ECONOMIC AND SOCIAL COMMISSION FOR WESTERN ASIA

ENVIRONMENTAL STANDARDS AND COMPETITIVENESS OF KEY ECONOMIC SECTORS

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Preface

This study has been prepared by the Sustainable Development and Productivity Division of the Economic and Social Commission for Western Asia (ESCWA) as part of its regular programme of work for the 2004-2005 biennium. The study draws upon case studies and strategic assessments prepared under the auspices of the MedPolicies Initiative of the Mediterranean Environmental Technical Assistance Programme (METAP), which has been implemented by ESCWA since 2001 with the financial support of the World Bank and the Bank-Netherlands Partnership Programme.

The MedPolicies Initiative is a capacity-building project that seeks to inform and engage public and private sector decision-makers with regard to the relationship between trade and the environment within the context of international competitiveness. The Initiative was launched by METAP in 1997. METAP has coordinated and provided technical assistance to the Mediterranean region since 1991 within a partnership framework between the European Commission (EC), the European Investment Bank (EIB), the United Nations Development Programme (UNDP), the World Bank and several bilateral donors, including the Swiss Agency for Development Cooperation.

ESCWA would like to acknowledge Mr. S. Arif, Regional Environmental Coordinator in the Middle East and North Africa region of the World Bank and Chair of the METAP secretariat, for his continuous support of the MedPolicies Initiative. Special appreciation is also extended to Mr. B. Larson, who developed the economic model upon which most empirical analysis conducted by the MedPolicies Initiative is based; and to Mr. K. Laraki, who assisted Mr. Larson in conducting training on the application of the Larson Model in the countries of North Africa and contributed to the preparation of MedPolicies studies on the textile and garment sector. Additionally, ESCWA would like to thank the many experts and researchers throughout the Arab region who prepared the trade and environment policy notes and the rapid assessments presented in this report.

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ABBREVIATIONS

AIDMO	Arab Industrial Development and Mining Organization
AMITH	Moroccan Association of the Textile and Garment Industries
ARC	Agricultural Research Centre
BNPP	Bank-Netherlands Partnership Programme
BOD	biological oxygen demand
BSR	Business for Social Responsibility
CAPL	Central Agricultural Pesticides Laboratory
CBP	Customs and Border Protection
CCNEA	Coordinating Committee for the Near East
COD	chemical oxygen demand
Codex	Codex Alimentarius
CTTH	Technical Centre for Textiles and Garments
DSU	Dispute Settlement Understanding
€	Euro
EC	European Commission
EU	European Union
EBDA	Egyptian Biodynamic Association
EFSA	European Food Safety Authority
EMAS	Eco-Management and Audit Scheme
ESCWA	Economic and Social Commission for Western Asia
FAO	Food and Agriculture Organization
FDA	Food and Drug Administration
FDCA	Federal Food, Drug, and Cosmetic Act
FDI	foreign direct investment
FSIS	Food Safety and Inspection Service
GAP	Good Agricultural Practices
GATT	General Agreement on Tariffs and Trade
GCC	Gulf Cooperation Council
GDP	gross domestic product
GMO	genetically modified organism
GOEIC	General Organization for Export and Import Control
GSMO	Gulf Standardization and Metrology Organization
HIID	Harvard Institute for International Development
ICPP	International Convention for the Protection of Plants
IDAL	Investment Development Authority of Lebanon
IFOAM	International Federation of Organic Agriculture Movements
IOE	International Office for Epidemics
ISO	International Organization for Standardization
JTC	Jordan Tanning Company
LAS	League of Arab States
MEA	multilateral environmental agreement
MENA	Middle East and North Africa
METAP	Mediterranean Environmental Technical Assistance Programme
mg/kg	milligrams per kilogramme
mg/l	milligrams per litre
MNC	multinational corporation
MRL	maximum residue level
NGO	non-governmental organization
OASIS	Operation and Administration System for Import Support
ODS	Ozone-depleting substances
OECD	Organization for Economic Cooperation and Development
PCP	pentachlorophenol
PFOS	perfluorooctane sulphonate
PPM	process and production method

ABBREVIATIONS (*continued*)

PVC	polyvinyl chloride
RASFF	Rapid Alert System for Food and Feed
SASO	Saudi Arabian Standards Organization
SME	small and medium-sized enterprise
SPS	sanitary and phytosanitary measures
SS	suspended solids
TBT	technical barriers to trade
TDS	total dissolved solids
TS	total solids
TWIN-SAL	Third World Intellectuals and NGOs Statement Against Linkage
UL	Underwriters Laboratories Incorporated
WEEE	waste electrical and electronic equipment
WHO	World Health Organization
WRAP	Worldwide Responsible Apparel Production
WTO	World Trade Organization

References to the dollar symbol ($) indicate American dollars.

