urban sprawl encroaches on fertile land that is already in short supply and on coastal areas that have a high potential for sustainable tourism. But even here co-benefits can be obtained by introducing incentives that influence the behaviour of private agents in desired directions. For example, it is possible to tax increased land values when granting development rights—as, for example, in the Amman Master Plan. Such a tax provides incentives to reduce environmental degradation, while generating financial resources for the greening of Amman and the conservation of heritage areas (Beauregard and Marpillero-Colomina 2011). Agglomeration effects in major urban areas are valuable as engines of economic growth and job creation (World Bank 2009a). Policies to promote concentration can prevent and mitigate negative environmental effects of urbanization while preserving welfare and growth objectives.

***7. Despite the likelihood of upfront and localized job losses, green growth policies have the potential to produce a net gain in jobs, while also preserving many existing jobs.*** The net impact of green policies on jobs depends on the balance between job creation and job destruction. Policies can be designed to maximize the former and minimize the latter—for example, by implementing a sound institutional framework for job creation. Evidence in developed countries suggests that well-designed environmental regulation and taxes do not necessarily have a negative impact on competitiveness and jobs, but may in fact have a positive impact when well articulated with other policies. Empirical results show ambiguous effects of green growth strategies on jobs, meaning sometimes there are gains but there could be challenges especially in the short run. These gains are clearly highlighted in two recent reports produced in the region, one by the Arab Forum for Environment and Development (AFED 2011) and the other by the Economic and Social Council of the Kingdom of Morocco (CESRM 2012). Under optimistic scenarios, some recent studies suggest that the net job gains could reach 10 per cent of the total jobs needed in SEMCs to accommodate demographic trends (FEMISE 2011, UNEP 2011). However, converting potential jobs into real jobs would require that green policies be combined with complementary actions to tackle structural labour market issues.

## ***Making the shift*** *to a green economy and to green growth*

***8. The experiences of countries that have tackled environmental challenges should be shared so as to better address the common environmental challenges faced by Mediterranean countries.*** Relying on various existing indicators, national strengths and priorities can be identified, ranging from pesticide regulation to marine protection, on both the

southern and northern shores of the Mediterranean. A more accurate assessment can be based on indicators devised especially for the purpose (OECD 2011, 2012). Because the entire region shares certain priorities, in particular, on air pollution and water management, positive experiences can be replicated and worst practices avoided. Of particular note for both public authorities and private actors are the potentially long-lasting consequences of environmentally harmful subsidies and mismanagement of coastal zones in the northern Mediterranean that are affecting tourism and fisheries.

***9. Because any green growth agenda will produce winners and losers, compensation mechanisms are needed to ease disruption in negatively affected sectors and facilitate social acceptance of the shift to green policies.*** Entrenched rent-seeking behaviours are largely to blame for environmental degradation. But the people of the SEMCs have clearly demonstrated their willingness to modify the status quo. The depth of popular support offers an opportunity to shift to green growth, provided ways can be found to minimize the opposition of potential losers, and ideally induce them to envision long-term gains and support green policies.

***10. Some initial steps toward green growth do not require new financial resources.*** Phasing out perverse incentives—such as fuel subsidies that are environmentally harmful, economically costly, and socially regressive—is not an easy task. But if such reforms are implemented, substantial public funds would be freed up, which is good news for governments facing budget constraints. Through complementary policies such as cash transfers, such a change can be made without hurting the poor. Oil subsidy reforms in Indonesia and Iran are among the best examples of this process (IMF 2011a). More generally, environmental taxes, market mechanisms, norms and standards, and regulations are tools that do not require upfront finance.

***11. Regional cooperation and partnerships between the public and private sectors can help mobilise the additional funding needed to implement a comprehensive green growth agenda.*** Experiences recorded in the case studies summarised in the *2012 MED Report* indicate that some projects are likely to attract support from multilateral or bilateral donors; others, such as renewable energy generation, are candidates for local or foreign private investors. Additional funding for large-scale municipal solid waste management and for initiatives in energy efficiency and renewable energy may be expected through innovative finance mechanisms. Private agents can contribute to the effort—and benefit from it—by improving the efficiency of their use of natural resources.

## ***Policies and incentives*** *to achieve green growth objectives*

***12. A mix of mutually reinforcing policies will be needed to accelerate the shift to green growth***—among them price-based mechanisms, regulations, targeted taxation, innovation and industrial policies, investments, product and process standards, ecolabelling, and communication campaigns. Nonmarket approaches can reinforce the effectiveness of market-based policies and compensate for the market failures and behavioural biases that sometimes prevent prices from affecting consumer behaviour.

***13. Prices, in particular, are critical to increase efficiency.*** Green growth policies normally rely on pricing to internalize the positive and negative externalities of natural resource use. Putting a price on natural assets (notably water) is a way of enhancing their productivity and avoiding their wasteful use. Similarly, assigning a value to negative external effects—notably of fossil fuel consumption—can facilitate a change in the behaviour of private agents. Proper pricing takes into account the social cost of an activity on the environment, on health, and on social equity. The first steps in the process of getting prices right are the gradual reduction of harmful subsidies and the conversion of ambiguous subsidies into well-targeted cash transfers.

***14. A variety of economic incentives are needed to nudge producers and consumers into alignment with the green growth agenda.***

- Fiscal incentives for investments in more fuel efficient equipment would reduce air pollution and carbon emissions, while also reducing imports of fossil fuels and preserving nonrenewable resources for export (IMF 2011a). Such incentives could be funded by reallocating a fraction of existing energy subsidies in sustainable and politically feasible ways. Intense awareness campaigns can ensure public support, especially with regard to energy and water subsidies.[2]
- Introducing market instruments for the allocation of water resources would improve economic efficiency by providing a larger share of this scarce resource to producers able to increase its productivity. Such instruments should be accompanied by complementary actions to ensure that they do not hurt the poor or place too great a burden on a few economic sectors. Such coordinated action requires institutional capacity as well as political will, since those who once had free access to a resource would have to pay for it.
- Energy and water satellite accounts, as part of national accounting frameworks (including the World Bank WAVES program), would provide useful information to policy makers to track progress and to identify priorities for action.
- Vigorously enforced regulations built on the polluter-pays principle could generate finance for green growth actions designed to provide tangible results in the short and medium term. Transitional support and other complementary measures need to be considered to avoid imposing a negative shock on the economic system.
- Private initiatives to include environmental practices in assessments of publicly traded companies—such as the Egyptian stock exchange's Economic and Social Governance Index and the Istanbul stock exchange's Sustainability Index Project—can foster a sense of social and environmental responsibility among producers and investors.

2. As proposed during the consultation process by the delegation from the Egyptian Ministry of Finance.

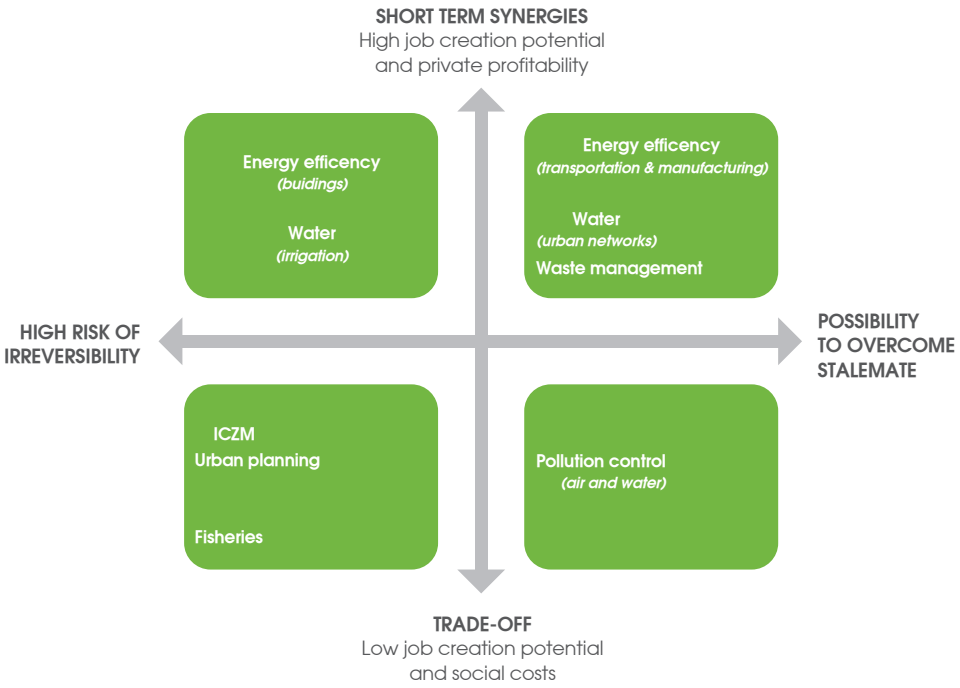
- Ecolabelling is among the best known of an emerging class of incentives that help consumers express their concern for the environment through informed buying decisions. By combining ecolabelling and soft loans to consumers, Tunisia has successfully nudged consumers toward energy efficiency (GEF 2007).

## *Identifying priorities for action*

***15. Looming threats to public health and the risk of irreversible changes in the environment are an immediate priority for public authorities, whose actions will have greater impact if taken in the context of a larger agenda.*** Better control of water pollution and solid waste is needed to improve and protect public health. A combination of regulatory and market-based instruments is needed to reduce the risk that the suboptimal management of fish stocks, agricultural soils, and coastal zones will become irreversible owing to a loss of resilience (Steward 2004). National priorities depend on local conditions, and development priorities are different across SEMCs. The report can help identify strengths and priorities using available indicators of environmental action, at both the regional and national levels. It can help to tailor national green agendas that suit national priorities, development conditions, and local social and economic factors.

***16. Mediterranean countries can take advantage of their common features to identify mutually beneficial priorities.*** Country environmental analyses undertaken by the World Bank (2004a, 2005, 2010a, 2011d) provide information for Egypt, Jordan, Lebanon, and Tunisia that indicates the presence of similar priorities and constraints amid the diversity of national environmental conditions. Green growth sectoral policy objectives can be classified as shown in figure A, in which the y-axis represents the extent of potential synergy in the development of new economic activities and jobs (net job creation), and the x-axis the risk of irreversibility or "lock-in" entailed by today's decisions on the left end of the continuum, and the possibility of overcoming social and political stalemates, often traceable to inertia, on the right.[3] In its use of the inertia concept, this approach is consistent with that developed in chapter 7 of the World Bank's report, *Inclusive Green Growth: The Pathway to Sustainable Development* (2012). Energy efficiency in buildings is deemed to present a high risk of irreversibility because buildings, once erected, are replaced slowly. Moving to the right on the continuum, inefficiencies in energy use for transportation and manufacturing that have high economic, social, and Environmental costs (and that thus offer high synergies) can be addressed more easily because it is easier to upgrade or replace equipment and to introduce energy-saving innovations than it is to upgrade or replace a building (or a natural habitat or species, once destroyed).

**◊ Figure A Tentative typology of green growth sectoral policy objectives in Mediterranean countries: job creation and risk of irreversibility**




*Note:* ICZM = Integrated Coastal Zone Management

3. Among the social and economic choices that may be considered irreversible (or locked in) are those affecting biodiversity (extinction is forever), climate (CO2 and methane molecules have a long residence time in the atmosphere), infrastructure and settlements (roads and buildings are long-lived assets; the development of cities is driven by transport infrastructure, and their form is quasi-irreversible), and technological solutions (innovation and R&D investments have a tendency to focus on existing, proven technologies). Inertia is a related concept, connoting the persistence of behavioral, technical, and institutional components of socioeconomic systems—among them consumption habits, the longevity of infrastructure and other aspects of the build environment, financing models, and government institutions. Specific policies focusing on sectors with high inertia are required, in addition to economy-wide policies (Lecocq et al. 1998; Jaccard and Rivers 2007; Vogt-Schilb and Hallegatte 2011).

In most Mediterranean countries, policies designed to improve energy and water efficiency are conducive to net job creation. ICZM, urban planning, and sustainable management of fisheries have a limited potential to create jobs but are among the most urgent actions owing to the high risk of irreversible environmental damage. Sound urban planning can result in net job creation because it makes cities more productive and attractive but opportunity costs of investing in urban infrastructures cannot be overlooked and are at the heart of existing trade-offs. Policies designed to improve air and water pollution control and waste management are unlikely to create large numbers of jobs but nevertheless can generate sizable welfare gains with positive effects on labour productivity.

The green growth policies of the highest priority are those that present the greatest risk of irreversibility (that is, the greatest urgency) and that offer the most immediate synergies in terms of job creation and profitability. These two criteria intersect in the upper-left quadrant of the figure.

## Recommendations

- Promote energy and water efficiency as top priorities.
- Get prices right for water, energy, and land by making sure they reflect social costs and other externalities of resource use.
- Reduce regressive subsidies to enhance the social acceptance of a green agenda, and combine with complementary measures to cancel the negative impact on the poor.
- Tackle market failures through institutional innovation, regulation, ecolabelling, and innovation and industrial policy.
- Nudge producers and consumers toward behaviours that reduce air and water pollution and improve waste management.
- Set medium-term objectives for urban planning, coastal zone management, and fisheries.
- Cooperate at the regional level for exchange of best practices and know-how. This kind of cooperation should include capacity building for implementing economic environmental accounts, especially at the macro level.
- Exploit innovative financial sources such as carbon facilities for new investment. Also, green economy credit lines could be created, targeting in particular local SMEs.[4]
- Engage the private sector to assume greater environmental responsibility and leverage private finance.

CMI, in cooperation with the Office de Coopération Économique pour la Méditerranée et l'Orient (OCEMO), Plan Bleu, the Forum Euro-Méditerranéen des Instituts de Sciences Economiques (FEMISE), and other partners, supported a working group of experts from civil society organizations in the North and South that worked in parallel with the *2012 MED Report* to develop recommendations to implement a green economy in the Mediterranean. Their recommendations (Working Group on Green Economy 2012) converge with those presented in chapter 6 hereof.

## *Call for action*

***17. Launching national green growth strategies in each country*** will enable the coherent implementation of public policies tailored to each local setting. These strategies will require strong national leadership and will be more likely to produce results if they are developed jointly by all major stakeholders in the society. A prerequisite of successful strategies is diagnostic work to identify the issues, challenges, and opportunities on the basis of which priorities have been selected. Close monitoring should be provided both to verify implementation and to make it possible to publicize results and adjust the course of implementation if necessary. Implementation depends strongly on key skills and competencies that will have to be developed—for example, by setting up programs to train practitioners in key occupations. Innovation—technological and social—will be indispensable. The involvement of large firms and the financial sector will encourage and support risk-taking and innovation by small and medium-sized enterprises. Pilot projects, developed and implemented with concerned citizens, as well as model initiatives in public services, can sow seeds that grow gradually but steadily. Successful implementation will have to be measured at the local level. The task will be to pair increased competitiveness of sub-national entities with progress toward an efficient green economy.

***18. At the regional level, it is time to move beyond the very fruitful sharing of experiences to place green growth on the Mediterranean agenda.*** The regional level is the right one for making concerted efforts within a framework of integration favourable to the development of the entire Mediterranean region. If the green economy can also be an efficient economy, then the major policies of the Mediterranean region should develop in that direction. Green growth policies should be part of the G8's Deauville process, supported by the Union for the Mediterranean, and on the agenda at meetings between finance ministers. Pertinent knowledge is available in the region, within the universities and specialised institutions and organizations.[5] One orientation could be to create a Mediterranean green growth platform, or, as a first step, to forge a Mediterranean link with the green growth knowledge platform launched recently by the World Bank, in partnership with OECD and UNEP. Existing mechanisms for deliberation such as the Mediterranean Commission for Sustainable Development and the Mediterranean Strategy for Sustainable Development could be redeployed or strengthened to contribute to the green growth process. Financial institutions are accustomed to coordination—they could collaborate to create green investment funds.

Placing green growth on the Mediterranean agenda is urgent; it is feasible; and it is necessary for the advancement of the people of the region.

4. As proposed by the delegation of the Egyptian Ministry of Finance during a consultation on the report.

5. Relevant knowledge is abundantly represented within FEMISE, the Economic Research Forum in Cairo, the United Nations Environment Programme's Mediterranean Action Plan Regional Activity Center (UNEP/MAP/REC), the Arab Forum for Environment and Development, and other organizations.

# Chapter summaries

## ***Introduction:*** *The case for a green growth agenda in Mediterranean countries*

*Green growth and the Mediterranean socioeconomic context.* In 2011 demand increased in the Southern and Eastern Mediterranean Countries (SEMCs) for a policy shift toward a new social paradigm fostering economic growth, job creation, and social equity (FEMISE 2011a). A green growth agenda could contribute to achieving those objectives by raising efficiency and productivity while reducing negative environmental externalities that disproportionately affect the poorest households and most vulnerable segments of the population.

*The environment-economy nexus.* The environment-economy nexus is at the heart of the challenges facing all the countries of the Mediterranean rim. The current level of environmental degradation is unsustainable and inefficient, hampering economic activity, job creation, and growth, and lowering welfare, notably through threats to public health. Green growth policies can make growth processes more resource-efficient, clean, and resilient without necessarily slowing them, thereby helping to achieve the objectives of job creation and social equity (World Bank 2012).

*The risks of loss of resilience and irreversibility.* Mainstreaming the environment into economic policies must be done without delay to avoid locking the economy into unsustainable patterns and causing irreversible environmental damage. Immediate action is needed to maintain the resilience of productive ecosystems that provide essential economic services. While sustainable development is important for all regions of the world, the implications of delay in addressing environmental threats are particularly severe in the Mediterranean region, where natural conditions (in particular a chronic water shortage) already negatively affect economic activity and welfare.

*Balancing winners and losers.* Although environmental degradation exacts a social cost that often exceeds cumulative private gains, economic actors that reap private gains from environmental damage are reluctant to accept an end to the status quo. Greater recognition of the true value of environmental assets is therefore needed to ensure that those assets are optimally—and sustainably—used. Various institutional arrangements and policy tools are available to address distributional issues, ensure social equity, and compensate property owners who stand to lose from measures taken to protect environmental assets for the public good.

## ***Chapter 1.*** *Short-term opportunities for co-benefits*

Case studies of energy efficiency, pollution control, and solid waste management indicate that combined economic and environmental gains (synergies or "co-benefits") are within reach in the short term. These gains exist because the current use of natural resources is highly inefficient, resulting in unnecessary economic costs and unnecessary environmental degradation. Potential improvements are as follows.

*Enhancing energy efficiency.* Greater energy efficiency has positive implications for all sectors. With the rapid pace of urbanization in the SEMCs, energy efficiency in buildings could also deliver long-term savings on energy expenditures and environmental benefits. It is also a large potential source of new jobs. For example, installing energy-efficient shells for new buildings by 2030 would create an estimated 1.3 million jobs (Plan Bleu 2011). A large share of the inputs would be imported, but jobs in installation and maintenance are mainly local.

*Improving public health through water and air pollution control.* Rapid, ongoing urbanization exacerbates the effects of water and air pollution on human health. Water pollution is particularly worrisome in the Mediterranean countries, causing chronic shortages and intermittent deliveries of water for households, industries, and farms. Air-pollution-related health conditions in the SEMCs are traceable largely to transportation and industrial emissions—as in the developed countries. Lessening air and water pollution is unlikely to result in massive job creation, but it would raise labour productivity and protect public health, thereby reducing spending on health care and increasing demand for other goods and services that contribute to individual and social welfare.

*Upgrading solid waste management.* Owing to rapid population growth, industrialization, and urbanization, a 50 per cent increase in waste generation is expected over the next 15 years in the SEMCs (Sherif 2010). Much of that waste will contain recoverable resources. To handle the anticipated increase, municipalities will have to find ways to upgrade their waste management practices. Different strategies are being explored in the SEMCs to improve recovery rates and generate new revenues, particularly through the Clean Development Mechanism (CDM) and by charging fees. In the meantime, composting has the potential to generate additional value added (SWEEP-Net 2010).

## ***Chapter 2.*** *Maximizing the productivity of natural assets while dealing with trade-offs*

Decision makers face hard choices and trade-offs in the management of freshwater resources, coastal areas, urban development, and fish stocks. Nevertheless, it does appear possible to improve the productivity of natural assets while ensuring sustainable development.

*Sustainable management of water resources.* Agricultural producers throughout the region suffer from water shortages, and in some areas water stress also affects households, tourism, and manufacturing. Improving water efficiency in agriculture, which consumes more water than any other sector, can increase output and value-added (and, therefore, food security) while also freeing up water for other higher-productivity sectors. Technologies to improve efficiency, such as drip irrigation and fuels made from agricultural by-products, are readily available and do not cost much. Expanding their use would benefit producers and consumers by cutting costs and raising the international competiveness of local companies, with concomitant effects on economic growth and employment.

*Integrated Coastal Zone Management (ICZM).* Rapid urbanization in the SEMCs is both a driver and a consequence of economic development (World Bank 2009). But it also concentrates people in narrow and increasingly overcrowded coastal zones, causing urban sprawl to encroach on fertile land that is already in short supply in many countries. The current pace of urbanization and coastal zone degradation means that delaying action is costly and likely to result in irreversible change. Upgrading the management of coastal zones through ICZM—a method for ensuring that coastal resources are used in a sustainable manner—would help to maximize ecosystem services and revenues from sustainable tourism. Finding a balance between environmental protection and economic and social development—without depriving societies of the economic benefits that urbanization delivers through agglomeration effects—requires that costs and benefits be quantified. Quantification makes it possible to evaluate individual projects targeted for either protection or development.

*Toward sustainable urbanization.* The current demographic pressures in the SEMCs, coupled with environmental degradation, call for a review of traditional approaches to urban development so that territorial development plans do not remain disconnected from sound environmental policies and growth-generating programs. In addition to population growth, rural exodus and unemployment are exacerbating the challenges faced by urban areas. Successful experiences with environmentally sensitive city planning from around the world suggest that the objectives of inclusive, sustainable, and resource-efficient urban growth can be achieved in the SEMCs.

*Cooperating to make fisheries sustainable.* Decades of mismanagement of coastal zones and fish stocks on the northern shore of the Mediterranean provide lessons for decision makers on the southern shore, offering them an opportunity to consider a more sustainable path. Overfishing in the southern and eastern Mediterranean is less severe than in the northern Mediterranean, but some stocks are already at risk, making immediate action a necessity to avoid irreversible environmental and economic losses. Preserving threatened environmental assets helps preserve ecosystems, and thus the jobs and incomes of lower-income households. Downsizing of the fleet should be carried out with a view to protecting small-scale fisheries and dependent coastal communities. To that end, two differentiated management regimes could be envisaged, one designed for large-scale fleets (where capacity adjustment and economic efficiency are the core) and the other targeted at small-scale fleets in coastal communities (with a focus on social objectives).

## ***Chapter 3.*** *Environmental action and job creation*

Over the next two decades, 30 to 40 million new jobs will have to be created to maintain the current rate of employment in the SEMCs. Much more would be needed to bring these economies to full employment. Taking steps to reduce environmental degradation and enhance the benefits of natural assets has the potential, at the country level, to create more new jobs than it destroys.

*A tense demographic context and a low rate of job creation.* The Mediterranean countries need millions of new jobs—now and in the years to come. In the SEMCs, around 30 per cent of the population is under the age of 15. Over the next two decades more than 80 per cent of the new labour force in the Euro-Mediterranean region will be located on the southern shore. Without massive job creation, social stability is in peril.

*Mechanisms of the green impact on economic activities and jobs.* Green growth creates jobs—but it also destroys them. For example, gains in renewable energy may parallel losses in petrochemicals. Ensuring that more jobs are created than destroyed requires measures to accelerate growth and to reduce the cost of labour relative to environmental assets (by raising the value of the latter), as well as robust policies to improve the skills of the workforce. Low-productivity jobs can help reduce unemployment, but high-productivity jobs promote economic growth over the long term. National policies can provide incentives inducing a gradual shift toward the balance of skilled and unskilled jobs that best suits each country.

*Jobs and greening: Neither myth nor automatic dividend.* The cost of environmental degradation in the SEMCs is estimated at 3–6 per cent of their average gross domestic product (GDP) each year (Croitoru and Sarraf 2010; Larsen 2010; EU 2011). Avoiding these losses through policies aimed at reducing negative environmental effects would stimulate economic activities. Although addressing environment degradation is not a silver bullet when it comes to reducing unemployment, a positive impact can be expected if policies are well designed. The Arab Forum for Environment and Development (AFED) advocates that efficient combinations of public policies, innovative approaches, business models, green investment opportunities have the potential to produce sizable gains in terms of job creation and economic benefits (AFED 2011).

*Tentative estimates of gross and net job creation.* According to preliminary results released by the Economic and Social Council of the Kingdom of Morocco (CESRM 2012), Morocco has the potential to create about 100,000 new jobs before 2030 in four sectors affected by green policies: renewable energies; energy efficiency; sewerage and liquid waste management; and urban solid waste management. A recent macro-level study of Mediterranean countries (FEMISE 2011b) suggests that likely net job gains from green growth could be on the order of 10 per cent of the total job creation required by the region in the next 10 years. While a green growth path is recommended, its efficacy depends on every policy step taken along the way. A prerequisite for realizing the potential job creation of green growth is to accompany green policies with complementary actions designed to tackle structural problems in the labour market.

## **Chapter 4.** *"Doing green": Assessing environmental progress and identifying strengths and priorities in environmental action*

A key element in the design of effective green policies is to improve the monitoring of environmental action. Collecting a multitude of progress indicators and constructing "green national accounts" can better inform decision makers responsible for setting national and local priorities.

*Action-oriented environmental indicators for Mediterranean countries.* Monitoring the state of environmental assets, the impact of economic activities, and the effectiveness of responses aimed at preventing or addressing environmental degradation is essential for identifying priorities for action. Such data inform policy makers about areas for progress and reasonable targets, while enabling the community to identify good practices. Environmental progress can be assessed at the national and sub-national level using a framework devised by the OECD (2011) that relies on indicators of productivity of environmental resources, the natural asset base, the environmental quality of life, economic opportunities, and policy responses.

*Using multi-criteria analysis to identify strengths and priorities.* The assessment of environmental performance can be based on a multi-criteria method that sorts each country using a series of indicators. *The 2012 MED Report* documents existing policy-related indicators of environmental performance, focusing on a data set covering most Mediterranean countries. The Environmental Performance Index database (EPI 2010) attempts to sort—among 25 individual indicators—those related to natural endowments and environmental status and those related to public policy and environmental action. Although sizable differences related to environmental protection can be observed across countries, similar weaknesses are apparent across the Mediterranean region, particularly with respect to air pollution and water management.

*Assessing sub-national diversity in environmental progress.* Considering the wide range of within-country spatial diversity in socioeconomic and natural conditions in the region, indicators of environmental status and action have to be collected and monitored at the sub-national level. Several indicators that are particularly relevant in the Mediterranean context display great within-country variation, in addition to international variation. Identifying areas that offer high social returns requires taking into account natural constraints and socioeconomic conditions that hamper or facilitate the implementation of environment-related economic policies.

*"Green national accounts" for Mediterranean countries.* Green national accounting is an excellent way to inform policy makers and other stakeholders about the level of the nation's environmental effort and the effectiveness of its actions. Considering the level of water stress already experienced in most areas, constructing so-called water satellite accounts using a consistent national framework is among the most useful steps to be considered. Because improving energy efficiency has been identified as a policy option that promises mutually reinforcing economic and environmental gains, energy satellite accounts are also important.

## **Chapter 5.** *Tools for environmental action and the implementation of a green growth agenda*

The critical step in shifting to green (or greener) growth is to implement effective tools of environmental action—in particular fiscal reform, market-based instruments, and incentives for environmental responsibility. The success stories and best practices of Mediterranean countries can be replicated or adapted to fit various socioeconomic and environmental settings.

*Promoting social equity and economic growth through environmental fiscal reforms.* Some of the financial resources required to implement a green growth agenda can be mobilized by reallocating public expenditures and introducing environmental fiscal reforms. In particular, phasing out fuel subsidies, while not necessarily an easy target, introduces the right incentives for producers and consumers and offers the tantalizing promise of economic growth and job creation through energy efficiency. Recent experiences in Indonesia, Iran, and Jordan indicate that phasing out fuel subsidies can be made socially acceptable through a gradual process with a clear road map and a comprehensive package of compensating measures for lower-income households (IMF 2011a).

*Promoting tradable rights and payments for ecosystem services.* Market-based instruments—such as individual or collective transferable quota systems for fisheries, or payment for ecosystems services in water catchment areas—have been recently introduced on both the northern and southern shores of the Mediterranean. Experiences in northern Morocco and other areas indicate a potential for the diffusion of such innovations. Similarly, ICZM that combines regulatory instruments and tradable building rights has been tested in some tourist areas of the Mediterranean. The results point to promising solutions in situations where potential losers from reforms can be expected to block progress unless their concerns are taken into account.

*Environmental and social responsibility.* The role of the private sector in enhancing the economic benefits of environmental assets could be stimulated by public incentives, both regulatory and fiscal. In the meantime, environmental responsibility on the part of producers and investors should be encouraged. Promising policy initiatives are being tried in emerging countries in the Mediterranean and elsewhere. The time is ripe to launch sustainable stock market indices, national and regional, with methodological input from the region's first movers, Egypt and Turkey, and from other regions of the world.

*Changing consumer and producer behaviour: Promoting ecolabels and certification.* Environmental regulation is not without cost to consumers and producers. But the perception among private agents of a trade-off between environmental regulations and profits may be reduced by policies that produce social and macroeconomic benefits. The increasing popularity of product-oriented environmental policy in the Mediterranean and elsewhere is based on a perception that the abatement of pollution from industrial and other large sources is now within reach. Ecolabelling and product certification can be effective

instruments that encourage sustainable consumption by providing consumers with information about the environmental impact of particular products and services. Companies are rewarded through public recognition, further encouraging proactive environmental management.

## ***Chapter 6.*** *Conclusions and call for action*

Shifting to green growth requires implementing a policy mix that includes many different components, including price- and market-based mechanisms, but also norms and regulations, innovation and industrial policies, and investments. Chapter 6 briefly explores some of those components, identifying several opportunities to test the promise of green growth.

Finally, some guidelines for national green growth strategies are presented. At the regional level, if the green economy can also be an efficient economy, then the major policies of the Mediterranean region should develop in that direction: It is urgent, possible, and necessary.

Introduction

# The Case for a Green Growth Agenda in Mediterranean Countries

**In this chapter**

/// What is green growth about?

/// Economic performance in Southern and Eastern Mediterranean Countries (SEMCs)

/// The Mediterranean as a hotspot of environmental degradation

/// Mainstreaming the environment in economic policies

*The Arab Spring signals a shift in popular political priorities toward a new social paradigm of social equity, job creation, and poverty alleviation. In that paradigm, economic progress can contribute to social stability when it is visible to the population and fairly shared within the society.*

**In the past decade, the Southern and Eastern Mediterranean Countries (SEMCs)[6] have made tremendous efforts to increase their openness to trade, investment, and international cooperation. Despite the economic crisis that hit Europe and the United States at the end of the decade, growth of gross domestic product (GDP) in the SEMCs was greater than 4 per cent per year on average during 2000–09, nearing the level that would allow the SEMCs to truly converge with their European neighbours (FEMISE 2011a). But while the decade was one of the best in a very long time from the perspective of economic integration, most of the progress benefitted an elite closely linked with politicians and businessmen (Galal 2011). Over time, the gap between the progress seen by the international community, local politicians, and media and as perceived by the population in their daily lives gradually broadened, culminating in the events of 2011. Although macroeconomic balances were kept under control despite the financial crisis and steep increases in the prices of food and energy, the SEMCs did not succeed in the challenge of creating jobs, or in reducing territorial disparities within countries.**

**The challenge now is to put in place a new development model for more inclusive growth while keeping intact the economic stabilization accomplished during the previous period. A green growth agenda could contribute—at least as well as standard growth models—to achieving those objectives by raising the productivity of natural assets and other production factors while simultaneously reducing the negative by-products of growth that disproportionately affect the poorest households and most vulnerable segments of the population.**

**A close look at the environment-economy nexus sharpens the case for adoption of a green growth agenda in the SEMCs. On the one hand, the SEMCs need an efficient and focused growth path; on the other, the current level of environmental degradation hampers economic efficiency, job creation, growth prospects, and welfare (Croitoru and Sarraf 2010, Larsen 2010). It would appear to be the perfect time to take action to increase the efficiency of use of natural assets. Unless environmental protection is built into mainstream economic policies very soon, there is a high risk that environmental degradation will become irreversible in the SEMCs, causing the loss of some of their most productive ecosystems. The implications of the loss of ecosystem resilience are particularly severe in the Mediterranean owing to the combination of unfavourable natural conditions (particularly chronic water shortage) and socioeconomic constraints related to rapid population growth and urbanization.**

# What is green growth about?

Green growth is a means of increasing the sustainability of economic and social development. It is based on recognition of the environment as an asset and on the implementation of a set of well-designed policies that engage and commit stakeholders. Green growth goes beyond specific environmental goals such as enhancing environmental amenities, controlling air and water pollution, improving water management, and preserving biodiversity; it also includes climate change mitigation.

Green growth is about the implementation of sustainable development strategies in the short term (1–2 years) and medium term (5–10 years), focusing on what should be done immediately and over the next 5–10 years to seize the opportunities that green policies can offer while avoiding irreversible changes. Green growth also takes into account real-world constraints on sustainable development, such as regional priorities (notably job creation in the SEMCs), political and social obstacles to effective collective action, and the need for rapid GDP growth in developing countries. Thus, green growth policies can be understood as a set of policies that minimize the costs of transitioning to sustainable growth, offsetting those costs, wherever possible, through direct environmental benefits and potential economic co-benefits. Environmental management under the green growth scenario becomes a productive investment, directly comparable to investment in physical capital, by virtue of including natural assets in the analysis of production processes.

Green growth is about making growth processes more resource efficient, clean, and resilient without necessarily slowing them. Green growth policies are thus an essential part of implementing sustainable development (Hallegatte et al. 2011). Such policies allow countries to better capture environmental benefits and to maximize co-benefits—outcomes that are beneficial for the environment as well as for the economy and for social equity. Therefore, green growth is compatible with most short- and medium-term national policy objectives.

Green growth seems particularly well adapted to the SEMCs because it consolidates variety of the region's issues and solutions related to economic performance and the environment. As an alternative development model, green growth will modify the distribution of wealth: There will be "winners" and "losers" in the shift to such an agenda. But the people of the SEMCs have clearly demonstrated their willingness to modify the status quo, and a green agenda appears consistent with the modifications sought. That coincidence offers an opportunity to shift more easily to green growth than might otherwise

6. The primary focus of this report is on the countries of the southern rim of the Mediterranean from Morocco to Turkey, referred to as the Southern and Eastern Mediterranean Countries (SEMCs).

be possible, provided ways can be found to induce potential losers to support rather than oppose green growth policies.

Although environmental degradation exacts a social cost that far exceeds cumulative private gains, economic actors that reap private gains from environmental damage are reluctant to accept the end of the status quo. Various institutional arrangements and policy tools are available to address distributional issues, ensure social equity, and compensate property owners who stand to lose from measures taken to protect environmental assets for the public good. At the same time, greater recognition of the true value of environmental assets is needed to ensure that those assets are optimally—and sustainably—used.

# Economic performance in the SEMCs

To succeed, a green agenda should be based on a solid economic foundation. Before the financial crisis, the SEMCs performed relatively well economically, with an average real growth rate of around 4.7 per cent during 2000–07. With the advent of deep recessions in the United States and Europe, that rate decreased to just 3.1 per cent in 2008–09 (FEMISE 2011a and b). Growth picked up in 2010, with a rate close to 4.9 per cent, suggesting that the SEMCs would return to pre-crisis growth levels. In fact, the limited financial openness of the SEMCs has protected them from financial turmoil and will continue to do so, to some extent. In recent years, the SEMCs have followed a significant opening trend in trade and foreign direct investment (FDI), attracting growing volumes of capital through a series of reforms to integrate the region into the world economy. That trend has produced positive spillovers and even an increase in global factor productivity. Since 1995 the simple average of most-favoured-nation customs duties, for instance, went down from 24 per cent, while the ratio of trade to GDP increased from 47 to 66 per cent (FEMISE-EIB 2010), and foreign investment flows multiplied by almost seven times between 2002 and 2008, with continuous improvements in the business climate and a newly found interest for emerging sectors.

Nevertheless, the SEMC average growth model has some built-in limitations that prevent the region from catching up more quickly.

First, the model is based mainly on capital accumulation, and before the 2000s, total factor productivity contributed only marginally to growth. Human capital accumulation, while positive, also had a limited effect.

Second, the high growth rates in recent years have been accompanied by increasing inflation (an average regional rate of 8.9 per cent in 2009), mainly because of the SEMCs' vulnerability to international food and energy prices. Among the 10 SEMCs, 7 or 8 are net hydrocarbon importers. Therefore, for the majority of the SEMCs, the rise in oil and food prices could materialize into a loss of roughly 3 per cent of GDP (IMF 2011b). Higher inflation rates have been sustained by expansionary fiscal policies aimed at trying to protect the population from the international crisis—with only limited success.

Third, the SEMCs generally have failed to spread the benefits of growth throughout their societies. While poverty remains lower than in many regions (less than 20 per cent of the population was living below the $2-a-day poverty line in 2005), a large share of the population is close to the poverty line, making them vulnerable to any external shock. The 2007–08 increase in commodity prices produced an uptick in poverty in most countries of the region (World Bank 2009b). Inequalities have grown during the recent economic turmoil, and the countries of the region suffer from an asymmetry in poverty changes over high- and low-growth periods: recessions have larger negative effects on poverty than the positive effects of periods of high growth because of the unequal distribution of gains from growth (World Bank 2010b).

Fourth, the SEMCs lack strong social safeguards. Social protection systems have been highly fragmented, with poor management of resources and varying coverage. They cover a small portion of the population. Workers in the informal sector and in rural areas lack meaningful protection (FEMISE 2009), even though the ratios of social-protection spending to GDP (and government revenue) are quite high. The inefficiency of the system stems from poor allocations of expenditures. In fact, most social safety nets in the region are subsidy schemes, which exert continuous pressure on the fiscal budget. Such schemes generally benefit the rich more than the poor and suffer from considerable leakages (World Bank 2010b).

Fifth, budgets in the SEMC countries have always been under pressure, a trend that will only worsen. During the 2000–07 period, the average fiscal deficit was 4.4 per cent of GDP. Fiscal imbalances jumped on average to more than 5.1 per cent of GDP in 2010 and are expected to increase to 6.7 per cent in 2011. To date, despite the international crisis, external debt remains under control. In 2010 it averaged 52.4 per cent of GDP and is expected to increase slightly to 53.6 per cent of GDP in 2011. The SEMCs have used a share of their past growth to clear debts (FEMISE 2009). Their external debt follows the same path and will stay within the limits of 30–35 per cent of GDP.

Sixth, the SEMCs are undergoing a demographic transition characterized by rapid increases in the total population and potential workforce. The SEMCs' populations are young: almost one SEMC resident in three is under 15 years of age. This means that more than 80 million young people will be competing to enter the formal labour market over the next 20 years and that the SEMCs must attain job-creation rates higher than the growth rate of the working-age population. In fact they were able to do just that for a few years in the mid-2000s but not since 2007; the negative trend may persist with the international crisis. It is expected, for instance, that the number of jobs in the region will increase by about 2.2 per cent, while the working-age population

will increase by 2.7 per cent per year over the next two decades. Even in the 2000s, with an average annual growth rate of 4.5–5.5 per cent, the SEMCs were not able to make significant progress in the labour participation rate (on average less than 50 per cent) or the unemployment rate (on average above 10 per cent, but 25 per cent among those aged 15–24 years; FEMISE 2011a).

# **The Mediterranean** as a hotspot of environmental degradation

The Mediterranean region is a study in environmental contrasts. Although real progress has been made on reducing pollution in the Mediterranean Sea and preserving biodiversity, a great deal remains to be done to properly manage scarce water and energy resources and to mitigate the effects of climate change.

First, the region has to deal with constrained resources. The main issue on this front concerns water. The region is affected by water shortages, both acute and chronic. On average, the SEMCs' inhabitants enjoy less than 1,000 cubic meters (m3) of water per year per capita, and 80 million face water shortages (less than 500 m3/capita/year). Where the deficit is greatest, people resort to so-called nonconventional water resources, such as reusing wastewater and desalinisation. Demand for water has doubled in the past 50 years, with agriculture remaining the top consumer. Diversions, leaks, and waste (particularly in agriculture) still represent nearly 40 per cent of total demand for water. To meet growing demand, countries are increasing their exploitation of non renewable water sources (16 km3/year for the entire region) thereby aggravating the already serious problem of salinization. In this context, economic instruments are expected to optimize the allocation and use of a scarce and unevenly distributed resource. Forests and soils may be regarded as other constrained resources. Historically marked by forests and open grazing areas, the terrestrial ecosystems of the Mediterranean have seen, in the north, a more or less vigorous return of wooded areas as marginal agricultural and grazing areas are abandoned and as reforestation campaigns have taken effect. In the SEMC region, by contrast, pressures on ecosystems remain very strong, particularly in the Maghreb, owing to the clearing of marginal land for cultivation, overharvesting of wood, and overgrazing. The traditional uses for wooded areas and pastures (wood for fuel, grazing), while increasingly outdated in the north, remain essential in the SEMCs. Meanwhile, these areas are increasingly recognized as local and global public goods, essential for the protection of soils and water, for combating erosion and desertification, for absorbing greenhouse gases, and for maintaining biodiversity among animals and plants. But they are regularly ravaged by fire. In the north, the growing incidence of fire touched 600,000 hectares in 2007, entailing costly prevention and containment efforts. Elsewhere in the region, the incidence of fire is lower, but growing (61,000 hectares in the south in 2005; 80,000 hectares in the east in 2007). The risk of fire increases as grazing recedes and brush grows up on pastureland. It will only increase as the climate changes and dry seasons become longer—and even drier.

Second, the land itself is in transition. Coastal zones and cities have to share priorities. The pride of the Mediterranean, its coasts, host an immense natural, cultural, and economic endowment, as well as daunting pressures—chief among them being telluric and marine pollution, urbanization, fishing, aquaculture, tourism, resource extraction, and invasive marine species. Coastal zones shelter two remarkable ecosystems: aquatic habitats for magnoliophyta (such as Posidonia, a key Mediterranean ecosystem) and coralligenous assemblages. It is notable that the Mediterranean contains 7–8 per cent of all known marine species in a sea that represents just 0.8 per cent of the world's oceans. That biodiversity is concentrated in the western basin and in shallow waters (0–50 metres deep). Forty per cent of the Mediterranean coastline has been built up and is occupied. Urbanization is accelerating: two out of three inhabitants of the region live in urban areas. More than half of urban dwellers live in towns and small cities of fewer than 300,000 inhabitants. These urbanized or semi-urbanized spaces are characterized by a dispersion of population and employment and by a twin trend toward peri-urbanization and metropolitanization over ever-greater expanses. The historical vulnerability of Mediterranean cities to meteorological accidents, earthquakes, and coastal erosion will be aggravated by these changes—and by the effects of climate change.

Third, the region has begun to suffer from specific pollution leading to specific issues. The World Health Organization (WHO) in 2006 indicated a strong impact of environment degradation on the burden of disease and above-average impacts in the region's most populous countries. Those negative impacts on health translate into economic development issues as they affect labour productivity and government expenditures. According to the WHO, water quality and air pollution are the main challenges. On a positive note, the heavy metal content of seawater is low and appears to be getting even lower. Eutrophication linked to fertilizer runoff, having risen over the past 20 years, remains confined to certain areas such as the northern Adriatic, the Gulf of Lion, and the Nile Delta. On the other hand, local marine pollution created by cities, industries, and tourist resorts is considerable. Large quantities of macro-waste have been detected on beaches and in the high sea. On another front, in the SEMCs access to sanitation and purification of wastewater lag behind access to potable water, but the situation in the region is much better than the world average. Since the 1990s, with support from regional and international sources, large investments have been made in the SEMCs. As yet, however, not all wastewater has been treated and purified. With the exception of Morocco, where more than 80 per cent of collected wastewater is treated, the SEMCs still lack adequate treatment facilities.

The lack of sanitation and water-treatment infrastructure degrades the quality of water and other resources and makes it

more difficult to supply clean water. Air quality is often a concern in major cities in the SEMCs. Inhabitants are more exposed to outdoor urban or industrial air pollution than to indoor air pollution. Again, the urbanization trend will reinforce the air pollution impact unless strong actions are taken. Waste constitutes one of the most serious pressures on the environment. Closely correlated with the level of economic development and associated changes in consumption and production, quantities of waste products have risen steadily. The organic composition of waste is dropping, while the share composed of materials with a high heat potential is rising quickly, owing to increases in packaging. With regard to toxicity, technological advances have made it possible to reduce the use of some substances (such as heavy metals) that still pose health risks, often because specialized systems to trap them have not been developed (as in the case of small household appliances). Systems of treatment and elimination using methods calibrated to particular waste sources continue in the north and are beginning in the south, through advances in recycling and the recovery of valuable materials.

Fourth, the region is a hotspot of climate change consequences (Plan Bleu 2010). Since 1970, temperatures in south-western Europe (the Iberian peninsula and southwest France) have risen by about 2°C, a rise also detected in North Africa. Changes in patterns of rainfall are already perceptible, with drops of nearly 20 per cent detected in some areas of southern Europe. Climate change is likely to affect the Mediterranean environment in the following ways:

The water cycle will change with increases in evaporation rates and decreases in precipitation. Substantial reduction in flow is expected for the Rhone, Po, and Ebre. The water question is central to the problem of sustainable development in the region because:

- *Soil composition will suffer from advancing desertification.*
- *Terrestrial and marine ecosystems will change.* Some species will move north or to higher ground, while less mobile and more sensitive species become extinct and new species take their places. The sea bottom will gradually become warmer, and low-lying shorelines will be inundated, hastening the erosion of cliffs and beaches.
- *Forests will become more vulnerable to fires and pests.* These changes will affect human activities, particularly agriculture and fishing (reduction in yields and catches), tourism (heat waves, water scarcity affecting tourist areas), coastal zones and infrastructure (increased exposure to waves, coastal storms, and other extreme weather events; advancing salinization; shrinking volumes of groundwater; intrusion of seawater into aquifers), and human health (heat waves).

Fifth, some essential Mediterranean economic activities reinforce the vulnerability of the SEMCs to environmental degradation, in particular, agriculture, fisheries, and tourism. Mediterranean agriculture is largely rain fed and strongly affected by soil and water conditions. The greatest productivity gains over the past 40 years have been achieved in irrigated areas, which have more than doubled during this period. Farming practices, meanwhile, have also changed to maximize yields, notably through specialization and intensification of crops. These improvements have been accompanied by increases in the use of fertilizers and pesticides. Alongside this evolution, organic farming has developed in a heterogeneous fashion, primarily in the north (led by Italy and Slovenia). Despite progress on several fronts, the SEMCs' food dependency has only grown. Water scarcity and the exhaustion of arable land, aggravated by climate change, are likely to continue to affect the region's agriculture. Tourism is essential for every country that borders the Mediterranean Sea. Lying at the crossroads of three continents, the countries of the region account for nearly 30 per cent of all international tourist arrivals, though their share has shrunk in recent years with unrest in the region and the growth of tourism elsewhere. A key source of jobs and foreign exchange, international tourism contributes mightily to the economic development of host countries. But countries in which it is the leading sector of the economy are highly vulnerable to dips in tourist activity. Airplanes and automobiles, the two main forms of transportation for tourists, contribute significantly to atmospheric pollution. And the seasonal nature and geographic concentration of tourism accentuates its environmental impact and puts pressure on water resources (leading to conflicts among users), natural environments (development of the coasts), and waste management. Inland from the coasts, tourism has been slow to develop.

# **Mainstreaming the environment** in economic policies

The specific combination of socioeconomic and environmental constraints just described indicates a sense of urgency, but also a favourable time to make changes. Making the case for adopting a green growth agenda in Mediterranean countries —that is, a set of actions aimed at enhancing the economic benefits of environmental assets—requires analysing the channels by which efficient environmental preservation leads to a high-growth path. This report begins by exploring case studies suggesting that the co-benefits of economic and environmental gains are within reach in a number of sectors, while decision makers face hard choices in other areas. Short-term double-dividend opportunities, for example, are identified in relation to energy efficiency, pollution control, and solid waste management (chapter 1). Decision makers have to deal with trade-offs in the management of freshwater resources, coastal areas, urban development, and fish stocks; that said, it seems possible to improve the productivity of natural assets while ensuring sustainable development (chapter 2). Taking steps to reduce environmental degradation and enhance the benefits from natural assets can result in sizable net job

creation or preservation of existing jobs in various sectors, and in net country-level job creation (chapter 3). One key element of designing effective green policies is to improve the monitoring of environmental actions. Collecting a large array of progress indicators and constructing green national accounts can better inform decision makers in the setting of national and local priorities (chapter 4). Mediterranean countries are currently experimenting with a variety of tools for shifting to green growth, including fiscal reform, the promotion of market-based instruments, and incentives for environmental responsibility. Success stories and best practices can be replicated or adapted to fit a variety of socioeconomic and environmental settings (chapter 5). The report's conclusion proposes that a set of mutually reinforcing policies along the four main axes is required for a shift toward green growth, involving action at both the national and regional level.

CHAPTER 1

# Short-Term Opportunities for Co-Benefits

**In this chapter**

/// Enhancing energy efficiency

/// Enhancing public health by reducing air and water pollution

/// Upgrading solid waste management and resource efficiency

*Case studies on the key sectors of energy efficiency, pollution control, and solid waste management indicate that there is low-hanging fruit within reach. Genuine opportunities to achieve co-benefits exist—that is, actions that can yield positive outcomes for both the environment and economic performance. In most cases, some tangible results could be obtained even in the short term, within one to two years, in local experiments. Such outcomes could be expected to spur the dissemination of best practices and to consolidate and generalize positive results at the country level.*

# Enhancing energy efficiency

The aim of this section is to demonstrate that investing in energy efficiency is a win-win proposition. It is good for the environment, it produces a good return on investment (ROI), and it creates jobs.

Faced with growing concerns about the possible consequences of climate change, mitigation and adjustment have become policy buzzwords. There are many issues and challenges, and actions must be implemented on a very tight timetable, given the warnings issued by the scientific community. To be effective, responses must reflect solidarity between the richest and the most vulnerable countries. Strategies and action plans must focus on the most energy-consuming sectors, marshalling technology to achieve energy savings and reduce greenhouse gas emissions.

Mediterranean countries, located in an area considered as a hotspot of climate change, are especially vulnerable. The region's population could reach 360 million inhabitants by 2030, and primary energy could rise by 50 per cent. In addition, the rapidly increasing energy dependence of the Southern and Eastern Mediterranean Countries (SEMCs) makes it necessary to anticipate heavy investments on the supply side (in renewable energy) and to take bold steps on the demand side (reducing energy consumption).

The SEMCs are experiencing rapid urbanization (over three-quarters of the population in the SEMCs will live in urban areas by 2030) and massive demand for housing. By 2030 experts predict a need for nearly 42 million additional housing units.

Buildings are the leading consumer of electricity and the second-highest consumer of fossil fuels (after transportation). The stakes are high in the building sector because both demand (energy efficiency) and supply (integration of renewables) play a role in improving the situation. Globally, it is estimated that the potential energy savings in this sector are as high as 40 per cent through actions that are already economically viable.

With support from the European Investment Bank (EIB), Plan Bleu produced a study that provides an overview of the construction sector in the SEMCs and analyses what could or should be its place in the context of ambitious policies for the control of energy demand. While the recommendations may apply to the entire construction sector, this report focuses on the residential sector (70 per cent of carbon dioxide [CO2] emissions and 27 per cent of energy consumption can be traced to housing) and especially on new residential housing in the formal sector. Regulatory actions and technical and financial resources for existing buildings and for the informal sector should be further investigated.

The potential for energy savings in the construction sector has not been exploited at fair value, and recent construction practices, based on international standards, are unsuited in most cases to the climate of the SEMCs. In many cases, to be reasonably comfortable, occupants must invest in equipment such as heaters and air conditioners—which are expensive for consumers and society.

Beyond the specificities of the SEMCs, the barriers to action as well as the gains to be had are quite similar to what we can see at the European and global levels. Therefore, the transfer of knowledge and skills through North–South and South–South partnerships should be encouraged in all its forms.

Plan Bleu's analysis of the best practices adopted by Mediterranean countries and of the mechanisms that might permit generalization of those practices to the SEMCs has gelled into two scenarios. The first is the trend, or reference, scenario. The second, the breakout scenario, takes into account the implementation of proactive policies to control energy demand and integrate renewable energy into current supplies. Plan Bleu also conducted a complementary study to assess the job content of the breakout scenario.

The breakout scenario is deliberately ambitious to take into account the above-mentioned stakes. It involves a high number of jobs created compared with other studies. The difference is almost entirely explained by the fact that in the Plan Bleu breakout scenario, investments in energy efficiency are huge. The ratio of jobs created per unit of investment is about the same as in other studies: about 10 jobs created for every €1 million invested.

## *Measures envisioned in the breakout scenario*

The energy-efficiency measures envisioned in the breakout scenario, corresponding to use of the most mature technologies in the SEMCs, are as follows:

- Large-scale dissemination of efficient shells for new buildings (through enforcement of existing thermal regulations, with periodic revisions).
- Gradual elimination of incandescent lamps from the market.
- Thermal renovation of buildings (roof and wall insulation, change of windows).
- Dissemination of efficient household appliances and heating and air-conditioning equipment.
- Dissemination of solar water heaters.

The priority measures for each climate zone, according to their energy-saving potential and economic impact, are given in table 1.1. The impact of two of these measures is detailed below.

**› Table 1.1 Effectiveness of energy-efficiency measures in various climate zones**

| Energy efficiency options or measures | Coastal zone | Mountain zone | Desert zone | Continental zone |
|---|---|---|---|---|
| Roof insulation | Highly efficient | | | |
| Wall insulation | Fairly efficient | Highly efficient | | |
| Window insulation | | | | |
| Solar protection of windows | Highly efficient | | | |
| Natural lighting | | | | |
| Efficient lighting | | | | |
| Solar water heater | | | | |
| Efficient cooling | Highly efficient | | | Not efficient |
| Efficient household appliances | Highly efficient | | | |
| Efficient heating | | | | |
| Lighting by photovoltaic panels | Fairly efficient | | | |

*Source:* Plan Bleu (2011a).

## ***Large-scale dissemination*** *of efficient shells for new buildings*

The large-scale dissemination of efficient shells for new building includes the insulation of the building envelope (roof, walls, and windows) and installation of heating and air-conditioning work. It is anticipated that funding for these measures in new buildings would be $132 billion over 20 years. Plan Bleu estimates the additional cost per 100 square metres at €3,300, which includes the cost of renovation, accounting for €2,500 of the total. Seventy per cent of additional costs are allocated to the initial additional investment in the construction, and 30 per cent is additional spending for energy-efficient equipment, including replacement and maintenance.

The employment effect of requiring energy-efficient shells for new buildings by 2030 is estimated at around 1.3 million jobs in the SEMCs. The first part of the additional investment involves all parts of the building: efficient construction materials (cement, insulation materials, glass) and skilled workers for masonry, roofing, finishing work, and engineering. The jobs related to building and engineering are essentially local. Jobs related to construction materials and insulation may be imported, depending on the state of the pertinent industries in each country.

The second part of the measure creates jobs in plumbing, electricity, and heating (installation and maintenance). Part of the production systems could be imported, according to the level of integration of industrial sectors. Jobs related to installation and maintenance are essentially local. An estimated 10 per cent share of jobs related to manufacturing equipment (insulation and heating and air conditioning) may be created outside the SEMCs, leaving the number created inside the SEMCs at around 1.1–1.2 million jobs.

## ***Thermal renovation*** *of buildings*

The second component—for equipment and maintenance—focuses primarily on the insulation of walls, roofs, and windows. It is anticipated that implementing these measures in new buildings will cost €49 billion over 20 years. The existing housing stock is composed mainly of family housing, and the additional costs for existing housing will be lower than for new housing. In addition, Plan Bleu estimates that the rate of replacement of single windows with double-glazed windows will be low in coastal areas, driving up costs for a 100 square-metre home to €2,500.

These figures assume that the renovations are done by skilled tradesmen. These jobs are local; however, equipment manufacturing (insulation, glass, wood, windows, and so on) may be imported.

Finally, the combination of the five breakout measures may create 2.9 million jobs in the SEMCs by 2030. These estimates take into account informal jobs and relate to gross creation—that is, they do not take into account the displacement or destruction of jobs. These new jobs are also conditioned on the implementation of industrial policies that promote local production of materials and equipment necessary for efficient housing. Given the productivity increase in sectors, job creation may be greater in the early years and lesser in the end.

**› Table 1.2 Employment potential associated with thermal renovation of buildings in 2030 (Syndex estimate)**

| | Universal adoption of efficient shells for new buildings | of which, from initial additional investment | of which, from additional investment in energy efficient equipment |
|---|---|---|---|
| **Total jobs created by 2030** | **1,384,680** | **933,240** | **451,440** |
| Algeria | 349,317 | 235,431 | 113,886 |
| Egypt | 390,228 | 263,004 | 127,224 |
| Israel | 36,715 | 24,745 | 11,970 |
| Jordan | 23,078 | 15,554 | 7,524 |
| Lebanon | 16,784 | 11,312 | 5,472 |
| Morocco | 158,399 | 106,757 | 51,642 |
| Syria | 100,704 | 67,872 | 32,832 |
| Palestine | 22,029 | 14,847 | 7,182 |
| Tunisia | 12,588 | 8,484 | 4,104 |
| Turkey | 421,698 | 284,214 | 137,484 |
| Libya | 31,470 | 21,210 | 10,260 |

*Source:* Plan Bleu (2011a).

# **Enhancing public health** by reducing air and water pollution

The rapid, ongoing process of urbanization exacerbates the health impacts of water and air pollution. Water pollution is particularly worrying in the Mediterranean countries due to freshwater stress, resulting in intermittent delivery and/or chronic shortages. Air-pollution-related health conditions in the SEMCs are mostly related to transportation and industrial emissions, and are, therefore, of a similar nature as in developed countries.

Health is a human right that has both an individual and a macroeconomic impact. In addition to the direct cost for the society in terms of social expenditures, pathologies related to environmental factors affect labour productivity; both result in short- and long-term losses that are an impediment to economic development. Acting to decrease the burden of environment degradation on health will have direct economic outcomes.

Analysis based on individual data can inform decision makers in the design of micro-level actions (with comparatively low cost) that could target the population most affected by the environmental burden of disease. The bottom-up approach and household surveys are efficient tools to reach such an objective.

## *The burden of environment-related disease on economic growth and social equity*

The World Health Organization (WHO) (Prüss-Üstün and Corvalán 2006) shows that environmental degradation impacts the burden of disease and its unequal distribution among developing and developed countries. Several SEMCs perform poorly compared to countries in other regions with comparable per capita income. According to the WHO data, the most populated Mediterranean countries are affected by above-average negative impacts.

On average at the global level, 17 per cent of deaths are due to environmental factors in developed countries, but the figure rises to 25 per cent in developing countries. Children are the most vulnerable, with environmental factors accounting for 36 per cent of their deaths. The number of healthy life years lost to environmental risk factors per capita was about five times greater in children under 5 years of age than in the total population. The total number of healthy life years lost per capita as a result of environmental factors per capita is 15 times higher in developing countries than in developed countries. In the SEMCs, too, the environmental burden of disease falls disproportionately on children and adults from lower-income households. These circumstances affect economic development prospects and social equity through: (i) reduced labour productivity, (ii) reduced female workforce participation, (iii) defensive expenditures reducing the purchasing power of lower-income households and therefore the demand for nonbasic foodstuffs and other superior goods and services, and (iv) defensive government expenditures for preventive and curative public health.

The WHO (Prüss-Üstün and Corvalán 2006) identifies diarrhoea and lower respiratory infections as the two groups of diseases with the largest absolute burden attributable to modifiable environmental factors, which put issues of water and air quality on the forefront. Environmental contributions to diarrhoea and lower respiratory infections account for around 4 per cent and 3.5 per cent of the disability-adjusted life year (DALY), respectively, at the global level. While environmental factors explain around half of the DALY for respiratory diseases, the burden of disease is almost exclusively environmental for diarrhoea.

## *Diseases related to water pollution*

Information available for a number of SEMCs indicates that a sizable share of the population lacks either access to piped water, or a sewage connection, or both (table 1.3). This statistic has not only a human cost but also an economic one. World Bank studies have estimated the cost of water pollution among the SEMCs at 0.6 per cent of gross domestic product (GDP) in Tunisia, 0.8 per cent in Algeria and Jordan, 1.23 per cent in Morocco, and 1.02 per cent in Lebanon in 2000. The cost of air pollution was estimated at 1.2 per cent of the GDP in Jordan, 2.1 per cent in Egypt, 1.02 per cent in Lebanon, 0.94 per cent in Algeria in 2002, and 1.03 per cent in Morocco (Croitoru and Sarraf 2010; METAP 2009; World Bank 2003, 2005). Estimates of monetary benefits from control of water and air pollution are found in a study on the European Neighbourhood Policy Initiative (ENPI) commissioned by the European Union (TenBrink et al. 2011). The benefits that could be obtained through investment aimed at water pollution control have been quantified in terms of number of cases of diarrhoea and number of deaths avoided (table 1.4), as well as in monetary terms (table 1.5).

**› Table 1.3 Population coverage of piped water supply and sewage connection in selected Mediterranean countries, 2008 (per cent)**

| | Piped water supply and sewage connection | Piped water supply but not sewage connection | Not piped water supply but has sewage connection | Not piped water supply and not sewage connection |
|---|---|---|---|---|
| Algeria | 70 | 2 | 7 | 21 |
| Egypt | 40–54 | 38–52 | 2 | 6 |
| Israel | 93–100 | 0–4 | 0 | 0–3 |
| Jordan | 51 | 40 | 2 | 7 |
| Lebanon | 66 | 14 | 0 | 20 |
| Morocco | 44 | 14 | 2 | 40 |
| Palestinian Territories | 63 | 15 | 2 | 20 |
| Syria | 63 | 20 | 7 | 10 |
| Tunisia | 55 | 21 | 2 | 22 |

*Source:* TenBrink et al. (2011).

### › Table 1.4 Estimates of quantitative benefits resulting from water pollution control in selected Mediterranean countries that could be achieved by 2020

| | Annual avoided | | | |
|---|---|---|---|---|
| | Diarrhoea (million cases) | | Deaths (persons) | |
| | Low | High | Low | High |
| Algeria | 7 | 16.1 | 1,313 | 3,024 |
| Egypt | 19 | 43.4 | 1,158 | 2,644 |
| Israel | 0.6 | 1 | 1 | 2 |
| Jordan | 1.5 | 3.2 | 55 | 119 |
| Lebanon | 0.7 | 1.6 | 11 | 24 |
| Morocco | 8.2 | 16.3 | 1,410 | 2,794 |
| Palestinian Territories | 1.2 | 2.6 | 88 | 193 |
| Syria | 4.9 | 11.3 | 234 | 536 |
| Tunisia | 2.2 | 4.7 | 79 | 168 |
| **Total** | 45.3 | 100.3 | 4,349 | 9,504 |

*Source:* TenBrink et al. (2011).

### › Table 1.5 Estimates of monetary benefits resulting from water pollution control in selected Mediterranean countries that could be achieved by 2020

| | Annual benefits (million euros at purchasing power parity, PPP) | | | |
|---|---|---|---|---|
| | Total | | Total (% GDP) | |
| | Low | High | Low | High |
| Algeria | 1,142 | 2,630 | 0,40 | 0,93 |
| Egypt | 1,231 | 2,809 | 0,26 | 0,60 |
| Israel | 124 | 227 | 0,06 | 0,11 |
| Jordan | 86 | 186 | 0,24 | 0,52 |
| Lebanon | 76 | 169 | 0,30 | 0,30 |
| Morocco | 672 | 1,333 | 0,50 | 0,99 |
| Palestinian Territories | 4 | 99 | 0,32 | 0,70 |
| Syria | 250 | 572 | 0,24 | 0,54 |
| Tunisia | 182 | 387 | 0,22 | 0,48 |
| **Total** | 3,808 | 8,412 | 0,28 | 0,57 |

*Source:* TenBrink et al. (2011).

## BOX 1.1 Linkages between health and water scarcity in Jordan

As part of the Health and Environment Linkages Initiative (HELI), in 2004 the WHO and United Nations Environment Programme (UNEP) conducted a pilot project analysing the impact of water-saving measures on health and the environment in Greater Amman. The case is interesting because Jordan is among the 10 countries most affected by water scarcity. Only about 160 cubic metres (m3) of water per capita is available for consumption each year; in other words, only 70 per cent of total water demand is being met. With the support of various ministries, the analysis of the impact of water scarcity on health found that the insufficient availability of water was related to an increased incidence of diarrhoea in the population. The study found that 40 per cent of the population of Greater Amman, including 26 villages in north and south Jordan (more than 300,000 connections), consumes less than 50 litres per day (according to data provided by the Ministry of Water and Irrigation and the French-British-Jordanian consortium, LEMA). The project included three phases, of which one was dedicated to an economic evaluation of health and environmental benefits to establish the cost-benefit ratios of different options: business as usual, a "midway scenario" (significant investments to improve the efficiency of water use over the period 2005–10), or a "mainstreaming scenario" (significant investment in the aim of achieving the best performance in the agricultural and domestic markets over the period 2005–15). The evaluation concluded that the scenarios would result in cost-benefit ratios ranging from 1:1.8 to 1:2.4, that is, each Jordanian dinar (JD) invested generates from 1.8 to 2.4 JD in profits.

**Overall cost benefit of water-efficiency measures**

Millions of Jordanian dinars

| Scenario | Environment/ water resource benefits | Health benefits | Environment/ energy resource benefits | Investment costs | Benefit/cost |
|---|---|---|---|---|---|
| Capital investment (2005–10) Benefit stream (2005–15) | 262.70 | 27.30 | 34.98 | 178.87 | 1.82 |
| Capital investment (2005–15) Benefit stream (2005–25) | 463.10 | 60.95 | 64.79 | 246.67 | 2.39 |

*Source:* Prüss-Ustün et al. (2008), reported in Samri (2011).

## *Diseases related to air pollution*

Air pollution has an impact on health via two main channels: outdoor and indoor pollution. Outdoor pollution refers to air quality that is degraded by vehicles and industry. These circumstances are most common in urban areas. The consequences for health include an increase in the risk of acute (for example, pneumonia) and chronic (for example, lung cancer) respiratory diseases as well as cardiovascular diseases. According to the WHO, by reducing the annual mean outdoor concentration of particles (PM10) from 70 to 20 micrograms per cubic metre, 15 per cent of deaths from air pollution can be averted. Reaching these lower levels of air pollution will also reduce respiratory and cardiovascular diseases as well as increase life expectancy among local populations.

It appears that, although people in developing countries are usually more exposed to indoor air pollution than to outdoor air pollution (whereas developed countries strongly suffer from outdoor air pollution), the SEMCs are closer to developed countries in terms of air pollution risk. This is well documented in Egypt in particular; most households use fossil fuels (liquefied petroleum gas [LPG], natural gas, or kerosene) for cooking, which are low risk from an indoor air pollution standpoint. Thus, Egyptians are more exposed to outdoor urban or industrial air pollution than to indoor air pollution. The EU (2011) provides estimates of monetary benefits that could be achieved through air pollution control.

**› Table 1.6 Estimates of monetary benefits resulting from air pollution control in selected Mediterranean countries**

| | Euro at PPP | | % of GDP | |
|---|---|---|---|---|
| | Low | High | Low | High |
| Algeria | 248 | 805 | 0,1 | 0,3 |
| Egypt | 7,149 | 23,185 | 1,6 | 5,1 |
| Israel | 1,556 | 5,017 | 0,1 | 0,2 |
| Jordan | 213 | 690 | 0,6 | 1,9 |
| Lebanon | 263 | 853 | 0,6 | 1,9 |
| Morocco | 1,022 | 3,314 | 0,8 | 2,4 |
| Palestinian Territories | 40 | 129 | 0,3 | 0,9 |
| Syria | 369 | 1,196 | 0,3 | 1,1 |
| Tunisia | 401 | 1,300 | 0,5 | 1,7 |
| **Total** | 11,260 | 36,519 | | |

*Source:* TenBrink et al. (2011).

## ***Evidence*** *from micro-level data*

### BOX 1.2 Improvements in fuel quality in Morocco

The replacement of dirty diesel (10,000 parts per million, ppm) with clean diesel (50 ppm) on the national market took effect in April 2009. The measure required an $850 million upgrade to SAMIR, Morocco's sole refinery. The shift to a fuel containing 200 times less sulphur will improve air quality.

This achievement was made possible by the strong commitment of the Mohamed VI Foundation to environmental protection. In 2002 the foundation initiated the "Quality Air" programme, with an aim to improving air quality through decreed control of exhaust gases. One of the signature measures of the programme was the introduction of 350 ppm diesel in August 2002. More recently, the foundation is piloting an eco-epidemiological air-quality-monitoring system known as "Casa Air Pur" in metropolitan Casablanca. It is also implementing campaigns to raise popular awareness about air pollution.

*Source:* Partnership for Clean Fuel and Vehicles (2011), reported in Samri (2011).

A review of country-level studies analysing the links between environmental conditions and human health using household survey data reveal a lack of pertinent microeconomic research on the SEMCs; exceptions are Abou-Ali (2003) and Deveto et al. (2011).[7]

The quality of infrastructure and access to water and sanitation are the main determinants of the prevalence of diarrhoea. The neighbourhood seems to play a major role, but other factors should be taken into account, including the availability of information about drinking water contamination to encourage households to purify their water.[8] Enhancing mother's education reduces the mortality risk. Evidence related to air pollution shows that the impact of the different sources of air pollution depends on the level of development of the country (Van der Klaauw and Wang 2011; Jacoby and Wang 2004; Boy, Bruce, and Delgado 2002; Pitt, Rosenzweig, and Hassan 2006).

Microeconomic analysis based on household data reveals that although Egypt has one of the highest connection rates to piped water among the SEMCs, inadequate access to safe water still has a sizable impact on child health. This suggests that the situation could be worse in other countries where the connection rate is lower (box 1.3). In the meantime, an analysis of individual data allows an identification of districts with the highest prevalence of morbidity. Such information can be used by decision makers to determine priorities in the allocation of public health expenditures and investment in infrastructures aimed at upgrading water access and sanitation.

## ***Spatial distribution*** *of negative externalities and the environmental burden of disease*

The issue of water and air pollution has specific spatial dimensions. Not all parts of a country are hit in the same way. A strong correlation is usually observed between district-level

7. Existing studies on the impact of air and water pollution using household data cover America (Argentina, Brazil, Peru, Guatemala), Asia (China, Philippines, Bangladesh, India, Malaysia, Indonesia, Vietnam), and Africa (Ethiopia, Kenya, Ghana). Evidence related to water pollution is presented particularly by Jalan and Ravallion (2003); Fink and Günther (2010); Fink, Günther, and Hill (2010); and Van der Klaauw and Wang (2011).

8. Result from a random experimental approach (Jalan and Somanathan 2008).

## BOX 1.3 Case study on water access in Egypt using Demographic and Health Surveys (DHS)

This case study, undertaken as part of the *2012 MED Report*, seeks to evaluate the impact of a defective access to water on child health based on a representative cross-sectional DHS of Egyptian households collected in 2008.

Since it is impossible to observe the situation of individuals both with and without defective access to water, impact evaluation determines a counterfactual so as to isolate the effects of access to water from other factors. This is implemented through the use of a control group, which is compared to the treatment group.

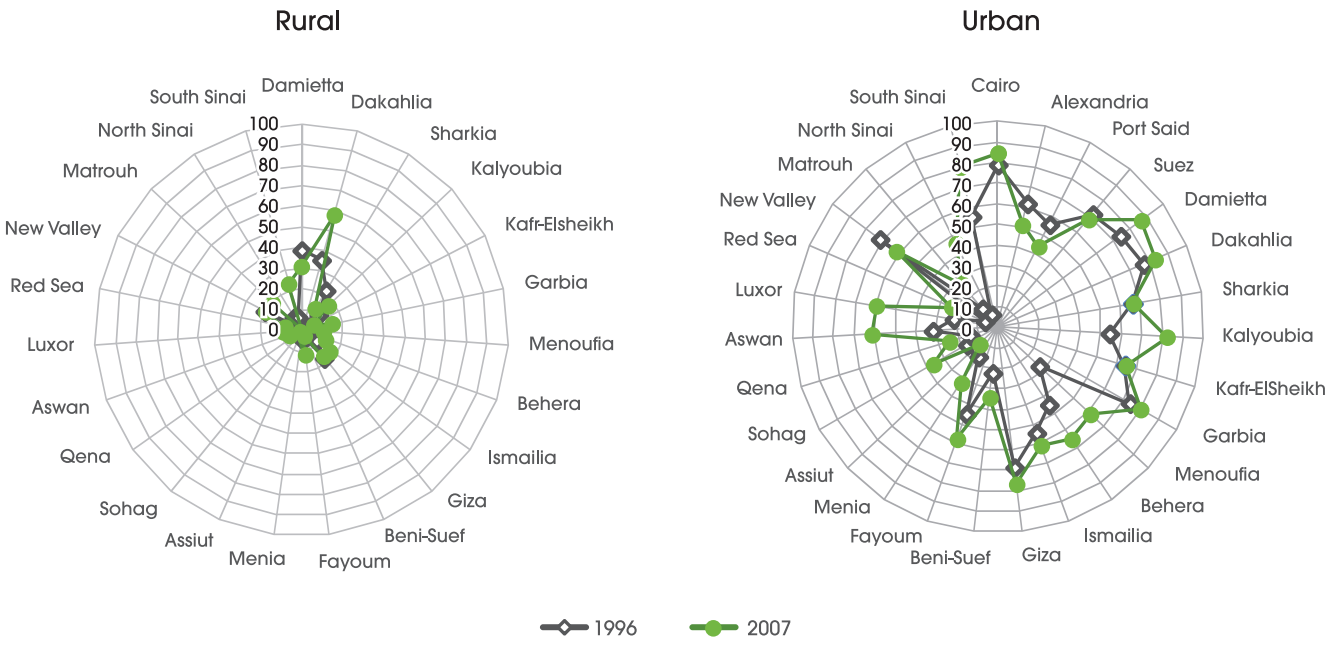
An overall and significant difference on the prevalence of diarrhoea between the two groups is found. The impact on diarrhoea is about 4.5 per cent higher for children facing defective access to drinking water. Including water cut-offs in the definition of defective access provides an overall and significant difference with a mean value of about 2.5 per cent. These findings suggest that despite an extended connection rate to piped water the problem relating to water access and water quality remain important.

*Note:* The overall household response rate was 99.1 per cent.

prevalence of diseases and average income levels and, within areas of high prevalence, the poorest households are proportionally more affected.

Governorate-level average data for water sanitation in rural and urban areas (figure 1.1) show that a sizable regional variance exists. Low levels are observed in some urban areas of Upper Egypt, which suggests that high social returns could be obtained from investment focused on these areas. The rural-urban divide is also striking. As the percentage of poor households is higher in rural areas, there is a strong correlation between poverty and water quality.

### ◊ Figure 1.1 Governorate-level water sanitation in urban areas of Egypt (% of households)




*Source:* Abou-Ali (2009), based on data supplied by the Ministry of Health and Population.

# Upgrading solid waste management and resource efficiency

Due to rapid population growth, industrialization, and urbanization, a 50 per cent increase in waste generation is expected over the next 15 years in the SEMCs (Sherif 2010).

The combination of social demand and commitment of public authorities has resulted in an increase in the volume of municipal solid waste (MSW); the cost of these services is therefore rising and municipalities have to find new resources to finance the upgrading of waste management (see, for example, Abu Qdais 2007).

Different strategies are being explored in the SEMCs to improve recovery rates and generate new revenues, particularly through the Clean Development Mechanism (CDM) and the charging of fees. In the meantime, waste valorisation through composting has the potential to generate new economic activities and financial resources (SWEEP-Net 2010).

## *The municipal solid waste situation in the SEMCs*

The combined volume of MSW for Algeria, Egypt, Jordan, Lebanon, Morocco, Syria, Tunisia, and Turkey is around 68 million tonnes per year (table 1.7). More than 50 per cent of the population of the SEMCs lives in urban areas and generates 0.6–1.2 kilograms (kg) of solid waste per capita per day, or 220–440 kg per capita per year. Cointreau (2007) notes that developed countries generate 1.4 kg per capita per day, middle-income developing countries 0.8 kg, and low-income countries 0.6 kg. The projected economic development and urbanization in the SEMCs during the coming 15 years is expected to increase the waste tonnage by around 50–60 per cent (Sherif 2010). If this estimate of an increase of 50 per cent is correct, then the eight countries listed here will generate more than 100 million tonnes of MSW per year by 2025.

Since the mid-1990s MSW has attracted public attention—and, subsequently, government attention—in the SEMC region. Poor management of MSW results in negative externalities for the environment, public health, and economic development (UN Habitat 2010). Upgrading waste management systems to suit changing volumes and the composition of solid waste could make a major contribution to sustainable growth.

Waste in the SEMCs is composed of 50–70 per cent organic content compared with 20–25 per cent in developed countries. The proportion of recyclable materials (plastics, glass, paper, and metal) ranges from 22 per cent (Morocco) to 40 per cent (Jordan) of the waste generated. The economic development of the SEMCs will lead to an increase in the share of recyclable materials and a decrease in organic content. The SEMCs therefore have a big opportunity over the next decade to increase the valorisation of waste products. The percentage of MSW recycled is actually less than 10 per cent and the valorisation of waste through compositing activities is still negligible in most SEMCs—it is just 9 per cent in Egypt and Lebanon and far lower in other countries in the region (table 1.8). The waste management system must be updated to suit the quantity and composition of waste to be an advantage to sustainable growth and not an obstacle.

## *Political, institutional, and legal situation*

From 2000 to 2010, all of the SEMCs made important progress in their solid waste management systems (Sherif 2010). The most important characteristics of this progress are improvements in MSW collection and disposal coverage, sanitary landfills, closure of old dumps, and increased recycling and recovery activities (Sherif 2010). Tunisia appears to be the best prepared politically, institutionally, and legally—it has had acceptable frameworks in place since 2000. During the past decade, Morocco, and, to a lesser extent, Algeria and Syria, made the greatest efforts to improve their MSW management; their situation in 2000 was the worst in the region, and they are just catching up. Some important progress remains to be made: Egypt and Lebanon have to improve their currently incomplete legal, regulatory, and institutional frameworks; Algeria, Syria, and Jordan have to increase participation of the private sector in waste collection and disposal.

**› Table 1.7 The municipal solid waste situation in the Southern and Eastern Mediterranean, 2009**

| | Morocco | Algeria | Tunisia | Egypt | Jordan | Lebanon | Syria | Turkey |
|---|---|---|---|---|---|---|---|---|
| MSW generation (million tonnes/year) | 5 | 8.5 | 2.3 | 19.7 | 2.0 | 1.6 | 4.5 | 24.4 |
| Per capita MSW generation in urban area (kg/day) | 0.8 | 0.7–0.9 | 0.6–0.9 | 0.7–1 | 1.0 | 0.9–1.1 | 0.6–0.7 | 1.2 |

*Source:* SWEEP-Net (2010), except for Turkey (Turkstat, www.turkstat.gov.tr).
*Note:* MSW = Municipal Solid Waste.

**› Table 1.8 Municipal solid waste composition and reuse, 2009**

Per cent of total waste

| | Morocco | Algeria | Tunisia | Egypt | Jordan | Lebanon | Syria | Turkey |
|---|---|---|---|---|---|---|---|---|
| Organic | 67 | 62 | 68 | 60 | 56 | 63 | 65 | 50–55 |
| Reusable | 22 | 24 | 26 | 27 | 41 | 33 | 28 | 30 |
| Other | 11 | 14 | 6 | 13 | 3 | 4 | 7 | 19 |
| % of MSW composted | <1 | 0 | <1 | 9 | 0 | 9 | 2 | 1 |
| % of MSW recycled | 9 | 4–5 | <1 | 2.5 | 10 | 8 | 3 | n.a. |

*Source:* SWEEP-Net (2010), except for Turkey (Turkstat, www.turkstat.gov.tr).
*Note:* MSW = Municipal Solid Waste
n.a. = Not applicable.

## *Financial considerations*

As discussed above, most of the SEMCs have improved—and are actively seeking to further improve—their MSW management services (box 1.4). But the cost of solid waste services is increasing and local government bodies have to find a way to finance it. There are two main financial needs: the ordinary MSW collection cost and the long-term infrastructure cost. To finance MSW services, the SEMCs need to raise collection fees; in many SEMCs, there is no specific MSW cost-recovery system. Recent experiences in Jordan have shown that the recovery rate can be dramatically improved—Amman boasts a 60 per cent cost-recovery rate (GTZ-ERM-GKW 2004). MSW collection fees could be collected inexpensively via the electricity bill, as in Egypt and Jordan. An important challenge for the SEMCs in the coming years will be to establish an efficient cost-recovery system.

Financing waste management infrastructure requires long-term capital. A national scheme in Tunisia gives municipalities access to low-interest loans. The CDM has the potential of becoming an important source of revenue to complement other sources of long-term capital. The SEMCs currently have a modest share of the global carbon market with less than 1 per cent of the registered projects, which is the same level as Honduras (Biscaglia 2010). Projects under CDM are opportunities for the SEMCs to get financial support for long-term investment while attracting international firms for collaboration and reaping technological spillovers from them. According to Sherif (2007), carbon sales revenues are commonly in the range of 10 to 50 per cent of total revenues for power and waste management projects. He underlines that, in Tunisia, CDM could generate $6 million of the $23 million needed for solid waste management projects. The complexity of CDM procedures can be solved with international assistance.

### BOX 1.4 Public-private partnership in Egypt

A public-private partnership between worldwide environmental services company Veolia and the Governorate of Alexandria not only improved the region's environmental situation, but also led to multiple positive externalities: 4,500 jobs were created in the formal sector with better work conditions for waste pickers and training sessions for workers as well as valorisation of waste though composting. In addition, Alexandria became more attractive for investors and tourists. Key elements of this success were the involvement of the local authority (Governorate of Alexandria) and the CDM procedure with the World Bank (UN Habitat 2007; Veolia 2006). Thanks to the quality of the waste management system, the Governorate of Alexandria has won the "Metropolis" first prize for global waste management and the cleanliness of its public places. But since 2007 the situation has deteriorated somewhat because of a change in local authorities' relations with Veolia and the problem of informal waste pickers, who compete with formal recycling activities. This case study underlines the importance of political and institutional arrangements.

### BOX 1.5 Eco-Lef in Tunisia

The Eco-Lef programme, which concerns the recycling of packaging waste using a pay-by-weight system, is a successful operation and generates numerous positive economic effects: higher collection of plastics and metal; creation of job opportunities in the formal sector; creation, partly by university graduates, of 200 micro-firms specialised in recycling; and creation of a national market of plastic reuse and exportation of plastic waste (METAP 2004). Producer responsibility as well as successful experience with the active development of plastics recycling via Eco-Lef in the city of Sousse was underlined as remarkable by the UN Habitat report "Solid Waste Management in the World's Cities" (UN Habitat 2010). Sousse also took up the challenge to prevent plastics from entering the waste stream and set up the Shams project. The campaign is very intensive and includes door-to-door collection of the waste separated at the houses of about 5,000 inhabitants. To finance the Eco-Lef system, Tunisia developed multiple financing sources: participation fees, ecological taxes, and the CDM of the World Bank Carbon Finance program.

CHAPTER 2

# Maximizing the Productivity of Natural Assets While Dealing with Trade-Offs

**In this chapter**

/// Optimizing water supply and quality

/// Managing coastal areas to maximize ecosystem services and sustainable tourism

/// Moving toward sustainable urbanization

/// Cooperating to make fisheries sustainable

*Decision makers face hard choices and trade-offs in the management of freshwater resources, coastal areas, urban development, and fish stocks; nevertheless, it does appear possible to improve the productivity of these natural assets while ensuring sustainable development.*

# **Optimizing** water supply and quality

In the Mediterranean region the volume of water withdrawn (from natural water resources) and produced (thanks to nonconventional water resources, such as treated wastewater reuse and desalination) doubled over the second half of the twentieth century. Future analyses also suggest that in a business-as-usual scenario, the pressure exerted on resources will intensify by 2025 (Benoît and Comeau 2005).

***Key messages***

*Effective demand management reduces water tensions.*

*Improving water services brings significant social and economic benefits.*

*Paying for environmental services and improving institutions and allocation systems significantly reduces the costs of the investments needed in the water sector and its negative externalities.*

## ***Reducing water tensions*** *through effective demand management*

Irrigation accounts for almost 65 per cent of water withdrawals throughout the whole of the Mediterranean, possibly even exceeding 80 per cent in the Southern and Eastern Mediterranean Countries (SEMCs). Total water-use efficiency for the Mediterranean countries stands at between 50 and 85 per cent (Thivet and Blinda 2007).

But in some countries, the share of abstractions dedicated to electricity production (storage in hydroelectric dams or for cooling thermal power stations) may also prove significant. Although only a tiny share is consumed, these abstractions nonetheless have a major impact on water system quality by limiting sediment and fish transit, creating a pollution risk (thermal pollution by power stations), and limiting the dilution or self-cleansing capacity of rivers when hydroelectric dams' releases do not coincide with periods of low water.

For domestic and other industrial water uses, final consumption levels are also low. More than 80 per cent of the water is actually returned to the environment as wastewater, its quality being more or less affected according to the wastes it contains (black water and grey water from domestic effluents, water from commercial establishments including hospitals, industrial effluents including hazardous chemicals, storm water, and other urban runoff) and to the type of treatment applied.

In the Mediterranean supply-driven policies have reached the physical, financial, and environmental limit of their ability to deal with water scarcity. Trends lead to an unsustainable gap between supply and demand, worsened by the impacts of climate change on hydrology and evapotranspiration. Improving the efficiency of water use and allocation can effectively limit water crises. In this region, agriculture is a key factor to unlock the "water potential."

Water Demand Management (WDM) is a set of technical, political, institutional, economic, training, and awareness-raising tools intended to encourage better use of existing water supply before considering increasing supply. WDM thus encompasses measures intended to improve water use efficiency both within the various uses and between uses.

WDM can unlock significant water volumes: in 2005 losses and minuses represented 40 per cent of the total Mediterranean region's water demand. By 2025, improving water-use efficiency could save the equivalent of 25 per cent of the total future regional water demand (Benoît and Comeau 2005; Thivet and Blinda 2007).

In various Mediterranean case studies (UNEP 2011; Plan Bleu 2010; Jagannathan, Shawky, and Kremer 2009; Rinaudo 2008a, 2008b; Maton 2008; AFD 2008; World Bank 2007; Kayaga and Smout 2007; Brooks, Thompson, and Fattal 2007; Maggiera, Taha, and Nolte 2006; Baroudy, Lahlou, and Attia 2005), WDM has also proved to be a more cost-effective and generally better way to allocate limited financial resources than, for instance, dam building, water transfers, or desalination, globally (box 2.1) and in areas facing water scarcity (box 2.2).

## BOX 2.1 Economic evaluation of water savings across the Mediterranean

In 2010 Plan Bleu carried out an economic analysis based on a set of the Mediterranean case studies: the Tensift basin (Morocco), the Hérault region (France), the Ardèche basin (France), the Karditsa region (Greece), the Guadalquivir basin (Spain), the IPEST university establishment (Tunisia), the Amman-Zarqa basin (Jordan), and the Gabès oasis (Tunisia). The evaluation was based on a cost-efficiency analysis and the evaluation of discount rates and payback periods. The main conclusions of the comparative analysis of the case studies are presented here.

### *When comparing measure-by-measure analysis (unit economic results)*

In the drinking water sector:

- Where the drinking water supply network's initial yield is low, the most effective solutions entail the reduction of leakage from the network.
- Installing water-efficient appliances is an effective solution for users and the service provider only when the additional demand that can be connected to the water supply network without exceeding its capacity is rising.

In the irrigation sector:

- Publicly owned and operated gravity-fed distribution canals can be optimized by pressurising them. Moreover, significant volumes can be saved by renovating or waterproofing the supply system: leakage may represent as much as 30 per cent of abstractions.
- The effectiveness of measures to improve hydraulic efficiency within the public supply system and in irrigated areas largely depends on the systems' initial hydraulic efficiency and irrigation techniques.

For instance, in the Western Hérault study, the unit cost of water may triple depending on the initial hydraulic efficiency of the irrigation system.

The case studies also reveal major spatial variability in cost-effectiveness ratios, particularly in the case of conversion to localized irrigation techniques. Under the Syrian national programme for converting to modern irrigation, for instance, it costs twice as much per hectare to convert from gravity fed to drip irrigation than to convert from gravity-fed to sprinkler and enhanced gravity-fed systems.

Analyses conducted in the field of agricultural water use tend to be limited to financial costs, without factoring in economic and environmental externalities. Moreover, of these financial costs, often only investment costs are included, while operation and maintenance (O&M) costs tend to be ignored. But the various irrigation techniques have different O&M costs: these costs also influence the attractiveness of a technical solution. Thus, for example, in the Guadalquivir basin, irrigators with pressurised systems spend on average 10.5 per cent of their gross income on water, while irrigators using gravity-fed systems spend only about 4 per cent.

None of the evaluations take into account the positive external effects that may stem from losses within networks, such as aquifer replenishment.

WDM measures may be of economic interest to irrigators since they secure their water supply, promote more efficient water use, and even increase the volume allocated to agriculture if water is a limiting factor. In that case, WDM measures do not release water for other uses or into the environment. The redistribution of water to other uses depends on the introduction of incentives or contractual or coercive measures, allowing for more flexible water rights. The results suggest that enforcing abstraction regulations may prove cost-effective.

For other uses:

- Allowing for more flexible use of the water stored in existing reservoirs is effective.
- Solutions aimed at limiting diffuse pollution are effective.
- Solutions involving increased supply, such as transfers or seawater desalination, are least effective.

### *When looking at entire projects*

Aside from measure-by-measure evaluations, the studies also assessed the cost-effectiveness ratios of various combinations of measures according to their goals: either to ease pressure on the environment or to meet new anthropogenic demand:

- Besides being the most cost-effective, measures reducing leakage in the network and the installation of water efficient appliances may make a significant contribution toward meeting future drinking water demand.
- Various elements need to be taken into account in project design:

  – The large spatial variation in the effectiveness of certain measures.

  – The significance of seasonal variability in the effectiveness of the measures.

  – Only measures with a negative ratio are likely to be spontaneously implemented, since they represent a clearly identified net profit for the beneficiary of the measure. Measures with low but positive ratios, on the other hand, generally demand collective financing (public, international, or some other source), particularly those that are related to indivisible investments with high fixed costs.

*Source:* Plan Bleu (2010).

## BOX 2.2 Managing water scarcity in the Neste system

The Compagnie d'Aménagement des Coteaux de Gascogne (CACG) was created in the early 1960s as a regional development agency for the southwest of France (Gascony), focusing on hydraulics and agriculture. The CACG was more specifically in charge of managing the Neste system, that is, all the rivers of Gascony that are recharged by a canal withdrawing water from the Neste River, an upstream tributary of the Garonne River.

Between the 1960s and the mid-1980s, the CACG mainly developed water supply (that is, dams and irrigation networks), while riparian individual irrigation also significantly increased within the Neste River system. At the end of the 1980s, the Neste River system faced a significant crisis, with increasing conflicts among users intensified by recurrent and intense drought periods. To solve it, the CACG fostered the creation of a users' community (the "Neste commission") and negotiated the implementation of a combination of contractual and economic instruments to manage water scarcity, including step pricing (discontinuous series of price levels, increasing with water demand) and quotas (defined according to rate and volume limits). To do so, a waiting list for quota redistribution had to be defined and agreed upon collectively. When the quota is exceeded, the marginal price of water dramatically increases. The contract fixes penalties for the user (in case of withdrawing above the subscribed flow or lack of water meter) and for the CACG (in case it had to reduce the quota because of a lack of supply prediction and management). Water price is based on the "sustainability cost," or the full cost of the water less the cost of the initial investment. With such a price, no new investment is possible, but budgetary constraints are met and sustainable O&M is ensured without having to resort to public funding. This integrated system developed to manage water scarcity has lasted since then, while also being regularly negotiated and adapted within the Neste Commission. In other words, it has become an "institution".

*Source:* Tardieu (2008).

## *The social and economic benefits of improved water services*

The World Health Organization (WHO) estimates returns of $3 to $34 for each $1 invested in safe drinking water and basic sanitation, depending on the region and technology used (World Water Assessment Programme 2009). In the Palestinian territories, the Word Bank estimated the cost of polluting domestic water in West Bank aquifers, from solid waste leakage and domestic wastewater, to be $6.5 million in 2005. The avoidable costs of disease in 2005, if small-scale wastewater treatment plants were implemented in all rural areas of the West Bank, were estimated at just under $8 million (Shankar and Abu-Ata 2004).

Drinking water accessibility and quality carry important technical, financial, social, political, and sanitation challenges. A first step in addressing these challenges is to better grasp the social construction of water services, their collective funding, and the rules that legitimate their functioning.

Water services are defined as the provision of water of a given quality, quantity, and reliability at a specific location. The definition emphasizes outputs—what people receive—rather than infrastructure: how to define drinking water and sanitation services that are financially, equitably, and sanitarily sustainable?

When water network supply is unsatisfactory, consumers cope by installing storage tanks or private pumping and treatment facilities, or by paying for expensive alternative water supplies. But the poorest consumers must spend labour and time fetching water from public outlets (Lee and Schwab 2005).

In most urban public water systems around the world, charges often barely cover recurrent O&M costs, leaving scant, if any, funds to recover the capital costs of modernization and expansion. According to a survey in 132 cities in high-, middle-, and low-income countries, 39 per cent of the cities did not recover even their O&M costs. There are three possible sources of financing: user tariffs, local and national public expenditure, and external aid. Recourse to these sources should be preceded and accompanied by efficiency measures to control operating costs and by careful project selection and design to ensure the best return on scarce resources (World Water Assessment Programme 2009), including the comparative evaluation of collective (network-based) and autonomous solutions for drinking water and sanitation services.

Water as an urban service is framed by policies reflecting compromises among at least partly conflicting concerns: efficiency, social equity, service management, and expansion (Jaglin and Zérah 2010). Territorial and social equalization systems developed for water pricing are always based on specific compromises. They are dynamic conventions that require regular public scrutiny and adaptation (Touzi, Barraqué, and Treyer 2010).

Access to safe water, sanitation, and hygiene also represents a significant health stake (Rajab 2006; Yassin, Amr, and Al-Najar 2006; Ayoub and Malaeb 2006; Mohamed et al. 1998).

In the Mediterranean, treated wastewater (TWW) reuse systems can be an effective solution to deal with local water tensions (at a national or regional level, TWW only amounts to 3 per cent of the water demand), as well as environmental and sanitary issues. The more critical the water scarcity is, the higher the extent of wastewater reuse, irrespective of its quality

parameters. But the safe and controlled reuse of wastewater requires a functioning sanitation system. Wastewater can be valued for various uses, such as for agriculture, urban uses other than drinking, golf courses, aquaculture, industries, groundwater or wetlands recharge, or keeping river flows from falling too low. These uses require different water-quality levels and associated treatment technologies. Like any other hydraulic project, the TWW reuse projects face constraints related to transport and storage, including temporal discrepancies between wastewater supply and reuse and water-quality issues involving bacteriology, salinity, and heavy metals (BRL 2011; AHT Group AG 2009a, 2009b, 2009c) (box 2.3).

## BOX 2.3 Reusing wastewater

*Tunisia*

In the Hammamet region, the Office National de l'Assainissement (ONAS) implemented a tertiary treatment system to allow Hammamet wastewater to be reused by two golf courses. The objectives were to (i) reduce the pressure exerted on the overexploited coastal aquifer, (ii) reduce the wastewater discharges on the coastline, and (iii) provide water to the golf courses. In addition to the ONAS, the Commissariat Régional de Développement Agricole (CRDA), the Agence Nationale de l'Aménagement du Territoire (ANAT), Tunisia's health and tourism ministries, and the golf managers actively contributed to the project design and financing. The project created 170 jobs and contributed to the maintenance of the touristic attractiveness of the region. But reducing the exploitation of the coastal aquifer greatly depends on the economic and institutional measures accompanying this innovation.

*Jordan*

Jordan is one of the most water-deprived countries of the Middle East and has some of the highest groundwater depletion rates. In 2000 the Jordanian authorities faced a major problem: Amman's treatment plant became saturated due to rapid urbanization, leading to a significant increase in pollution of the Zarka River and its associated King Tahal dam, with eutrophication risks that were detrimental to downstream irrigating farmers. The Water Jordan Authority (WJA) and Jordan Valley Authority (JVA) decided to build a bigger treatment plant allowing downstream water reuse. The project was based on a public-private partnership (build, operate, and transfer); the private operator charged urban users fees, while the JVA billed the farmers. The results were very positive. The water quality level was high enough to allow its direct reuse in fruit and vegetable production. More than 3,500 direct jobs have been created, along with around 20,000 indirect jobs.

The water transportation costs of the project are limited since the treated wastewater is discharged by gravity into the river. Today, more than 70 million cubic metres (m3) of reclaimed wastewater are used either directly or indirectly each year in Jordan, making up around 10 per cent of the total national water supply. This progress is due to the steady evolution of Jordan's wastewater policy framework. Standards governing wastewater use have gone through four iterations. Initial standards were introduced in 1982 but were replaced first with the 1989 WHO Guidelines and then, in 1995, with a more comprehensive set of standards dealing with wastewater use and environmental discharges.

Finally, in 2003 more stringent standards were promulgated following a multiyear consultation process with stakeholders. Under the new standards, groundwater recharge is permitted, but not for potable use. Jordan's experience demonstrates that wastewater use has great potential in water-scarce areas, but that planning for wastewater use must be integrated coherently with water resources planning, environmental management, and financial arrangements.

*Source:* BRL (2011); Bartone and Mara (2010).

## ***The benefits of paid environmental services,*** *better institutions, and more-efficient allocation systems*

Is it more effective to pollute and then treat water than to avoid polluting in the first place? Not always, especially when an increasing number of parameters have to be taken into account and when dealing with nonpoint source pollution.

This reality makes it necessary to renew the relations that govern water and territories thanks to instruments such as payments for environmental services, incentive pricing for decreasing the amount of wastewater produced, improvements to hydrosystems' autofiltration capacities, and a larger range of technological solutions.

Investing in the ecosystem service of water purification can be an effective alternative to building expensive treatment plants (Salzman 2005). Maintaining wetlands on the flood plains can contribute to flood control (Salzman, Thompson, and Daily 2001; Ferraro 2008). In Syria, Greece, Italy, Morocco, Algeria, and Egypt, watershed protection is the most valuable forest benefit, and in Tunisia it is second only to grazing (Croitoru 2007). In Croatia, Egypt, Tunisia, and Turkey, clean production processes have reduced the amounts of pollution emitted (box2.4).

## BOX 2.4 Examples of pollution reduction thanks to clean production processes

In Turkey, a tire factory in the Izmit region reduced its water consumption by nearly three-quarters, from 900,000 litres a day to 250,000 litres, thereby reducing its discharges into the community sewers as well. A detailed analysis made it possible to replace a cooling system with a closed-circuit system for an investment cost of $5,000 and a return time of two years.

In Egypt, one of the largest tinned food manufacturers (Montazah, near Alexandria) underwent an eco-audit and introduced measures to reduce energy consumption: insulating steam pipes, replacing leaky parts, fitting a pressure regulator to the sterilisers, and improving the recuperation system and boiler efficiency. Water consumption was reduced by monitoring, installing sprinklers (so that water flows only when needed), and improving the water collection and recycling system. The savings in water, steam, and energy (nearly 40 per cent savings in fuel consumption) made it possible to reduce discharges and amortise investments over 1 to 44 months.

One of Croatia's biggest dairy companies, LURA, in Zagreb-Lurat, undertook measures such as employee training, reducing the diameter of cleaning pipes, and changing the hot water circuit that reduced effluents by 286,000 m3 a year (or 27 per cent) and drinking water by 280,000 m3 a year. These simple, low-cost measures (investment of €31,000) inspired employees, saved water and energy (equivalent to €328,000 a year), and reduced effluents, with an investment amortisation of less than one month.

In Tunisia a manufacturer of car batteries identified 19 ways of preventing contamination and pollution (acids, lead scoria, and waste-water) and saving lead and energy. The costs of the new measures were $522,500, while savings amounted to $1.5 million a year.

*Source:* Benoît and Comeau (2005).

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# **Managing coastal areas** to maximize ecosystem services and sustainable tourism

Integrated Coastal Zone Management (ICZM) is a method for ensuring that coastal resources are used in a sustainable manner. The Protocol for the Integrated Management of Mediterranean Coastal Zones was signed in Madrid in January 2008 by 14 contracting parties to the Barcelona Convention after a six-year consultation period. The protocol recognizes the important economic role of coastal zones in promoting development and employment in the Mediterranean, but it also stresses the importance of protecting the natural resource base to ensure that future growth is indeed green and that the region's development is indeed sustainable.

ICZM relies on a number of measures to achieve its goals, including institutional coordination; physical limits on coastal development; integration of environmental concerns into the regulation of agriculture, fisheries, tourism, mining, energy production, and infrastructure development in coastal zones; creation of protected areas where appropriate; wider public participation in the ICZM process; and awareness raising, training, and research. A greater role is envisaged for international cooperation in managing coastal resources in the Mediterranean.

Of particular relevance to this review is the role of economic and financial instruments (article 17 of the protocol). These promote the adoption of "relevant financial and economic instruments intended to support local, regional and national initiatives for the integrated management of coastal zones" and the establishment of "taxes and charges intended to dissuade and prevent activities damaging to the coastal zone, the product of which shall be assigned to the maintenance and management of coastal areas."

To date most of the work in ICZM has been in the legislative and regulatory sphere, with some attention being given to increasing public participation and improving governance. Yet, little has been done to help strike a balance between environmental protection and economic and social development. This requires quantification of the costs and benefits of the actions from which one can evaluate individual projects that are nominated for protection or development. Key to this work is establishing the links between proposed improvements and flows of ecosystem services and services produced solely or chiefly through human activity (Markandya et al. 2008). Research has been ongoing in this area, but only a small amount of it has been put into practise.

## *Examples* of good practice

In spite of these shortcomings, some coastal resources have indeed been managed in a way that promotes development while ensuring that the environment is protected. Boxes 2.5 and 2.6 provide examples from Morocco and Tunisia, respectively; other success stories can be found in Algeria and Egypt.

## *Wanted: New tools for promoting green growth*

As noted, to be effective in promoting green growth the authorities have to make more use of financial and economic instruments. Three such instruments merit special mention: (i) transferable development rights, (ii) a development or land tax, and (iii) an eco tax or tourism tax.

Under a system of transferable development rights, an authority that restricts development in one area compensates those who lost value as a result of the restrictions by allocating rights in other areas. Such systems have been an effective planning tool in municipalities and districts in the United States and elsewhere. Alternatively, authorities that were given coastal development rights could share the benefits with those whose rights were denied. A similar approach is found in Italy, where the so-called *perequazione urbanistica* has allowed areas to be protected by arranging the transfer of benefits from other areas since the early 1980s.

Another important instrument that can protect coastal development is land taxation. It may be possible to tax increased land values when development rights are accorded for coastal areas. This can generate much-needed revenues that can help finance the development or protection of other areas, including transfers to these areas to make up for restricting development. Such tax transfers could, for example, fund programs to promote job creation in the area.

Frequently, the creation of new tourism developments creates a demand for local public services that cannot be met from the normal sources of funds, such as property taxes. In such cases a special charge on tourists can be levied to cover the additional costs. An eco tax or a tourism tax, depending on what it is used for, has been introduced in a number of countries with limited tax capacities, such as Bhutan, Nepal, and the Dominican Republic. It has also been tried in a developed region—the Balearic Islands in Spain.

### BOX 2.5 Integrated Coastal Zone Development in Morocco

Morocco's Central Rif Mediterranean coastal zone has benefited from two important projects over the past three years—the Mediterranean Action Plan (MAP) CAMP and the European Commission's "Destinations" project. Both projects were implemented in collaboration with the Moroccan State Secretariat for Water (SEEE) and MAP, and both had the objective of contributing to the economic opening up of the zone while ensuring the protection of its coastal resources. The projects' task was twofold: (i) to evaluate natural and cultural resources of the zone and (ii) to recommend management measures and optimal ways to ensure balanced and sustainable development, which would be mainly based on tourism and associated activities.

One good example of seeking this balance is the Souani tourist project, with impacts on the dunes and Sfiha beach as well as on water, forest, and halieutic resources of the Bay of Al Hoceïma. Another is the Al Mazamma archaeological site, where a decline in construction has had economic impacts that need to be addressed.

There is also an important development in the lagoon of Marchica, which seeks to develop a tourism facility that will provide 80,000 jobs, 15,000 of will be permanent. With an investment of 28 billion dirham (€2.5 billion) for the tourist accommodation alone, the project aims to find a balance between protection of the region's rich biodiversity and the need to create employment and improve living standards for the area's residents. A special agency has been set up for the management of the lagoon, to ensure that the development of the area is coherent. There are seven centres envisaged, which together will provide 101,000 beds and occupy 1,612 hectares. The initial €2.5 billion investment is expected to induce a further €1.6 billion of investment in the provision of associated goods and services.

The challenge is to implement the project while respecting the rich biodiversity of the lagoon and ensuring that the management of the site is consistent with the broader goals of sustainable development.

Overall, the Moroccan programme sees sustainable tourism as a motor for development and improvements in the living standards of the population. To this end it sets out to allow construction in locations where it can guarantee developers adequate water resources. Developers are also expected to manage water use and the disposal of other wastes in a sustainable manner. Furthermore, the ICZM encourages them to make use of wind and solar energy where possible. In addition to environmental factors, the actions required of tourism development cover a range of social and economic issues. On the social side, they seek to promote local cultural sites and practices; on the economic side, they aim to expand local value added in the provision of services to tourists and to ensure that the areas are well maintained and managed.

*Source:* PAC-Maroc (2010).

## BOX 2.6 Integrated Coastal Zone Development in Tunisia

Over the last two decades, Tunisia has seen a major shift of population growth, urbanization, industrialization, and tourism toward its coastal zone. The emerging problems are typical, involving a combination of rapid land use change, population growth (driven to a large degree by migration from inland agricultural areas), depletion of water resources often accompanied by overexploitation of groundwater resources and consequent saltwater intrusion in the immediate coastal zone, pollution from unchecked economic development, and insufficient waste and wastewater management. These trends conflict with the parallel development of tourism, which depends on the same resource base, but also on a clean and attractive environment.

To address these conflicts the country has engaged in strengthening its existing legal and institutional framework and has initiated a number of projects. Examples where a compromise is being achieved between promoting tourism and employment and protecting the environment include the following:

*Tabarka.* Scuba diving has brought tourist development (10,000 divers visiting annually) and employment to the local community. But recreational and commercial fishing is also important to Tabarka and can conflict with the diving. The aim is to have the area declared protected and to prepare a plan for the sustainable management of the area, with agreements on ways the two activities can be harmoniously carried out.

*Djerba.* The coastal morphology of this special site makes it a unique landscape that merits special conservation measures. It is an area with a lot of tourism; presently there are about 23,000 beds and, in summer, around 60,000 visitors. Recreational fishing is also a source of pressure on the environment, affecting benthic resources (resources on the bottom layer of the water body). Finally, sand extraction is causing a deterioration of the coastline. The actions being proposed involve a strong nongovernmental organization that is working with the Agency for the Protection and Management of the Coast that sets out agreements on the way key economic activities are carried out. Tourism is located in a part of the area that is not remarkable for its biodiversity, but it is nevertheless impacting on the morphology of the region and needs to be regulated for these impacts. This can be done effectively, but only if it is declared a protected area.

*Source:* UNEP (2005).

# Moving toward sustainable urbanization

The SEMCs are expected to pursue and in some cases experience an acceleration of their rapid urbanization process in the coming two decades. This situation creates challenges: city planners will have to anticipate the conditions required to prevent the formation of new slums, the construction of substandard new housing that would later require heavy upgrading investments, and the development of low-density buildings that would make poor use of scarce agricultural land or coastal areas.

But this rapid urbanization process also creates opportunities. A large share of the residential housing stock that will exist in 2025 or 2050 will be built in the coming years. The enforcement of local regulations can make a difference by nudging developers toward the construction of energy-efficient buildings. Existing construction techniques allow new buildings to incorporate energy-saving equipment such as solar water heaters that are also cost-efficient when fuel subsidies do not distort prices (or when the social cost of these subsidies is taken into account). In addition, the location of these new urban areas and their density could be selected according to a master plan to minimize not only the risk related to construction in landslide- or flood-prone areas (World Bank 2011b) but the cost of building and operating transportation networks and other infrastructure.

Rural exodus and unemployment are exacerbating the urban situation and making it a top priority at local, national, and regional levels. Throughout the Mediterranean region, territorial development plans cannot be disconnected from sound environmental policies and growth-generating programs. Successful experiences of environmentally sensitive city planning from around the world provide lessons for the Mediterranean cities and could be tailored to suit local conditions. The integration of environmental considerations in urban strategic planning can contribute to green growth, sustainable job creation, and improved living conditions.

## Planning eco-cities

The concept of an Eco2 city (that is, an "ecological city as economic city") was launched by the World Bank in 2009 to respond to the challenge of rapid, unplanned urbanization. Eco2 cities are set up to create economic opportunities for their citizens in a way that is inclusive, sustainable, and resource efficient. At the same time, they have the objective of protecting and nurturing local ecology and global public goods, protecting the environment, and preparing for future generations. The concept of an Eco2 city was first experimented in Europe and North America. The experience of Curitiba, Brazil, however, demonstrates that the approach could be tailored to middle-income countries such as those in the Mediterranean region.

Curitiba has implemented innovative, imaginative, and practical solutions that demonstrate that resource constraints need not be a barrier to sustainable, ecological and economic urban planning and development—and that sustainable planning is in fact an investment in the future of a city's economy and the welfare of its people. Through innovative approaches to urban planning, city management, and transport planning, Curitiba has been able to sustainably absorb a population increase from 361,000 (in 1960) to 1,797,000 (in 2007) and create jobs accordingly. In fact, the poor have always been an integral part of the city's initiatives, and have benefited from community housing and small business assistance programs. Through an innovative waste collection and recycling program, the poor can exchange collected waste for transport coupons and food.

In the Mediterranean region, the Amman Master Plan (AMP) provides one of the most comprehensive examples of strategic urban planning. The AMP envisions the future of the Greater Amman Municipality (GAM), a city that should absorb a population of 4 million new residents by 2025, and determines the location of high-density, mixed-use (HDMU) development in selected areas and the conditions for their development. HDMU development will be banned in red zones corresponding to landslide areas, heritage sites, and important cultural sites, as well as industrial areas and transportation transfer stations. Sites suitable for HDMU development are identified as green zones, while other possibilities might eventually be considered in orange zones in which development can take place.

The massive investments required for building new transportation infrastructure and the opportunity cost of losing agricultural land in coastal areas make the construction of high-rise buildings an attractive proposition. Social equity can be enhanced if public authorities collect a larger share of the additional land rent generated by urban expansion. In particular, the introduction of payment for development rights can generate public revenues that would render the greening of existing urban areas more affordable (box 2.7).

Morocco has embarked on a "cities without slums" strategy that calls for the creation of 1.5 million homes by 2020. In addition, government agendas are pressured to include employment as a performance indicator (200,000 to 300,000 new jobs are required per year). This is why large-scale development programs such as the new city AUDA in Casablanca (500,000 direct and indirect jobs) and Zenata (100,000 direct and indirect jobs), and Jnane Saiss at the periphery of Fes (300,000 direct and indirect jobs). As part of the urbanization strategy of Morocco, the new city of Zenata represents a pilot example of an Eco2 city, where large investments are planned to ensure sustainability and create new jobs (box 2.8).

Marchica, Morocco's new ecological city, has demonstrated how dedicated governance, combined with stakeholder engagement, can make environmental rehabilitation more efficient. In fact, the cleaning of a polluted lake has resulted in the regeneration of fishing—and fishermen's livelihoods—throughout the area. The Marchica Agency is a publicly owned firm created by decree in June 2009 to carry out this multidimensional project on an area of 2,000 acres for a total investment of $6 billion. The overall programme would generate 80,000 jobs.

Stockholm has demonstrated how integrated and collaborative planning and management can transform an old inner-city industrial area into an attractive and ecologically sustainable district based on a cyclical urban metabolism. The district is seamlessly integrated into the larger urban fabric, and has provided inspiration for more initiatives in the city and catalysed change. Some of the initial results have been a 30 per cent reduction in nonrenewable energy use and a 41 per cent reduction in water use.

### BOX 2.7 Amman Master Plan

In February 2007 the GAM publicly announced the Interim Growth Strategy (IGS), the primary purpose of which was to regulate the location and height of HMDU developments in the city. The IGS designated three locations for mixed-use, high-rise projects: the Central Parkway area, the Northern Gateway, and the Southern Gateway. HDMU projects would only be allowed in these three areas and on the 80-hectare Abdali site where a Jordanian quasi-governmental development entity (Mawared) and Saudi investors were building 1.7 million square metres of office space; luxury apartments; and retail and cultural and entertainment facilities. Height limits were established, along with new fees for infrastructure improvements to the sites and surrounding areas. A "purchase of development rights" payment was added to GAM's fees to capture the value added by the zone designation. This payment is known locally as the Robin Hood policy, and the resultant funds are to be used to "green" Amman and conserve heritage areas. In rapid succession, four more phases of the master plan were approved by the city council and publicly announced: the Corridor Intensification Strategy, Industrial Lands Policy, Rural Residential Policy, and Airport Corridor Plan. Within 10 months of the king's directive, the core components of the plan had been completed, regulations were in place to control large-scale development, and numerous other initiatives (for example, a bus rapid transit system) were underway.

*Source:* Beauregard and Marpillero-Colomina (2011: 28, 62-69).

## BOX 2.8 The new city of Zenata (Morocco)

Zenata is a life-scale example of an Eco2 city (1,205 acres and 500,000 habitants). The primary objective of this city is to create new activities the offer added value while generating wealth and new jobs and protecting the environment. The Zenata project will create a new urban centre that responds to the expectations of an emerging middle class and, through both a social and spatial mix, develop services of strong value added for the region and the country. Emphasis is put on an environmentally sound approach and on energy saving, which translates into long-term economic savings. Thus, global investment is around $2.5 billion, 30 per cent of which is for land acquisition. Such a large investment calls for a sophisticated financial structure and the involvement of international capital ventures. Meanwhile, international involvement puts a spotlight on the sustainable and socially responsible nature of the investments involved. The Zenata project could become a Mediterranean model of a city conceived in a sustainable fashion, with a focus on job creation.

*Source:* www.leconomiste.com/article/889124-ville-nouvelle-de-zenatabrultime-chance-pour-le-foncier-du-grand-casablanca www.leconomiste.com/article/889125-ville-nouvelle-de-zenatabr120000-m2-pour-le-pole-retail

## BOX 2.9 The Taxi Replacement Project in Egypt

This Egyptian project supports the enforcement of a traffic law that makes owners of mass transport vehicles (including taxis) that are more than 20 years old ineligible for a new or renewed operating license.

Owners of taxis affected by the law may voluntarily surrender their vehicle for managed scrapping and recycling, in exchange for financial incentives that they can use to purchase a new vehicle from a participating vehicle dealer. Under the program, 41,000 vehicles have been replaced to date in Greater Cairo.

This project is the first of its kind to be registered as a Clean Development Mechanism (CDM) activity under the United Nations Framework Convention on Climate Change and the Kyoto Protocol. It is expected to result in a reduction of 20,000–30,000 tonnes of $CO_2$ per year in Greater Cairo alone. The World Bank purchases these emission reductions on behalf of the contributors within the framework of the CDM.

*Source:* Egyptian Ministry of Finance delegation, as proposed during consultation process on *2012 MED Report.*

## *Promoting energy-efficient and cost-efficient urban transportation*

Cleaner and more efficient forms of urban mobility can make a dramatic difference in the economic and environmental impact of urbanization (box 2.9). A rapid increase in the fleet of private vehicles used in urban areas has been observed over the past two decades, spurred by the emergence of a middle class and, in some cases, further encouraged by subsidised fuel prices making the use of public transportation comparatively costly. The negative externalities associated with urban congestion can be measured in time wasted in traffic and air pollution. Congestion also results in the fragmentation of urban areas; residents in remote neighbourhoods might need to commute an unreasonable number of hours to benefit from labour opportunities in central urban areas. Efforts to invest in diversified public transportation have been observed to also contribute to reducing air pollution. A recent Plan Bleu study (Plan Bleu 2011b) documents examples of this phenomenon in Algiers, Cairo, Istanbul, Tangiers, and Tunis. The challenge is now to tailor urban transportation networks to local specificities.

One necessary step, for example, is to adapt public transportation to the hilly topography of a number of Mediterranean cities. In such settings, aerial tramways offer a number of attractive features. First, they are inexpensive to build compared to surface tramways—only 10 to 20 per cent of the investment required per kilometre. In particular, they provide the cheapest means of crossing rivers for mass transit passenger transportation. They are also inexpensive to operate; maintenance requires technical skills of a type that are commonly available in a middle-income country. In addition, aerial tramways are energy efficient because there generate only limited friction, and no motorization of the cabin is required. They also provide high-frequency service—up to every 5 or 20 seconds at times of peak use—and they can traverse steep slopes, and therefore easily connect neighbourhoods at different elevations. Finally, their impact is extremely limited in terms of land use and therefore barely affects other modes of transportation during construction. The main downside of aerial tramways is that their maintenance usually requires a complete suspension of operations during a few days per year. But this has not prevented local urban authorities in settings as various as Algiers, Barcelona, Medellin, Rio de Janeiro, and Portland from investing in aerial tramways as a mass transit option. Among the Mediterranean countries, Algeria offers the best example of an urban transportation programme making extensive use of an aerial tramway (box 2.10).

**BOX 2.10 Urban transportation by aerial tramway in Algeria**

In Constantine, a city of 750,000 residents, the 1.5-kilometre aerial tramway inaugurated in 2008 has been a great success. It links the central part of the city to an industrial area (147 metres different in elevation). It accommodates up to 24,000 passengers per day (40 cabins of 15 places each, operated from 6 a.m. to 11 p.m.). The same type of equipment is also in operation in Skikda (189,000 residents) and Tlemcen (179,000). Three new lines are under construction in Algiers, and a total of 10 new projects are under way in Algeria as a whole.

*Source:* La percée du tramway aérien, *Ville, Rail et Transport, (March 24, 2010)* .

## *Lessons*

*Set housing and job creation as top priorities.* The priority throughout the Mediterranean region is to create jobs and stimulate wealth-generating activities, in addition to developing appropriate housing for the expanding population. Thus, any territorial development initiative should fit into the national strategic agenda, as should the goal of sustainability. Green growth means optimal and long-term development on the one hand; on the other hand, it focuses on social concerns and involves civil society actors as partners in the urbanization process. In fact, urbanization performance should be evaluated based on household stability, job creation, organised mobility systems, and a positive environmental assessment.

*Establish public and private sector partnerships to support green growth.* The main challenge faced by large urbanization programs is to identify appropriate sources of finance. Large investments are called for when setting up new urban centres and restructuring existing cities. Such investments require the involvement of both the public and the private sector. Thus, pension funds and investment funds with long-term horizons will be the most appropriate for such initiatives. The example of the new city of Zenata is very illustrative, as it is managed through the development arm of Caisse de Dépôt et de Gestion, which managed a public sector pension fund of around €40 billion. Tunisia has also started work in establishing a similar model for the expansion and sustainable development of its cities, with job creation as the primary objective. Defining projects that are bankable paves the way for the successful Public-Private Partnerships (PPPs) required to support green growth.

*Involve civil society and strengthen local governance.* Since the Arab Spring, incorporating the voice of civil society has become increasingly seen as a key to the success of sustainable cities. An integrated approach requires the involvement of civil society and all stakeholders in every stage of the process—from conceptualisation to implementation to maintenance and beyond. Improving the capacity of local governance is key to successful territorial management and sustainable urbanization.

# **Cooperating** to make fisheries sustainable

The aims of this section are twofold: first, to assess the current economic and social value of marine fisheries to the Mediterranean region and, second, and perhaps more important, to estimate the sector's potential economic and social value if it were managed optimally. Setting the conditions that will put marine fisheries on a more sustainable path is critical from an economic and social standpoint. The immediate goal is to avoid the predicted Tragedy of the Commons (Harding 1968), or a "race for the last fish" and its attendant destruction of critical marine ecosystems, the cost of which will be borne by present and future generations. Meanwhile, effective planning can maximize the economic benefits to be derived from marine environmental assets over the long run, while considering employment. These objectives can only be achieved through greater cooperation at the regional, national, and local levels.

Sustainable fisheries in the Mediterranean have been documented over millennia. Taking advantage of the great ecological diversity of this enclosed sea, multispecific and multigear fisheries were developed over time and today have come to represent a particularly important socioeconomic sector in most of the region's coastal countries. Fisheries are an important source of nutrition, employment, and income, and they meet a growing demand for fish products emblematic of the Mediterranean art of living so prized by tourists. Most if not all Mediterranean fisheries, however, now face serious challenges resulting from a series of impacts: environmental degradation, overexploitation of stocks, and poor management of shared resources. In addition, the impacts of climate change are now starting to be felt, exacerbating the impacts on both ecosystems and species.

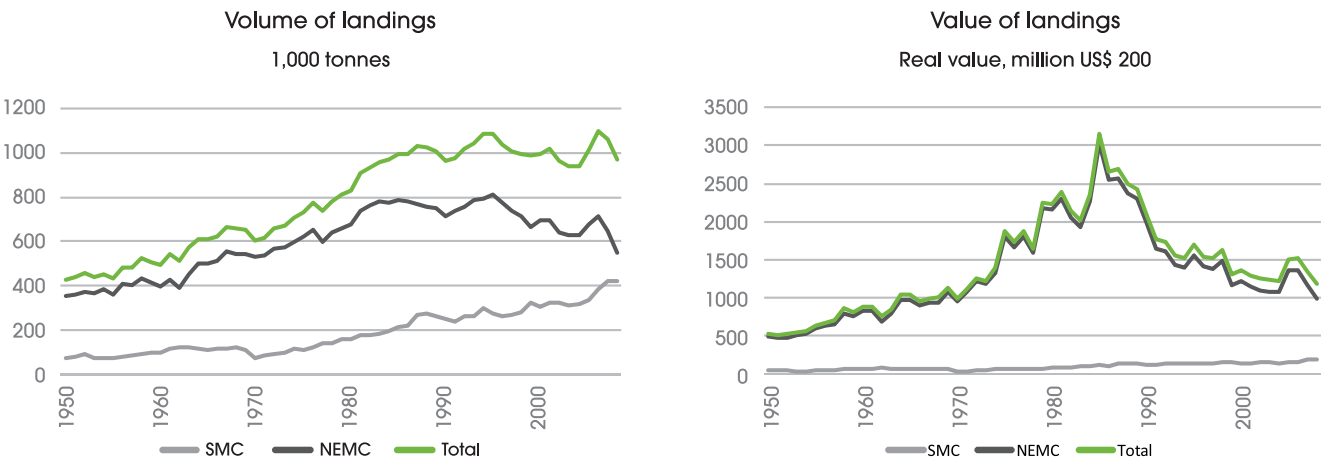
These growing difficulties are not specific to the Mediterranean, but rather mirror a global fisheries crisis that is now abundantly clear. This point is widely documented in recent studies carried out at a global level by the United Nations Environment Programme (UNEP) (Sumaila 2011), the World Bank (World Bank, FAO and World Fish Center 2010; Garcia 2009; World Bank 2009e), and the FAO (2010). These authoritative studies illustrate not only the extent of the problem (85 per cent of stocks worldwide are either fully exploited, overexploited, depleted, or recovering from depletion), but also some of the root causes of the problem, including the completely irrational system of subsidies, which worldwide fuels overfishing to a significant degree.

To the extent possible, results have been updated from various statistical sources (Eurostat, UNData, FishStat, FAO country profiles) and detailed for each coastal state. Recommendations drawn at the regional level by the General Fisheries Commission for the Mediterranean (GFCM) European level in the wake of the preparation of the next Common Fishery Policy and the International Convention for the Conservation of Atlantic Tuna (ICCAT) have also been incorporated into a new set of propositions laid out in this report, which focuses on marine fisheries instead of inland captures and aquaculture.

The total catch from the Mediterranean marine-capture fisheries rose from 420,000 tonnes in 1950 to approximately 1,000,000 tonnes in the 1980s (figure 2.1, left), with a peak of 1,093,000 reached in 1995. The level of catches has been slowly decreasing ever since, with the exception of a short-burst increase in 2006, which was essentially due to an exceptional level of landings for small pelagics, species that are very sensitive to environmental variations. The total landed value (figure 2.1, right) presents a different pattern, with a clear peak in 1985 at $3 billion (three times the 1950 value per tonne), followed by a steady decrease to $1.5 billion, which is similar to the value reached in 1975 in real $2,000. The significant difference in landed values between the Southern Mediterranean Countries and the Northern and Eastern Mediterranean Countries can be explained by the very low valorisation for catches sold locally in the southern Mediterranean countries.

While employment in capture fisheries has declined since the 1990s in countries on the northern shore of the Mediterranean, figures are much higher on the southern shore, where 319,000 individuals are still employed in the sector, including postharvest (table 2.1). More than 55 per cent of this workforce is employed in small-scale fisheries, which play an important role in the social fabric and cultural identity of many Mediterranean coastal regions, and where employment related to capture fisheries in the southern rim countries can reach almost 1.3 per cent of the total active population. (The figures do not include aquaculture employment or upstream activities such as boat construction, engine maintenance, gear manufacture, and so on.)

### ◊ Figure 2.1 Landings and landed value of regional marine fisheries: 1950–2008




*Source:* Sea Around Us (landings and values) and CGPM (recent landings).
*Note:* NEMC: North and East Mediterranean Countries; SMC: South Mediterranean Countries.

### › Table 2.1 Mediterranean marine capture fishing employment, 2008 (estimates)

| Area | Fishing fleet (no. of vessels) | Artisanal vessels (%) | Direct fisheries employment ('000s) | Total employment ('000s) | Value of catch ($ million) | Indirect output multiplier | Indirect output ($ million) |
|---|---|---|---|---|---|---|---|
| NEMC | 49,700 | 82 | 102 | 138 | 1,136 | 2.5 | 2,840 |
| SMC | 32,307 | 85 | 147 | 319 | 175 | 1.5 | 263 |
| **Total** | 82,000 | 83 | 249 | 458 | 1,311 | 2.4 | 3,103 |

*Source:* FAO FishStat; Sea Around Us project; employment in marine fisheries, including downstream activities, estimated by Plan Bleu from Sacchi (2011) and Dyck and Sumaila (2010); active population of the Mediterranean countries, (year 2008), extracted from UNDATA; ratio coastal population /total population: Plan Bleu estimate, from various national sources.
*Note:* NEMC = Northern and Eastern Mediterranean Countries; SMC = Southern Mediterranean Countries.

In spite of the importance of this sector for so many coastal populations, most of these fisheries are exploited at an unsustainable level (which directly threatens stocks and leads to the long-term depletion of the whole sector), increasing economic costs and leading to employment losses. An analysis prepared for Plan Bleu (Garcia 2011) indicates that in the span of 15 years, from 1991 to 2006, the percentage of fishery resources in the senescent phase has increased from 15 per cent to nearly 60 per cent, affecting especially the most valuable species (bottom fishes, lobsters) and the top predators (tuna, sharks, and rays), which are known to play key roles in the trophic chain.

The situation is slightly less worrisome in the home fishing areas of the southern rim countries, where the number of resources in the senescent phase has increased by only a third, while it has more than doubled in other Mediterranean countries. The essential findings of this analysis are summarised below.

Marine fisheries are crucial, both socially and economically, to the Mediterranean region, providing animal protein and supporting food security for over 452,000,000 people (table 2.1).[9] An estimated 32 per cent of this population lives in close proximity to coastal areas, relying on fish resources not just for food but also for their livelihoods—from fishing and induced activities, but also increasingly from fishing tourism (Attané, Courbage, and Batisse 2001). Currently, the Mediterranean fisheries deliver annual revenues that amount to around $1.3 billion and support 458,000 jobs directly and indirectly (Dyck and Sumaila 2010). When the total direct and indirect economic effects arising from fish populations in the regional economy are accounted for, the total contribution of the sector to national economic outputs is estimated at some $3.1 billion a year.

That said, the Mediterranean marine fisheries, particularly those on the northern rim, are not only overexploited, but have been underperforming in both economic and social terms for decades. The Mediterranean countries currently generate a negative rent of $1 billion a year from fishing, when the total cost of fishing ($1.6 billion) and subsidies ($727 million) are deducted from the total value of $1.3 billion that fishing generates (table 2.2). (This appalling result does not extend to all fisheries, however, as some southern artisanal fisheries still succeed in generating positive rents—see Idrissi et al. 2003.)

Investments that will help achieve sustainable levels of fishing can secure a vital revenue stream in the long run. If the current path is maintained, overexploitation and operating deficits will increase, requiring still higher subsidies. Any effort to increase the sustainability of fisheries will require a reorientation of public expenditures, in particular a reduction in harmful subsidies. It is imperative that fisheries management be strengthened to allow overfished and depleted stocks to recover. This can be accomplished, for example, by decommissioning vessels and equitably relocating employment in the short term. It is estimated that an investment of $3 billion[10] would reduce excess capacity, allow depleted stocks to recover, and could result in a 66 per cent increase of catch per unit effort (CPUE) in the long term, in spite of an expected 17 per cent drop in total Mediterranean catches.

**› Table 2.2 Sustainable fisheries, key economic figures; Comparison between two scenarios, current situation and sustainable fisheries as modelled**

| | Unit | Current situation | Sustainable fisheries |
|---|---|---|---|
| Harvest | thousands of tonnes | 1,053 | 876 |
| Fishing effort | Index | 1 | 0.46 |
| Price of landings | $ / tonne | 1,300 | 1,600 |
| Value of landing | $ millions | 1,345 | 1,415 |
| Cost of fishing | $ millions | 1,618 | 736 |
| Subsidies | $ millions | 727 | 363 |
| Rent | $ millions | –999 | 315 |
| Wages | $ millions | 631 | 287 |
| Payment to capital | $ millions | 146 | 66 |
| Total value-added | $ millions | –222 | 668 |

*Source:* Methods from Sumaila (2011), World Bank (2009e), Arnason (2007b), Srinivasan (2010), and Lam et al. (2010). Data from Sea Around us Project and FishStatJ.

9. Population of the Mediterranean countries estimated by Plan Bleu, from the World Development Index for the year 2008.

10. This figure is based on the estimated reduction of fishing effort of sustainable fisheries scenario (see table 2.2) and on average costs of vessel buyback and of crew retraining used by Sumaila (2011).

Transitioning Mediterranean fisheries to a sustainable model would dramatically increase their resource rent, from a negative $1 billion to an estimated positive $315 million year. The total value added to the economy of the region from fishing in such a scenario is estimated at $668 million year, compared to the current negative $222 million. Not accounting for the potential boost to recreational fisheries and multiplier and nonmarket values that are likely to be realized, the potential present value of reforming fisheries is at least six times the cost of required investment.[11]

Bringing and keeping the capacity of the fishing fleets in line with the sustainable fishing scenario will improve the wealth of the nation and the individual revenues of remaining fishermen but will inevitably lead to less overall employment in the catching sector. It should be considered, however, that the employment losses could be more significant in the business-as-usual scenario. History shows us that overexploitation can lead to disasters, as in the case of cod exploitation in Newfoundland, the largest cod fishery in the world, where the industry and associated employment collapsed entirely in the early 1990s. Because of irreversible changes to the ecosystem, Newfoundland's cod industry has not recovered to date in spite of a moratorium on fishing. Making fisheries sustainable through reform—and implementing this reform in such a way as to cushion the effect on impacted populations—is a key issue of political import.

A number of other available management tools and funding sources can be used to move the regional fisheries sector from its current underperforming state to one that delivers higher, but socially acceptable benefits, while achieving sustainable levels of fishing in the long run for the benefit of current and future generations. The necessary downsizing of the fleet should be carried out with a view to protecting small-scale fisheries and associated and dependent coastal communities, while allowing larger fleets to undergo the necessary adaptations. To that end, two differentiated management regimes could be envisaged: one, designed for large-scale fleets with capacity adjustment and economic efficiency at the core, and the other, targeted at small-scale fleets in coastal communities with a focus on social objectives. In line with the principles of the future European Common Fisheries Policy (CFP), arrangements for the large-scale segment could include economic incentives for fleet adaptation such as market-based allocation mechanisms, while small-scale coastal fisheries would be managed through direct allocation of quotas or effort or through collective schemes. The approach to public financial support could be different for the two segments: the large-scale fleet would be expected to be economically self-reliant, while public funding may help the small-scale segment adapt to changing conditions toward more sustainable fisheries, thereby strengthening its economic viability, and maintaining its contribution to the life of coastal communities. These proposals are illustrated in the two following cases: the first, about the emblematic Bluefin Tuna large scale fishery and, the second, presenting reforms in the Moroccan small-scale artisanal fisheries.

Proposals for steering toward sustainable, socially beneficial, and economically profitable fisheries will be exemplified by two case studies on Bluefin tuna and on small-scale artisanal fisheries.

## Bluefin tuna

Bluefin tuna has been listed in the International Union for Conservation of Nature (IUCN) Red List as an endangered population. Bluefin tuna, one of the most valuable harvested fish in the world, faces a significant risk of outright collapse, jeopardising an activity that currently provides around 4,000 direct and 4,000 indirect jobs. Sumaila and Huang (2010) have analyzed the Bluefin tuna economy for each fishing country. Specific to the Mediterranean coastal countries, table 2.3 summarises the findings for 2006, showing a low rent level that stands in stark contrast to an estimated economic impact in the range of half a billion dollars. A collapse of this fishery would thus have dramatic impacts, both economically and socially, for the communities involved.

Because of increasingly poor management, the ICCAT, the regional fisheries management organization in charge of this resource, has had to set the total allowable catches (TAC) for 2011 at 12,900 tonnes to try and allow the stock to recover. By contrast, the ICCAT estimates that the long-term potential yield is as high as 50,000 tonnes per year, but only if sustainable practices are followed. The difference between the current TAC and estimated potential yield can be valued between $370 million (landed value) and $950 million (Japanese market) per year.[12]

**› Table 2.3 The economics of Bluefin tuna in 2006**

| Area | Total reported catch (t) | Landed value ($ million) | Cost ($ million) | Resource rent ($ million) | Economic impact ($ million) |
|---|---|---|---|---|---|
| NEMC | 17,544 | 171 | 155 | 24 | 563 |
| SMC | 5,053 | 50 | 45 | 5 | 71 |
| Total | 22,597 | 221 | 200 | 29 | 634 |

*Source:* Sumaila and Huang (2010); ICCAT (2008).
*Note:* NEMC = Northern and Eastern Mediterranean Countries; SMC = Southern Mediterranean Countries.

11. The present value of benefits induced by the sustainable fisheries scenario is estimated by discounting the yearly flow of change in added value between current situation and sustainable fisheries scenarios (that is, $929 million) over the next 50 years at 3 per cent and 5 per cent.

12. Valuation of the difference in volume between the ICCAT recommended TAC for 2011 (12,900 tonnes) and the long-term potential yield estimated by the ICCAT (50,000 tonnes per year), that is, 37,100 tonnes per year. The average landing value for Bluefin tuna fished in the Mediterranean Sea, according Sumaila and Huang (2010), was $9.80 per kilogram (kg) in 2006. The average fresh tuna price in "ten cities' wholesale markets" was 2,972 yen per kg in 2006 (Japan Statistical Yearbook 2011) or $25.55 per kg.

According to Murno (2010) and FAO (2010), the root of the problem is straightforward: as illustrated by the well-known "prisoner's dilemma," the cooperative game that should be the base of any regional fisheries management organization, has degenerated in the case of Bluefin tuna into a competitive one. Predictably, this competitive approach leads to unavoidable overexploitation of the resource. Game theory shows that the only solution to avoid overexploitation is the strengthening of regional cooperation, which in turn will allow the adoption of tried-and-true successful management measures.

Sumaila and Huang (2010), among others, suggest a compelling list of effective cooperative mechanisms, including the introduction of enforceable penalty regimes and the improvement of monitoring systems. More specifically, these authors recommend studying the establishment of marine protected areas (MPAs) in the well-defined spawning areas of Bluefin tuna, where breeding individuals are especially vulnerable. A mutual compensation fund could be established to promote such cooperation among concerned countries. Moreover, the European Union (EU) should be convinced to reduce its fishery subsidies for fattening farms and vessel modernization. Individual countries could also improve their domestic management by allocating individual transferable quotas (ITQs) or even dedicated access privileges (DAPs). DAPs differ from ITQs inasmuch as they grant individuals or communities the privilege to fish for a portion of the national allowable catch and do not transfer property rights as ITQs do. For this reason, DAPs are probably better suited to this highly migratory resource and would likely be considered more equitable by fishermen.

## *Small-scale artisanal fisheries: Involving stakeholders in the sustainable management of marine life*

Small-scale artisanal fisheries are often at a disadvantage, especially in their interactions with other, larger fisheries. In Morocco the artisanal fishermen are in direct conflict with coastal fishermen, who, even though they are legally excluded from a zone that extends three nautical miles from the coast, often "poach" in these same waters. Artisanal fishermen operate much smaller and rudimentary wooden boats equipped with outboard engines, and operate all their fishing gear by hand. In addition, a major source of hardship for these fishermen is that they are frequently at the mercy of traders and collectors who buy their catches at fixed and depressed prices, and supply them with basic necessities (replacement gear, engine repair, gas, and even investment funds) at exorbitant rates. As a result, these fishermen are among the poorest in Morocco and their activities are coming under increasing pressure, including from the impacts of climate change on the stocks they target.

In spite of these great difficulties, however, a number of innovative initiatives were recently launched in Morocco to try and support their activities, without increasing their level of effort and thus the pressure that is brought to bear on fish stocks. These initiatives are remarkable in that they address the sustainability of the resource at different but important stages: before it is harvested ("fish in the water," wholly dependent on critical ecosystems), as it is being harvested (restrictions on destructive fishing gear), and after it is landed (market conditions). Such initiatives serve as reminders that no single link of the fishing/marketing chain can be ignored, and that creative and innovative approaches must be adopted to address the multitude of factors at play.

### Protecting stocks and key ecosystems

The most innovative approaches taken to protect marine living resources in Morocco involve a parallel focus on the biological integrity of targeted stocks and related ecosystems such as marine protected areas (MPAs) and artificial reefs. The artificial reefs initiative was inspired by a similar and successful pilot project first developed in Tunisia, where very basic underwater structures were deployed at sea in areas that were known by the fishermen to be usual breeding grounds. These structures provide shelter to juveniles of limited commercial value. When the individuals grow to adult size, or when their number exceeds the carrying capacity of the reef, they can no longer find refuge in it and thus migrate to surrounding areas, where they become fair game for the fishermen who had the wisdom to let them grow past the reproductive stage. The structures are very cheap to build and are often built by fishermen cooperatives themselves, with very basic material (such as poured concrete, rebar, and pottery jars). Meanwhile, fishermen are educated in the importance of refraining from fishing in these areas. An added benefit of these structures is that they present a risk for the coastal trawling fleets, which are thus discouraged from fishing in the areas designated for artisanal fishermen.

In parallel, the Kingdom of Morocco has recently launched a national initiative focusing on MPAs. Here again, the approach is predicated upon the recognition that some critical habitats must be protected from destructive fishing practices and that stocks must be spared at least during some of their life stages (particularly around breeding grounds and nurseries). MPAs are being set up in full cooperation with the fishermen themselves, and with the understanding that those who bear the costs of the MPAs (particularly the opportunity cost of not fishing in these areas) will also be the ones who will reap the benefits expected (in the form of increased biomass in areas surrounding the MPAs).

*Improving fish landings.* Protecting the fish while they are still in the water is necessary, but far from sufficient to reduce poverty among artisanal fishermen. While they can expect healthier stocks, and thus higher CPUE, fishermen also recognize the importance of maintaining the quality of fish once caught. To that end, a national initiative aimed at improving landing sites and port access was recently launched, which specifically addresses the need for adequate infrastructures to keep the catches fresh as long as possible. A network of landing sites is thus being built along both the Mediterranean and the Atlantic coast, with access to water, electricity, and ice, and open markets where prices are determined by supply and demand. The goal is for fishermen to increase their revenue by increasing the quality of the catches they land, without increasing the volume of their landings.

### Encouraging ownership of resources throughout the value chain

The final level at which direct support is being provided to the fishermen is through the marketing of the landed catches. When looking at the value chain for the fisheries sector in Morocco, it quickly becomes apparent that the largest marginal increase in value occurs very early on, at the so-called first sale stage, where the fishermen sell and completely lose ownership of their catches. A small number of fishing cooperatives have attempted to capture that increase in value by grouping and purchasing all the landings from their members and then reselling to various intermediaries, thus cutting out, to the extent possible, the middlemen who traditionally take advantage of artisanal fishermen under pressure.

Although the initiatives described are still at an embryonic stage, some key lessons already stand out:

- Reducing poverty, in the long run, can only be achieved by increasing the *quality* of the catches, not their *quantity.*
- Efforts cannot be applied to the targeted stocks alone, but instead must take into account key and related ecosystems.
- Intervention should occur at all stages: when the resources are still in the water, when they are landed, and as they enter the transformation and marketing cycle.
- Small-scale fishermen are almost always better off when they organize and form cooperatives. These cooperatives in turn must be supported by local, regional, and national authorities and their capacity expanded.
- Regional lesson sharing is key; for example, the artificial reefs being built in Morocco were initially piloted in Tunisia for similar fisheries.
- Because fishing initiatives are complex and interrelated, different donors are required to cooperate to avoid overlap and gaps. The various activities described above were funded by the Government of Morocco, Japanese bilateral assistance (Japan International Cooperation Agency, or JICA), U.S. bilateral assistance (Millennium Challenge Corporation, or MCC), and the World Bank.

CHAPTER 3

# Environmental Action and Job Creation

**In this chapter**

/// A tense demographic context and a low rate of job creation

/// Sectoral mechanisms of green impact on economic activity and jobs

/// Jobs and greening: Neither myth nor automatic dividend

*Over the next two decades, 30 to 40 million new jobs must be created to maintain the current rate of employment in the Southern and Eastern Mediterranean Countries (SEMCs), and even more jobs are needed to reach full employment. Taking steps to reduce environmental degradation and increase the benefits derived from natural assets can result in net job creation or the preservation of existing jobs in individual sectors and in the economy as a whole. But this potential impact is not automatic and will require well-designed policies to maintain or create a sound overall macroeconomic framework.*

# A tense demographic context and a low rate of job creation

The coming years will require the SEMCs to create unprecedented numbers of decent jobs to absorb rising numbers of newcomers to the labour market. This is in part because the age pyramid in these countries is dominated by young people. Although demographic growth rates have slackened and fertility rates are converging toward European levels, the impact of high fertility rates in the past is now being felt. Youth unemployment rates, troubling as they are now, are expected to soar by 2030. Still more jobs will be required as female participation in the economy increases, and to meet the needs of the high proportion of the population that is not economically active. Increasing labour participation would be the easiest way of accelerating economic growth.

Previous chapters have highlighted approaches that seek to increase economic activity (and thus job creation) using pro-environment policies in certain sectors. Can isolated sectoral effects produce a net positive impact for the economy as a whole? Provided that environmental policy is well designed, does green growth hold the potential for net job creation?

The answer is a qualified yes. Several macroeconomic analyses have shown that green policies can result in net job creation of significant magnitude in various regions of the world. Some studies estimate the gain at 10 per cent of the overall need for new jobs in the SEMCs.

The demographic pattern of the working population and the labour market situation in the 10 SEMCs (Algeria, Egypt, Israel, Jordan, Lebanon, Morocco, Palestine, Syria, Tunisia, and Turkey, all of which belong to the EuroMed partnership and to which all of the following figures apply) make job creation the most important objective of the coming years (table 3.1). For every three people in the region one is under the age of 15 and will soon hope to find work, inflating the labour supply. The under-15 group represents 81.5 million people in a total population of 269 million. This is not merely a demographic question or a matter of duelling estimates or expected effects. These are people who will be looking for work in the coming 20 years, and they are already more numerous than the number of formal jobs available. The issue is economic, and it is urgent.

There is already a substantial gap between the number of people potentially seeking employment and the number of jobs formally on offer (187 million people over 15, of which 173 million are potentially economically active, compared with 74 million jobs currently on offer). The participation rate, therefore, is below 50 per cent: fewer than half of inhabitants of working age are actively employed or seeking a job in the SEMCs. Therefore, 96 million people of working age are not currently in the labour market. A significant number undertake informal work as a matter of survival, but their productivity is low, and they are relegated to the margins of social protection measures. Thus the official unemployment rate of 11.6 per cent—8.5 million people—is almost certainly an underestimate. Bringing informal workers into the formal (and more productive) sector would increase income and accelerate economic growth.

**› Table 3.1 Demographic indicators in the Southern and Eastern Mediterranean labour markets in 2007**

| Total population *** | Number under 15 | Proportion under 15 | Population of working age (15 and older) | Active population ** [a] | Jobs ** |
|---|---|---|---|---|---|
| 269,215,108 | 81,540,022 | 30.3% | 187,675,086 | 83,463,607 | 74,810,990 |

**› Table 3.2 Activity indicators in the Southern and Eastern Mediterranean labour markets in 2007**

| Population of working age (15 and older)* [1] | Active population 2007** [2] | Number of non active [3]=[1]–[2] | Rate of activity [2]/[1] | Number of unemployed [4] | Rate of unemployed [4]/[2] | Number of nonactives and unemployed [3]+[4] |
|---|---|---|---|---|---|---|
| 187,675,086 | 83,463,607 | 95,904,812 | 44.47% | 8,652,617 | 11.57% | 104,557,429 |

*Source:* Blanc (2011), based on * UN Population Division quinquennial estimates and projections; ** ILO, LABORSTA Labour Statistics Database; *** World Bank, WDI online.
*Note:* Active population is the sum of the employed and unemployed.

The distribution is very unequal between the European Union's 27 countries (EU-27) and the SEMCs. The SEMCs represent 34 per cent of the total population of the Euro-Med region. They have half of its young population (49.8 per cent of those under 15) but only a quarter of the employees (25.5 per cent). In other words, Europe currently accounts for 70 per cent of the jobs, but it has less than half of the population under 15. These figures indicate that the currently active population is concentrated in the northern Mediterranean, whereas the active population of tomorrow will be centred in the southern Mediterranean.

From 2007 to 2030, the working-age population (those over 15) will increase in the SEMCs by more than 87 million people, according to the United Nations' mid-range scenario forecast. These additional potential workers greatly outnumber the formal jobs currently on offer.

To maintain current activity and unemployment rates in the face of the wave of newcomers, the SEMCs will have to create 34 million jobs in the coming 20 years—about 1.5 million jobs per year. That target should be seen as the bare minimum because, even if it is met, the SEMCs will have more than 150 million non-economically active inhabitants in 2030. (The number of new jobs needed to maintain the current absolute numbers of nonworking people is around 95 million, or more than 4 million per year from now through 2030.)

Before the 2008 financial crisis and the Arab Spring, the number of jobs in the SEMCs rose at an annual rate of 2 per cent—around 1.2 million jobs per year. Those figures take into account the negative growth observed in Turkey, which lost 600,000 jobs between 2005 and 2007. For the nine other countries, growth in the 2004–07 period preceding the current global crisis exceeded 3.5 per cent per year, which translates into about 1.8 million jobs created per year. That figure owes much to Egypt's performance during the period.

Within the tense demographic context of the SEMCs, the potential for job creation is limited by several structural factors. Whatever the potential of green growth to create jobs, the actual outcome will depend on traditional structural policies. (See World Bank 2011c for a recent focus on green growth and structural policies in South Africa.) As discussed below, some important employment issues in the SEMCs must be tackled if green growth is to fulfil its potential to create jobs.

First, the public sector can no longer be viewed as the employer of last resort (IMF 2003; FEMISE 2003). The public sector in the SEMCs is large and shows low productivity; moreover, the macroeconomic context, coupled with globalization, make it difficult for countries to develop without cultivating their competitiveness in accordance with international standards. Second, other structural issues must be solved before the SEMCs can create sufficient productive jobs, among them: (i) the effects of the large informal sector, (ii) the quality of education and human capital, and (iii) the effectiveness of institutions that aim to reduce the mismatch between demand for and supply of skills (World Bank 2004a).

The informal sector in the region accounts for an estimated at 40 per cent of total employment, according to the International Labour Organization (ILO) (FEMISE 2007), which in good part explains the low labour-market participation rate shown in table 3.2. A first consequence of the low participation rate is that attempts to reform labour markets through legal reforms targeting formal labour seldom bear fruit because they concern only a minority of the working-age population. Informality is sometimes seen as having positive effects—notably in enabling people to avoid abject poverty, providing the society with a hedge against social instability (until now), and introducing some flexibility in labour markets that are considered too rigid by serving as an incubator of firms and individuals that later join the formal sector. In these respects, the SEMCs' experiences have been mixed, and the Arab Spring has now clearly shown that the negative effects of the bloated informal sector far exceed its purported benefits.

In general, the extent of informality in the region raises three major problems:

- A large share of workers and firms are excluded from the scope and effect of active policies.
- Informal employment, while enabling millions to survive, does not typically meet the standard of a "decent" job or provide social stability.
- Informality creates a "low-productivity trap" that exerts pressure on the entire economic system. This point may be of importance as the region looks to shift to a greener growth strategy, as productivity issues loom large in shaping the actual effects of green growth measures, a point discussed further on.
- Because informal firms and workers are usually not subject to taxation, government revenues are raised from a narrow base, requiring higher rates. High rates in turn reduce the return on investment and increase the barriers for firms moving from the informal to the formal sector.

With regard to education, the SEMCs suffer from a mismatch between educational outcomes and labour market demand, despite the remarkable progress achieved during the past four decades (World Bank 2007; FEMISE 2007). The countries of the region consistently allocate as much as 5 per cent of their gross domestic product (GDP) and around 20 per cent of their government budgets to education, which has enabled them to push down illiteracy rates, but higher education in the SEMCs still does not assure the graduate a job. For example, 80 per cent of the unemployed in Egypt have a secondary education, whereas those with secondary education make up on 42 per cent of the labour force. The corresponding figures are 44 per cent and 45 per cent in Jordan, 38 per cent and 20 per cent in Algeria, and 30 per cent and 16 per cent in Morocco.

A second limitation of the region's education systems lies in the relative prevalence of humanities and social sciences relative to engineering and sciences. Students of the sciences represent less than 20 per cent of enrolments in most cases, far below the best performers in Asia and Latin America. As a consequence, the private sector cannot attract the competencies it needs for its development, especially since so

many graduates have incentives to wait for a public sector job or to emigrate. The mismatch between graduates' competencies and available jobs lowers the level of total factor productivity in the region, and this has little to do with the quality of educational systems. This misallocation of labour factors assumes even greater importance under a green growth strategy that may create jobs, as potential jobs without workers is only half a solution and a new problem. Lifelong learning and vocational training systems focused on mid-level qualifications will be necessary to realise the job-creating potential of green growth.

With regard to institutions, the evidence is that labour market laws and institutions affect job creation because they skew the allocation of resources, as well as the smoothness and the speed of allocation. Nearly all studies of the job impact of green policies agree that those two points are key to realizing the potential of green growth to create jobs. And the labour framework is not the only thing at stake here: The business environment will play an equally important role. How easy is it to set up a new business, obtain private domestic financing, or trade internationally? The key role of the business environment derives from the fact that most green growth outcomes, particularly the short-term effects, stem from a better allocation of resources and factors. Putting in place frameworks that support speed and smooth adjustments is a key to success.

It is also clear that a political reform that affects the social contract is a very sensitive and complex issue in the SEMCs, given social pressure to protect employment. The challenge is to introduce further flexibility into the social contract, as has already been done on the hiring side (by introducing temporary contracts), to make it easier for firms to adjust to demand. This can be successfully tackled only within the context of an expansion of social protection.

Two other issues should be underlined. The first concerns women's participation to the labour market. Independently of questions of ethics and equality, designing special vocational training programs that prepare women to join the labour market would seem to meet the twin objectives of remedying structural impediments to employment in the SEMCs and maximizing their green growth potential. The second issue relates to training institutions. General education is not the only way to develop human capital. Vocational training as practiced with good results in Canada, France, Germany, and elsewhere is probably an efficient method of addressing the skill mismatch issue in the SEMCs.

To draw maximum benefit from the job creating potential of green growth, the SEMCs will need to tackle the root causes of the slow pace of job creation. Structural changes to address informality, make education more relevant, and make the labour market more efficient will interact positively with green growth measures, as shown in the following pages, to encourage smooth and speedy adjustments in labour markets.

# **Sectoral mechanisms** for green impact on economic activity and jobs

Poor environmental policy has a negative economic impact that is often immediate. But well-designed and well-implemented environmental policies could also have positive economic effects, even in the short term. This could be done by treating the environment as an asset and establishing environmental management policies that preserve and enhance the potential of natural assets. Where this is done, environmental achievements can improve national macroeconomic performance. To assess the extent to which policy deficiencies affect economic development and job creation in the SEMCs, one must understand how (and how intensely) they affect the economy, particularly job creation. This section will present some channels through which green policies exert their economic effects. Reference will be made to case studies presented in previous sections of the report to illustrate potential impact of better environmental policies on jobs and economic growth.

As indicated in the 2012 World Bank Report, Inclusive Green Growth: The Pathway to Sustainable Development, environmental regulation can contribute to growth in various ways, mainly by (i) increasing factors that contribute to economic production, natural capital, and human capital through improvements in health, education, cohesion, and stability; (ii) increasing economic efficiency through better exploitation of existing technologies, which also lowers production costs and therefore improves competitiveness (as the economy approaches its production frontier); and (iii) increasing innovation and knowledge spillovers in the overall economy, allowing it to produce more with fewer resources (that is, shifting the production frontier). Moreover, co-benefits can extend to social welfare by (i) increasing resilience to environmental and economic shocks (for example, oil shocks and volatility in commodity prices) and (ii) increasing inclusive growth, as the poorest households appear to be those most affected by environmental degradation and least able to support the private costs of remediation.

The environment has specific characteristics relative to other economic assets that may prevent its efficient use. In particular, the "common property" nature of environmental assets may lead to inefficient exploitation and often to overexploitation. Moreover, the value of the services it provides is hard to estimate and, in fact, is commonly underestimated. The rationale for green policies is that they lead to more efficient uses of

natural assets through measures such as taxation, reallocation of subsidies, and the creation of tradable property rights, among others. These policies change the structure of production and consumption by affecting relative prices. Doing this in an efficient way may generate economic co-benefits in the short term, which can offset or compensate for the inevitable cost of applying these policies.

Environmental regulations often increase production costs and promote changes in technologies. The increase in production costs results in reduced output, and thus reduced employment. But the change in technology can lead firms to substitute labour for capital and energy, thus modifying the labour-intensity of the production system and creating jobs. Morgenstern, Pizer, and Shih (2000) find that this second channel is important in the United States and that the combination of the two channels leads to job creation in some industries and job destruction in others.

The role of innovation was initially formalised by Porter and Van der Linde (1995). Since that influential paper appeared, economists' views of how environmental protection also protects the economy have evolved. Previously, protection had been considered only as a burden, as firms were required to allocate inputs and bear new costs to reduce pollution in an essentially unproductive way that reduced profits. The common view is that in a competitive world efficient firms will take steps to reduce pollution as a step toward competitive advantage if opportunities to profit from environmental protection exist. Porter and Van deer Linde proposed a view based on the notion that pollution is often a waste of resources. Reducing pollution in such a scheme may lead to a more efficient use of resources and improve productivity, pushing the firm to the production frontier (the "X-efficiency" argument). The authors argued that well-designed environmental protection can trigger innovation "that may partially or more than fully offset the costs of complying with them" in some cases.

The so-called Porter analysis is another view in which environmental protection is not always detrimental to growth. It has stimulated much political (and economic) debate. The chief critique of the hypothesis rests on the assumption that firms always maximize profit, an assumption questioned by Porter, especially in presence of imperfect information, imperfectly functioning (or absent) institutions, and market failures. On the whole, the Porter analysis explains mechanisms of opportunities rather than stating laws. It does not support the idea that environmental regulations always lead to innovation (only well-designed regulations do so), or that innovation always offsets regulation costs. A weak endorsement of the view holds that the Porter mechanism accelerates innovation but does not necessarily increase firms' profitability. Others go a step further, arguing that innovation increases firms' competitiveness, often completely offsetting regulation costs. Theoretical papers have explored ways to explain the innovation mechanism, for example, through the rational behaviour of managers (Aghion et al. 1997), the existence of market failures (André et al. 2009), organizational failure, and so on. Other papers that have conducted empirical tests; most of these have found evidence that at least supports the notion of an innovation boost. Results are less conclusive on the link between environmental protection and productivity and profitability. A positive link with productivity often appears, but there is a delay before it has a positive effect on profit. Although inconclusive, these results do indicate that the trade-off between environmental protection and competitiveness is not as simple or inevitable as is commonly believed.

# Jobs and greening: Neither myth nor automatic dividend

There is a growing literature about the relationship between environmental protection and the economy, particularly in relation to jobs. Meyer (1992), ranking the 50 U.S. states, shows that the most ambitious in terms of environmental protection were also the ones with the highest levels of growth and job creation over the 1973–89 period. Bedzek (1993, 1995) shows that strict environmental standards may also foster economic development in U.S. industry and rejects a negative relationship. Goodstein (1994) tests the relationship between environmental protection and employment and finds that ex ante estimates of the cost of protection are much higher than their actual cost. He also discusses the conditions under which environmental protection can lead to increased employment. Morgenstern, Pizer, and Ahih (1998) show that increases in environmental spending in heavy polluting industries do not cause net job losses, as the overall demand effect is mitigated by employment increases associated with new environmental spending. Renner (2000) estimates that creating environmentally sustainable economies generated 14 million jobs worldwide.

Simulations have estimated the potential net impact of environmental action on jobs. Geller, DeCicco, and Laitner (1992) estimate the impact of a "high efficiency" scenario for energy-consuming sectors at 1 million net new jobs in 10 years. Bernow et al. (1999) estimate the impact of U.S. compliance with the Kyoto Protocol and find a potential of 900,000 net new jobs in 10 years. Bedzek, Wending, and Diperna (2008) investigate the link between environmental protection and the U.S. economy and the qualitative aspects of created jobs. They provide three findings using an industrial survey in the United States:

- Growth, job creation, and environmental protection are complementary. Investments in environmental protection create and displace jobs, but with a positive net effect.
- Most of the created jobs are conventional ones (such as those of accountants, engineers, and factory workers); ecology-related jobs are only a small fraction.

- Created jobs are concentrated in manufacturing, professional services, information, and scientific and technical services.

Some contest the positive net impact of green policies. For Michaels and Murphy (2009), most of the positive results were found in studies that suffer from methodological weaknesses. Not taking into account ideological objections (for example, views about Keynes or about the government's ability to make efficient choices), Michaels and Murphy highlight some biases that undercut claims of job creation from green policies. These biases mainly consist of underestimations of the costs of green programs, underestimation of the impact on other economic sectors of the shift of labour and capital resources to green activities, the assumption that no skill shortages will appear, and the absence of a labour productivity effect. The fiscal impact on the overall economy of taxing non-green operations is also seen as a major drawback that may drive down the growth rate. However, it should be underlined that the costs of environmental regulations and taxes in most industrial sectors constitute only a minor part of production costs. Therefore, their impact may be considered marginal relative to other choice factors such as labour skills, business framework, financial sector efficiency. Hourcade and Quirion (2004), for example, estimated the impact on marginal cost of a €20 per tonne $CO_2$ tax in the European Union to be lower than the impact of exchange rates variations, even in energy-intensive sectors. This negative effect of green taxes is confirmed by an analysis of U.K. firms (Martin et al. 2011), the results of which pointed to a significant positive impact on energy efficiency but no impact on economic performance. Anger and Oberndorfer (2008) reached the same conclusion in their study on German firms regarding the impact of the European Emission Trading Scheme.

The U.S. Congressional Budget Office (CBO 2010) reviewed three different studies that estimated the employment impact of green measures on the U.S. economy. The main findings are not positive: Green measures will create winners and losers. In the detailed results, the CBO finds an overall negative effect on manufacturing. This sector will possibly lose net jobs, while higher raw job creation will occur in services. In quantitative terms, the net effect may be positive, but the CBO points out the risk of high localized costs (for example, in communities that depend heavily on one losing sector), a negative effect on the real wages of particular workers, and the risk of a decline in international competitiveness in some industries. Their analysis also highlights that the contents of the green policies, the adjustment speed of the labour force and capital, and the accompanying adjustment measures are decisive in determining the final impact.

The German experience with policies to promote renewable energy, considered a model, was examined by Fondel et al. (2009), who take a sceptical view. Examining the German experience of promoting renewable energy through massive subsidies and guaranteed feed-in tariffs, they find the program weak in terms of efficiency, mainly because of the high cost of the achieved reductions in carbon dioxide ($CO_2$) emissions. Moreover, they find that the overall economic impact of the changes was small relative to the subsidies provided. The green jobs created under the program went to people who were already employed; moreover, those jobs appeared likely to vanish with the end of subsidies. In the end, the authors argue that the (relative) failure of the German experience (given the considerable achievement of renewables installation) can be traced to the policy tools used and not the principle. Better economic impacts might be had with a less distortionary scheme and more public investment in research and development (R&D), rather than subsidies. However, by focusing on the economic impact alone, Fondel's team overlooks the main aim and outcome of the German policies: The policy objectives were not only to reduce emissions, but also to promote innovation, to reduce renewable energy costs, and to trigger a long-term transition in the energy system (del Rio Gonzalez 2008; Vogt-Schilb and Hallegatte 2011; Grau et al. 2011).

Conte et al. (2010) have questioned the potential of green policies in the 27 member countries of the European Union (EU-27). They examine various policy options (and mixes) in the EU context designed to allow the EU to meet its 2020 gas emissions target. Policy options differ, mainly in their capacity to tackle two market failures—first, the absence of spontaneous demand for green technologies, and second, the lack of incentives for firms to invest green. Through simulations of GDP growth and employment impacts (among others), the authors find that it is possible to achieve mutually reinforcing economic and environmental results. The overall impact on growth and jobs may be negative when the policy mix is not efficient (in particular, when it does not address the two market failures), but at the same time there are policy mixes that lead, under the same model and in the same context, to positive gains, both in terms of growth and job creation. The sign of the impact (gain or loss) as well as the magnitude are therefore dependent on the adopted policy mix, the efficiency of which does not rely on simple lump sum taxes but on a combination of labour incentives and R&D measures (in green and other sectors). With appropriate sets, the magnitude of net overall job gains may vary between +0.15 and +0.30 per cent of total employment. This net positive effect on European employment is confirmed by Jaeger et al. (2011), who find that increasing the European target for lowering gas emissions by 20 to 30 per cent may lead to the creation of around 6 million new jobs within the EU-27.

The United Nations Environment Programme (UNEP, 2011) reports that "a green economy grows faster than a brown economy over time, while maintaining and restoring natural capital." In a green scenario, additional investments amounting to 2 per cent of global GDP are allocated to the greening of selected sectors. According to UNEP's simulation, the average annual rate of job growth between 2011 and 2050 may be between 0.08 and 0.13 per cent higher in the green scenario, despite jobs losses in sectors based on resource extraction. It is important to note that the additional jobs come not only from the additional amounts invested. Compared to another scenario in which additional investments equivalent to 2 per cent of GDP are injected into the brown economy, the green scenario still exhibits higher job creation. Gains are present in the short term and long term (from 6 to 9.5 per cent of total employment by 2015 and from 1.5 to 1.6 per cent of total employment by 2050). Such estimates applied to the SEMCs would imply additional net job creation ranging from 440,000 to 750,000 jobs in five years and between 2.8 and 3.3 million new jobs by 2050.

Two recent regional studies produced by Mediterranean institutions show interesting results. The Arab Forum for Environment and Development (AFED), an international nongovernmental organization, published a report in November 2011 entitled *"Sustainable Transition in a Changing Arab World."* The authors stipulate that "transitioning to the green economy is not only an option for the Arab region, rather it is an obligation to secure a proper path to sustainable development." Addressing eight sectors—agriculture, water, energy, industry, cities and buildings, transportation, tourism, and waste management—the report argues that through efficient combinations of public policies, innovative approaches, business models, and green investment opportunities substantial gains in job creation and economic growth are possible (box 3.1).

## BOX 3.1 The green economy in a changing Arab World

In a 2011 report entitled *Green Economy in a Changing Arab World*, the Arab Forum for Environment and Development (AFED) endeavours to explain the underperformance of Arab economies over the past four decades. For the AFED, the countries of the region "have adopted aggressive economic growth models, but in doing so have gravely undermined progress on social and environmental issues." Inattention to those issues contributed to poverty, unemployment, food and water insecurity, and environmental degradation.

According to the report, "a green economy places great emphasis on the efficient use and deployment of natural assets to diversify the economy, which in turn provides immunity against the volatilities and recessionary pressures of the global economy." The authors estimate that the average annual cost of environmental degradation in Arab countries is close to 5 per cent of their combined GDP in 2010—about $95 billion.

Nearly all of the analyzed sectors can contribute significantly to economic growth. For example, "a 25 per cent reduction in energy subsidies would free up over $100 billion over a three-year period." That amount could be shifted to finance conversion to green energy sources or to generate other benefits. The report estimates that a 30 per cent reduction in energy requirements, based primarily on more efficient industrial processes, would result in annual savings of 150,000 billion kWh or $12.3 billion. Higher energy efficiency, accompanied by increased use of public transport and hybrid vehicles, could generate annual savings of $23 billion.

Energy efficiency in buildings could also produce huge co-benefits. The report estimates that greater efficiency in buildings has the potential to cut energy consumption by 217 billion kWh, representing annual savings of $17.5 billion and a 29 per cent reduction in projected $CO_2$ emissions by 2020. Moreover, "spending $100 billion in greening 20 per cent of the existing building stock in Arab countries over the next 10 years, by investing an average of $10,000 per building for retrofitting, is expected to create four million jobs."

"Because it is labour intensive and stimulates the demand for products, systems, and services in other industries" waste management also offers the potential for job creation. Effective waste management would save Arab countries $5.7 billion annually, according to the report.

*Source:* AFED (2011).

The Economic and Social Council of the Kingdom of Morocco recently published a summary of its ongoing work on the potential of the green economy in the country (CESRM 2012). The preliminary results in four sectors (renewable energies, energy efficiency, sewerage and liquid waste management, and urban solid waste management) point to a potential of almost 100,000 new jobs for Morocco before 2030 (box 3.2).

A recent macro-level study of the SEMCs (FEMISE 2011b) suggests that the potential of job gains from green growth could reach a similar magnitude (3.5 to 4 million in 20 years). The study simulates the impact on net job creation of reducing environmental degradation in five SEMCs (Algeria, Egypt, Morocco, Syria, and Tunisia). The value used for environmental degradation ranges from 2 to 5 per cent of GDP in those countries, according to the Mediterranean Technical Assistance Program (Croitoru and Sarraf 2010) and other estimates (for example, Bartelmus 2009; Larsen 2011). In a best-case scenario the simulation shows that by reducing the negative effects of environmental degradation on productive natural assets, factor productivity, and demand for new products and services the potential for job creation in the SEMC region could be 6.8 per cent higher in the coming 20 years—accounting for 10 per cent of total necessary job creation.

Such results are important, as they confirm the possibility of sizable net positive effects on the whole economy. Despite the limitations of such a modelling exercises, they are generally consistent with the idea that a green growth agenda should not be automatically associated with job losses. They point to the possibility of potential co-benefits of sizeable magnitude for near-term growth, especially in certain sectors and when green policies are well combined with other reforms to tackle fundamental structural issues. The main message of such studies is this: a more efficient and effective green growth path may generate economic co-benefits, even in terms of jobs, and depends on well-designed green policy actions taken in a suitable macroeconomic framework.

The limits of the models may be handled by combining sectoral and national approaches for different countries, though the lack of accurate and comparable data remains a problem. As discussed in the next chapter, the issue of generating data to monitor and explore the channels of the green economy should be a high priority.

## BOX 3.2 The job potential of the green economy in Morocco

The following figures are extracted from *"Green Economy: Opportunities for Creating Wealth and Jobs,"* a preliminary draft report from the Economic and Social Council of the Kingdom of Morocco (March 2012).

The Council analysed four sectors—renewable energy, energy efficiency, sewage disposal, and management of solid waste—and identified the green jobs potential in each, with the proviso that necessary accompanying measures are put in place.

The analysis reports the following potential for direct job creation, by sector:

- Renewable energy: more than 23,000 jobs by 2025.
- Energy efficiency: more than 40,000 jobs by 2030.
- Sewage disposal and discharges: 10,000 jobs by 2020.
- Solid waste: more than 11,000 jobs by 2025.

Among its cross-cutting recommendations and accompanying measures for the transition to a green economy in Morocco, the report lists the following:

- Creating administrative tools to implement and support green economy.
- Strengthening financial instruments through the creation of environmental funds.
- Diversifying governance, land management, and sectoral management, public and private, with the creation of delegated management agencies.
- Mobilization and commitment of public and private actors, including nongovernmental organizations, to ensure the involvement of all relevant actors, coordinated by renowned NGOs such as the Mohamed VI Foundation for Environmental Protection.

*Source:* CESRM (2012).

CHAPTER 4

# Doing Green: Assessing Environmental Progress and Identifying Strengths and Priorities in Environmental Action

**In this chapter**

/// Action-oriented environmental indicators for Mediterranean countries

/// Using multi-criteria analysis to identify strengths and priorities

/// Assessing sub-national environmental performance

/// Green national accounting for the Mediterranean countries

*One key to designing effective green policies is to improve the monitoring of environmental actions. Collecting a large array of indicators of progress and constructing green national accounts can better inform decision makers in the setting of national and local priorities.*

The authors are grateful to Kirk Hamilton (World Bank) and Myriam Linster (OECD) for useful comments and suggestions.

**Existing indicators allow assessment of various aspects of country-level environmental performance and can inform decision makers as they identify priorities in public policies aimed at enhancing the economic benefits of environmental assets.**

**If Mediterranean countries outside the Organization for Economic Co-operation and Development (OECD) were to begin compiling the indicators of environmental effort presented in the OECD's recent green growth report (OECD 2011), it would become possible to compare their environmental performance to that of socioeconomically and geographically comparable OECD countries.**

**Additional indicators of environmental performance could be devised to better inform decision makers of the most policy-relevant issues in Mediterranean countries. Multi-criteria analysis can be used to assess areas of comparative strength and priorities in national environmental performance.**

**Considering the variance of environmental indicators observed in most Mediterranean countries, sub-national-level data could also help decision makers allocate public investment across districts or provinces.**

**Setting up a green national accounts system is useful to provide a more accurate understanding of national trends in welfare, consumption, and production sustainability, and of the level of efficiency in societies' uses of natural resources. The United Nations and the developed countries have begun to implement a new system of integrated economic environmental accounts, making available strong expertise and experiences in the field.**

# Action-oriented environmental indicators for Mediterranean countries

This section examines the availability of action-oriented environmental indicators and argues that the framework and list of indicators presented in the recent OECD report on green growth should be regarded as a guide and a source of inspiration for devising additional measures of environmental performance.

## *Availability and desirable properties for indicators of environmental performance*

Two types of indicators are available for Mediterranean countries: on the one hand, macro-level measures based on the concepts of green national accounting and wealth accounting[13]; on the other, indicators that measure the environmental state of specific natural assets.

Action-relevant measures of performance are critical to inform decision makers and assist them in devising policies and determining paths to follow to reduce environmental degradation, implement responses effectively, enhance the productivity of environmental assets, and maximize the social return from natural capital. Environmental performance should be considered using a triple dividend approach (at both micro and macro levels), meaning that environmental preservation/remediation should be seen in terms of economic growth and employment, as well as promoting social well-being and equity.

The assessment of environmental performance could be based on a criterion of proactivity. The most relevant actions to consider are anticipatory or self-initiated measures. This means that different stakeholders would be expected to implement voluntary responses aimed at remediation and prevention, even in the absence of coercion (by international agreements or local regulations).

The recent OECD green growth report released in May 2011 highlights that, although indicators of environmental state have been extensively collected and analyzed during the past decades, comparatively little is available on outcomes and achievements in environmental policy. In practical terms, three main desirable properties are identified for indicators of environmental performance: relevance, analytical soundness, and measurability.

- Relevance. Indicators should inform policy makers and other stakeholders in Mediterranean countries. Therefore, desirable indicators should be related to environmental impacts and responses, rather than being restricted to drivers, pressures, or states of the environment.[14]
- Analytical soundness. In particular, indicators should be monotonic—that is, either strictly increasing or strictly decreasing—and ideally continuous, that is, with no gaps.
- Measurability. This implies in particular the ability to collect data in a consistent fashion over time and space.

Ideally, the scope of the set of indicators to consider would cover all interactions between economic agents and natural assets. Economic agents could be enterprises, households (rural and urban), public administrations (central and local), and the financial

13. In particular, the environmentally adjusted net domestic product (EDP) approach (Bartelmus 2009); the Index of Sustainable Economic Well-being (Daly and Cobb 1989); the Genuine Saving and Comprehensive Wealth (World Bank); and the System of Environmental and Economic Accounts (SEEA, UN). Within the SEEA framework, water (and energy) satellite accounts can be constructed and are particularly relevant in the case of Mediterranean countries.

14. Cf. the DPSIR (Driving Forces-Pressures-State-Impacts-Responses) analytical framework devised by the OECD and European Environmental Agency (EEA).

15. A log-linear form could be more suitable if the aim is to highlight improvements at low levels of performance.

sector; in principle, all type of natural assets would be taken into account: marine and coastal areas, freshwater, fossil aquifers, air, arable land, forest/wilderness, and biodiversity. The tools used for implementing responses might include regulatory and fiscal instruments, tradable rights, payment of environmental services, environmental and social governance, ecolabels, and so on.

Since actions taken by different types of stakeholders are considered, it is also desirable to seek consistency between micro- and macro-level indicators (that is, similar criteria of proactivity at the micro and macro level): at the firm level, Environmental and Social Governance (ESG); at the consumer level, willingness to pay for ecolabels. For both firms and consumers, the willingness to pay for ecosystem services could be also assessed. Desirable macro-level indicators would measure the willingness to act and to effectively implement norms and regulations.

## *Collecting green growth indicators for non-OECD Mediterranean countries*

The OECD green growth report (OECD 2011) provides a convenient framework for non-OECD Mediterranean countries engaged in monitoring their environmental performance. The report shifts the perspective from an assessment of the state of the environment to the measure of efforts, considering four types of indicators:

- Environment and resource productivity. Carbon and energy productivity, material resources productivity, and multifactor productivity.
- Natural asset base. Renewable stocks, nonrenewable stocks, and biodiversity and ecosystems.
- Environmental quality of life. Environmental health and risks, and environmental services and amenities.
- Economic opportunities and policy responses. Technology and innovation, international financial flows, prices and transfers, regulatory and management approaches, and training and skill development.

Although the last indicators are still under discussion and construction, a number of OECD countries are currently preparing publications of figures for these indicators. Since a consensus has been achieved among the OECD countries on both the methodology and actual implementation of this programme, the non-OECD Mediterranean countries that collect data would be able to benchmark their environmental indicators relative to those collected by those OECD countries with similar socioeconomic conditions and natural constraints (particularly, water stress and climate).

## *Devising and collecting additional action-oriented indicators*

Although the approaches and list of indicators presented in the OECD's 2011 green growth report are convenient, it is not ideally suited to the natural conditions and priorities of the Mediterranean countries. Additional indicators could be devised in a similar fashion, in consultation with experts and policy makers, to cover other environmental assets that are particularly relevant to the Mediterranean.

A tentative typology for additional classes of indicators, with some preliminary examples, could be as follows:

- Reducing impacts. Minimizing natural capital consumption (degradation/depletion), ratio of harmful to total (including ambiguous) subsidies in fisheries, ratio of fuel subsidies to "optimal" price (Ley and Boccardo 2009), and share of coastline consumed annually.
- Implementing responses. Addressing environmental degradation and its implications for human well-being, share of solid waste recycled (per cent of volume), share of consumer durables covered by ecolabels, and compliance with Global Reporting Initiative guidelines by listed companies (percentage).
- Improving the physical productivity of natural capital. Improving energy efficiency, water efficiency, and the physical productivity of other environmental assets; water efficiency in agriculture (by crop, output in tonne per cubic meter of water); and energy efficiency in new residential constructions (energy per square meter).
- Maximizing the social return on natural capital. Ensuring social equity in the distribution of revenues from natural assets, and in the exposure to negative externalities; share of coastal wasteland reused for new development projects (percentage); and enforcement of payment for ecosystem services schemes for water catchment areas (percentage).

Devising indicators of environmental performance, collecting raw data corresponding to these indicators, and monitoring change over time would allow decision makers to assess the Return On Investment (ROI) for various types of environment-related public actions. Regional cooperation is critical to ensure that the indicators most relevant in the Mediterranean context, in particular those of water efficiency, can be collected in a consistent manner at regular intervals. The number of countries should be large enough to allow performing multi-criteria analysis or other approaches in the international comparison of performance. Regional cooperation is also critical to guaranteeing that the results of the surveys are released in an objective way on a periodic basis.

Public authorities may be concerned that some results indicate poor national-level performance in certain areas. But since most indicators are influenced by local natural endowments or socioeconomic conditions, changes over time are at least as important as absolute levels. Granting researchers free access to a database of national-level indicators of environmental performance would stimulate new streams of study and generate public interest in national achievements.

# **Using multi-criteria analysis** to identify strengths and priorities

This section documents existing policy-related environmental performance indicators with a focus on a data set covering most Mediterranean countries. Based on the Environmental Performance Index database (EPI 2010), the section also attempts to sort among the 25 individual indicators to separate those related to natural endowments and the environmental state from those related to public policy and environmental action.

## ***Endowment-related indicators*** *and policy-oriented indicators in the EPI database*

A close investigation of the EPI database makes it possible to sort, on the one hand, indicators related to endowments of natural capital and the environmental state of each country and, on the other hand, policy-oriented indicators assessing the extent and effectiveness of action aimed at reducing environmental degradation or enhancing the benefits from natural assets.

Out of the 25 EPI indicators, 11 environmental-state indicators are strongly influenced by natural or socioeconomic conditions. One, the Marine Trophic Index (labelled in the EPI database as MTI), is mostly determined by biophysical conditions. Another, Ecosystem Ozone (OZONE), is largely determined by local climate conditions. Seven other indicators can be regarded as strongly influenced by the technologies used: the Water Stress Index (WATSTR), Outdoor Air Pollution (PM10), and $SO_2$ per populated area ($SO_2$), $NO_X$ per populated area ($NO_X$), non-$CH_4$ volatile organic emissions per populated area (NMVOC), the Water Quality Index (WQI), and the Water Scarcity Index (WSI). Finally, two additional indicators are strongly influenced by per capita income level: Greenhouse Gas Emission per Capita (GHGCAP) and Industrial Greenhouse Gas Emission Intensity (GHGIND). Out of the 11 EPI indicators measuring the environmental state of a given country, 7 are related to air, 3 to fresh water, and 1 to marine ecosystems.

The remaining 14 indicators provide information that can be used for assessing environmental public policy and in some cases actions undertaken by public and private agents in a broader sense. Six of these indicators are unambiguously relate to regulation and enforcement of environmental policy: Biome Protection (PACOV), Marine Protection (MPAEEZ), Critical Habitat Protection (AZE), Trawling Intensity (EETZD), Agricultural Subsidies (AGSUB), and Pesticide Regulation (AGPEST). Three other policy-related indicators are determined by the quality of existing infrastructures: Access to Water (WATSUP), Access to Sanitation (ACSAT), and $CO_2$ Emission per Kilowatt-hour of Electricity Generated ($CO_2$KWH). Two are mostly determined by public policy while also influenced by the behaviour of private agents: Environmental Burden of Disease (DALY) and Indoor Pollution (INDOOR). Finally, three other indicators are related to the management of natural resources: Agricultural Water Intensity (AGWAT), Growing Stock Change of Forests (FORGRO), and Forest Cover Change (FORCOV).

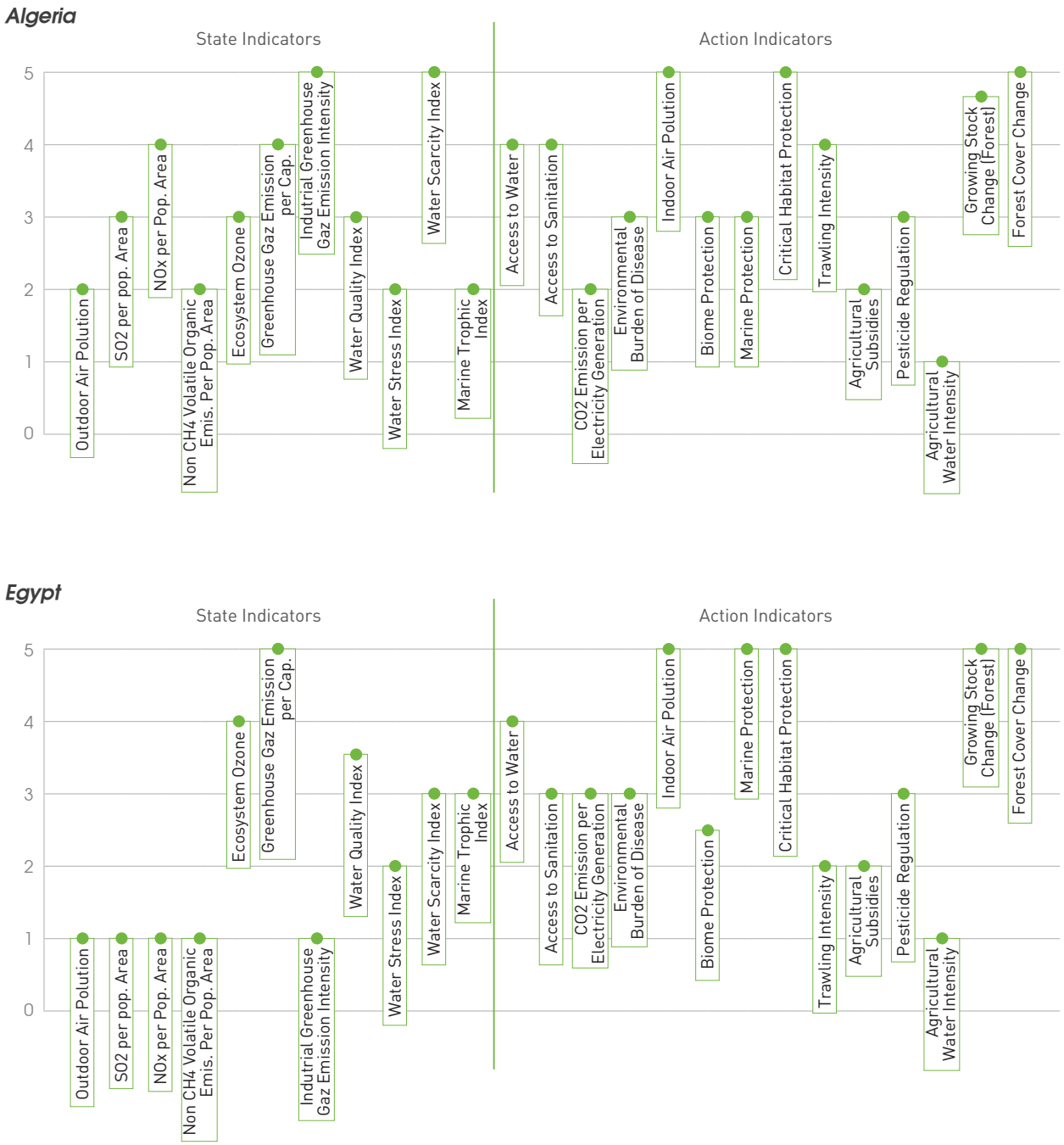
## ***Identification*** *of country strengths and priorities*

The assessment of environmental progress can be based on a multi-criteria method that sorts each country on the basis of an "outranking" approach (see annexes 4 and 5).

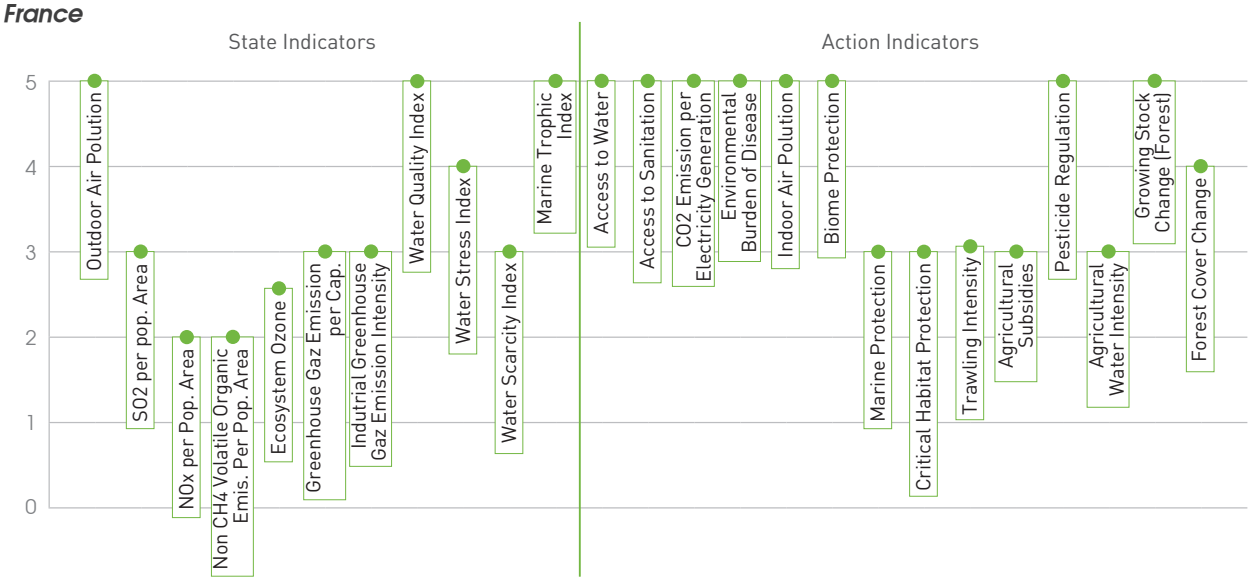
The country profiles presented in figure 4.1 make it possible to identify the major strengths and priorities that can also inform decision makers in the identification of priorities in public policies at the national level. These country-level results can also be used for setting targets for improvements on the basis of results obtained by countries exposed to comparable natural conditions (in particular, water stress) or experiencing similar priorities in terms of environmental state.

## ◊ Figure 4.1 Identification of strengths and priorities in environmental performance of selected Mediterranean countries using multi-criteria analysis of EPI indicators

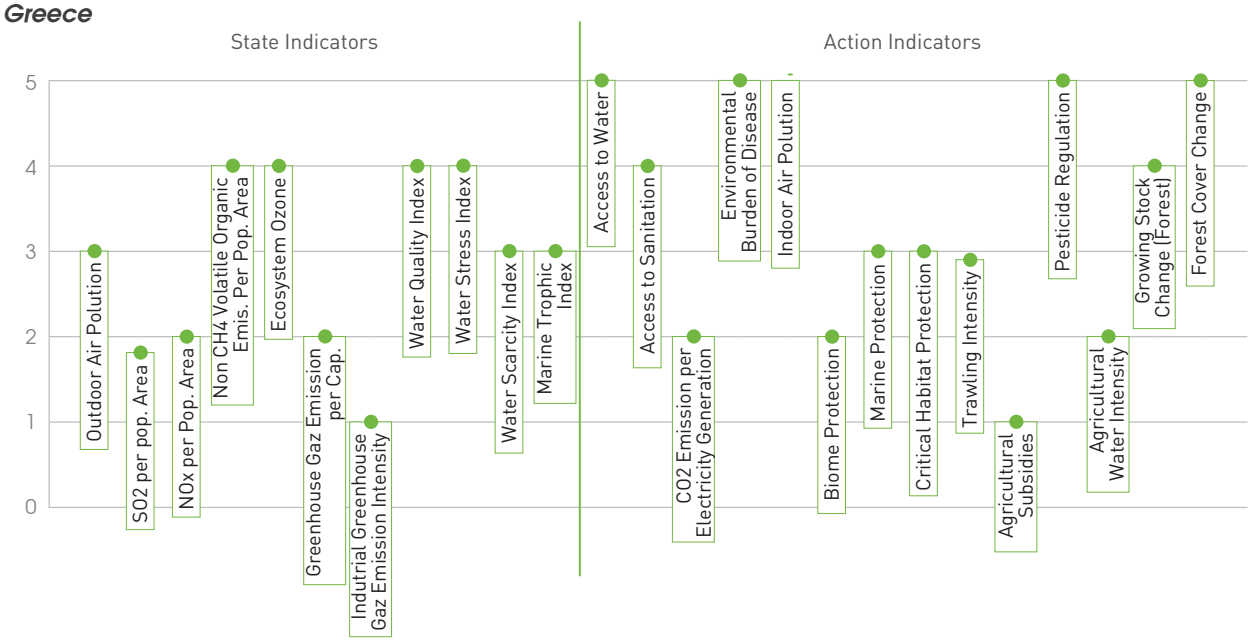
In the following graphs, the scale of indicators ranges from 5 (indicating a country strength) to 1 (indicating a priority).
A value of 3 indicates that the country situation is average relative to the 163 countries of the sample.



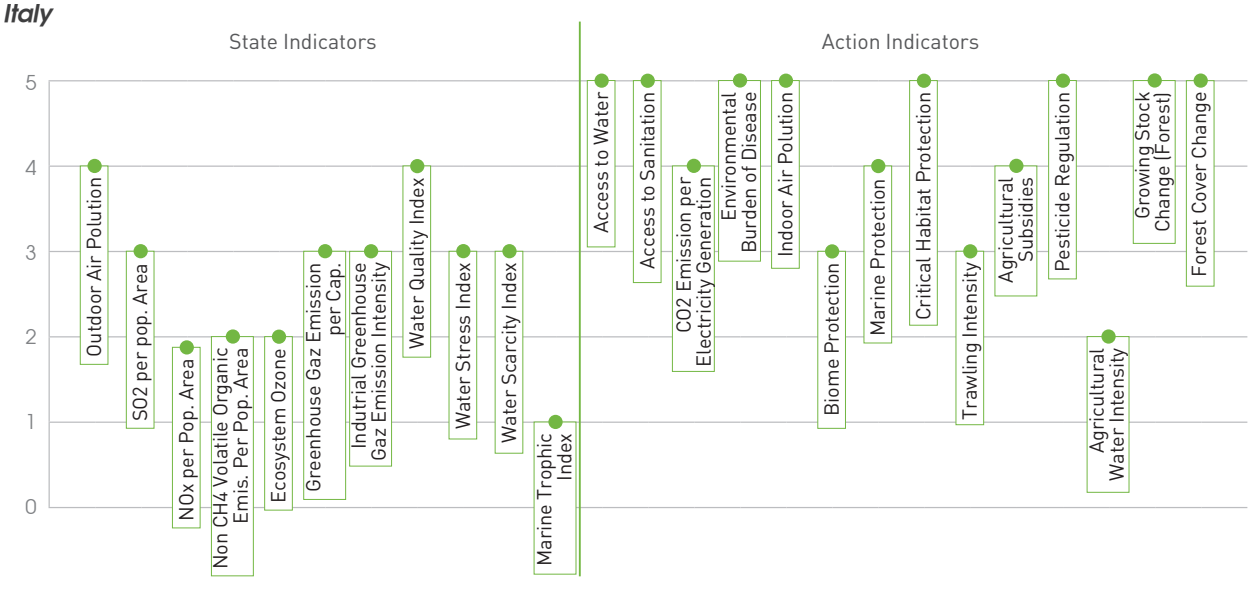
***France***



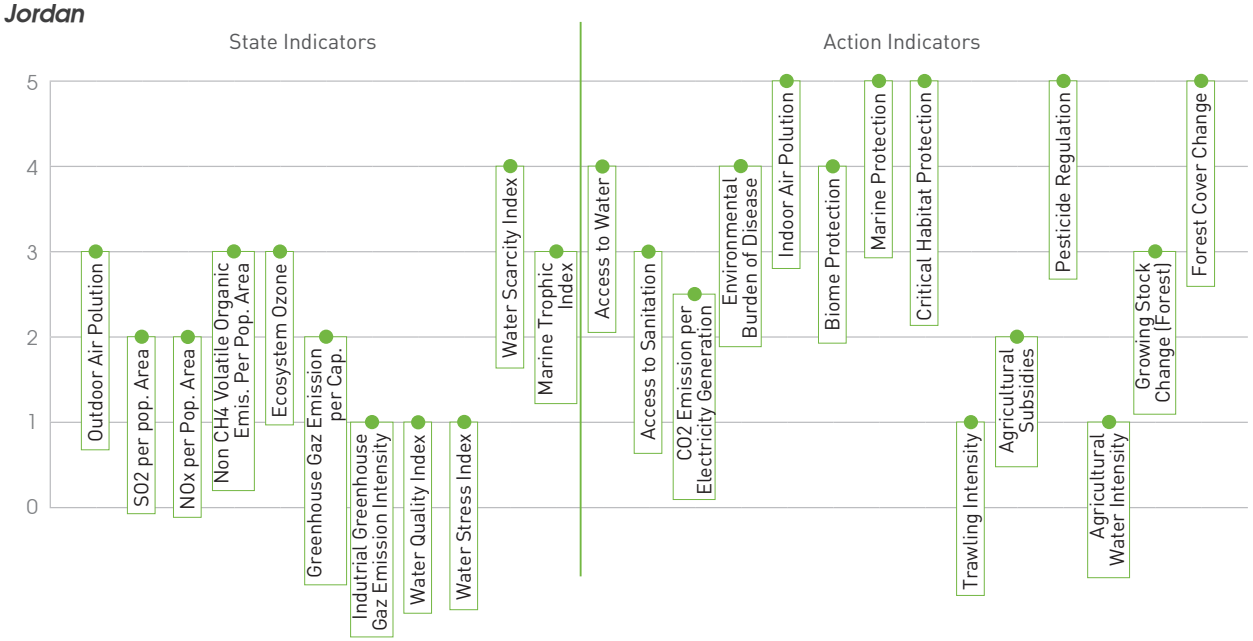

***Greece***



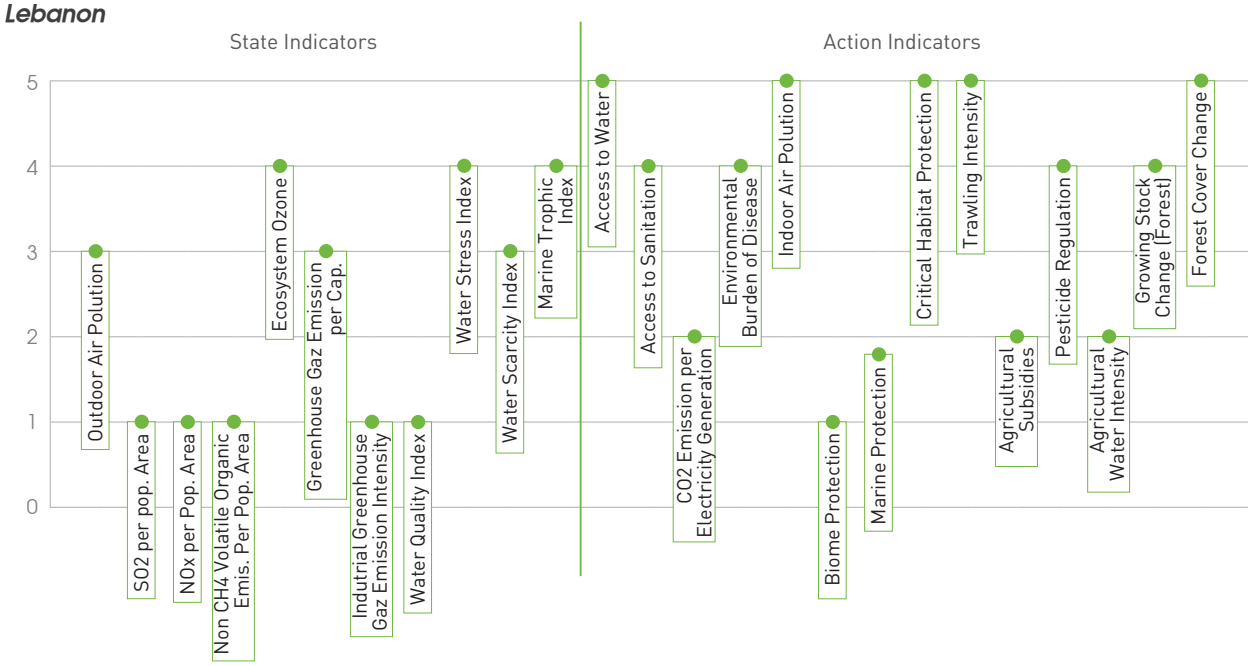

***Italy***



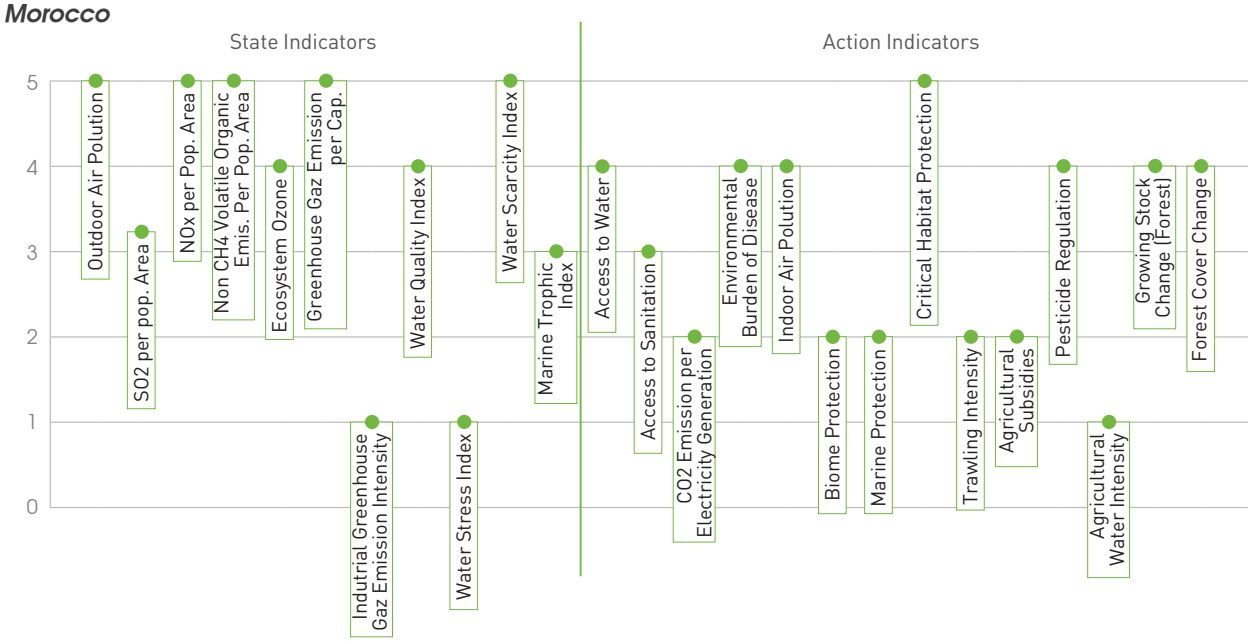
***Jordan***



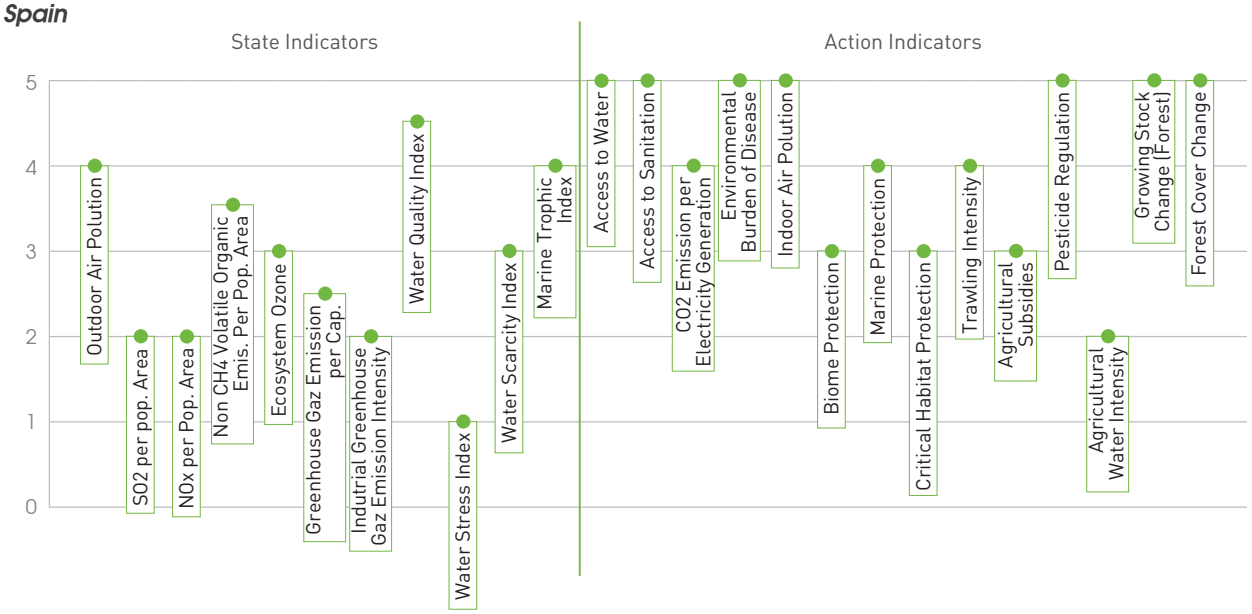

***Lebanon***



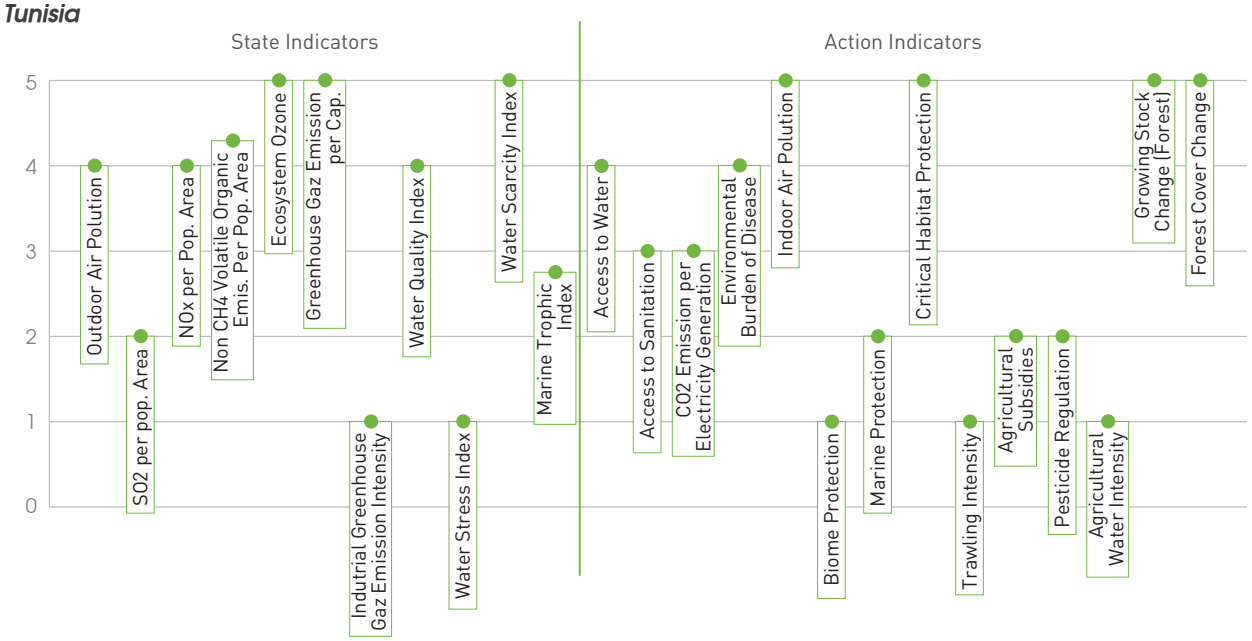

***Morocco***



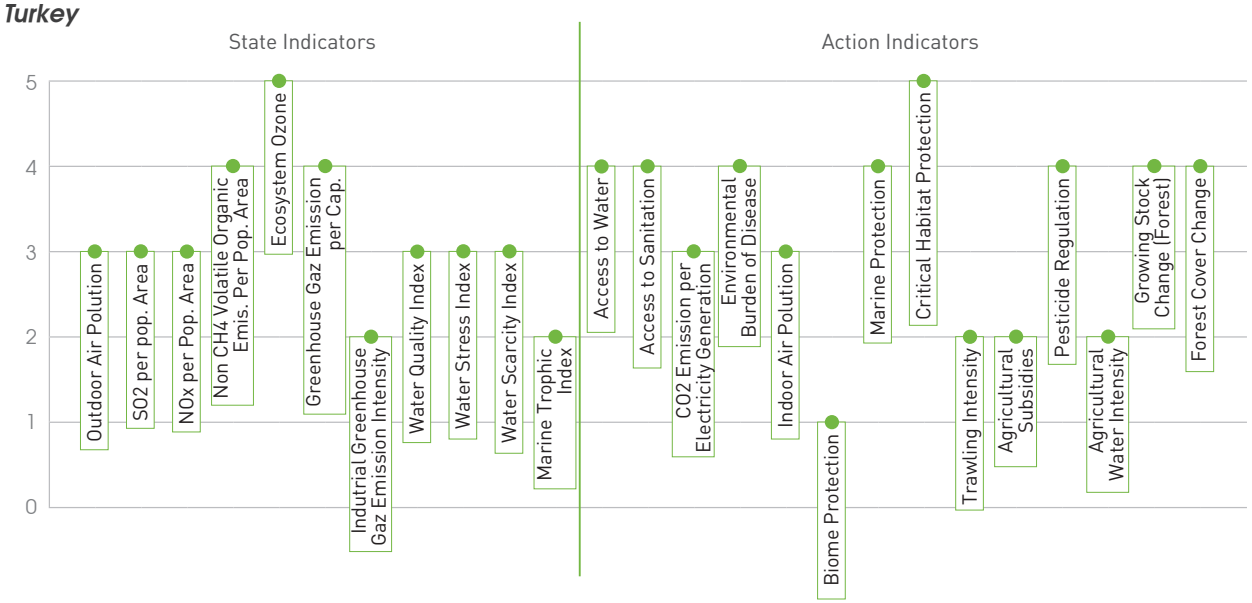
***Spain***




***Tunisia***




***Turkey***



Several Mediterranean countries' EPI strengths and priorities are identified in tables 4.1 (environmental state) and 4.2 (environmental action).

Although sizable differences related to environmental protection can be observed across countries, similar priorities are identified in the entire Mediterranean region, related particularly to air pollution and water management issues. Air pollution is more severe in the northern Mediterranean, while water management issues are more of a problem in the southern Mediterranean. Mediterranean riparian countries with sizable areas of non-Mediterranean (for example, oceanic or continental temperate) climates enjoy unsurprisingly favourable results for water (in particular, France and Turkey). Among Mashreq countries, air pollution is a major issue for the environmental state, particularly in Egypt and Lebanon, but their position is only slightly better for water-related indicators. The opposite is observed in Jordan, where the severity of the water stress induces a lower relative position for water-related indicators than for air-pollution-related issues.

With regard to environmental action, the relative position of northern Mediterranean countries is only marginally due to infrastructure, which is itself influenced by the level of per capita gross domestic product (GDP). The explanation of the North-South gap is mostly explained by indicators related to regulation. This finding implies that the adoption and strict enforcement of regulations could result in a rapid improvement of the relative position of southern Mediterranean countries. In Mashreq countries where a higher relative position can be identified for action-related indicators than for the environmental state, the performance is in the medium range but appears insufficient to stop environmental degradation and ensure remediation.

**› Table 4.1 Areas of strength and priorities identified in the multi-criteria analysis (MCA) of EPI indicators of environmental state**

| | Main areas of relative strength (4 or 5 in MCA) | Main priorities (1 or 2 in MCA) |
|---|---|---|
| Algeria | Industrial greenhouse emission, water scarcity, NOx per pop. area, greenhouse gas emission | Outdoor air pollution, non-CH4 volatile organic emission, water stress index, marine trophic index |
| Egypt | Greenhouse gas emission, ecosystem ozone | Outdoor air pollution, SO2, NOx, and non-CH4 volatile organic emission, industrial greenhouse emission, water stress index |
| France | Outdoor air pollution, water quality index, water stress index, marine trophic index | NOx, non-CH4 volatile organic emission |
| Greece | Non-CH4 volatile organic emission, ecosystem ozone, water quality index, water stress index | Industrial greenhouse gas emission, SO2, NOx, greenhouse gas emission |
| Italy | Outdoor air pollution, water quality index | Marine trophic index, NOx, non-CH4 volatile organic emission, ecosystem ozone |
| Jordan | Non-CH4 volatile organic emission, ecosystem ozone, water scarcity index | Industrial greenhouse gas emission, water quality index, water stress index, SO2, NOx |
| Lebanon | Ecosystem ozone, water stress index, marine trophic index | SO2, NOx, non-CH4 volatile organic emission, industrial greenhouse gas emission, water quality index |
| Morocco | Outdoor air pollution, NOx, non-CH4 volatile organic emission, greenhouse gas emission, water scarcity index, water quality index | Industrial greenhouse gas emission, water stress index |
| Spain | Water quality index, outdoor air pollution, marine trophic index | Water stress index, SO2, NOx, industrial greenhouse gas emission |
| Tunisia | Ecosystem ozone, greenhouse gas emission, water scarcity index, non-CH4 volatile organic emission, outdoor air pollution, NOx, water quality index | Industrial greenhouse gas emission, water stress index, SO2 |
| Turkey | Ecosystem ozone, non-CH4 volatile organic emission, greenhouse gas emission | Industrial greenhouse gas emission, marine trophic index |

*Note:* SO2 = sulphur dioxide; NOx = nitrogen oxides; CH4 = methane.

## › Table 4.2 Areas of strength and priorities identified in multi-criteria analysis (MCA) of EPI indicators of environmental action

| | Main areas of relative strength (5 or 4 in MCA) | Three main areas of priorities (1 or 2 in MCA) |
|---|---|---|
| Algeria | Indoor air pollution, critical habitat protection, forest cover change, growing stock change of forest | Agricultural water intensity, CO2 emission per electricity generation, agricultural subsidies |
| Egypt | Indoor air pollution, marine protection, critical habitat protection, growing stock change of forest, forest cover change | Agricultural water intensity, trawling intensity, agricultural subsidies |
| France | Access to water, access to sanitation, CO2 emission per electricity generation, environmental burden of disease, indoor air pollution, biome protection, pesticide regulation, growing stock change of forest, forest cover change | |
| Greece | Access to water, environmental burden of disease, indoor air pollution, pesticide regulation, forest cover change | Agricultural subsidies, CO2 emission per electricity generation, biome protection, agricultural water intensity |
| Italy | Access to water, access to sanitation, environmental burden of disease, indoor air pollution, critical habitat protection, pesticide regulation, growing stock change of forest, forest cover change | Agricultural water intensity |
| Jordan | Indoor air pollution, marine protection, critical habitat protection, pesticide regulation, forest cover change | Trawling intensity, agricultural water intensity, agricultural subsidies |
| Lebanon | Access to water, indoor air pollution, critical habitat protection, trawling intensity, forest cover change | Biome protection, marine protection, CO2 emission per electricity generation, agricultural subsidies, agricultural water intensity |
| Morocco | Critical habitat protection, access to water, environmental burden of disease, indoor air pollution, growing stock change of forest, forest cover change | Agricultural water intensity, CO2 emission per electricity generation, biome protection, marine protection, trawling intensity, agricultural subsidies |
| Spain | Access to water, access to sanitation, environmental burden of disease, indoor air pollution, pesticide regulation, growing stock change of forest, forest cover change | Agricultural water intensity |
| Tunisia | Indoor air pollution, critical habitat protection, growing stock change of forest, forest cover change, access to water, environmental burden of disease | Biome protection, trawling intensity, agricultural water intensity, marine protection, agricultural subsidies, pesticide regulation |
| Turkey | Critical habitat protection, access to water, access to sanitation, environmental burden of disease, marine protection, pesticide regulation, growing stock change of forest, forest cover change | Biome protection, trawling intensity, agricultural subsidies, agricultural water intensity |

*Note:* SO2 = sulphur dioxide; NOx = nitrogen oxides; CH4 = methane.

# Assessing sub-national environmental performance

This section discusses the relevance and availability of sub-national-level indicators of environmental performance in Mediterranean countries.

## *Relevance and availability of sub-national environmental indicators*

District-level data could inform policy makers involved in the allocation of public resources among districts and urban areas. Considering the wide range of within-country spatial diversity in socioeconomic and natural conditions across Mediterranean countries (average per capita income, population density, literacy, rainfall as well as urbanization, coastal area usages, arable land, forest cover, and so on), it is desirable to collect and monitor indicators of environmental state and action at the sub-national regional level (for example, NUTS 2 of the Eurostat database).

A sizable regional variance can be observed, for instance, for levels of air pollution recorded in Mediterranean urban areas documented by the Eurostat Urban Audit database, which covers the European Union (EU) Mediterranean countries, Croatia, and Turkey. This data set includes in particular: (i) number of days ozone concentration exceeds 120 µg/m³ (days per year) and (ii) number of days with particulate matter concentrations (PM10) exceeding 50 µg/m³ (days per year).

This information could be used as benchmarks for setting reasonable objectives across Mediterranean countries. What is more, cities in which the best performance can be observed may be used as models of best practices (unless natural conditions, such a topography, along with wind and rainfall regimes explain a large part of the performance in air pollution).

## *Regional variance in environmental performance in Turkey and multi-criteria analysis*

The methodology already used for a country-level multi-criteria analysis of the EPI database is employed for analyzing Turkish data. The same weight is given to each of the eight indicators covering three areas: air pollution, water sanitation, and waste management (4, 2, and 2 indicators respectively). Regional profiles are presented for a selection of Turkish regions in annex 6. The main results can be summarised as follows:

- The best environmental performance is observed in regions that include large cities, which indicate that income levels positively influence the ranking.
- The Istanbul region is the best performer, largely due to excellent water access and treatment. For waste collection and air quality, the results are excellent compared to other regions but improvements are still possible.
- The Izmir region has a similar profile albeit with performances lower than Istanbul for waste collection. A performance gap also exists for sulphur dioxide (SO2), but the comparison of changes over time suggests that this region is approaching Istanbul's levels.
- The Ankara region is somehow lagging behind, mostly due to air pollution, but unlike the Izmir region, it does not seem to be closing the gap. Wastewater treatment is, however, comparatively good, suggesting that specific factors, including perhaps local climate conditions, explain relatively bad air pollution.
- Trabzon and Lanliurfa have the lowest ranking, mostly due to infrastructure-related issues (water and waste management), while air quality is comparatively good.

# Green national accounting for the Mediterranean countries

Setting up a green national accounts system will help provide a more accurate understanding of national trends in welfare, consumption, production sustainability, and efficiency in society's use of natural assets.

The United Nations and the developed countries have begun to implement a new system of integrated economic environmental accounts, making available expertise and experience in the field. These previous experiences can help Mediterranean countries develop a faster and more efficient system adapted to priorities in water, energy, land (including use of soil), and fisheries.

Environmental accounts need to deliver clear messages regarding the consequences of variation in various indicators. Their main strength is that they provide indicators in formats

that are harmonized with the national accounts commonly used by policy makers. Environmental accounts are integrated with national accounts and can be used jointly to feed enlarged macroeconomic analysis and models. Regarding the impacts of economic activities, it is essential that accounts give a clear sense of context. This context can be geographical, historical, or political. The use of geo-referenced databases and geographical information systems helps produce accounts meeting these conditions.

Economic growth in the Mediterranean region, and green growth in particular, faces specific environmental constraints related to water scarcity, concentration of population in the coastal zone, and depletion of fisheries. Subsoil resources (oil, phosphate, fossil water) are abundant only in a small number of countries and are nonrenewable regardless. At the same time, nature provides unique natural assets such as climate and landscapes that provide many economic opportunities. Careful management of natural resources is a necessity for all development programs. Economic-environmental accounts are designed to be integrated with the UN System of National Accounts 2008 (SNA). They are prone to delivering biophysical and monetary data to support macroeconomic, sectoral, and regional green growth assessments and forward-looking modelling.[16]

## *Purposes of green accounting*

Accounts—private, public, or national—are tools for performance assessment and for control of information quality and fairness. Performance is measured first as the difference between receipts and expenditures (benefit or loss), and as a change in net wealth (net wealth of physical assets, credits, and debts). Regarding an economy's interaction with the physical world, performance can be assessed as well as the ratio between the creation of economic value (expressed in monetary units) and the use of natural resources (expressed in appropriate physical units).

The purpose of environmental-economic accounts is to supply the missing elements (such as use of natural resources, disposal of residuals, real price of commodities, effects of depletion and degradation of natural assets, and accessibility to ecosystems services) and allow decision makers to consider the broader picture when addressing issues such as well-being, sustainability of consumption and production patterns and resource-use efficiency, risks and adaptability to changing conditions, and ecological debts.

Worldwide case studies have provided experience on the usefulness of integrated accounts for policy making. Examples are water use recorded by economic sectors (agriculture, hydroelectricity, water supply, municipal services, households), which can be compared to relevant indicators of consumption and value added. Advanced tools have been developed that combine the regular monetary input-output tables used by modellers with physical data on water use to test scenarios of economic development in hybrid national accounting matrices. Another important application of this methodology relates to the United Nations Framework Convention on Climate Change (UNFCCC) greenhouse gas (GHG) inventories, reporting of which is converted into an economic classification to allow correct calculation of the GHG/GDP ratio and sector analysis. Another example of application of the System of Integrated Environmental and Economic Accounts (SEEA) is the production of accounts of environmental protection that measure the national effort and compare the relative burden of the central government, the local government, industries, and households. Where produced, these accounts are appreciated by the eco-business as an assessment of market trends in their domain.

Taking stock of the progress, in 2007, the UN Statistical Commission decided to upgrade the SEEA 2003 to an international standard. The revised SEEA will be available in 2012 or 2013. SEEA Volume 1 addresses subjects mostly related to the SNA statistical units. It includes supply and use tables of economic resources and corresponding assets in physical units, and accounts of residuals. Natural assets valuation is addressed as well as the calculation of resource depletion. A special chapter presents environmental protection and management accounts with particular attention to environmental taxes and subsidies. The SEEA Volume 2 will address ecosystem accounts in physical and monetary units. Ecosystem assets and ecosystem services encompass the renewable economic resources managed and operated for profits into broader systems that deliver private values and public goods all together. Valuation will highlight the benefits of ecosystem services intertwined with the economic values of commodities or real estate and, when possible, the value of unpaid externalities. Because the SEEA is about national accounts, valuation methodologies will have to be compatible with the SNA standards. The main SEEA handbook will be supplemented by specific manuals for water, energy, land and ecosystems, and agriculture/forestry/fisheries. This initiative responds to recurrent policy demands for improving the current measurement of economic performance delivered by conventional national accounts aggregates.

Such demand for green national accounts dates from the 1992 "Agenda 21" and has been recently reiterated by the Economics of Ecosystems and Biodiversity (TEEB) report, the European "Beyond GDP" initiative and its follow-up, in particular by the Stiglitz-Sen-Fitoussi Commission, in discussions related to the green economy (United Nations Environment Programme, UNEP) and green growth (OECD), in the 2010 Convention on Biological Diversity (CDB) Aichi-Nagoya Strategy, and in the Wealth Accounting and the Valuation of Ecosystem Services (WAVES) global partnership launched in 2011 by the World Bank as a continuation of its pioneering work in the calculation of "genuine savings" and wealth.

16. "The SEEA 2003 [System of Integrated Environmental and Economic Accounts] is a satellite system of the System of National Accounts. It brings together economic and environmental information in a common framework to measure the contribution of the environment to the economy and the impact of the economy on the environment. It provides policy makers with indicators and descriptive statistics to monitor these interactions as well as a database for strategic planning and policy analysis to identify more sustainable paths of development" (www.unstats.un.org/unsd/envaccounting/pubs.asp).

## *Green accounting in the Mediterranean*

### Learning from previous attempts at green accounting . . .

Environmental accounts are not a new subject in the Mediterranean region. The most visible efforts and achievements are in the domain of water accounts, where balances have been compiled since the pioneering work of Jean Margat for the United Nations Educational, Scientific and Cultural Organization (UNESCO) and Plan Bleu. Water accounts were one topic of MEDSTAT I and II, the statistical capacity-building programme of the Euro-Mediterranean cooperation. MEDSTAT/Water has been used by the UN Statistical Division and the UN Economic and Social Commission for Western Asia (ESCWA) as a test case for the interim "SEEA-Water" manual, implementation of which is still on the agenda.

An excessive burden was put on the shoulders of national statistical offices, which were both understaffed and inexperienced in water science. This problem could be overcome by more directly and actively involving the various national agencies that collect water data, such as environment, agriculture and public works ministries, water agencies, and meteorological offices. International programs are also sources of information: Food and Agriculture Organization (FAO) Aquastat, Global Earth Observation (GEO), and global change programs.

A "SEEA-Energy" handbook has been drafted to bridge energy statistics and economic-environmental accounts. It will give adequate methodological support for the implementation of such accounts.

### . . . to build an efficient system

Priorities for implementing economic-environmental accounts in the Mediterranean region are water, energy, socio-ecological landscapes (including agriculture, urban and tourism areas, and coastal zones) and fisheries, followed by soil, forests, and wetlands. Although data are scattered across countries, ministries and agencies within countries, and research programs, significant information exists as attested by the developments steered by national and international organizations and programs since the Plan Bleu report of 1989. The coordination of these activities is progressing. Existing international cooperative programs such as the Euro-Mediterranean Partnership initiative and World Bank's WAVES could provide an institutional umbrella for such endeavours and mobilize capacities for short-term implementation of a priority set of accounts.

Land cover and use accounts can benefit from the development of surveys from satellite images, which are available in all countries of the region at a medium scale and in most of them at higher resolution. Mediterranean countries that are members of the EEA (European Environmental Agency) are regularly covered by the Corine land cover program, while other countries have similar maps with the support of the FAO (EEA 2006). The EEA and FAO methodologies are compatible. Satellite images are abundant and usually free, and space agencies are keen to support the development of applications. One example in the region is GLOBWETLANDS II, which the European Space Agency has focused on the Mediterranean at the kind request of the Ramsar Convention and the EEA. The Global Earth Observation (GEO) secretariat, which covers all space agencies, has decided to include support of environmental accounting in its new 2012–15 work plan. In addition to open data access, cloud computing systems developed by major IT companies now offer advanced data-processing possibilities. Meanwhile, in the course of the SEEA revision, the FAO has undertaken the development of a specific handbook for agriculture, forestry, and fisheries that will support accounting developments.

Coasts are both rich in potential and under high stress from human activities, particularly in the Mediterranean. Several research programs have addressed this issue. PEGASO's ongoing research of the Mediterranean and Black Sea coasts includes ecosystem capital accounting coordinated with current SEEA development. The new European research known as MEDINA, which covers North African countries, will provide additional monitoring data on coasts and lagoons as well as seas and fisheries. Such programs can provide inputs in the short term and allow systematic accounting of coasts at a low marginal cost.

Data dispersion is a major concern for environmental accounting implementation in water and other domains. The involvement of national statistical offices is important because of such offices' responsibility and expertise in national accounting. A more decentralized approach to data collection and assimilation into statistical and geographical databases—one that involves all institutional sectors—is necessary.

## *Implementation guidelines*

The macro approach is the only way to begin to implement economic environmental accounts, as the final product is a macro vision of the relation between the economy and the environment. But macro accounts must be downscaled to the sectoral and local levels where statistics are more readily available. Meanwhile, findings must be accessible to local actors, not just central decision makers. Local institutions are examined in the EEA report (2010). For businesses, integrating ecosystem and biodiversity into financial accounting standards is a relatively recent concern. Very large companies seem to be leading the move toward the inclusion of environmental and sustainable development items in accounting standards to better account for risks, responsibilities, costs, and options.

Recent examples of raising interest are, for example, the activity of EMAN, the Environmental and Sustainability Management Accounting Network of business accountants, or the *2030 Water Resources Group* report on *Charting Our Water Future: Economic Frameworks to Inform Decision Making* (World Bank 2009a). Meanwhile, the UNEP Finance Initiative, a global partnership between the UNEP and financial sector, is active in the green economy. Another example is the Biodiversity Accountability Framework of Houdet,

Trommetter, and Weber (2010), which aims at promoting reporting standards that integrate financial and biodiversity and ecosystem services (BES).

*Water Costs and Accounts, Proposal for an Eco-Integrated Approach* is a study that summarizes the findings of a group of Spanish researchers gathered around an economist (J.-M. Naredo) and a thermodynamicist (A. Valero). Early work on Spain was presented before the OECD as far back as 1986. The originality of the method is its integration of quantity and quality into one single measurement. It is particularly relevant for arid countries. Based on this methodology, Naredo (2007) proposed a strict calculation of physical and economic costs that match the requirements of the European Water Framework Directive.

## BOX 4.1 The TEEB, a useful example for the Mediterranean

In 2010 the EEA conducted a methodological study for the TEEB called *"Ecosystem Accounting for the Cost of Biodiversity Losses: The Case of Coastal Mediterranean Wetlands"* (EEA 2010), containing monographs on four wetlands: Donana, Camargue, Amvrakikos, and the Danube Delta. Important findings of the study relate to the linkages between ecosystem services and natural capital, to the expression in statistical units of the concept of "socio-ecological systems" (Gallopin 1991; Glaser 2008), thereby allowing them to be used in national accounts. Other findings concern the need to address ecosystem services at multiple scales; for example, by providing the geographical and economic contexts of local wetlands, including their key role in supporting birds' migratory flyways. The study concludes with a discussion of the complementarity of top-down and bottom-up approaches, as opposed to previous attempts to generalize microaccounts up to the national level. These conclusions are presented in the EEA report and summarized in the TEEB D1.

*Source:* EEA (2010).

CHAPTER 5

# Tools for Environmental Action and the Implementation of a Green Growth Agenda

**In this chapter**

/// Promoting social equity and economic growth through environmental fiscal reforms

/// Promoting tradable rights and payments for ecosystem services

/// Corporate social responsibility and socially responsible investment in Mediterranean countries

/// Changing consumer and producer behaviour: Promoting ecolabels and certification

*To shift to green (or greener) growth, it is critical to implement effective tools of environmental action—in particular, fiscal reform, the promotion of market-based instruments, and environmental responsibility. Some success stories and best practices experienced in Mediterranean countries can be replicated or adapted to fit other socioeconomic and environmental settings.*

# Promoting social equity and economic growth through environmental fiscal reforms

Mediterranean countries and other middle-income countries that have recently introduced environment-related taxation have experienced positive outcomes that have yielded "co-benefits," that is, both environmental and economic gains (Goulder 2002; World Bank 2005; OECD 2005). Environmental fiscal reforms (as discussed in GTZ 2004, 2010; World Bank 2008; UNEP 2010; OECD 2011) imply, in particular, a phasing out of fuel subsidies to encourage energy efficiency while reducing pro-rich transfers that are a burden on public finance. For such a policy to gain wide acceptance and generate economic gains, it should be accompanied by measures promoting the use of improved or alternative technologies along with payment of transitory compensation to the main losers. Shifting from fuel subsidies to fuel taxation, along with phasing out untargeted food subsidies that tend to negatively affect health conditions, can allow governments to reallocate expenditures for other purposes such as the promotion of energy and water efficiency. Shifting from untargeted food subsidies to pro-poor conditional cash transfers can result in improved coverage of the targeted population while reducing the drain on public finance.

Environmental fiscal reforms have been introduced or are being discussed in a number of Mediterranean countries (box 5.1), either on purpose or as an indirect consequence of policies aimed at reducing public deficits. In the Southern and Eastern Mediterranean Countries (SEMCs), fiscal reform agendas include re-evaluating the economic, social, and environmental impacts of fuel and food subsidies that account for a sizable share of public expenditures and have either negative or ambiguous impacts in economic, social, and environmental terms. In light of increasing energy and food prices, however, scrapping subsidies without compensation is socially inequitable and politically untenable.

Fuel subsidies have been identified as "the engine of an inefficient consumption energy" (World Bank 2009b). The time is ripe for new energy-efficient policies that could boost gross domestic product (GDP) by a total $23 billion in Egypt, Morocco, and Tunisia, which contribute to the improvement of environmental performance and social welfare. According to the International Energy Agency (IEA), consumption subsidies accounted for as much as half of the full cost of supply in several SEMCs, equivalent to an annual cash transfer of $150–$300 per person in 2009.

Fuel subsidies also tend to be pro-rich transfers. A recent International Monetary Fund (IMF) study using a large sample of developing countries shows that, on average, the top income quintile captures six times as much in subsidies as the bottom quintile (Arze del Granado, Coady, and Gillingham 2010). Almost immediate improvements can be achieved by reducing fuel subsidies and reallocating the major part of expenditures as transfer payments to all households. Such a policy introduced in Iran in December 2010 resulted in a sharp decline in fuel consumption while increasing the disposable income of the poorest households (IMF 2011a).

## BOX 5.1 Environmental fiscal policy in Morocco

The government of Morocco has been undertaking, with the technical support of Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), a review of environmental fiscal instruments in the European Union (EU) countries and Turkey to benchmark existing environmental fiscal tools and other regulatory instruments in Morocco (for example, the Foundation for Democratic Process [FODEP] and tax exemptions), and to identify opportunities for further actions. The agenda includes water demand management, coastal management, and municipal and hazardous waste management.

*Source:* CNE (2009).

**◊ Figure 5.1** **Fuel and food subsidies in individual SEMCs as a percentage of current government expenditures**


*Source:* Albers and Peters (2011), box 4 (calculation based on data reported by ministries of finance of the respective countries and the International Monetary Fund [IMF] Article IV).

## BOX 5.2 Mechanisms to mitigate negative effects of economic reforms: The Egyptian Social Fund for Development

The Social Fund for Development (SFD) was created by the government of Egypt in 1991 to mitigate the adverse effects of the Economic Reform and Structural Adjustment Program (ERSAP) launched in the early 1990s. SFD mobilizes national and international resources to invest in social development, with priority given to job creation through development of micro and small enterprises (MSEs) and improvement in the quality of life of low-income groups. The Small Enterprises Law of 2004 reinforced the key role of SFD in developing MSEs in Egypt. With its headquarters in Cairo, the SFD works through a network of 32 regional offices covering the 27 governorates of Egypt in addition to more than 500 nongovernmental organizations and more than 12 banks. SFD covers the following areas: (i) small enterprise development, (ii) microfinance development, (iii) community infrastructure development, (iv) human resources development, and (v) business services.

The mission of the SFD's Small Enterprise Development Group (SEDG) is to establish, develop, support, and finance job-creating MSEs through an integrated package of financial and nonfinancial services. It seeks to address critical areas for MSE development, such as insufficient access to markets, limited access to finance, and underdeveloped managerial capabilities,

SFD's microfinance sector supports income-generating activities and seeks to create sustainable job opportunities with the aim of supporting poor families, especially female-headed households, financing existing and new microenterprises and cooperating with microfinance institutions and NGOs to upgrade their microlending services.

*Source:* Egyptian Ministry of Finance delegation, as proposed during the consultation process of the *2012 MED Report.*

## The case for shifting to fuel taxation

Drastic changes in energy policy have been introduced in developing Mediterranean countries. Turkey shifted from relatively low to extremely high fuel tax rates (among the highest in the world) during the 2000s. Impact assessments undertaken in anticipation of the policy reform pointed toward a possible "double dividend" of environmental fiscal policy—both economic and environmental gains. But the positive outcomes observed can in fact be regarded as evidence of a triple dividend: higher fuel prices provided incentives for energy efficiency in manufacturing and transportation and also resulted in the rapid development of public urban transportation infrastructure, reducing both urban pollution and the time and cost of commuting for lower-income people. Indirect effects and spillovers include recent developments in the manufacturing of transportation equipment, solar water, heat pumps, and energy-efficient consumer durables.

By reducing energy consumption, energy-efficiency programs could improve fiscal balance, and some of the savings could be directed toward targeted transfers to the poor and the upgrading of the social safety net (World Bank 2009b). Since 2008 Jordan has had a successful policy aimed at eliminating fuel subsidies (box 5.3).

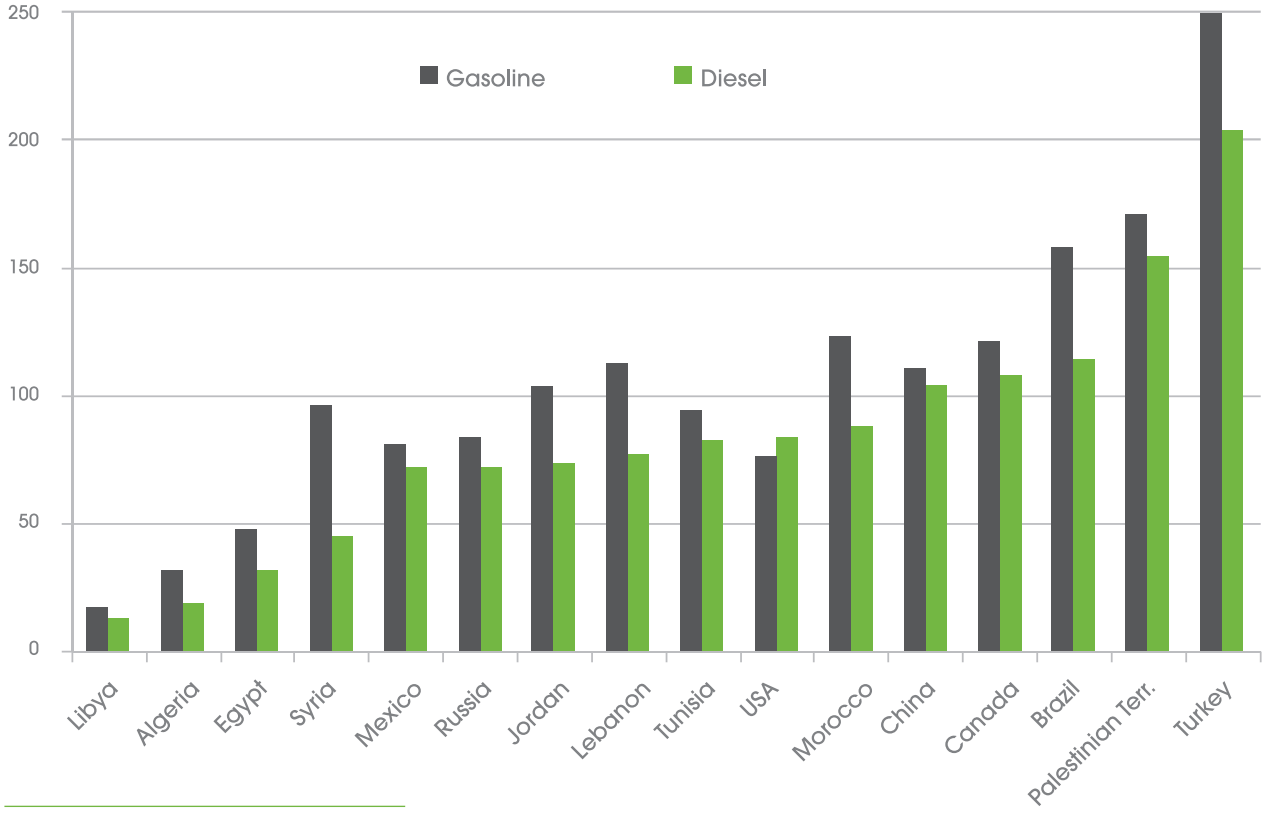
In those SEMCs where fuel is either heavily subsidised or under-taxed (GIZ 2011), it is crucial to estimate the optimal fuel price accurately. To do so, these countries may look to methods devised by the Organization for Economic Co-operation and Development (OECD) and other (non-SEMC) countries (Ley and Boccardo 2009).

### BOX 5.3 A gradual approach in the elimination of oil subsidies in Jordan

Jordan followed a gradual approach to phase out fuel price subsidies starting in 2005. By February 2008 domestic fuel prices followed international prices via a monthly automatic pricing regime. Mitigation measures included increases in minimum and civil service wages, one-time bonuses to government employees and pensioners with low incomes, introduction of a lifeline electricity tariff structure, provision of cash transfers to low-income households, and increased allocations to the National Aid Fund (the government's social assistance entity). But in January 2011, due to social pressures, the authorities temporarily suspended the automatic fuel price adjustment and reduced taxes on gasoline, diesel, and kerosene. Overall, the Jordanian experience illustrates the importance of putting in place effective social safety nets as part of price subsidy reforms that can be quickly scaled up to reduce the odds of reform reversal in case of sudden shocks.

*Source:* IMF (2011a).

**◊ Figure 5.2 Comparison of retail prices of gasoline and diesel in selected countries in mid-November 2010 (in U.S. cents per litre)**




*Source:* GIZ (2011).
*Note:* Based on crude oil price of $81 per barrel.

## The case for shifting from untargeted food subsidies to conditional cash transfers

The upward trend in the price of staples and other foodstuffs observed at the global level raises legitimate concerns for food security among net importers of foodstuffs, particularly in the SEMCs, both at the macro and household level (Breisinger et al. 2010). Untargeted food subsidies distort prices, do not sufficiently reach poor households, and have negative health and environmental consequences.

The causal role of staple food, sugar, and edible oil subsidies in the prevalence of obesity among Egyptian lower-income urban households is well documented (Asfaw 2007). For this group, changes in relative prices have resulted in a rise in demand for subsidised goods that already account for an extremely high share of caloric intake of the poor. This has led to lower food diversity, aggravating malnutrition in this group (Jensen and Miller 2010).

Soft wheat and sugar subsidies are particularly harmful for health. They reduce the demand for locally produced staples and pulses that are close substitutes[17], and even to some extent for high-protein, high-calorie nuts (almonds), and high-calorie dried fruits (dates, figs, grapes). This further reduces the diversity of the sources of micronutrients and vegetal proteins. Food subsidies for imported edible oil also shift the demand from locally produced, relatively high nutritional quality foodstuffs (almond and olive oil) to imported edible oils and fats of lower nutritional quality.

Food subsidies also have an indirect negative effect on soil conservation and natural fertility. Not only do they lower incentives to maintain a diversified production of annual crops that favour biodiversity of microfauna (insects and bacteria), they also discourage the cultivation of beans, which enhance the soil's nitrogen content, and unirrigated orchards, which prevent water and wind erosion.

Other methods of cash transfer allow better targeting of lower-income households (Muller and Bibi 2010) without affecting other groups much (Dhehibi and Gil 2003) (box 5.4). Experimental programs in Latin America have shown that conditional cash transfers to the target population have a number of advantages, particularly with regard to nutrition, health, and education (Bassett 2008). A regional targeting method could be used to reduce undercoverage of the target population in remote rural regions, where data collection remains less dependable than in urban areas (Douidich et al. 2008).

### BOX 5.4 A new methodology for shifting untargeted food price subsidies to targeted cash transfers in Tunisia

Untargeted food subsidies have traditionally been the main way to protect the purchasing power and nutritional health of the poor in the SEMCs. But these schemes largely miss their intended target.

The three main reasons are as follows: (i) untargeted food subsidies amount to transferring the same amount of cash to all households, including medium- and higher-income ones; (ii) subsidies do not benefit rural households producing self-consumed basic foodstuffs, even though these households are usually among the poorest across all the Mediterranean countries; and (iii) subsidised basic foodstuffs tend to be used as feed for poultry, although per capita consumption of poultry and eggs is conspicuously higher for higher- and middle-income households than for lower-income households.

Current public finance constraints and adjustment programs impose cuts on ambiguous food subsidies that fail to reach the intended targeted population. Muller and Bibi (2010) propose a new methodology to target direct transfers against poverty. Using data from Tunisian household surveys, they estimate focused transfers that greatly improve anti-poverty targeting performances and result in particularly low levels of undercoverage of the poor. In countries where reasonably accurate household survey data are available, the methodology is comparatively easy to implement.

*Source:* GEF (2007).

## The case for promoting organic food production

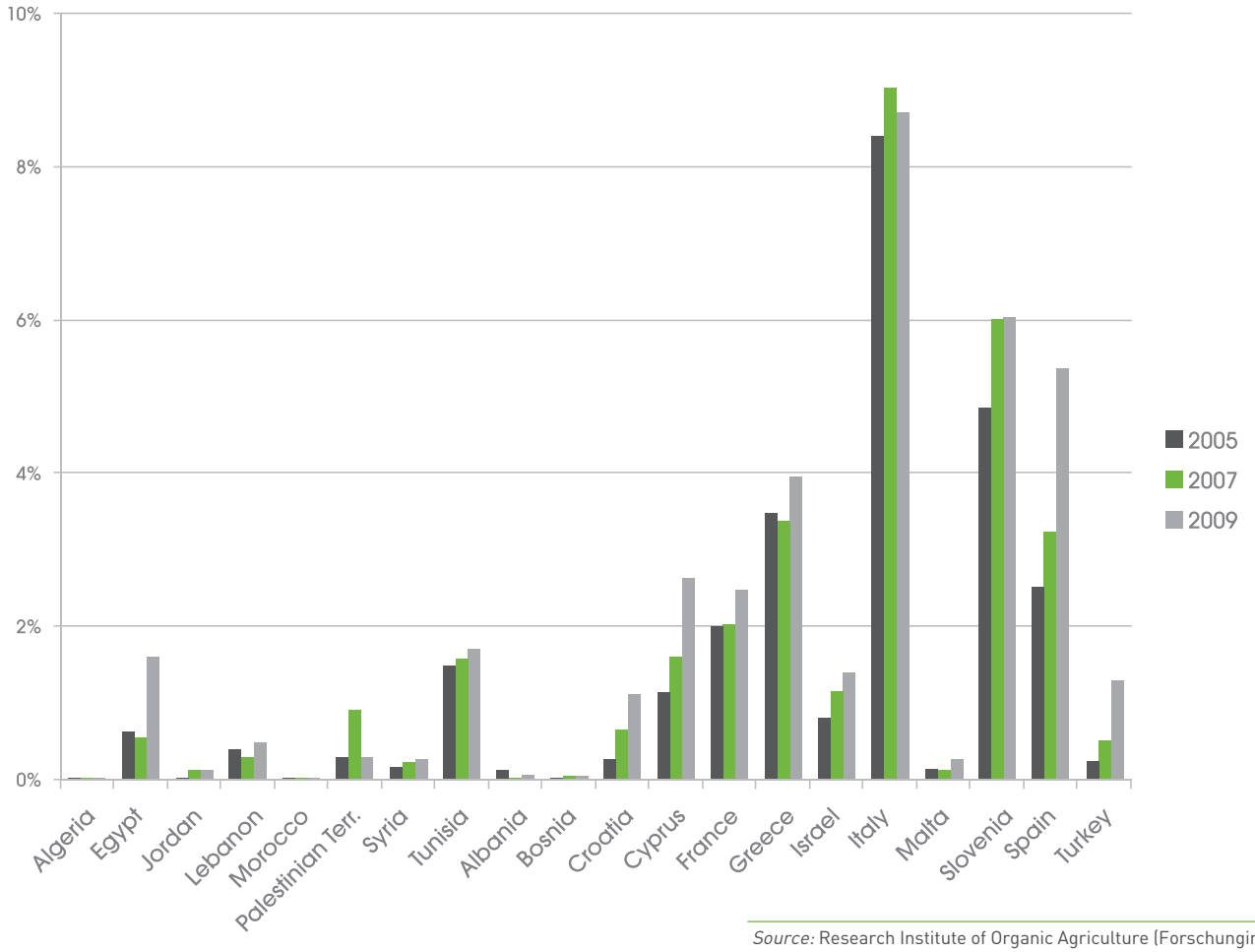
Since the prevalence of poverty in Mediterranean countries is higher in rural areas than in urban ones (in percentage of households), food security should be considered as a serious issue in rural areas. The degree of exposure to food price shocks for rural households depends on land distribution and the diversity of crops cultivated, which influences the share of self-consumption in total food supply. Hence, at the household level as well as the macro level, promoting self-reliance (achieving food security through trade) may be more effective than aiming for self-sufficiency in cereals. Small-scale cereal producers or stockbreeders in dry land areas of Mediterranean countries are among the most specialised agricultural households and, therefore, the most vulnerable.

Organic food production or more conventional low-pesticide production are viable pro-poor options. While organic production is essentially a niche market (in particular for export to

17. Durum, barley, oats, rye, millet, buckwheat, potatoes, lens, beans, chickpeas, peas, broad beans, and so on.

Europe or the Gulf countries), low-pesticide production has the potential to become the standard since it can result in a reduction in the use of intermediate consumptions that are useless for crops and tend to be harmful for human health. In both cases, it appears possible to maximize the per capita (or per household) income of small-scale producers by raising unit prices or reducing intermediate consumption per unit produced. The adoption of organic production techniques usually results in a higher value added per unit produced, thereby enhancing land productivity and water efficiency; when appropriate know-how transfer programs are implemented, organic yields per hectare are not necessarily lower than those obtained by small-scale conventional producers. In addition, since the domestic and international trade of organic production is increasingly associated with fair-trade criteria and objectives, the unit prices paid to producers tend to be substantially higher than for nonorganic crops. Furthermore, lower inputs of pesticides per hectare and the increased diversity of crops inherent to organic production techniques benefit both biodiversity and soil conservation. In the meantime, reducing pesticide use tends to reduce intermediate consumption while requiring more labour inputs. Shifting to organic production could therefore yield a triple dividend: economic, social, and environmental.

**◊ Figure 5.3 Share of agricultural land under organic cultivation in Mediterranean countries**




*Source:* Research Institute of Organic Agriculture (Forschunginstitüt für biologischen Landbau FiBL) and International Federation of Organic Agriculture Movements (IFOAM).

The share of agricultural land under organic cultivation (for horticulture and other crops, including cereals) is relatively low in the SEMCs (figure 5.3); Tunisia and Egypt are the main exceptions. An upward trend in acreage devoted to organic farming is observed between 2005 and 2009 in most northern Mediterranean countries, particularly in Spain, whose climatic conditions (and water scarcity constraints) are comparable to those recorded in the SEMCs.

Encouraging the production and consumption of organic (or low-pesticide-residue) food through ecolabelling is also a way to improving public health in areas where phytosanitary norms are not enforced, resulting in a high prevalence of pathologies related to pesticide use.

# Promoting tradable rights and payments for ecosystem services

Some SEMCs, Morocco and Tunisia in particular, have already experienced systems of tradable property rights and payments for environmental services (PES). These mechanisms could be developed much further, bringing economic, social, and environmental benefits (Bourgeon, Easter, and Smith 2008).

Agricultural water markets, individual transferable fishing quotas (ITQs), and PES introduce compensation schemes that are financed by the market and not the taxpayers. By compensating for the short-run economic costs of a more sustainable management of natural resources, these schemes generally meet lower resistance from stakeholders and benefit from higher political acceptability than other regulations such as standards, administrative quotas, taxes, and charges.

These mechanisms require legal and institutional reforms such as the decentralisation of natural resources management. Several SEMCs, such as Morocco, Tunisia, and Turkey, have already implemented such reforms.

**› Table 5.1 An assessment of shadow prices in agriculture in Morocco**

| Crop | Shadow price (dirham per cubic meter) |
|---|---|
| Sugarcane | 2.364 |
| Other cereals | 3.012 |
| Sugar beats | 3.042 |
| Fodder | 3.047 |
| Barley | 3.291 |
| Maize | 3.426 |
| Citrus | 3.692 |
| Legumes | 5.603 |
| Sunflower | 6.219 |
| Wheat | 7.498 |
| Vegetables | 7.498 |

*Source:* Bouhia (2001: table 4–29).

Under certain conditions, the development of irrigation water trading would result in significant benefits, including higher revenues and more employment for the local populations, productivity gains in the farming sector, and lower water use. Water reform raises productive efficiency, and this leads to lower input prices, all else being equal (Diao, Roe, and Doukkali 2005). The efficient use of water and dissemination of efficient irrigation techniques would induce a reduction in the use of freshwater, for example, by as much as 47 per cent in certain sectors of Tunisian farming (Boubaker 2010). Water markets favour the efficient use of water, but it is necessary to enable interdistrict and intersector transfers so as to maximize this outcome. Simulations for the north-western Tunisian area of Bouhertma (governorate of Jendouba) show that with inter-regional and intersectoral water trading, farmers' revenues would increase substantially, by as much as 7 per cent or 9.36 per cent respectively (Zekri and Easter 2005). In Morocco the magnitude of differences in shadow prices suggests that allowing agricultural producers to trade water use rights would lead to significant drops in the production of industrialized protected crops (in particular, sugar) and increased production of fruits, vegetables, and tubers (for example, watermelon, tomatoes, potatoes) (table 5.1).

Fishing is another industry that could benefit from tradable property rights. Any policy aimed at reducing overfishing and moving to sustainable management must have two essential objectives: the setting of the total allowable catches (TAC) and the definition, recognition, and enforcement of property rights on the resource. A likely third objective is the appropriation of resource rent for the benefit of local fisheries or the government, as illustrated by the example of "Namibianization" below. This rent can serve to mitigate, or in some cases totally offset, the potential short-run economic and social (employment) costs induced by a reduction in the TAC.

The main purpose of the ITQ schemes is to help fishing industries to comply with a reduction in the TAC in an efficient way. The Australian experience with ITQs in southern Bluefin tuna (SBT) offers a good illustration of this efficient process. In 1982 Australia, Japan, and New Zealand agreed to limit their catches of SBT, and in 1984 Australia implemented an ITQ scheme within its fishing zones. Quotas (shares of the TAC) were granted at no cost to 136 incumbent companies and fishers on a boat-by-boat basis (Meany 2001), and the TAC has been reduced almost yearly. The Australian SBT fishing sector has complied with the regulation and restructured quickly. After just two years, two-thirds of the boats—mainly the smallest and oldest, or generally the least productive—had left the fishery, selling their quotas (one-third of the total) to others (Campbell 2001). This concentration increased economic efficiency, which was further improved by capital investment in new fishing techniques and equipment. The fishermen who had decided to quit the sector sold their quotas and thus received monetary compensation financed by the market (that is, Japanese consumers) and not by the Australian taxpayers. The implementation of ITQs in Iceland in the early 1980s offers another good illustration of this market-based financing of fishing-fleet restructuring and decommissioning (Arnason 2002).

Market-based solutions such as these require governments to reform their legal systems and design institutional arrangements that minimize transaction costs. One method is through decentralization, involving the transfer of governance and management of natural resources to local communities (Johansson 2000). Morocco, Tunisia, and Turkey have already decentralized irrigation water management. Turkey is a leader in the transfer of irrigation schemes to water-user associations (WUAs). The transfer to WUAs of nearly all large surface-irrigation schemes (accounting for half of the total irrigated area) developed by the state appears to be complete (Cakmak 2010). Water decentralization was implemented in Morocco in 1984 (law 2/1984), providing the legal basis for the establishment of WUAs and defining their role for the operation and management of irrigation water. In 1995 a new law set a more favourable context for the decentralization at the basin level (CEDARE 2006).

Since the 1990s, the Tunisian government has transferred the local management, control, servicing, and maintenance to Groupements d'Intérêt Collectif (GICs). In each governorate, a government water agency allocates water among GICs, and then the GICs distribute water rights to their members (farmers). They also have the right to collect taxes among users so as to finance the servicing and maintenance of the local infrastructures. The government's role is restricted to maintaining and servicing the larger infrastructures, creating a supportive institutional context, defining and enforcing water rights, and monitoring and regulating externalities and third-party effects.

The same could be done with fish stocks. The OECD (2003) explains that centralized governmental management of fisheries is costly, ranging from 3 per cent to as much as 20 per cent of the aggregate landed value, with an average of 6 to 8 per cent. Arnason (2007a) explains that decentralization is more efficient, reducing the cost of providing information and incentives. In the decentralization process, the author includes all fisheries management services such as setting, monitoring, and enforcing of the TAC. Under ITQ systems, these services can be regarded as a club good (nonrivalrous but excludable), which can be effectively provided by the club (Buchanan 1965). ITQ holders constitute a well-defined club that can manage fisheries effectively (Arnason 2007a).

Authorities should grant some of the rights at no cost to compensate the actors potentially hurt by the environmental reform. For example, the market value of quotas can offset the revenue loss of an agent obliged to reduce its natural resource use. In the same vein, the initial quota distribution can serve to increase the political acceptability of the environmental reform (Stavins 1998).

In the case of irrigation water markets, Thobani (1997) recommends an allocation of the rights free of charge based on historic usage but taking into account potential negative third-party effects such as drops in income, output, employment, or land value. He adds that new rights should be sold (auctioned) by authorities in a transparent way. The initial rights allocation is a central issue (FAO 2006) and might be influenced by equity principles that often drive water policy objectives. Nonetheless, equity and efficiency dimensions should be separated, as the former refers to a policy objective whereas the latter refers to a managerial objective (Johansson 2000).

An alternative to tradable property rights is administrative pricing—for example, adjusting the price of irrigation water or access to fish stocks. But experience has demonstrated that administrative pricing is generally inappropriate. For example, in Egypt, to induce a 15 per cent decrease in water demand, it would be necessary to raise water prices by an amount equivalent to 25 per cent of farmers' average net income (Perry 1996). This would be politically infeasible.

## BOX 5.5 Irrigation water markets in Chile and Morocco

The Chilean water reform of 1981 is the only countrywide example of a reform based on water markets. This has led to significant local transfers of use rights, mainly in regions with water scarcity, from farmers to other more efficient farmers, industrial firms, and water utilities. The reform has induced efficiency gains and increased farming income through crop substitution and investment in more efficient water management and irrigation techniques. The increased output has been accompanied by job creation and poverty reduction.

The Chilean authorities designed an institutional context that encouraged local exchange and decentralized water management, creating local WUAs in charge of monitoring, distributing, and enforcing the rights.

This reform has nonetheless suffered from an incomplete definition of property rights, the lack of a clear judicial framework devoted to conflict resolution, the nonintegration of equity concerns during the initial rights allocation, and the absence of integrated water resources management (Bauer 2005).

Water trading has existed for decades in Morocco in the large-scale irrigation areas of Nfis and Haut Ziz (Shobha 2006) and the area of Bitit (CEDARE 2006). In Bitit the system is based on both an accurate specification of water rights and a clear and transparent rule for permits allocation, the "Jrida," managed by farmers themselves. Such initiatives emerged to compensate for the rigidities of the use rights repartition operated by the Regional Agricultural Development Offices (ORMVA). In Nfis allocation of water quotas is based on irrigated land surfaces and introduces significant disparities among farmers in the marginal benefits of water use. The Moroccan examples underline the need to separate water rights from land ownership, and to allow complete or partial transfers of water rights to nonagricultural sectors (Shobha 2006; CEDARE 2006).

## BOX 5.6 ITQ systems in Morocco and Namibia

Namibia reformed its fisheries soon after independence, implementing an ITQ system for several fish species in 1994. More than 15 years later, the system has permitted the recovery and rebuilding of fish stocks, except for sardines. The domestic fish-processing sector has developed from zero plants in 1991 to 20 in 2003, employing 8,000 people. An additional 6,000 people are working on vessels, 68 per cent of which are Namibian.

At independence (in 1990), the fleet was half Namibian; in 2003 it was 71 per cent Namibian, and it continues to attract foreign capital. Namibians controlled only 17 per cent of the hake quotas in 1991, but by 2003 they controlled 96 per cent. The onshore processing of fish products contributed to another 1.4 per cent of GDP in 2009. The fishing and fish-processing sector, largely export oriented, is the third-largest economic sector of the country, after farming and mining.[18] The Namibian government is now pursuing a conservative resource management policy along with a strict enforcement of fisheries regulation. It participates actively in regional conventions and programs for the integrated and sustainable management of shared marine resources.[19]

The Moroccan fishery management system was reformed with the introduction of an ITQ system in 2004, following the 2001–03 collapse of the cephalopod populations. The Moroccan Ministry of fisheries sets each year's TAC. The TAC was 12,300 tonnes in 2009 and was reduced to 10,000 tonnes in 2010, despite strong opposition by local fishing industries. The TAC was then separated into fixed allowable catches (FAC), one for each of the three segments of the sector: coastal fisheries, artisanal fisheries, and freezers. FACs are divided into quotas that are allocated to vessels owners, based on historical catches. In the artisanal sector, quotas are allocated to villages rather than to individuals. Quotas can then be traded, but only within the segment (Steward 2004).

## BOX 5.7 Payment for environmental services

The SEMCs have significant potential to boost revenue and employment through the improved management of environmental assets. The Tunisian cork oak forest of Iteimia is an important generator of employment for local populations in Tunisia, thanks to the production of cork and to the raising of livestock and crops (Campos et al. 2008). Similarly, Mavsar and Farreras (2010) estimate the benefits of better conservation of the Moroccan forest of Bouhacem, located near Chefchaouen. The authors use a contingent valuation method (questionnaires given to a representative sample of the population) to estimate the aggregate willingness to pay for the provision of the environmental services rendered by this forest: biodiversity, hydroecological services, soil conservation, and recreational services. The interviewed population revealed its willingness to pay for better management of the forest, including a halt in deforestation; better conservation of the forest's biodiversity; a reduction in soil erosion; and the development of forest-based recreational activities. Aggregating the results for the entire local population, the authors conclude that people would be ready to pay, on an annual basis, a total of 1.096 million dirhams, in 2010 values, for better management and conservation of this forest.

18. U.S. Department of State, www.state.gov

19. The Convention on Conservation and Management of Fisheries Resources in the South-East Atlantic (Seafo Convention) and the Benguela Current Large Marine Ecosystem (BCLME) program.

# **Corporate social responsibility** and socially responsible investment in Mediterranean countries

There are significant firm-level gains to be had from greening production processes and investment strategies. To this end, several multilateral and private initiatives are mainstreaming responsible investment. Meanwhile, a number of practical solutions are being proposed by a wide spectrum of actors seeking to overcome current challenges in environmental and social reporting. In this section we review several promising policy initiatives in emerging countries, with a focus on stock exchanges, carbon finance, and public policy, both within and outside the SEMC region. These findings suggest that future sustainable development strategies in the SEMC region could include the following element:

- The creation of a sustainability committee at each stock exchange with a mandate to improve listing requirements, environmental and social governance (ESG) data collection, and stakeholder engagement (in line with the United Nations Conference on Trade and Development [UNCTAD], Principles for Responsible Investment [PRI], and Global Compact's recommendations).
- The creation of a network of sustainability committees with a mission to develop a regionwide, mandatory, integrated triple-bottom-line reporting system for listed companies (in line with the key performance indicators).
- A multilateral financing scheme for firm-level ESG data collection, with the operational side outsourced to a third party (in line with the South African experience).
- The launch of broad-, sector-, and issue-based national and regional sustainable stock market indices (with methodological input from the region's first movers, Egypt and Turkey).
- The introduction of a set of banking and administrative corporate social responsibility (CSR) incentives for unlisted companies (in line with the Moroccan experience).
- A shift in the priorities of public financial institutions toward the financing of innovative green infrastructures (in line with the Moroccan experience).
- The creation of a voluntary regional carbon market and support of local eligible projects with additional multilateral financing (in line with the Brazilian and Moroccan experiences).

## ***Review*** *of evidence*

Over the past 20 years management scholars have sought to establish a business case for CSR.[20] The literature highlights two key mechanisms through which CSR could favourably impact firm performance. On the one hand, refocusing managerial decisions on eco-efficiency could cut costs at the firm level (Epstein and Roy 2001). Indeed, implementing a sustainability strategy may allow firms to substitute existing inputs for cheaper materials, resulting in higher operational efficiency. In addition, the financial industry is increasingly embracing the objectives of CSR (as shown by the widespread development of sustainability indices and the inclusion of environmental objectives in the stock selection processes of mutual funds). As a consequence, focusing on CSR can improve relations between firms and their capital suppliers, ultimately lowering the cost of external finance and driving up the net present value (NPV) of selected investment projects. Finally, a good CSR track enables managers to improve contacts with regulators and civil society. This mitigates the costs of adverse regulations and hedges a firm against reputational risk (for example, by mitigating adverse NGO campaigns and media representations). In addition, CSR should help firms increase cash inflows. This may be accomplished through innovative CSR-related products or production processes that create new market opportunities, enhanced consumer loyalty, and increased labour productivity (firms practicing CSR can easily recruit, motivate, and retain talented employees).

Several empirical studies have sought to identify the existence of a specific premium for Socially Responsible Investment (SRI) strategies. Typically, researchers have composed mutually exclusive portfolios based on a variety of CSR indicators, and then measured the differences in portfolio returns over a given horizon. For instance, Blank and Daniel (2002) have suggested that investing in an equally weighted eco-efficient portfolio yields higher risk-adjusted returns than a standard diversified portfolio.

Another group of studies analyse the financial implications of CSR based on multifactor models, whereby expected returns depend on exposure to a variety of risk factors and on an "alpha" corresponding to the regression's intercept term and capturing abnormal returns. In comparison to portfolio studies, this framework allows us to observe (i) whether CSR improves returns on investment and (ii) whether CSR policy affects risk exposure. In an influential study, Derwall et al. (2005) analysed the impact of eco-efficiency on an unbalanced sample of 450 U.S. companies from 1995 to 2003 and found that a high ecoefficiency portfolio appeared to earn a positive and significant 3.98 per cent alpha, while the alpha on the low eco-efficiency portfolio was negative and not significant. In addition, a positive and significant alpha was

20. Following the European Commission, CSR is defined here as "a concept whereby companies decide voluntarily to contribute to a better society and a cleaner environment" (COM 2001: 4) by integrating "social and environmental concerns into their business operations and in their interaction with their stakeholders" (COM 2001: 6).

observed on the difference portfolio. These findings suggest that, in line with the "business case for CSR," eco-efficient companies tend to generate superior returns. This may explain why many portfolio studies report superior performance for SRI strategies, in spite of a restricted set of investment opportunities.

Similarly, Guenster et al. (2010) matched the Innovest database to the Centre for Sustainable Resource Processing (CSRP) and Compustat U.S. databases, yielding an unbalanced sample of 519 companies for the 1996–2004 period, and investigated the impact of eco-efficiency on Tobin's Q. They reported a positive and significant coefficient on the eco-efficiency variable. A one-point gain in the eco-efficiency ranking caused Q to increase by 0.07, corresponding to an increase of 3.2 per cent of the sample's average value. In addition, the negative coefficient on the low eco-efficiency dummy appeared larger than the positive coefficient on the high eco-efficiency dummy, suggesting that investors are particularly sensitive to downside environmental risk. Overall, these findings suggest that environmental performance is a powerful driver of financial performance. One important implication is that investors may use environmental information releases to forecast firm valuation.

## BOX 5.8 Listing requirements in Malaysia

In September 2006 the Bursa Malaysia began shifting its policies toward ESG by encouraging publicly listed companies to follow a triple-bottom-line approach to information disclosure. It launched a four-dimensional CSR reporting framework focusing on the following:

- Environment (climate change, energy, biodiversity, waste management, wildlife)
- Community (employee voluntarism, education, youth development, the underprivileged, graduate employment, children)
- Marketplace (green products, stakeholder engagement, ethical procurement, supplier management, vendor development, social branding, corporate governance)
- Workplace (employee involvement, workplace diversity, gender issues, human capital development, quality of life, labour rights, human rights, health and safety)

Adherence to these principles was initially voluntary, following a "one-size-does-not-fit-all" approach. Then, in 2007, Bursa Malaysia mandated CSR Asia to conduct an online survey on CSR practices within the exchange. A questionnaire was sent to all listed companies, and respondents were compared to a random international sample of 200 companies. The analysis highlighted that the policy failed to improve the companies' CSR record significantly. Only 32.5 per cent of listed companies were in the above-average categories for CSR practices; only 4.5 per cent were in the leading category, 67 per cent of them being multinational companies. In addition, companies in regulated industries (alcohol, gambling, tobacco) scored the best result. This study showed an overall lack of awareness and knowledge of CSR in Malaysia. Authorities reacted by making CSR disclosure part of the listing requirements of Bursa Malaysia as of December 2007 (Appendix 9C, Part A, paragraph 29).

*Source:* www.bursamalaysia.com

## BOX 5.9 Sustainable indices: Egypt and Turkey

On March 23, 2010, the S&P/Egypt Stock Exchange Economic and Social Governance Index (S&P–EGX ESG) was launched at the Egyptian Exchange. This index gathers a subset of 30 companies selected from the 100 largest, most liquid companies, using both quantitative (internal) and qualitative (external) ESG information.

The creation of the index was powered by the Egyptian Corporate Responsibility Centre, a task force comprising the United Nations Development Programme (UNDP), the Egyptian Ministry of Investment, and the Egyptian Exchange. The selection of index constituents is based on a three-step process. In the first step, each listed company is assigned a quantitative ranking based on the sum of three subrankings reflecting the transparency and disclosure of corporate governance, environmental practices, and social governance. In the second step, leading companies undergo a qualitative analysis based on independent sources of information (media, trade unions, environmental organizations) and have their performance ranked on a scale of 1 to 5, with 5 indicating the highest ESG performance. Finally, a composite score is calculated for each company by summing the qualitative score and the quantitative score, thereby establishing the final ESG ranking. The top 100 stocks are chosen as the eligible pool, and the top 30 stocks are included in the index. Each year companies are assigned new scores based on their latest filings, news, and other material information in the public domain. The index is adjusted for aberrations on a quarterly basis.

It should be noted that the higher the ESG score, the more weight a company has in the index. This implies that the best ESG performers attract a higher share of an index tracker portfolio. The ESG performance of the index is rather positive: the average ESG score of the 100 largest Egyptian companies has improved by nearly 40 per cent between 2006 and 2009, and members of the S&P/EGX ESG Index have improved their score by approximately 80 per cent.

A similar policy is currently being implemented in Turkey, where the Istanbul Stock Exchange Sustainability Index Project was launched in August 2010. This project was powered by the Istanbul Stock Exchange and the Turkish Business Council for Sustainable Development, which gathered 29 Global Compact member companies. Company assessment has been outsourced to a third-party vendor, with input from Dow Jones and Sustainability and Sustainable Asset Management.

*Source:* S&P/EGX ESG Index Methodology, S&P (2010).

## BOX 5.10 The Brazilian Carbon Market

Since September 2005 BM&F Bovespa (Bolsa de Valores, Mercadorias & Futuros de São Paulo) has operated a carbon market within the framework of the Clean Development Mechanism (CDM) outlined in Article 12 of the Kyoto Protocol. The CDM enables industrialized countries to meet part of their emission reduction target by financing greenhouse gas (GHG) reduction projects in developing countries. The Brazilian Carbon Market consists of two entities: a project data bank (the Carbon Facility) and an electronic Carbon Credit Auction platform. Projects are screened by UN-certified designated national authorities prior to inclusion in the Carbon Facility. On the supply side, foreign government entities, multilateral organizations, and NGOs can announce their intention to participate and state the type of project they seek. Electronic carbon credit auctions are then scheduled by BM&FBovespa on an ad hoc basis and are open to all global carbon market participants. The first auction was organised in 2007. It involved 14 international institutions, and about 800,000 Certified Emission Reductions (CERs) were sold at the price of 16.20 per tonne of carbon dioxide ($CO_2$).

*Source:* www.wbcarbonfinance.org/Router.cfm?Page=Projport&ProjID=54386

## BOX 5.11 The Moroccan CGEM CSR label

In 2006 the Confédération Générale des Entreprises du Maroc (CGEM) launched a CSR label recognising firms' commitments to sustainable development. To make the label attractive to Moroccan businesses, a number of financial and administrative incentives were designed in partnership with public and private stakeholders:

- Domestic and international banks (Crédit Agricole du Maroc, Groupe Banques Populaires, Banque Marocaine pour le Commerce et l'Industrie) offer lower interest rates, cheaper account management, and lower banking fees to labelled firms
- National administrations (social security, customs, tax authorities) offer faster and simplified procedures to labelled firms.
- The CGEM CSR label is granted following a three-step process. In the first step, the applicant selects one of the eight accredited auditors, which include local and international companies (such as VIGEO or Grant Thornton). In the second step, the appointed auditor provides a report and a set of recommendations. In the third step, the company submits an action plan with detailed objectives. These are evaluated by an independent board that can (i) grant the label for two years, (ii) grant the label subject to the company's implementing key actions and agreeing to undergo another audit within the next six months, or (iii) reject the application.

*Source:* www.cgem.ma

## BOX 5.12 Public institutions: The Moroccan Caisse des Dépôts et de Gestion (CDG)

The Caisse des Dépôts et de Gestion (CDG) is a public financial institution created in 1959 with a view to mobilising and allocating long-term savings toward strategic projects in line with the Morocco's development objectives. As part of its quality control, the CDG increasingly incorporates the principles of sustainable development into its operations. In addition, the CDG has begun supporting projects based on their environmental externalities:

- In 2009 a joint venture was established with the French Caisse des Dépôts et Consignations (CDC) to create the Société Forestière de la Caisse des Dépôts et de Gestion (SFCDG), an investment fund of 200 million dirhams to reforest 25,000 hectares within 10 years, while progressively incorporating sustainability principles in the wood production sector. The fund is 70 per cent owned by the CDG and 30 per cent owned by the CDC.
- The CDG is also participating (with the CDC and the European Investment Bank, EIB) in the creation of the Fonds Capital Carbone Maroc, an investment fund whose objective is to promote Kyoto Protocol–relevant projects within the framework of the CDM. One of the fund's objectives is to leverage political support for renewable energy projects such as the Moroccan solar plan (targeting an output of 2,000 megawatts [MW] by 2020) and the Moroccan wind plan (targeting an output of 1,440 MW by 2012).

*Source:* Caisse de Dépôt et de Gestion (2009).

# Changing consumer and producer behaviour: Promoting ecolabels and certification

Environmental regulation is not without cost to consumers and producers. But private agents' perception that good environmental practices and profits are mutually exclusive may be reduced by policies that produce social and macroeconomic benefits, including improvements in living standards and the modernization of industry practices. The increasing popularity of product-oriented environmental policy in the Mediterranean and elsewhere is based on consumers' perception that changes in their behaviour can contribute to reducing pollution from industrial and other large sources. It is now more important than ever to look at the nonpoint source pollution and resource use associated with private consumption (Geyer-Allély and Eppel 1997; Sitarz 1994).

Ecolabelling and product certification can encourage sustainable consumption by providing consumers with information about the environmental impact of particular products and services. Companies are rewarded through public recognition, further encouraging proactive environmental management.

## *Ecolabels and certification: Rationale and impact*

Ecolabels applied to consumer products (appliances, automobiles, food) provide information on the environmental performance or effects of the labelled items. They are generally awarded by an impartial third party that authorizes the use of the label on products within a certain category.

Ecolabels may be voluntary, but some labelling systems are now required by law in most OECD countries, notably for major appliances and automobiles. They are a greening measure that aim to help consumers take environmental concerns into account when shopping. Requiring ecolabels is a demand-side management policy. They generally cost the public little (in general a small share of the budget of a National Green Agency, most of it invested in communication) and generate high returns in terms of saved energy consumption. See, for example, Meyers et al. (2003) for the U.S. case. Part of the cost is supported by consumers, as they replace old appliances with new and more efficient models. Such expenditures in turn generate savings for households over time—even as policy measures and incentives may dramatically change the timing of returns on investment. It should also be noted that mandatory ecolabelling seems to be more effective than any voluntary schemes.

On the producer side, companies are rewarded through public recognition, thus encouraging attitudes toward more proactive environmental management.

The idea is to label the least harmful products in such a way that consumers can distinguish them from others. The hope is that consumers' choices will give producers of (relatively) environmentally friendly products a competitive advantage, allowing them to gradually push less environmentally friendly products out of the market (OECD 2007). In addition, it is hoped that the anticipated competitive advantage gives companies an incentive to develop new products that are less harmful to the environment (OECD 1991; EPA 1998). Promoting ecolabelling in the Mediterranean region could:

- Expand the region's market access into environmentally conscious zones.
- Ensure that environmental considerations do not act as a barrier to trade.
- Reduce costs of production, thereby increasing competitiveness.
- Demonstrate the region's proactive engagement in the era of green consumerism.
- Promote the ideals of green procurement.
- Develop policies that give priority to sustainable consumption and production.
- Reverse the impacts of climate change.

The practice of ecolabelling is still very new in the Mediterranean region, and promises to be more effective if it takes into consideration several lessons learned elsewhere:

- Increase awareness among consumers, producers, and public agencies about the economic and environmental benefits of ecolabelling.
- Make ecolabels simple and readily understandable.
- Design proper trade and industrial policies that give priority to ecolabelling.
- Secure sufficient business leadership and political will to promote ecolabelling.
- Provide adequate training and expertise in ecolabelling preparation and certification.
- Introduce incentives and appropriate pressure to promote ecolabelling.

## BOX 5.13 GEF/AFD case studies: Refrigerators in Tunisia

Cooling appliances represent the largest share of household spending, accounting for 40 per cent of total consumption of electrical appliances and 10 per cent of the national consumption of electricity. With the support of the Global Environment Facility and Agence Française de Développement, the Tunisian government in 2000 launched a project to devise a legal framework for the labelling of cooling appliances produced and sold in Tunisia. In its first phase, the project planned to introduce mandatory labelling of the power consumption of appliances. A second phase was to set minimum energy performance standards (MEPS). The achievements of the project, according to the final project evaluation, are as follows:

- A reduction of 8.6 TWh in the consumption of electricity between 2005 and 2030, equivalent to a reduction in GHG emissions of about 3.4 metric tonnes of $CO_2$ equivalent.
- A net gain for consumers of about 721 million Tunisian dinars over the same period. Although consumers pay an additional 92 million dinars for their appliances, they save 813 million dinars on power.
- A reduction in gas imports of about 183 million Tunisian dinars.
- Savings of 152 million dinars on imports of equipment related to the generation and distribution of electricity.
- An increase of about 57 million dinars in imports of components and equipment for the manufacture of cooling appliances.
- A net reduction of 277 million dinars in import costs (gas, power-related equipment, and appliance components.
- Savings of 254 million dinars in investment costs by the country's gas and electric utility.

*Source:* GEF, final evaluation of project TUN/98/G35, (2004) (www.ccevaluation.org/inventory/190-GEF/version/6/part/13/data/993%20Rapport%20final%20tun%2098%20G35%20(novembre%202004)1.pdf?branch=main&language=en

## Ecotourism

Ecolabels are increasingly popular tools to motivate consumers to switch to more environmentally friendly and less resource-intensive products. They also are a means to reduce pollution and resource use from consumption. An example of an ecolabelling activity is ecotourism. It is based on unifying sustainable travel, conservation, and communities. Ecotourism entails minimizing the environmental impact of travel through environmentally conscious activities. This, in turn, builds cultural awareness and promotes a positive connection between visitors and local people. Ecotourism provides financial benefits for conservation and for the empowerment of local people. It is further seen as an important means of supporting sustainable development, with fewer negative effects on the environment and society than generated by uncontrolled mass tourism. Moreover, it opens new sources of income to indigenous people who are often marginalised and poor.

In sum, ecotourism, defined here as a way for individuals or small groups to travel to untouched natural places and learn by witnessing the natural environment and the lives of local people, is becoming increasingly important throughout the world, particularly in less developed countries and arid regions.

The Mediterranean countries, with their varied topography and climate, offer a good platform for ecotourism. This capacity is neither well managed nor fully exploited. Boxes 5.14 and 5.15 focus on these two points by offering examples of Jordan's and Turkey's experiences with ecotourism.

## BOX 5.14 Protected area management in Jordan

In Jordan, protected areas are privately managed, requiring unique and somewhat challenging management efforts. A study by Schneider and Burnett (2000) reviews the establishment and administration of Jordan's protected areas with particular emphasis on the challenges of multiple administrative and legislative layers, departmental working relationships, and a paucity of funding. Interviews with government and nongovernmental experts in Jordan, coupled with a review of pertinent academic and planning literature, served as the information base for the study. Despite new legislative and administrative initiatives, results reveal that Jordan faces substantive and ongoing challenges as it seeks to effectively manage protected areas. Obstacles include administrative policies that create unnecessary bureaucracy with multiple organizational layers.

Recommendations include completion of protected area inventories that will enhance current and future efforts to understand the magnitude of Jordan's resources. Improving governance capacity is challenging but necessary for effective management of any resource. For protected areas, the challenge is to discover what mix of public oversight and private control is efficient, effective, and equitable. Beyond the mix of public and private management, several other efforts must be strengthened. First, Jordan suffers from a scarcity of professional managers. Second, the need for knowledge of landscape assessment and ecosystem management training is essential. An additional requirement will be time to understand, monitor, and sustainably manage these areas. Furthermore, managers must be encouraged to cooperate for the common good. The Ministry of Tourism (MOT) and Royal Society for the Conservation of Nature (RSCN) must move beyond cordiality to become full-fledged partners in their quest for sustainable development related to tourism. The public also must be recognised as a key partner in protecting natural resources. Environmental education is explicitly necessary for natural resource protection. Given a growing, largely urban population, environmental education will be increasingly challenging in Jordan.

Observers hope that the recent flurry of activity—the generation of laws, policies, strategic plans, reorganization charts, and proposals—surrounding Jordan's protected areas and natural resources will lead to a brighter future for its people.

*Source:* Schneider and Burnett (2000).

## BOX 5.15 Ecotourism in Turkey

Yilmaz (2011) analyses the potential of ecotourism in Gölhisar, a town and district of Burdur Province in the Mediterranean region of Turkey. He examines ecotourism activities that are seen to have a positive contribution to the prosperity of local people. The natural and cultural heritages of the Gölhisar district and its suitability for ecotourism are explored using fieldwork and the global positioning system (GPS) technology. The result shows that Gölhisar district has plenty of potential for ecotourism activities. If those potentials are exploited, this will provide extra income to local people while avoiding the environmental devastation of mass tourism.

*Source:* Yilmaz (2011).

## *The impact of environmental performance reporting on firms' economic behaviour*

There are various actors involved in moving toward a greener economy: the firm, the consumer, the state, local authorities, and NGOs. They all have to work together to achieve desirable environmental outcomes. For example, behavioural change is a necessity, especially when considering the increasing demand for the planet's resources as developing countries improve their standard of living. But changes in individual behaviour will certainly not, on their own, make the modern way of life sustainable. Such changes must be accompanied by improvements in the technologies implemented by firms. Governments play a necessary oversight role.

One way to encourage firms to make necessary changes is through environmental performance reporting. Environmental performance encompasses a firm's efforts to minimize the negative environmental impacts of its products throughout their life cycle (Labatt and White 2002). It measures how successful a firm has been in reducing and minimizing its adverse impact on the environment. By requiring such reporting, policy makers can pressure firms to internalise the external costs associated with their emissions.

Over the past 25 years, American firms have shown that environmental management means more than just compliance with existing regulations (Jones, Seville, and Meadows 2002). While compliance with some environmental regulations is compulsory, some companies, in the pursuit of increased market share, have been freely adopting other environmental regulations. According to Kautto and Melanen (2004), customers

may be the principal source of pressure to improve firms' environmental performance.

According to some economic theories, environmental performance reporting leads to positive financial outcomes for firms, resulting in a win-win situation in which both the society and the firm gain from the internalization of external costs. Society benefits alongside the health of ecosystems and individual beneficiaries; firms see higher benefits in the medium term as they reduce production costs, win market share, and gain the confidence of their customers. But environmental performance may also lead to negative financial effects, as investments such as abatement and transaction costs in general result in higher production costs and lower profits. On average, environmental performance reporting, especially as driven by regulations, has a neutral effect on financial outcomes when the costs of adaptation are shifted to the demand side.

In principle the relationship between environmental and economic performance is not straightforward. It depends on several factors such as efficiency, the way that environmental investments are carried out, the timing of the investments, the market structure facing the firm, and demand responses to the supplied goods.

### Capital modernization

According to Porter (1991) and Porter and Van der Linde (1995a, 1995b) a given regulation's ability to produce a win-win situation is often exemplified by higher firm profitability due to reduced production costs and increased consumer satisfaction, leading to higher sales volumes. But the adoption of regulations may have two effects, according to Xepapadeas and de Zeeuw (1999). Using a model in which firms can invest in machines with different characteristics, where newer machines are more productive and "cleaner" but also more expensive than older machines, Xepapadeas and de Zeeuw (1999) isolate two effects resulting from the introduction of a stricter environmental policy in the form of a tax on emissions:

- *A productivity effect.* If a firm is downsizing due to stricter environmental policy accompanied by modernization—that is, a reduction in the average age of capital stock—then the average productivity of the capital stock increases.
- *A profit/emission effect.* Profits and emissions decrease under stricter environmental policy. But if capital stock can be composed of newer, more productive machines rather than older, less productive machines, an environmental tax would have a smaller effect on profits. The results of Xepapadeas and de Zeeuw (1999) show that although a stricter environmental policy cannot be expected to provide a win-win situation that both reduces emissions and increases profitability in an industry, one may expect increased productivity of the capital stock, along with a relatively less severe impact on profits and more emission reductions, when the stricter policy induces modernization of the capital stock. The trade-off between environmental conditions and profits remains, but is less sharp as the industry is downsized and modernized.

### Different industries will be variously affected by going green

Environmental management and its positive impacts on competitiveness, as well as timing related to introducing green products, may also play a decisive role in the relationship between environmental and economic performance (see, for example, Vogel 1995). If released too early, there may not be sufficient demand for a green good due to its higher costs compared to nongreen substitutes and lower consumer willingness to pay. Increase in profits depends on the demand and supply elasticity of the product. For example, the more elastic the demand, the more production quantity changes and the less market prices change. When it is difficult to shift the cost, companies bear more of it. On the other hand, if the supply curve is elastic the change in market price leads to change in supply, and vice versa. Besides the importance of the price elasticity of a product, the size and sign of the relationship between environmental and financial outcomes also depends on the market where the firm is operating. Competitive markets with free entry are different from oligopolistic as well as monopolistic markets where profits are, in general, warranted.

## ***Review of instruments*** *that stimulate behaviour for better environmental performance*

Many believe that the nature of environmental policy is changing. In much of the world during the last couple of decades of the twentieth century, environmental policy was dominated by "command-and-control" approaches (Andrews 1994; Hays 1987; tenBrink 2002) but a shift to fiscal policies has been observed from the late 1990s. Under command and control, government agencies develop a set of rules or standards. These determine technologies to be used or avoided; amounts of pollutants that can be emitted from a particular waste pipe, smokestack, or factory; or the amounts or kinds of resources that may be extracted from a common resource such as a fishery or a forest. The agencies then issue commands in the form of regulations and permits to control the behaviour of private firms, other government agencies, or individuals. This approach can be found as far back as the 4,000-year-old Code of Hammurabi, which prescribes penalties for faulty construction.[21]

Experiments with market-based environmental policies spread in the late 1980s and early 1990s. This change came in response both to theoretical developments in economics and to the continued resistance to command-and-control policies of those regulated. Using market-based approaches, instead of detailing what can and cannot be done, governments place a constraint or tax on pollution or resource extraction. Those targeted by a given policy decide how best to economise on the affected activities. One of the best-known market-based strategies is tradable emission permits (Tietenberg 1985, 2002; Rose 2002). Another market-based approach is a pollution tax, which provides an incentive for producers to reduce

21. www.yale.edu/lawweb/avalon/hammenu.htm

environmental impacts while compensating society as a whole (Freeman 1993; Kneese and Bower 1968).

Although command-and-control and market-based approaches have dominated European and U.S. environmental policy in the past, other approaches are also emerging. These include environmental education efforts aimed at both the public and students and information-based efforts for energy conservation, such as home energy audits and appliance-labelling programs. We can classify such approaches into five types:

- Command and control.
- Market based.
- Education.
- Provision of information.
- Investment.
- Voluntary measures.

The first two approaches constitute the traditional tools that have been most prominent over the past quarter century in the developed world; the last three are the new tools that are the subject of current implementation. Traditionally, explicit external controls are placed on behaviour: those who do not do as prescribed face specific tangible sanctions. The new tools rely more on implicit sources of behavioural control, so that the resulting behaviour is likely to be perceived as voluntary. Education includes the provision of information in a systematic and structured way, but usually goes further, encouraging deeper understanding and, perhaps, values and norms regarding behaviours. In other words, new tools use education and the provision of information to try to change behaviour, and the changes in behaviour are voluntary in the sense that they are not driven by specific regulatory directives, externality taxes, or permit markets.

## *Review of the role of the government in enforcing environmental performance*

Government, often in cooperation with stakeholders, must design the institutions that will implement tradable permits or pollution taxes. It must set the level of pollution allowed or the tax rate, as well as penalties for breaking the rules. It may also require market participants to provide accurate information on their resource use or pollutant emissions. All these activities involve command and control. New tools based on education, information, and voluntary measures are present in every command-and-control and market-based policy as well. New measures, whether command and control or market based, always involve a learning curve in which those affected must learn how to operate efficiently in the face of the changed environment. As public information and the way it is presented are crucial, let us consider how public information is offered in Indonesia.

The problem of how to offer public information to Indonesian consumers in a simple, understandable way was overcome by a number of jurisdictions through the development of a public rating system. Rating systems simplify the flow of information to the public by summarizing a regulated firm's performance into a grade. The grading scale can be simple or complicated. Table 5.2 provides an example of public grading in Indonesia. Support of the local media is critical to public information campaigns. To ensure accurate press reports and to foster a working relationship with the media, the environmental management program should invite reporters to a detailed presentation of the information campaign, including an explanation of how the information was collected and analysed. The information should also be in a format that can be easily communicated by the broadcast and print media.

Ideally, an information strategy should be flexible enough to accommodate regulated firms with different characteristics. It should be simple and easily understandable by the public. Finally, it should offer the regulated firm a chance to improve its performance before the information becomes public. Many firms will take this opportunity to come into compliance rather than risk damage to their reputations or the accrual of more severe fines. The effectiveness of public involvement in information strategies will vary with the nature of the sectors and firms regulated. It will be a challenge to bring market pressure on firms that provide products or services in sectors with limited competition or where a brand name is not dependent on public goodwill. Closely held and government-owned enterprises also have a degree of insulation from external pressure. But all firms can be reached with carefully planned strategies.

**› Table 5.2 Indonesia's environmental report card**

| Compliance status | Colour rating | Performance |
|---|---|---|
| Not in compliance | Black | Polluter does not control pollution and is deeply damaging the environment |
| Not in compliance | Red | Polluter is making some effort but is not doing enough |
| In compliance | Blue | Polluter is meeting the standard |
| In compliance | Green | Polluter is emitting emissions below the standards |
| In compliance | Gold | Polluter is meeting high international standards through recycling and using clean technology |

*Source:* INECE (2009).

CHAPTER 6

# Conclusions and Call for Action

*Shifting to green growth requires a policy mix made up of many different components—among them price- and market-based mechanisms, norms and regulations, industrial and innovation policies, and investments. Local conditions in the Mediterranean region are diverse, particularly in terms of water stress, energy subsidies, and relative factor prices. Therefore, public environmental actions must be tailored to suit national priorities and development objectives.*

**Nevertheless, many common features can be observed among Mediterranean countries. Country environmental analyses undertaken by the World Bank (2004a, 2005, 2010a, 2011d) provide information for Egypt, Jordan, Lebanon, and Tunisia that indicates the presence of similar priorities and constraints amid the diversity of national environmental conditions. Therefore, the tools that will be the most appropriate and cost-effective for environmental action are above all sector-specific. The next section examines tools that can be used to advantage in key sectors of a typical Mediterranean country.**

## **Green growth is pure economics—** and can generate benefits

Green growth should be carefully considered by Southern and Eastern Mediterranean Countries (SEMCs) as a means of enhancing the sustainability of economic and social development. It is argued in this report that a green growth agenda could, in principle, help the SEMCs meet some of their main challenges, particularly those related to economic growth, job creation, and social equity. Through case studies the report demonstrates that well-designed green policies have the potential to generate both environmental and economic benefits, or "co-benefits."

Case studies in some important sectors have illustrated interesting characteristics in the Mediterranean context, correcting some erroneous assumptions related to the costs of such policies. It has been shown that green policies are not overly costly, nor need they be harmful to growth or jobs. They have the potential to favour innovation, to improve daily life for poor households, and to promote wiser use of the region's environmental assets while avoiding irreversible damage, notably to the environment.

"Green" and "growth" are not natural opposites. At the same time, green policies are not "silver bullets" or, in isolation, miraculous tools capable of quickly solving all of the problems of the Mediterranean region. They are not even new, being commonly based on a more efficient use of resources. They are, simply, tools to make growth processes more resource efficient, clean, and resilient.

As common economic tools, green policies are subject to some well-known principles:

- Green policies cannot remove all structural sources of economic inefficiency; indeed, they can deliver their potential benefits only when other structural bottlenecks are corrected. This is particularly true in terms of jobs. New job opportunities may be created by green policies, but those opportunities will not translate into higher employment unless workers with the required competencies can be found and the business framework is adapted. A green growth agenda should be combined with other structural policies to stimulate the economic potential of the region.
- In the short term, green policies will have economic costs—chiefly in the form of investment, operating costs, and opportunity costs. Trade-offs will be unavoidable, both in conventional economic terms and in terms of social acceptance of changes to the status quo. However, from the Mediterranean case studies examined in this report, it appears that there are possibilities to offset costs and trade-offs by maximizing synergies and co-benefits. An efficient combination of market-based instruments, carefully crafted regulations, and effective institutions can facilitate a fruitful shift toward green growth.

## **Green growth** for the Mediterranean is feasible

In some cases, green policies may bring co-benefits in the short term and at low cost. The report identifies co-benefit opportunities for private agents that would require little public intervention. In these cases, market-based instruments, combined with well-designed institutions for enforcing regulations and monitoring results, can ensure a smooth transition toward green growth. Several of those opportunities involve energy efficiency (box 6.1).

The advantages of demonstrating co-benefits in the short term are twofold. On the one hand, doing so would serve to rally social support for changing the unsustainable status quo; on the other, it would create financial space to tackle more complex and costly issues fraught with trade-offs between potential uses or potential users. In such cases, a deeper and more sustained public intervention may be necessary to correct market failures and supply a share of the needed investment.

## BOX 6.1 Co-benefits obtainable in the short term and at low cost: The case of energy efficiency

The Mediterranean case studies highlight substantial but inexpensive short-term co-benefits that can be expected from energy efficiency. It is clear that the potential for energy savings has not yet been exploited. A look at the region's building sector, for example, reveals that using efficient shells for new buildings could create up to 1.3 million new direct jobs and cut energy use by 60 per cent, at an additional cost ranging from 3 to 10 per cent. In almost all cases, savings from reduced consumption of an increasingly expensive resource can offset these additional costs.

*Source:* Plan Bleu (2011a).

Where the right incentives exist, producers and consumers will modify their behaviour to capitalize on opportunities, with important outcomes in terms of overall energy consumption. From the producer perspective, studies in Germany and the United Kingdom have shown that investments to reduce consumption effectively increase energy efficiency with no negative effect on performance (see chapter 3). From the consumer perspective, the case of eco-labelling of domestic appliances in Tunisia, for example, indicates that expected savings on electricity consumption over 20 years are almost 9 times higher than the cost of replacing the appliances.

It seems clear that shifting from fuel subsidies to fuel taxation should be considered as a pillar of any green growth agenda (box 6.2). Reducing fuel subsidies and reallocating part of the savings to compensate the most vulnerable households can achieve real improvements. The main challenge is to secure social acceptance for a policy that will increase fuel costs for many who have become accustomed to paying lower-than-optimal prices.

## BOX 6.2 Harmful fuel subsidies

Cutting energy subsidies from the national budget can result in savings for the economy as a whole. In Egypt, for example, subsidizing domestic fuel prices cost the nation 62.7 billion Egyptian pounds in 2008/09, increasing an increase of more than 56 per cent from 2006/07. Fuel subsidies account for 67 per cent of total subsidies and 18 per cent of public expenditures (El-Deken, Farag, and Hamdy 2011). In addition to their fiscal burden, fuel subsidies are discourage investment in energy efficiency and provide disproportionate benefit to richer households (which use more fuel). A recent study by the International Monetary Fund in developing countries shows that, on average, the top income quintile captures six times as much from fuel subsidies as the bottom quintile (Arze del Granado, Coady, and Gillingham 2010).

Recent Mediterranean experiences with reducing fuel subsidies have been mixed. Turkey implemented a policy of cutting subsidies and raising taxes and now has among the highest fuel tax rates in the world. In Jordan, a gradual shift toward high taxation began in 2008 but was stopped in January 2011 because of social pressure. A similar policy introduced in Iran in December 2010 resulted in a sharp decline in fuel consumption while increasing the disposable income of the poorest households (IMF 2011a). These cases illustrate that initiatives to alter subsidy schemes should include social safety nets as part of the reform package. Safety nets should be designed to protect poor households (those that cannot afford higher fuel prices) from the potentially debilitating effects of price increases.

Another promising area for action is waste management. Here the expected co-benefits are slightly different from those promised by energy efficiency. Given the current low rate of recycling (less than 10 per cent) and the expected increase in the proportion of recyclable materials with economic development, the monetization of waste products recovered through recycling will represent an important economic opportunity for the SEMCs over the next decade.

In some countries (such as Egypt), informal waste management and recycling already provide informal jobs. A more efficient waste management system would transform these activities into decent jobs and productive enterprises. In its recent report on the green economy, the Economic and Social Council of the Kingdom of Morocco (CESRM 2012) estimates that waste management has the potential to create more than 11,000 direct jobs.

Moreover, by reducing tangible disamenities, an efficient waste management system may be a good way to reinforce the social acceptance of green policies. Two key issues should be considered to ensure the success of the transformation of the waste management system: technology choices and cost recovery/financing. In terms of technology choices, case studies show that an important condition of success is to avoid competing with the informal sector. Technology choices should follow informal practice and attempt to integrate the informal sector into the formal system. Thus, choices should favour labour-intensive methods (for example, separation rather than incineration). Part of the early success of the Alexandria waste management system was its close cooperation between private partners, local government, and informal workers.

In terms of cost recovery, the waste management system will have to raise collection fees. Recent experiences in Jordan have shown that the cost-recovery rate can be dramatically improved: Amman boasts a 60 per cent cost-recovery rate (GTZ-ERM-GKW 2004). Fees could be collected efficiently by being added to electricity bills, as in Egypt and Jordan.

The control of water and air pollution provides good illustrations of important social benefits associated with indirect economic benefits that accumulate over time. According to the World Health Organization, environmental factors explain about half of disabilities from respiratory disease, and almost all cases of diarrhoea. In addition to these daily-life disamenities, pollution imposes economic costs. Through the METAP program (2009), the World Bank estimates that the cost of water pollution in SEMCs ranges from 0.8 to 2 per cent of GDP.

Reductions in disamenities from pollution can be counted on to raise social support for green policies in the short term. Further growth in support can be expected as the economic co-benefits of those reductions (such as the preservation of human and natural resources, with their attendant impact on factor productivity) accumulate over time. Pollution-abatement technologies are already available, but investment and operating costs remain a major bottleneck. Nevertheless, several case studies have shown positive cost-benefit results (box 6.3).

The initial investment required to control pollution may appear high relative to its impact, which is believed to be mainly indirect. However, the indirect impact may well be complemented by a substantive direct impact. The Economic and Social Council of the Kingdom of Morocco, for example, estimated that the measures adopted to obtain cleaner water offer the potential to create some 10,000 jobs (CESRM 2012). The report also highlights in four detailed cases the possibilities of integrating private initiatives to increase the efficiency of resource use and obtain economic returns in the short term (from one to forty months).

## BOX 6.3 A high return on investment in water distribution and sanitation

The World Health Organization estimates returns of $3 to $34 for each $1 invested in safe drinking water and basic sanitation, depending on the region and technology used (World Water Assessment Programme 2009). In Greater Amman, each dinar invested in water efficiency may generate about 2 dinars in profit, in addition to the expected health improvement.

## **A blend of market and nonmarket instruments** will be needed to maximize the potential for co-benefits

Another specificity of the water sector is the very real risk of irreversible depletion of fossil aquifers and other nonrenewable assets. That risk, which must be factored into the trade-off equation, provides a classic justification for public intervention.

The related cases of coastal zone management and urban planning—both aspects of land management—illustrate the needed mix of market instruments, accompanied by well-crafted regulations and efficient institutions to correct market failures and monitor actions. Public intervention is needed chiefly to reallocate rents and ensure a fair distribution among potential uses and potential users, while avoiding irreversible degradation of natural assets that cannot be regenerated. In terms of financial and economic instruments, three such instruments are worth mentioning: (i) transferable development rights, (ii) a development or land tax, and (iii) an eco tax or tourism tax.

Successful application of green policies in water resource management, as in other sectors, will require the right balance of market and nonmarket instruments. In water as elsewhere, strategic public interventions, financing, and support will be decisive, because of the important trade-offs that must be faced before major co-benefits materialise.

Those trade-offs will come in various forms—including opportunity costs and the presence of obvious winners and losers. In the case of water, for example, it may be possible, as with energy efficiency, to obtain quick co-benefits (and so reduce tensions) through demand-side management. But, in contrast to the situation with energy efficiency, it will also be necessary to build infrastructure and upgrade institutions to ensure access to all users. The costs of those investments can be reduced and efficient distribution encouraged by charging appropriate prices for environmental services and streamlining institutions and allocation systems. But these steps require public intervention.

## BOX 6.4 Efficient territorial management to foster co-benefits

In the Moroccan lagoon of Marchica, the centre of an effort to develop a tourism facility providing 80,000 jobs (of which 15,000 would be permanent), a balance must be found between the compelling need to create jobs and improve living standards for the residents of the area, on the one hand, and, on the other, the need to protect biodiversity and other natural assets. A special agency has been set up to manage the lagoon, with the objective of ensuring a coherent plan to develop the area.

In the case of urban planning, the massive investments required to build new transportation infrastructure and the opportunity cost of losing agricultural land in coastal areas make the construction of high-density buildings an attractive proposition. Social equity can be enhanced if public authorities collect a larger share of the additional land rent generated by urban expansion. In particular, charging fees for development rights would generate revenue that could be used, in part, to make existing urban areas greener. A more detailed analysis can be found in the recent Center for Mediterranean Integration–World Bank report on adaptation to climate change and preparedness for natural disasters in the coastal cities of North Africa (CMI–World Bank, 2011). Such a concept was introduced in Jordan in the Greater Amman master plan, under which a payment for development rights is added to municipal fees (see box 2.7).

The case of fisheries provides a final example of the dividends paid by green policies. In this case, the dividend is expressed in terms of costs avoided. The urgent actions needed in the fisheries sector come with costs, both social and financial, but they are essential to avoiding the even greater future cost that would come with the disappearance of fishing in the Mediterranean.

Most Mediterranean fisheries are exploited in a way that threatens the entire sector with depletion, which would exact immense economic costs, not least in terms of the extinction of jobs if not of species of fish. The action required to preserve natural assets (and, in the long term, the livelihoods of those who exploit those assets) involves downsizing the fishing fleet. But whereas larger firms may be able to weather the changes, it will be more difficult for small-scale fisheries and dependent coastal communities to do so.

In response to the dilemma, two differentiated management regimes are envisaged: one designed for application to large fleets that are believed to have the capacity to adjust, and the other targeting small-scale fleets in coastal communities. Here, public funding may help the small-scale segment to adapt to the changes needed to sustain fisheries. The paramount goal of both regimes is to strengthen the economic viability of the industry and to maintain its contribution to the life of coastal communities.

Other arrangements may be found to help fishermen to generate sufficient revenues. In studying the value chain for the fisheries sector in Morocco, it was found that the largest marginal increase in value occurs with the first sale. A small number of fishing cooperatives have attempted to capture that increase in value by grouping together and purchasing all of their members' landings for resale to various intermediaries, thus cutting out, to the extent possible, those intermediaries that traditionally take a large share of value added.

Agricultural soils and coastal zones face some of the same threats as fisheries—notably the threat of irreversible damage—and are candidates for similar combinations of regulatory and market-based solutions (Steward 2004).

# Green actions and expected outcomes: A typology for decision making

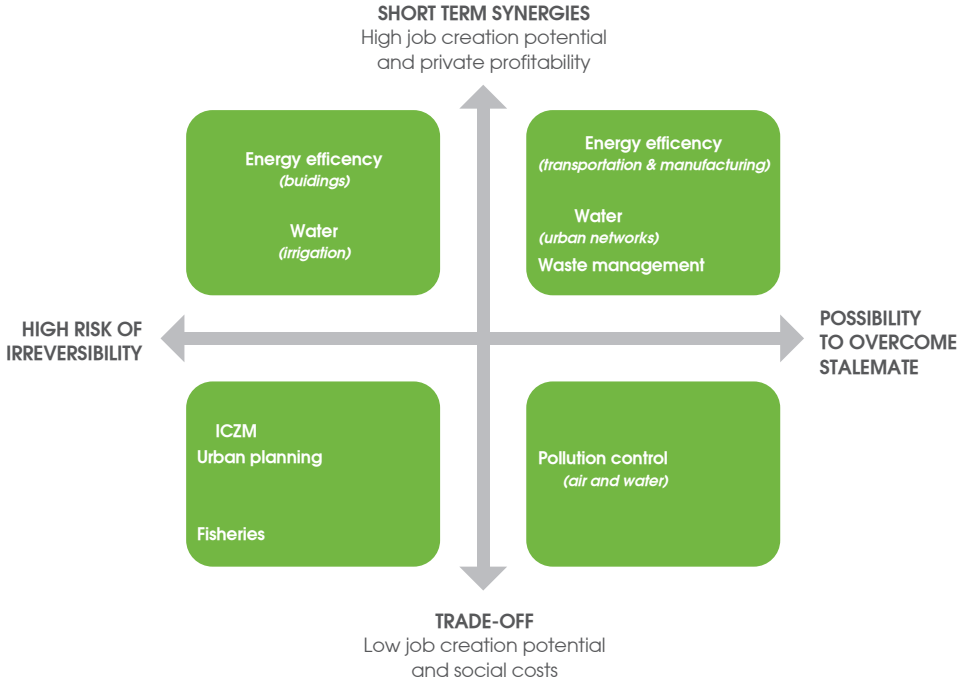
The similarities in the environmental challenges facing Mediterranean countries make it possible to devise a common framework for green actions and their expected outcomes at the sector level. Considering the risk of irreversible degradation of environmental assets and the importance of job creation in the political agendas of these countries, green growth sectoral policy objectives may be classified as shown in figure 6.1, in which the y-axis represents the extent of potential synergy in the development of new economic activities and jobs (net job creation), and the x-axis the risk of irreversibility or "lock-in" entailed by today's decisions.

Among the social and economic choices that may be considered irreversible (or locked in) are those affecting biodiversity (extinction is forever), climate (CO2 and methane molecules have a long residence time in the atmosphere), infrastructure and settlements (roads and buildings are long-lived assets; the development of cities is driven by transport infrastructure, and their form is quasi-irreversible), and technological solutions (innovation and R&D investments have a tendency to focus on existing, proven technologies). Inertia is a related concept connoting the persistence of behavioural, technical, and institutional components of socioeconomic systems—among them consumption habits, the longevity of infrastructure and other aspects of the built environment, financing models, and government institutions. In its use of the inertia concept, this approach is consistent with that developed in chapter 7 of the World Bank's report on green growth (2012). Specific policies focusing on sectors with high inertia are required, in addition to economy-wide policies (Lecocq et al.1998; Jaccard and Rivers 2007; Vogt-Schilb and Hallegatte 2011).

With reference to the figure, energy efficiency in buildings is deemed to present a high risk of irreversibility because buildings, once erected, are replaced slowly. Toward the other end of the continuum, inefficiencies in energy use for transportation and manufacturing that have high economic, social, and environmental costs can be addressed more easily because it is easier to upgrade or replace equipment and to introduce energy-saving innovations than it is to upgrade or replace a building (or a natural habitat or species, once destroyed).

The green growth policies of the highest priority are those that present the greatest risk of irreversibility (that is, the greatest urgency) and that offer the most immediate synergies in terms of job creation and profitability. These two criteria intersect in the upper-left quadrant of the figure.

**◊ Figure A** **Tentative typology of green growth sectoral policy objectives in Mediterranean countries: job creation and risk of irreversibility**




*Note:* ICZM = Integrated Coastal Zone Management

# Avoiding irreversibility and overcoming stalemates

On the x-axis, the sectors in which it is comparatively easy to overcome stalemates appear on the right, and those exposed to high risks of irreversibility on the left. On both sides, the degree of (ir)reversibility can be traced to environmental or institutional constraints, or, in most cases, to a combination of the two.

To take one example, the objective of upgrading waste management and improving air and water pollution control can be achieved within a relatively short time. But an element of irreversibility exists when heavy metal contamination affects soils and fresh water. Accordingly, waste management is positioned on the right half of the figure but close to the centre.

Energy efficiency in transportation and manufacturing are placed further to the right because energy-saving innovations can be introduced and existing equipment upgraded in the short term with a low degree of inertia, as dictated by patterns of replacement of capital stock in these sectors (in general, around 10 years).

By contrast, energy efficiency in buildings, which can be easily introduced in new dwellings and nonresidential construction, shows a much higher inertia (stalemate) because buildings typically are replaced only at long intervals. The inertia is amplified in the Mediterranean context by the effect of fuel subsidies, which reduces the cost of air conditioning and therefore the incentives to improve the energy efficiency of old buildings.

The obstacles to improving water management are different in the urban and rural (irrigation) contexts. While various experiences in developed and developing countries show that urban networks can be renovated in a short time, given sufficient investment capacity, irrigation systems are exposed to the risk of irreversible degradation from depletion of aquifers (particularly fossil aquifers) and the political difficulties of reallocating water among agricultural producers.

In most countries, even higher risks of irreversibility are observed in coastal zone management, urban planning, and fisheries (the latter owing to the risk of loss of resilience of depleted fish stocks). However, as highlighted in chapter 3, the extent of environmental degradation is usually less severe in the SEMCs than on the northern shore—an indication that action is urgently required to avoid a replication of the damage done along the northern rim.

# Maximizing synergies and dealing with trade-offs

On the y-axis, too, a continuum exists. Environmental actions related to energy efficiency promise the highest co-benefits, notably the potential for substantial job creation (as highlighted in chapter 1). Sustainable management of fisheries, by contrast, is unlikely to result in sizable net job creation; in some cases it would, at best, preserve only some of the existing jobs.

The y-axis also distinguishes those sectors in which, with the right incentives, private firms might be expected to bear most of the burden of new investment required from in which public investment will likely be required. In some sectors, open competition would be the most efficient way to involve the private sector, for instance in energy efficiency of buildings, whereas public-private partnerships would be more suitable in other areas, such as water supply.

Public investment, of course, can widen the scope of environmental action, but where investments promise private profit improvements can be expected even where public budgets are severely constrained. Market failures and large social costs characterise the sectors in the bottom quadrants of the figure. Public investment will be required if improvements are to be achieved. The private sector can lend support in these sectors but will not compensate for the lack of public investment.

In the case of air and water pollution, private gains for polluters, resulting from lax or absent regulation, are usually far lower than the true social cost of pollution (diseases, disamenities, loss of productivity, loss of value added in agriculture, fisheries, tourism, and other sectors). Better control of water pollution and solid waste is needed to improve and protect public health. Although policies designed to improve air and water pollution control are unlikely to generate large numbers of jobs, they can nevertheless result in sizable welfare gains with positive effects on labour productivity that build over time to create spillovers and long-term gains.

Integrated coastal zone management, urban planning, and sustainable management of fisheries have a limited potential to create jobs but are among the most urgent actions, owing to the high risk of irreversible environmental damage. Sound urban planning can result in net job creation because it makes cities more productive and attractive, but the opportunity costs of investing in urban infrastructure cannot be overlooked—they are at the heart of the trade-offs facing the region.

The report has highlighted the need for green strategies that are coherent at the national level, and for the engagement of all stakeholders. Close monitoring is key to achieving coherence in public actions and should be based on indicators that reflect local conditions relative to other countries and region, and that make it possible to analyse local actions. Methodologies such as the one proposed in chapter 4 allow for fine-tuning at the national level so as to maximize the potential outcomes. Such methodologies should be expanded by creating specific indicators derived from the green national accounting systems described in this report.

Extending monitoring to the sub-national level will also be of great importance, as shown in the "Doing Green" exercise in chapter 4. The sub-national approach may also foster the convergence of national, regional, and local initiatives with social acceptance of the green agenda.

Looming threats to public health and the risk of irreversible damage to the environment are an immediate priority for public authorities, whose actions will have greater impact if taken in the context of a larger agenda. Environmental action can be undertaken at the central and local government levels, as well as by municipalities, communities, and individual producers, consumers, and investors.

# Recommendations to policy makers and other stakeholders[22]

- Promote energy and water efficiency as top priorities.
- Get prices right for water, energy, and land by making sure they reflect social costs and other externalities of resource use.
- Reduce regressive subsidies to enhance the social acceptance of a green agenda, and combine with complementary measures to cancel the negative impact on the poor.
- Tackle market failures through institutional innovation, regulation, ecolabelling, and innovation and industrial policy.

22. CMI, in cooperation with the Office de Coopération Économique pour la Méditerranée et l'Orient (OCEMO), Plan Bleu, the Forum Euro-Méditerranéen des Instituts de Sciences Economiques (FEMISE), and other partners, supported a working group of experts from civil society organizations in the North and South that worked in parallel with the *2012 MED Report* to develop recommendations to implement a green economy in the Mediterranean. Their recommendations (Working Group on Green Economy 2012) converge with those presented in chapter 6 hereof.

- Nudge producers and consumers toward behaviours that reduce air and water pollution and improve waste management.
- Set medium-term objectives for urban planning, coastal zone management, and fisheries.
- Cooperate at the regional level for exchange of best practices and know-how. This kind of cooperation should include capacity building for implementing economic environmental accounts, especially at the macro level.
- Exploit innovative financial sources such as carbon facilities for new investment. Also, green economy credit lines could be created, targeting in particular local SMEs.[23]
- Engage the private sector to assume greater environmental responsibility and leverage private finance.

# **Call** for action

## ***Toward efficient*** *economic policies*

The stakes for the region are clear: Jobs, welfare, and development. And popular demand for change has been made increasingly clear over the past year. These social and economic challenges are, at bottom, political, and they call for political responses.

The situation of the SEMCs pose major challenges of the sustainable development of natural resources: water, energy, soils, and ecosystems. It is vital that the region summon the will and the capacity to manage its precious and scarce natural capital in a sustainable way, particularly because that capital is threatened both by human activity at the local level (in the form of uncontrolled urbanization, for example) and by global climate change (the Mediterranean is a global hot spot of climate change).

It is therefore urgent and imperative that the region should identify and implement economic policies that encompass both economic development and the sustainable management of natural assets. In so doing, the region will be able to enjoy simultaneously the benefits of a prosperous economy and a healthy environment.

The indispensable new policies will have to be implemented on a territorial basis. The World Bank's World Development Report 2009: *Reshaping Economic Geography* demonstrated that economic development is based on competition among territories at all levels: continental, regional, national, and sub-national (local). One of the engines of that competition is the mobilization of citizens, local actors, and the private sector. The case studies presented in this report provide ample evidence that successes are locally based (box 6.5) and built on social initiatives and innovations that allow all local actors, including those who had benefited from the waste of natural resources, to obtain returns and reap gains in the short or medium term.

### BOX 6.5 Co-benefits from small-scale local initiatives

It was the 50 Moroccan inhabitants and farmers of the oasis, gathered together in the Al Madania cooperative, who worked out a way to manage water better and, in so doing, to increase their cultivated area, and thus their agricultural production and their income. It was their success that induced the return of the young people whose labour was essential to the survival of what they had built (see chapter 1).

It is through voluntarism and the mobilization of human capital at the national, local, and regional levels that green growth and an efficient economy become possible and come to thrive.

## ***Toward national*** *green growth strategies*

This report has shown that the paths to green growth are closely dependent on local circumstances. Platitudes about tailored policies are not enough. Within each country, choices of priorities are there to be made. The paths to their implementation will depend on cultural and institutional contexts. It is at this same level—the national level—that the overall coherence of approaches must be assured, if only because it is at that level that sector-specific actions can be made to reinforce each other. For example, wise water management depends on wise energy management, just as the preservation of agricultural land depends on effective management of urbanization.

It would appear indispensable, therefore, to recommend that national green growth strategies should be launched in every country. To succeed, such strategies will require strong guidance at the national level. They will produce results to the extent that they have been worked out in close consultation with all of the country's major stakeholders.

A prerequisite of successful strategies is diagnostic work to identify the issues, challenges, and opportunities on the basis of which priorities have been selected. Governments will then be able to deploy the full panoply of instruments described in chapter 5—regulatory, economic and financial, and institutional.

23. As proposed by the delegation of the Egyptian Ministry of Finance during a consultation on the report.

Close monitoring should be provided both to verify implementation and to make it possible to publicise results and adjust the course of implementation if necessary. Chapter 4 proposes a variety of indicators, drawing inspiration from those of the Organization for Economic Co-operation and Development (OECD 2012). Putting in place a suitable system of national accounts (see chapter 5) will facilitate transparent monitoring, accompanied by economic and monetary valuation of the results obtained, both social and environmental.

Implementation depends strongly on key skills and competencies that will have to be developed—for example, by setting up programs to train practitioners in key occupations (FEMISE 2012). It is clear that innovation—both technological and social—will be indispensable (box 6.6), and unnecessary disturbances in the labour market must be avoided. Communications will have to be finely calibrated to avoid misunderstandings and hasty reactions from those who believe that they might stand to lose from the changes under way.

The involvement of large firms and the financial sector will encourage and support risk-taking and innovation by small and medium-sized enterprises.

Pilot projects, developed and implemented with concerned citizens, as well as model initiatives in public services, can sow seeds that grow gradually but steadily (box 6.7).

### BOX 6.6 Financial resources for innovation

The Egyptian Governorate of Alexandria gave the task of solid waste management and sanitation to an international company that agreed to protect jobs. Through the company's recovery of methane from waste, the governorate has earned carbon credits. In Morocco, FODEP, a special fund devoted to industrial pollution abatement, is now able to support important innovations such as the use of oil cake to supply electricity to olive oil factories). In Algeria, since 1998, the European Investment Bank has supported pollution abatement in plants in Skikda and Annaba on the northeast coast, helping those plants to achieve sharp increases in productivity.

*Source:* EIB internal report.

### BOX 6.7 Pilot projects to prepare new regulations

During a period of urban expansion, the Tunisian government introduced regulatory changes to improve the energy efficiency of new buildings over a long experimental period (1998–2008) that was known as "experimental anticipation." The project was led by ANME, the national agency for energy management, in cooperation with several ministries and concerned professionals. A total of 46 pilot projects were carried out across the country, involving buildings of all types. The participatory approach encompassed a full range of stakeholders, including architects, developers, and manufacturers of building materials, as well as the general public. Improvements made to building designs and construction practices resulted in a reduction of 33 per cent in energy consumption. Tradesmen and technicians received special training through programs that have now been expanded to include the entire country. Manufacturers invested in new products (such as new forms of insulation) and created new jobs. The pragmatic regulations that governed the program were widely accepted.

*Source:* AFD (2008).

Successful implementation will have to be measured at the local level. The task will be to pair increased competitiveness of sub-national entities with progress toward an efficient green economy. At the community level (fishing villages, agricultural villages, oases, and hydrological basins), residents have a better understanding than anyone else of the problems they face and are in a better position to devise consensual solutions to those problems. Here, the private sector has a major role (box 6.8).

### BOX 6.8 Public-Private Partnership can make the difference

A Public-Private Partnership that helped farmers in the Oued El Guerdane basin of Morocco to improve their management of underground and dammed water involved them in process of setting prices, developing irrigation techniques, and expanding the area under cultivation. The 11,000 jobs created or preserved were essential to the financial viability of the operation. The farmers now pay for the water they use.

But, with the strong trend in the SEMCs toward urbanization (and even the formation of megacities), the epicentre of the green economy will be found in the cities. Armed with a vision of urban development, local authorities can plan and coordinate their efforts, mobilizing knowledge and investments in urban planning, urban migrations, management of public services, and other areas (box 6.9).

### BOX 6.9 Territorial cohesion as an engine of green growth policy

The gradual mobilization of the city of Amman, which now leads a Mediterranean Ecocities network, began with deliberations over the master plan, which extended into the vital management of water, a resource so scarce that it seriously affects the health of a large number of inhabitants.

On Morocco's coast, the development of the city of Nador and its lagoon, as a city and a tourist destination, required a coordinated approach by a dedicated national agency, the Marchica Agency, which began by investing heavily in waste management, urban sanitation, and reforestation. Today, urbanization and tourism are creating jobs and raising the quality of life. Investments are expanding.

## ***Regional cooperation*** *to foster green growth*

Green growth policy objectives can be achieved in a national framework but regional cooperation could further enhance the scope and cost-effectiveness of national policies. Public and private foreign investment is required in order to overcome stalemate, ensure social acceptance, and set a momentum in the implementation of a green growth agenda. Official assistance and funding by nonprofit organizations could play a significant role in some areas, such biodiversity preservation, that are not attractive for the private sector but are nevertheless of critical importance.

Two other specific areas of regional cooperation appear particularly relevant:

- Design, collection, publication and analysis of indicators of environmental actions at the national and sub-national level; and
- Dissemination of best practices, know-how, and appropriate technologies.

The regional level is the right one for making concerted efforts within a framework of integration favourable to the development of the entire Mediterranean region.

If the green economy can also be an efficient economy, then the major policies of the Mediterranean region should develop in that direction. Green growth policies should be part of the G8's Deauville process, supported by the Union for the Mediterranean, and on the agenda at meetings between finance ministers.

Pertinent knowledge is available in the region, within the universities and specialised institutions and organizations—among them the Forum Euro-Méditerranéan des Instituts de Sciences Economiques (FEMISE), the Economic Research Forum in Cairo, the United Nations Environment Programme's Mediterranean Action Plan Regional Activity Centre (UNEP/MAP/REC), and the Arab Forum for Environment and Development.

Instruments to share knowledge are essential prerequisite to move toward green agendas. During the consultation process of the *2012 MED Report,* and particularly during the final regional conference in Marseille on May 23–24, experts and partners, including the civil society working group formed at the beginning of 2012, proposed the launch of a regional platform for the exchange of knowledge on green growth. Such a platform should make it possible to:

- Launch a tool to gather data on green growth policy efforts undertaken by countries, in the manner discussed in chapter 4.
- Survey and analyse the region's successes and failures in order to draw lessons from those experiences and share them.
- Mobilise competencies to support national efforts to launch and implement green strategies and to set up green national accounts (linked to the WAVES project).
- Arrange colloquia to develop recommendations for public policies to promote green growth.
- Deliver high-level training for top decision makers in Mediterranean countries, a sort of "academy for sustainable development and green growth".
- Develop proposals for an information site on regional green growth challenges in the Mediterranean (data, statistics).

The importance of exchanging and disseminating knowledge and experience led the OECD, the World Bank, and UNEP in 2011 to launch the global Green Growth Knowledge Platform.[24] Now would seem to be a good time to develop a Mediterranean component for this existing global platform.

Existing mechanisms for deliberation such as the Mediterranean Commission for Sustainable Development and the Mediterranean Strategy for Sustainable Development can be redeployed or strengthened to contribute to the green growth process. Financial institutions are accustomed to coordination—they could collaborate to create green investment funds to support the spread of green innovation, for example, by financing small and medium-sized enterprises.

Placing green growth on the Mediterranean agenda is urgent; it is feasible; and it is necessary for the advancement of the people of the region.

24. www.greengrowthknowledge.org/

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# Annexes

# A1 Case study on water access in Egypt using Demographic and Health Surveys (DHS)

This case study, undertaken as part of the *2012 MED Report*, seeks to evaluate the impact of insufficient access to water on child health based on a representative cross-sectional DHS of Egyptian households collected in 2008. The overall household response rate was 99.1 per cent.

We focus on diarrhoea, which is common in all areas of Egypt; the prevalence of irrigation-related waterborne diseases such as schistosomiasis is more localized. The survey consists of three separate questionnaires: a household questionnaire, a women's questionnaire covering all married (or once-married) women between ages 15 and 49, and a health issues questionnaire.

Using a selective set of indicators to assess the impacts of environmental factors on health is important. For this reason, inadequate access to safe drinking water is defined using two indicators. We first turn our attention to water sources. In the questionnaire, improved sources include water obtained from a piped source within the dwelling, a public tap, a tube hole or borehole, or a protected well or spring. This makes it possible to ascertain water quality. But to better ascertain actual access to water, we use another measure to identify problems of quantity when the time required to reach the water source exceeds 5 minutes. Then the first indicator combines unimproved drinking water sources and nonneighbourhood access to water (5 per cent of households). As water cut-offs may reveal difficulties in access, we add a second indicator accounting for cases that report daily (or almost daily) water cut-offs. This represents 15 per cent of households questioned.

Propensity score matching techniques are used in order to isolate the impact of insufficient access to water from other factors and to control for potential selection bias. This allows us to understand what would have happened if access to water was better. Since it is impossible to observe the situation of individuals both with and without defective access to water, impact evaluation determines a counterfactual so as to isolate the effects of access to water from other factors. This is implemented through the use of a control group, which is compared to the treatment group.

An overall and significant difference on the prevalence of diarrhoea between the two groups is found. The impact on diarrhoea is about 4.5 per cent higher for children facing defective access to drinking water when access is defined according to the first indicator (type of drinking water source and time to get to the water source). Including water cut-offs in defective access (second indicator) provides an overall and significant difference with a mean value of about 2.5 per cent. These results are robust to five different estimators of matching. These findings suggest that despite an extended connection rate to piped water, problems of water access and water quality remain important. Children suffering from severe diarrhoea cannot go to school. Diarrhoea weakens the health of children, making them more vulnerable to illness. It may impact all members of a household because ill children need someone at home to look after them, preventing parents or sisters or brothers from going to school or to work. In this way, it is a general loss for the household in terms of money or investment in the level of education of their children.

# A2 Multi-criteria methodology

This method assigns each country of the sample to a hierarchical class.[25] Class n°5, for instance, includes the best-performing economies with regard to the chosen criteria; class n°4 covers those economies less powerful than class n°5 but more powerful than class n°3; and so forth.

The assignment of an economy to a class rests on the comparison of the performances of this economy to previously established hierarchical profiles. The "outranking" principle means that, for a given set of criteria, country A outranks profile i when it obtains "at least as good" a result as that of the profile considered in a majority of cases.[26] If country A outranks profile n°1, it is assigned to class n°5. If not, it is compared with profile n°2 and, in the event of a positive result, assigned to class n°4; or compared with the next profiles, etc. If the country is outranked by all the profiles, it is assigned to the last class.

In order to have robust results, the outranking must be without ambiguity. In addition to the inaccuracy of statistical measurements, it is advisable to know when the value of a statistical indicator must be judged better than another value. Does an indicator of solid waste collection of 17.5 per cent really outclass a rate of 17 per cent? To address this issue, we use the notion of pseudo-criteria by the mean of the definition of thresholds of indifference (Sa) and strict preference (Sp). The indifference threshold makes it possible to define, for a criterion, a minimal value Sa below which the difference between an economy and a profile, for this criterion, will be considered as nonrelevant. If the threshold of indifference Sa is set at 0.5 per cent, the two values 17 per cent and 17.5 per cent are equivalent. If the threshold is set at 0.2, a value of 17 per cent is regarded as worse than 17.5 per cent, while a value of 17.3 per cent is regarded as equivalent to 17.5 per cent.

The threshold of strict preference Sb (defined also for each criterion) indicates the value beyond which there is a clear outranking. Sb is generally higher than Sa. In our example, by setting Sa at 0.2 and Sb at 0.5, we consider that a value of 17.3 per cent is equivalent to 17.5 per cent, but that a value of 17 per cent (17.5 Sb) is worse than the two others.

Provided with these thresholds, the method calculates for each country a degree of outranking relative to each profile taking into account all criteria. The degree varies between 0 and 1 and indicates the relevance of the assertion: "this country outranks this profile." If, for a given profile, this degree is higher than a given value (70 per cent in the multicriteria analysis performed in the document), the country outranks this profile. This degree is used to set the position of the point on the graph.

The procedure used to establish the profiles and the thresholds is critical in order to obtain results. In the multicriteria analysis performed in the document, we adopted as a norm the 80th percentile of the distribution for profile 1, the 60th percentile for profile 2, the 40th percentile for profile 3, and the 20th percentile for profile 4. The percentiles of the distribution are also used for the calculation of the thresholds.

25. We build here on the "electre-tri" method.

26. This description implies that equal weight is given to each indicator. An alternative approach is possible with unequal weights that could be justified by data availability constraints if the objectives of the multi-criteria analysis are to obtain an overall result with an equal weight for different domains of environmental performance.

# A3 Application of multi-criteria analysis to EPI individual indicators

The weighting of indicators adopted by the researchers who devised the EPI (Environmental Performance Index) does not seem suitable for the multi-criteria analysis. In the EPI database, the 11 indicators we identify as related to environmental state have a dominant weight of 64.6 per cent in total, of which 25 per cent is for the "environmental burden of disease" alone. Furthermore, we can note that, among action-related indicators, those measuring public policy influencing the quality of air is dominant (29 per cent, out of a mere 35.4 per cent for all action-related indicators).

In order to address these imbalances, an alternative weighting is adopted that gives the same weight for each group (i.e., state and action) and a similar weight for each subgroup (air-related indicators on the one hand, fresh- and marine-water-related indicators on the other). Among indicators of environmental state, we give a 25 per cent weight for air-related indicators, and 25 per cent for water. Similarly, each of the four sub-domains of environmental action is given the same weight of 12.5 per cent each of the 4 sub-domains identified above (in 2.2, regulation, infrastructures, behaviour, and natural resources). An equal weight is given within to each of the 6, 3, 2, and 3 indicators included in these sub-domains, respectively.

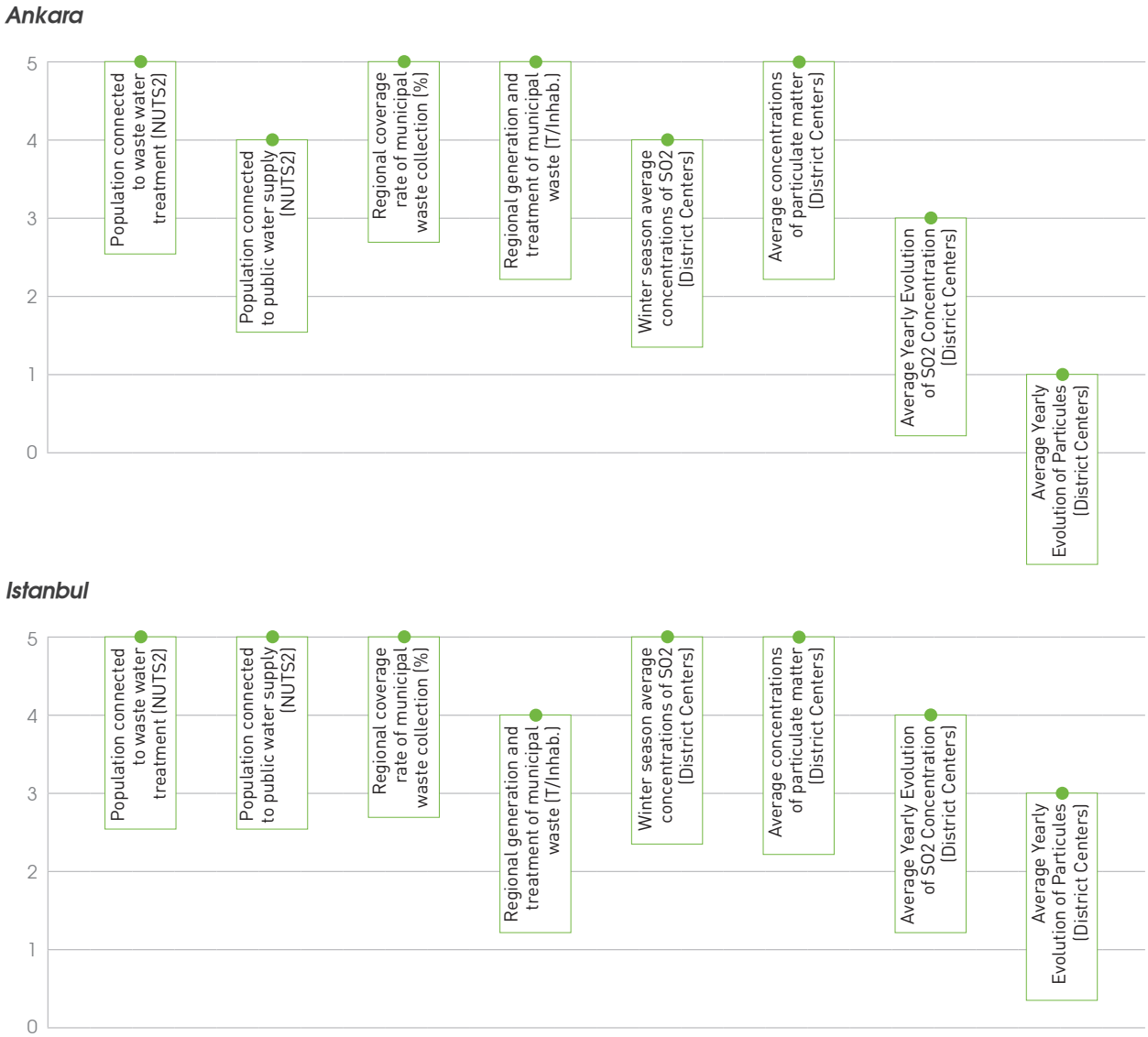
Among the 166 countries of the sample, only 2 are in class 5 (best performance) and 32 in class 1 (worst performance). The same countries are at the top and bottom of the Mediterranean sample: Spain is at the end of class 4 and Cyprus at the end of class 2. The averages for southern and northern countries are in the same range, in the lower half of class 3. Overall, Mediterranean countries are also in midrange for the different indicators and have, therefore, few areas of remarkable strength or weakness.

In the EPI database, some values are for a number of countries and indicators. For Southern and Eastern Mediterranean Countries, data are entirely missing for "critical habitat protection" and "agricultural subsidies." For the purpose of multi-criteria analysis, the average for the southern or northern Mediterranean region was used as a proxy.

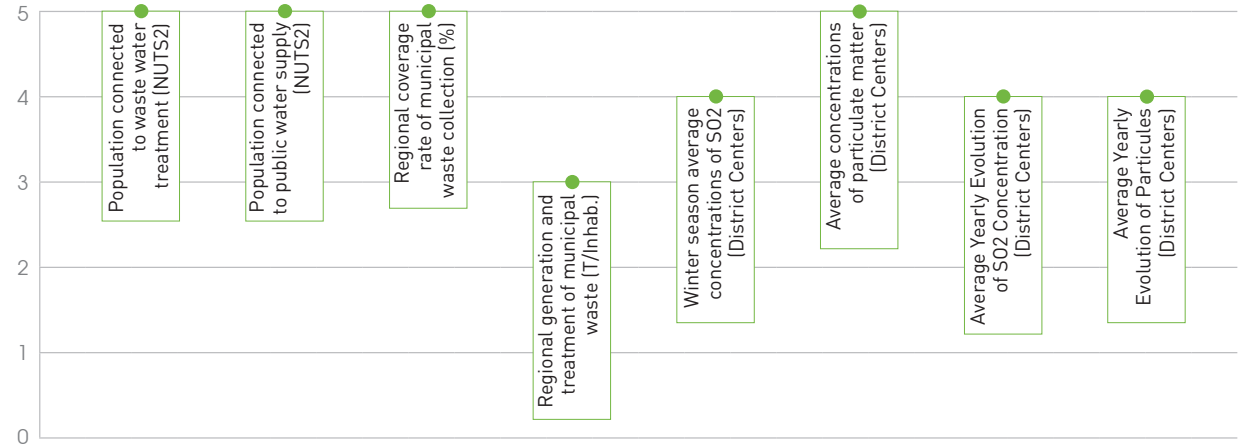
# A4 Multi-criteria analysis using sub-national Turkish data

**◊ Figure A4.1 Results of multi-criteria analysis of selected indicators for selected Turkish regions (Ankara, Istanbul, Izmir, Sanliurfa, and Trabzon)**

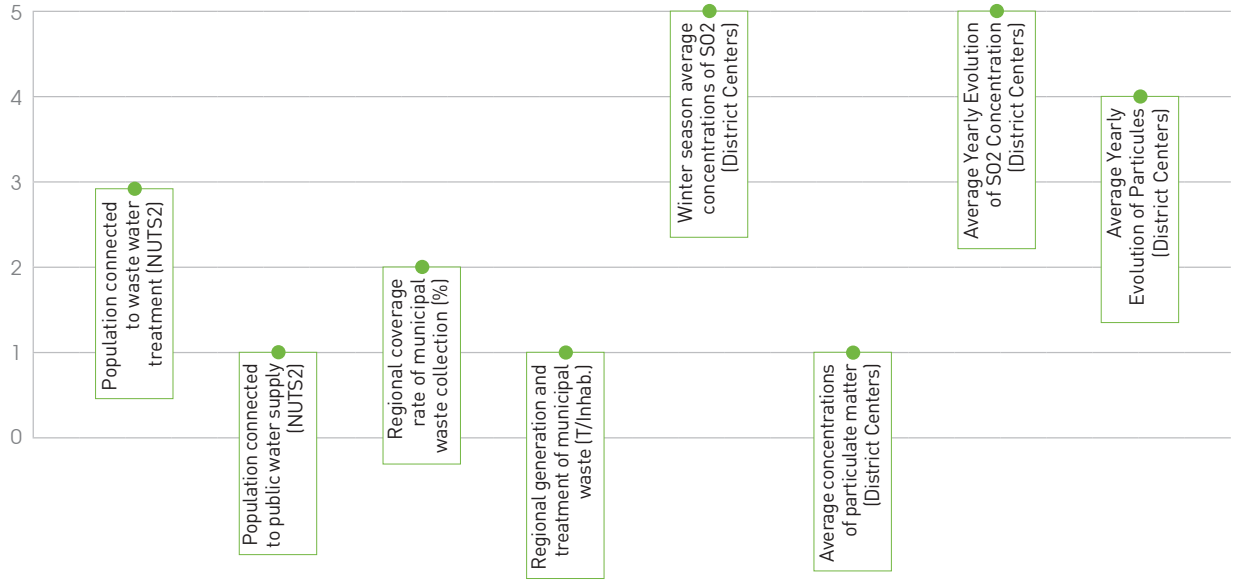
In the following graphs, the scale of indicators ranges from 5 (indicating a district strength) to 1 (indicating a district weakness). A value of 3 indicates that the district's situation is average for the nation (i.e., relative to the other country's districts).



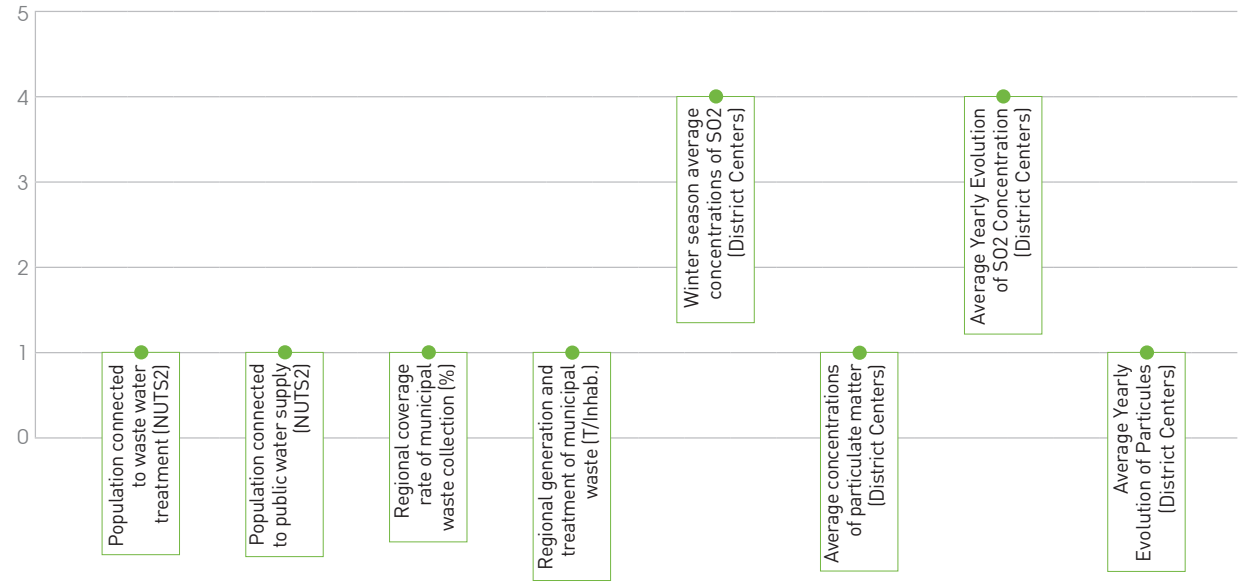
### Izmir




### Sanliurfa




### Trabzon



# A5 Main environmental institutions and governance in selected countries

## *The main institutions involved with environmental issues in Algeria*

### Institutions reporting to the Ministry of Regional Development and Environment

The Ministère de l'Aménagement du Territoire et de l'Environnement (MATE, Ministry of Regional Development and Environment) has two general directorates, one of which is the Direction Générale de l'Environnement et du Développement Durable (General Directorate for the Environment and Sustainable Development). Its missions are carried out by five offices:

- Direction de la Politique Environnementale Urbaine (Directorate of Urban Environmental Policy), with three subdirectorates.
- Direction de la Politique Environnementale Industrielle (Directorate of Industrial Environmental Policy), with four subdirectorates.
- Direction de la Conservation de la Diversité Biologique, du Milieu Naturel, des Aires Protégées, du Littoral, du Changement Climatique (Directorate for Conservation of Biological Diversity, the Natural Environment, Protected Areas, Coastlines, and Climate Change), with four subdirectorates.
- Direction de l'Evaluation des Etudes Environnementales (Directorate of Environmental Research and Assessments), with two subdirectorates.
- Direction de la Sensibilisation, de l'Education Environnementale et du Partenariat (Directorate of Environmental Education, Awareness, and Partnerships), with two subdirectorates.

The ministry includes agencies, offices, and centres at the central level:

- Agence Nationale des Déchets (National Waste Products Agency). This agency is responsible for promoting the sorting, collection, transportation, processing, and commercialization of waste products.
- Observatoire National de l'Environnement et du Développement Durable (ONEDD, National Observatory for the Environment and Sustainable Development). ONEDD is responsible for establishing and managing networks to observe and measure pollution and to monitor various environments.
- Centre National de Développement des Ressources Biologiques (CNDRB, National Center for Biological Resource Development) is responsible for inventorying the nation's stocks of wildlife, plant life, habitats, and ecosystems, and for the exploitation and preservation of these natural assets.
- Centre National des Technologies de Production plus Propre (CNTPP, National Center for Cleaner Production Technologies) pursues the following objectives: (i) promoting the transfer of know-how and the exchange of technical information on and experience with clean production; (ii) encouraging industry to respect the environment by favouring manufacturing processes that generate less pollution and consume fewer natural resources; (iii) improving the productivity and competitiveness of Algerian enterprises within the context of compliance with environmental requirements.
- Centre de Développement des Énergies Renouvelables (CDER, Center for Development of Renewable Energy) is responsible for managing and monitoring the implementation of projects falling under national research programs in renewable energy, nuclear technology, and hydrocarbons.
- Conservatoire National des Formations à l'Environnement (CNEFE, National Conservatory for Environmental Training) is responsible for providing training in fields related to the environment.

At the wilaya level, MATE has 48 environmental directorates, each responsible for carrying out environmental policy and ensuring compliance with environmental regulations.

At the commune level, there are offices responsible for public health, management of household wastes, and drinking water.

### Other institutions involved in environmental matters

The Ministère des Ressources en Eau (MRE, Ministry of Water Resources) deals with problems related to the quality of water destined for human consumption and of wastewater. The ministry includes the Direction de l'Assainissement et de la Protection de l'Environnement (Directorate of Sanitation and Environmental Protection), which oversees the following agencies and offices:

- 5 basin-level hydrography agencies: Oranie–Chott Chergui (OCC), Algerois-Hodna-Soummam (AHS), Constantinois-Seybousse-Mellegue (CSM), Sahara, Cheliff–Zahrez (CZ).
- Office National de l'Assainissement (National Sanitation Office), responsible for wastewater management.

- Agence Nationale des Ressources Hydrauliques (ANRH, National Agency for Hydraulic Resources), responsible for quantitative and qualitative assessments of water resources.
- Agence Nationale de Réalisation et de Gestion des Infrastructures Hydrauliques pour l'Irrigation et le Drainage (AGID, National Agency for the Implementation and Management of Hydraulic Infrastructure for Irrigation and Drainage).

## *The main institutions involved with environmental issues in Egypt*

### Background

In 1992, the first Environmental Action Plan (NEAP) was a crucial step toward environmental management. The plan led in 1994 to an environmental protection law and to the restructuring of the Egyptian Environmental Affairs Agency (EEAA). The national government and the United Nations Development Programme established the Technical Cooperation Office for the Environment (TCOE) within the EEAA in 1992 to plan, along with donors, actions and projects identified in the NEAP.

In June 1997, the first full-time Ministry of State for Environmental Affairs (MSEA) was established by presidential decree, with the EEAA being its executive arm.

In 1999, with the support of UNDP, the MSEA revised the NEAP of 1992 to "represent Egypt's agenda for environmental actions over 15 years."

### Institutions at the central level

The MSEA, acting through EEAA, has the missions of preparing the national plans for environmental protection, preparing the emergency environmental plan to cope with disasters, preparing draft legislation concerning the environment, implementing experimental projects, preparing environmental training and planning policy, drafting the necessary norms and standards to ensure that the environment is not polluted, formulating the basis and procedures for assessing the environmental impact of projects, and supervising the Environmental Protection and Development Fund.

The EEAA includes:

- Central Department of Engineering Affairs.
- General Directorate of Environmental NGO Affairs.
- General Directorate of Planning and Monitoring.
- General Directorate for the Board of Directors' Secretariat.
- General Directorate of Legal Affairs.
- General Directorate of Financial and Administrative Inspection.
- General Directorate of Citizen Services.
- General Directorate for the Elsalam Garden.
- Department of Security.
- Department of Public Relations.

The EEAA also supervises:

- Central Department of Publications, Culture, and Environmental Awareness.
- Sector of Financial and Administrative Affairs.
- Sector of Nature Protection.
- Sector of Branch Affairs.
- Sector of Environmental Quality.
- Sector of Environmental Management.

The environmental policies formulated by the MSEA are carried out fin accordance with four main principles: (i) strengthening the integrative capacity of central and local government, (ii) strengthening public-private partnerships, (iii) strengthening partnerships with environmental nongovernmental organizations, and (iv) integrating gender issues in environmental policies and programs.

Environmental management issues can also be found in other ministries or institutions, but they often have limited experience. Coordination with the EEAA is not apparent.

### Institutions at the decentralized level

The EEAA develops the "capacities and partnerships necessary to strengthen its presence in the governorates." There is a network of regional branch offices (RBOs) as well as environmental management units (EMUs); each of the 26 governorates has an EMU. An EEAA decree in 2001 defined the policies and operational procedures of RBOs. Coordination between the EEAA, its RBOs, and the EMUs is explained in detail in a study by the Organizational Support Programme with support from the Danish Government.

Meanwhile, most relevant ministries and national institutions have a department or unit mandated with environmental management issues.

In the last decade, the EEAA has been providing support for development of environmental action plans in the governorates of Sohag and Dahkaliya with support from the Environmental Assessment and Management initiative of the United Kingdom Department for International Development (DFID). Environmental improvements to benefit the poor in Sohag and Dakahliya have been achieved through community projects focusing on solid waste management. The programs in Sohag and Dahkaliya received the European Environment Award for the year 2000.

Based on the success of those activities, the government intends to pursue similar plans in the governorates of Qena, Beni Sueif, and Aswan, and in the Delta governorate of Damietta. In Qena and Damietta, baseline studies for background information have already started with support from DFID. In Beni

Sueif and Aswan, support for the EMUs is expected from the Danish Government.

### Policy and planning

#### *Waste management*

Solid waste management

- National strategy for integrated waste management (2000).
- Mediterranean Environmental Technical Assistance Program report (2004).
- Strategic framework for recycling (2006).

Hazardous waste management

- National strategy for managing hazardous waste from health facilities.
- An integrated strategy for managing hazardous substances and waste is in preparation.

Private sector participation

- A strategy on private sector participation (PSP) is being prepared.

For the time being, nine private companies (including three international companies) are involved in waste collection in major governorates. Also, the informal sector and small private businesses conduct door-to-door collection in other places. Meanwhile, contracts for integrated solid waste management with international companies include sorting, recycling and composting of organic waste. Also, two projects receive carbon credits: a composting and sorting facility for the area south of Cairo and a project for flaring gas from landfills in Borg El Arab and El-Hammam.

#### *Air quality*

The EEAA's Environmental Information and Monitoring Programme (EIMP) has been monitoring air pollution and collecting relevant data since 1998. Under the supervision of the EEAA, the Centre for Environmental Hazard Mitigation (CEHM) at Cairo University and the Institute of Graduate Studies and Research (IGSR) at Alexandria University both operate the air quality–monitoring network.

#### *Coastal water*

The EIMP also has a coastal water monitoring component focusing on pollution of the coastal waters of Egypt, the coast of the Mediterranean Sea, and the Red Sea region. It was implemented by the IGSR at Alexandria University and by the National Institute of Oceanography and Fisheries. The program monitors pollutants in coastal areas to respond to changes in water quality due to human uses.

## *The main institutions involved with environmental issues in Jordan*

### Background information

In 1991, Jordan introduced a National Environmental Strategy (NES) with the help of the International Union for the Conservation of Nature (IUCN) and the U.S. Agency for International Development (USAID). Meanwhile, Jordan developed an economic and social development plan for the 1993–97 period that would prioritize environmental issues and identify major environmental challenges.

Until 1995, if the government needed to take environmental action it had to rely on a multitude of overlapping laws and gaps with regard to environmental issues. The 1995 environmental protection law consolidated national environmental protection authority under the newly created General Cooperation for Environmental Protection (GCEP). In 1996 the National Agenda 21 project was initiated to provide a national environmental strategy and action plan for the twenty-first century.

In 2003, a new environmental protection law was passed and the CGEP was transformed into the Ministry of Environment (MoE).

The national energy strategy was modernised in 2006 with the goal of diversifying local energy resources, increasing the share of the domestic energy resources, reducing dependency on oil imports, and increasing environmental protection.

In 2009 the Second National Communication Report focused on specific sectors (including agriculture, energy, and waste) where environmental measures are considered important.

### Institutions at the central level

#### *Ministry of Environment (MoE)*

Under the environment law, the MoE is the competent authority to protect the environment in the Kingdom; it is responsible for carrying out the law and related rules and regulations. It is also responsible at the national, regional, and international levels for cooperation and coordination with donors and other outside agencies on environmental issues.

The Environmental Protection Law of 2003 gave the MoE authority to deal with issues related to environmental protection; authorized NGOs to work in environmental protection; created a strategy for environmental awareness, education, and connection; established a ban on dangerous substances; improved contact with other countries and with international environmental organizations; set up an advisory board; and set fines for various infractions causing harm to the environment (Saed 2006).

The MoE includes among others, governorate-level environmental directorates, a Directorate for Inspection and Pollution Control, a Directorate for Environmental Impact Assessment, a Directorate for Waste Management and Chemicals, a Directorate for Nature Protection, a Directorate for Awareness and Environmental Media, and a Directorate for Planning and International Cooperation.

### Policy and Planning

#### *Water*

Many governmental and nongovernmental agencies monitor water quality in Jordan, but the level of coordination is very poor. Assessment, policy and planning functions are not clearly separated from services. Regulatory entities include many water users, thus generating a conflict of interest.

The Ministry of Water and Irrigation has been trying to tackle the situation, in partnership with outside entities, through projects such as the Red Sea–Dead Sea Conduit Initiative, but lack of financial resources is still a great constraint.

The Water and Environment Research and Study Centre (WERSC) is the research centre for the Ministry of Water and Irrigation and other public and private agencies.

#### *Air*

In Jordan, there is a deficit of coordination among the various institutions involved in air quality monitoring and assessment.

## *The main institutions involved with environmental issues in Lebanon*

### General comments

The Ministry of Environment (MoE) was created in 1993 to study, propose, and implement national environmental policies. It is in charge of protecting Lebanon's environment. The first environmental protection law was adopted in 1988. In 2002 a National Code of the Environment was introduced to define the basis and norms for environment protection. Legislation to restructure the MoE was passed in 2005.

There is a clear lack of human and financial resources and a need for a national environmental plan. Meanwhile, the implementation of Lebanon's 2002 environment law has been stalled, despite pressing needs for its implementation, because the government is incapable of issuing executive decrees. A decree on strategic environmental assessment has been approved by the Council of State but is awaiting approval by the Council of Ministers.

An overall environmental strategy was approved in August 2005 in connection with the restructuring of the MoE. But the draft National Environmental Action Plan (NEAP) of 2005 has yet to be approved. An environmental analysis now under way with World Bank support could provide more insight.

### Authorities

The MoE is the official authority for environmental protection and policy. Its role is to set general policies, projects, and plans on issues related to environmental safety and sustainability of natural resources. It can also propose means for implementation and monitoring.

Other ministries play a role as well.

- Industrial permits are issued by Mohafaza under the authority of the Ministry of Interior.
- The Council for Development and Reconstruction manages major infrastructure projects.
- MoE regional offices in Lebanon's municipalities are responsible for certain infrastructure and for providing basic services, such as wastewater treatment and solid waste management.

Other ministries such as those of Public Health, of Energy and Water, of Public Works and Transport, and of Agriculture, as well as the Higher Council for Urban Planning and the National Council for Scientific Research, are also involved to some degree in environmental matters.

Since 2002, the MoE has supervised the National Council for Quarries, which approves and sets standards for quarry operations.

Finally, some sector-specific plans have been prepared (management of solid waste, wastewater, and quarries), and various ministries, together with the Council for Development and Reconstruction, are trying to implement projects to address the needs identified in those plans.

### Policy and planning

#### *Air and water quality*

Air quality is not systematically monitored. Very little wastewater treatment capacity is in operation, despite initiatives to improve the situation.

#### *Waste management*

No effective solutions are in place for industrial, hospital, or slaughterhouse waste. Municipalities are responsible for waste management, but lack of funds and know-how, as well as an inefficient tax system, have worsened environmental problems. Only a handful of municipalities have sorting facilities, and not all of them are operative. Meanwhile, the Emergency Initiative for Rehabilitation Employment Services and Development, supported by Italy's aid agency, invested in the development of a sound solid waste management strategy in Lebanon and began pilot initiatives in collaboration with two Italian NGOs (COSV-CISP and UCODEP). The agency funded a project in four locations (Kherbet Selim, Bent Jbail, Kfar Sir, Aytaroun) to address the core problems of waste management for domestic communities.

Also, the Environment and Energy Program of the UNDP office in Lebanon reinforces institutional capacity and offers policy support to the authorities, especially for environmental sustainability.

Support is also provided by the UN Early Recovery Program to respond to environmental harm done by the 2006 war.

The UNDP Energy and Environment Programme implements several national projects (i) to reduce ozone depleting substances and implement energy audits; (ii) to fight desertification and floods; and (iii) to encourage energy efficiency.

## The main institutions involved with environmental issues in Morocco

The word environment appeared in Moroccan government as early as 1972 with the creation of the Ministère de l'Urbanisme, de l'Habitat et de la Protection de l'Environnement (Ministry of Urbanism, Housing, and Environmental Protection). But a separate Ministry of the Environment was not created until 1995. Two years later, that ministry was abolished, and the environmental portfolio was included in a new Ministère de l'Agriculture, de l'Equipement et de l'Environnement (Ministry of Agriculture, Infrastructure, and Environment), with its own secretary of state. In 1998, a new secretariat of state for water and the environment (SEEE) became part of the Ministère de l'Aménagement du Territoire, de l'Environnement, de l'Urbanisme et de l'Habitat (Ministry of Regional Development, Environment, Urbanism, and Housing). In 2007, SEEE was transferred to the Ministère de l'Energie, des Mines et de l'Eau (Ministry of Energy, Mines, and Water).

To carry out its missions the SEEE has:

- Four central directorates:
  - Direction Générale de l'Hydraulique (General Directorate of Hydraulics);
  - Direction des Aménagements Hydrauliques (Directorate of Hydraulic Development);
  - Direction de la Recherche et de la Planification de l'Eau (Directorate of Water Research and Planning);
  - Direction des Affaires Générales et Techniques (Directorate of General and Technical Affairs).
- One directorate operating as an autonomous service (SEGMA). The Direction de la Météorologie Nationale (National Meteorological Directorate) has four regional directorates for meteorology in the northern, central, southern, and eastern zones of the country.
- One public body operating as an industrial or commercial entity: the Office National de l'Eau Potable (National Office for Potable Water).
- The Conseil Supérieur de l'Eau et du Climat (High Council on Water and Climate) is responsible under the water law of 1995 for the general direction of national water and climate policy and for reviewing the national strategy on climate change and its impact on water resources, the national water plan, and plans for integrated water resource management. The council accords special importance to the allocation of water among water-using sectors, to water transfers, and to provisions for the commercial use and protection of water resources. Although the council's missions are set forth in detail, the legislature left open to the government the possibility of submitting to the council other questions related to national water policy.
- The Conseil National de l'Environnement (CNE, National Environmental Council), established in 1980, is a coordinating body for entities concerned with the environment (ministries, local governments, industry, NGOs, and academics). Its chief mission is to work to protect the environment by preserving the ecological balance of natural settings, improving the living conditions of the people, and integrating environmental concerns into the process of economic and social development so as to ensure that development is sustainable.

Oddly, SEEE has no directorate for the environment.

At the regional level, one finds:

- Financially autonomous public regional institutions structured as corporations serving the country's hydrological basins: Sebou, Oum Er Rbia, Tensift, Loukkos, Souss-Massa-Draa, Moulouya, Bouregreg et de la Chaouia, Guir-Ziz-Ghris, Sakia El Hamra–Oued Eddahab.
- 16 regional observatories that monitor the environment and sites for the disposal, processing, and recycling of solid and liquid wastes, including wastewater, that handle up to 260 million cubic metres per year. The network of observatories was created in 2010 as part of the implementation of Morocco's environmental charter.
- Regional environmental councils, complemented by wilaya-level and provincial councils that serve as local coordinating units.

## The main institutions involved with environmental issues in Tunisia

### Background

Establishment of the institutional framework for environmental protection in Tunisia commenced with the creation in 1991 of the Ministère de l'Environnement et de l'Aménagement du Territoire (Ministry of the Environment and Regional Development). Chief among its functions was monitoring and coordinating government actions and programmes related to the environment. At the time, the Ministère de l'Agriculture et des Ressources Hydrauliques (MARH, Ministry of Agriculture and Water Resources) was responsible for managing natural resources.

In 2005, the environment was separated from regional development, and the Ministère de l'Environnement et du Développement Durable (MEDD, Ministry of Environment and Sustainable Development) was formed.

The government that was formed on 17 January 2011 created a Ministry of Agriculture and the Environment.

### Institutions at the central level

***The former MEDD (2005–11) comprised:***

- A general directorate for environment and quality of life.
- A general directorate for sustainable development.
- A directorate for international cooperation and partnerships.

The MEDD oversaw:

- The Agence Nationale de Protection de l'Environnement (ANPE, National Environmental Protection Agency), created in 1988 and still operating. In addition to its headquarters units, the ANPE maintains eight regional offices, one in each of the country's major regions. The ANPE's two principal missions are as follows:
  - To contribute to the development of the government's overall policy to control pollution and protect the environment, and to implement that policy through specific sectoral measures and general measures called for by and consistent with the national development plan.
  - To propose to the competent authorities measures of a general or specific nature designed to ensure the application of the government's policy on control of pollution and protection of the environment, especially measures to preserve the environment and to strengthen mechanisms conducive to such preservation, and, generally, to propose measures to prevent natural and industrial risks and catastrophes.
- The missions of the Observatoire Tunisien de l'Environnement et du Développement Durable (OTED, Tunisian Observatory on the Environment and Sustainable Development) are as follows:
  - To develop and implement information systems related to the environment and sustainable development.
  - To produce statistics and indicators on the environment and development, notably indicators of sustainable development.
  - To contribute to studies of various environmental problems.
  - By providing information, to contribute to the incorporation of the concept of sustainable development into decision-making processes.
  - To regularly publish reports and documents on the state of the environment.
- The Centre International des Technologies de l'Environnement de Tunis (CITET, Tunis International Center for Environmental Technologies), which, since its founding in June 1996, has been dedicated to the expansion of national competencies in the use of environmental technologies for sustainable development in Tunisia and the Arabian and Mediterranean region. CITET plays a fundamental role in upgrading environmental capacity in firms through a panoply of technical assistance services that enable firms to meet national and international standards and thereby increase their competitiveness.
- The Agence de Protection et d'Aménagement du Littoral (APAL, Agency for Coastal Protection and Development).

### *The Ministère de l'Agriculture et des Ressources Hydrauliques*

The former MARH administered the following institutions responsible for water and related environmental problems:

- Bureau de l'Inventaire et des Recherches Hydrauliques (BIRH, Bureau of Water Monitoring and Research).
- Bureau de Planification et des Equilibres Hydrauliques (BPEH, Bureau of Hydraulic Planning and Equilibrium).
- Direction Générale des Ressources en Eau (DGRE, General Directorate for Water Resources).
- Direction Générale du Génie Rural et de l'Exploitation des Eaux (DGGREE, General Directorate of Rural Engineering and Water Use).
- Direction Générale des Barrages et des Grands Travaux Hydrauliques (DGBGTH, General Directorate of Dams and Large Hydraulic Facilities).
- Institut National des Recherches en Génie Rural, Eau et Forêts (INRGREF, National Institute for Research in Rural Engineering, Water, and Forests).
- Régie des Sondages Hydrauliques (RSH, Water Survey Office).
- Société d'Exploitation du Canal et des Adductions des Eaux du Nord (SECADENORD, Northern Canal and Water Conveyance Company).
- Société Nationale d'Exploitation et de Distribution des Eaux (SONEDE, National Water Use and Distribution Company).
- Office National de l'Assainissement (ONAS, National Sanitation Office).

SONEDE is a public operating company with the mission of producing and distributing drinking water throughout Tunisia. It is responsible for the operation and maintenance of facilities for capturing, treating, and distributing water.

ONAS is the lead organization in the area of protecting water resources and fighting all sources of pollution. It is a financially autonomous public institution with a corporate structure, operating under the Ministry of Agriculture and the Environment.

### Institutions at the decentralized level

The MARH maintained 24 regional agricultural development commissions responsible for local monitoring of the implementation of government policy related to agricultural and water resources.

The MEDD operated regional offices that were to be transferred to the new Ministry of Agriculture and the Environment.

Planning and investment related to the distribution of drinking water in rural areas are carried out by the DGGREE within the MARH and by water-user associations. Rural sanitation is still at the stage of pilot projects.

# *The main institutions involved with environmental issues in Turkey*

## Background

Turkey's first environmental law was passed in 1983. The Ministry of Environment was inaugurated eight years later, in 1991. The national Seventh Development Plan (1996–2000) called for development of a national environmental strategy, in response to which the National Environmental Action Plan (NEAP) was drafted.

A climate change adaptation strategy was to be submitted to the Ministry of Environment and Forestry in late 2010. A project entitled "Developing Turkey's National Climate Change Action Plan" was established to draft the plan. Turkey's First National Climate Change Action Plan was released by the Ministry of Environment and Forestry in 2011.

Environmental affairs are administered at the central and local levels.

## Institutions at the central level

### *Ministries*

Central administration is split among provinces, districts, and other regions. Apart from the Prime Ministry, which is devoted to harmonization and coordination, the most important institutions dealing with environmental issues at the central level are:

- The State Planning Organization (DPTSPO), which prepares five-year development plans, yearly investment plans, and so on.
- The Ministry of Environment and Forestry (ÇOBMoEF), which provides general coordination for the development and application of the environment policies.
- The Undersecretariat of Maritime Affairs, which is responsible for managing and developing maritime systems and services.
- The Ministry of Environment and Urbanization.
- The Ministry of Agriculture and Rural Affairs, which is responsible for water quality, monitoring, protection, and uses of seas and inland waters.
- The Ministry of Energy and Natural Resources (ETKB), which is responsible for setting energy policy and targets, among other matters.

### *Energy efficiency strategy*

Organizations responsible for energy efficiency policy are the aforementioned Ministry of Energy and Natural Resources and the General Directorate of Electrical Power Resources Survey and Development Administration (EIE) / National Energy Conservation Centre (NECC). The first is responsible for formulating policies and overseeing their implementation, whereas the second focuses on implementation and coordination of energy efficiency programs.

Each ministry participates in the national energy efficiency strategy. Among the most important participants is the Ministry of Environment and Forestry, which focuses on environmentally friendly energy efficiency projects, environmental protection legislation, and control over emissions from heating and power plants.

### *Waste management*

An effective and sustainable waste management system has long been lacking in Turkey. A reform of the Turkish waste industry now seems likely.

## Institutions at the decentralized level

Local administrations are charged with protecting environment quality. Sectoral unions are responsible for monitoring application of the law. Environmental NGOs such as TEMA and ÇEVKO are formed by civil initiative.

Local bodies also contribute to the national energy efficiency strategy. Municipalities are responsible for making decisions about municipal infrastructure, for planning and implementing energy efficiency in municipal supply structures, for supervising building insulation and energy performance measures, for improving the rate of uptake, and for increasing public awareness.

# A6 Acronyms and abbreviations used in the report

| | |
|---|---|
| $ | U.S. Dollar |
| € | Euro |
| AFD | Agence Française de Développement |
| AFED | Arab Forum for Environment and Development |
| AMP | Amman Master Plan |
| ANAT | Agence Nationale de l'Aménagement du Territoire (Tunisia) |
| APAL | Agency for the Protection and Management of the Coast |
| BCLME | Benguela Current Large Marine Ecosystem |
| BES | Biodiversity and Ecosystem Services |
| CACG | Compagnie d'Aménagement des Coteaux de Gascogne (France) |
| CBO | U.S. Congressional Budget Office |
| CDC | Caisse des Dépôts et Consignations (France) |
| CDG | Caisse des Dépôts et de Gestion (Morocco) |
| CDM | Clean Development Mechanism |
| CEA | Cost-Efficiency Analysis |
| CEDARE | Center for the Environment and Development in the Arab Region and Europe |
| CER | Certified Emission Reductions |
| CESRM | Conseil Economique et Social du Royaume du Maroc |
| CFP | Common Fisheries Policy |
| CGEM | Confédération Générale des Entreprises du Maroc |
| CH | Methane |
| CMI | Center for Mediterranean Integration |
| CNE | Conseil National de l'Environnement (Morocco) |
| CO | Carbon dioxide |
| COM | Commission of the European Communities |
| CPUE | Catch per unit effort |
| CRDA | Commissariat Régional de Développement Agricole (Tunisia) |
| CSR | Corporate social responsibility |
| DAPs | Dedicated access privileges |
| DHS | Demographic and health surveys |
| DPSIR | Driving forces-pressures-state-impacts-responses (OECD model) |
| EEA | European Environmental Agency |
| EFR | Environmental fiscal reforms |
| EIB | European Investment Bank |
| ENPI | European Neighbourhood Policy Initiative |
| EPI | Environmental Performance Index |
| ERF | Economic Research Forum (Cairo) |
| ESCWA | UN Economic and Social Commission for Western Asia |
| ESG | Environmental and social governance |
| EU | European Union |

| | |
|---|---|
| EU-27 | The 27 member countries of the European Union |
| FAC | Fixed allowable catch |
| FAO | Food and Agriculture Organization (United Nations) |
| FDI | Foreign direct investment |
| FEMISE | Forum Euro-Méditerranéen des Instituts de Sciences Economiques |
| FiBL | Forschunginstitüt für biologischen Landbau (Research Institute of Organic Agriculture) |
| FODEP | Foundation for Democratic Process |
| GAM | Greater Amman Municipality |
| GDP | Gross domestic product |
| GEF | Global Environment Facility |
| GEO | Global Earth Observation |
| GFCM | General Fisheries Commission for the Mediterranean |
| GFCM /SAC | General Fishing Commission for the Mediterranean, Scientific Advisory Committee |
| GHGCAP | Greenhouse gas emission per capita |
| GHGIND | Industrial greenhouse gas emission intensity |
| GIC | Groupements d'Intérêt Collectif |
| GIZ | Deutsche Gesellschaft für Internationale Zusammenarbeit (formerly GTZ) |
| GPS | Global Positioning System |
| GTZ | Now GIZ |
| HDMU | High density, Mixed use |
| HELI | Health and Environment Linkages Initiative |
| ICCAT | International Commission for the Conservation of Atlantic Tuna (including the Mediterranean Sea) |
| ICES | International Council for the Exploration of the Sea |
| ICZM | Integrated Coastal Zone Management |
| IEA | International Energy Agency |
| IFOAM | International Federation of Organic Agriculture Movements |
| IGS | Interim Growth Strategy |
| IMF | International Monetary Fund |
| INECE | International Network for Environmental Compliance and Enforcement |
| ITQs | Transferable quotas |
| IUCN | International Union for Conservation of Nature |
| JD | Jordanian dinar |
| JICA | Japan International Cooperation Agency |
| JVA | Jordan Valley Authority |
| kg | Kilogram |
| LPG | Liquefied petroleum gas |
| m | Cubic metre |
| MAP | Mediterranean Action Plan |
| MCA | Multi-criteria analysis |
| MCC | Millennium Challenge Corporation (United States) |
| METAP | Mediterranean Environmental Technical Assistance Program |
| MOT | Ministry of Tourism |
| MPA | Marine Protected Area |
| MSW | Municipal Solid Waste |
| MTI | Marine Trophic Index |
| MW | Megawatt |
| NEMC | Northern and Eastern Mediterranean Countries |
| NGO | Nongovernmental organization |

| | |
|---|---|
| NMVOC | Non-CH4 volatile organic emissions per pop. area |
| NOx | Nitrogen oxides |
| NPV | Net present value |
| OCEMO | Office de Coopération Economique pour la Méditerranée et l'Orient |
| OECD | Organization for Economic Co-operation and Development |
| ONAS | Office National de l'Assainissement (Tunisia) |
| PES | Payments for environmental services |
| ppm | Parts per million |
| PPP | Purchasing power parity |
| PPPs | Public-Private Partnerships |
| R&D | Research and Development |
| ROI | Return On Investment |
| RSCN | Royal Society for the Conservation of Nature |
| S&P–EGX ESG | S&P/Egypt Stock Exchange Economic and Social Governance Index |
| SBT | Southern Bluefin Tuna |
| SEEA | System of Integrated Environmental and Economic Accounts (or Accounting) |
| SEEAW | System of Environmental-Economic Accounts (or Accounting) for Water |
| SEEE | Moroccan State Secretariat for Water and the Environment |
| SEMCs | Southern and Eastern Mediterranean Countries |
| SFCDG | Société Forestière de la Caisse des Dépôts et de Gestion |
| SMC | Southern Mediterranean Countries |
| SNA | UN System of National Accounts |
| $SO_2$ | Sulphur dioxide |
| SRI | Socially responsible investment |
| STECF | Scientific, Technical and Economic Committee for Fisheries (EU) |
| TAC | Total allowable catch |
| TEEB | The Economics of Ecosystems and Biodiversity |
| tonne | Metric ton (1,000 kilograms) |
| TWW | Treated wastewater |
| TWWR | Treated wastewater reuse |
| UNCTAD | United Nations Conference on Trade and Development |
| UNEP | United Nations Environment Programme |
| UNEP/MAP/RAC | UNEP Mediterranean Action Plan Regional Activity Center |
| UNESCO | United Nations Educational, Scientific, and Cultural Organization |
| UNFCCC | United Nations Framework Convention on Climate Change |
| UNSD | United Nations Statistics Division |
| WATSTR | Water Stress Index |
| WAVES | Wealth Accounting and the Valuation of Ecosystem Services |
| WDM | Water Demand Management |
| WHO | World Health Organization |
| WJA | Water Jordan Authority (Jordan) |
| WQI | Water Quality Index |
| WSI | Water Scarcity Index |
| WTO | World Trade Organization |
| WUA | Water-User Association |

# Notes

# About the *2012 MED Report*

While countries increasingly see sound environmental practices as critical to long-term growth, policy implications for transitioning to a green growth agenda are less clear. The *2012 MED Report "Towards Green Growth in the Mediterranean Countries"* gathers evidence on the environmental, social and economic performance of natural assets and key sectors from several countries bordering the Mediterranean. It reveals environmental and economic gains or "co-benefits" in some sectors, trade-offs and hard-choices in others. The authors also provide estimates of gross and net job creation for the Mediterranean countries over the next ten years given a shift to green growth policies. The report offers a range of policy tools that can help facilitate the move towards green growth and related job creation focusing on fiscal reforms, market-based instruments, greater environmental responsibility, eco-labeling and certification. The report makes actionable recommendations at the national level jointly within the context of broad economic reforms and presents a case for regional cooperation between governments and international institutions to preserve threatened natural assets. Based on a review of case studies and best practices, the findings will be useful to policy makers, academia, civil society actors and donors alike who wish to promote a green growth agenda, encourage green national accounting and monitor environmental actions.

2012 MED Report

# Toward Green Growth in Mediterranean Countries

## Implementing Policies to Enhance the Productivity of Natural Assets

*"Green growth means to sustain a descent, healthy and productive life for us and for our children; we live on a land borrowed from the future generations. Making the human rights greener is the main objective we should strive for, but jobs is our main concern, with the 2012 MED Report we have some thoughts to deal with both of these issues."*
H.E. the Palestinian Minister of Environment Dr. Yousef Abu-Safieh

*"As a corroboration of the CMI 2012 MED Report, Morocco is strongly committed in the transition to green growth, in particular in the sectors enlightened by the report such as energy, sanitation or waste management. The programs implemented could lead to the creation of thousands of jobs."*
H.E. the Moroccan Minister of Economy and Finance, Mr. Nizar Baraka

*"The protection of the environment and of natural resources is a necessity, if we want to give future generations a better life. The value of this report is that it shows that this task is not only necessary and possible but that it produces economic benefits and creates jobs. I believe that this is an inspiring message, especially for the young generation in the Southern Mediterranean."*
Mr. Gerd Leipold, former Executive Director of Greenpeace International

**CMI**

The Center for Mediterranean Integration is a multi-partner Cooperative Arrangement to facilitate access to advanced knowledge and best practices while generating support among public and independent institutions to increase cooperation, enhance sustainable development and integrate policies in the Mediterranean Region. CMI programs strive to provide solid inputs for evidence-based policy choices and, in so doing, help to improve governments strategies and actions, increase the level of innovative activities and investments in the Region, and stimulate cooperation between countries around the Mediterranean.

**Contact**
Center for Mediterranean Integration (CMI)
Villa Valmer
271 Corniche Kennedy
13007 Marseille – France
Phone: + 33 (0)4 91 99 24 51 /56
Fax: + 33 (0)4 91 99 24 79
www.cmimarseille.org