Executive summary

The relationship between environmental standards and competitiveness is complicated. Some experts consider compliance with environmental requirements as an additional burden, which increases production costs and harms the competitiveness of firms and industrial sectors. Others maintain that environmental standards are a valuable mechanism for improving production efficiency and reducing adverse impacts on the environment where the costs of environmental degradation are paid by society as a whole. Consequently, there is a need to understand whether environmental standards and efforts to ensure environmental quality ultimately increase or decrease competitiveness.

The degree of competitiveness at a national or corporate level is determined by an ability to increase income despite challenges posed by the international marketplace. The ability to foster cost-effective strategies in terms of price, production and export of goods and services is therefore fundamental to efforts aimed at increasing competitiveness, particularly in those countries that have adopted export-led growth strategies and trade liberalization policies. This study examines the relationship between environmental standards and competitiveness by assessing the scope and scale of the impact on competitiveness of conformity with environmental standards. This relationship can be assessed by applying the Larson Model, which is a simple, empirically tractable economic forecasting policy tool that was developed under the auspices of the MedPolicies Initiative of the Mediterranean Environmental Technical Assistance Programme (METAP). The Model estimates the percentage change in output, exports and imports from compliance with an environmental requirement based on the following three-step logical progression:

(a) While conformity with environmental standards can increase production costs, the size of the cost change attributable to environmental compliance can be small relative to total production costs, thereby limiting the implication for output, exports and competitiveness;

(b) Given the business instincts of entrepreneurs, higher input costs caused by new environmental requirements can be offset by seeking out lower cost alternatives, and by implementing efficiency gains and productivity improvements in order to maintain, or even reduce, the cost of production in a free market system;

(c) While competition in the international marketplace is rife, manufacturers in developing countries with strategic vision can comply with stronger environmental standards and still reap a profit by attracting consumers, particularly in niche markets, who are willing to pay more for environmentally friendly products or specialized goods.

This study provides examples from both sides of the debate, namely: (a) cases where conformity with environmental standards increases costs and reduces exports; and (b) cases where the cost of conformity with environmental, health and safety standards is minimal, and where improvement in environmental performance provides opportunities for increasing competitiveness and accessing new markets. Accordingly, the answer as to whether there is a positive or negative relationship between environmental standards and competitiveness often depends on the measure and sector under examination, as well as the policy interests of decision-makers. However, rather than providing a mere list of prevailing opportunities and challenges, this report seeks to underscore the importance of assessing the scope and scale of impact on key economic sectors within the framework of set environmental requirements, thereby informing effectively the decision-making process and the policy debate on sustainable development.

Environmental standards and competitiveness can go hand in hand with efforts aimed at increasing economic growth and achieving sustainable development. The challenge for Arab countries is to ensure that environmental regulations adopted at a national level are appropriate to local conditions and are consistently enforced; and that environmental standards required in export markets are not discriminatory and are applied in the least trade-distorting manner. Within that context, Arab countries need to support efforts aimed at strengthening environmental regimes for the purpose of protecting public health and welfare, and to mitigate problems that arise when environmental measures are adopted that are protectionist in nature or when conformity with a particular standard is excessively costly, particularly for small and medium-sized enterprises (SMEs). Furthermore, special care is needed not to aggregate policy analysis on the cost of

conformity, given that the cost of compliance with environmental standards can differ for various sub-sectors in the same industry, or between large and small firms.

Policy measures, an enabling infrastructure and the business environment all play pivotal roles in influencing the efficient and effective adoption by a company of a new environmental requirement. Moreover, they help to determine the magnitude of the cost of conformity with a given environmental standard. Governments are therefore actively encouraged to assist companies, particularly SMEs, in accessing the information and technologies needed to reduce adverse impacts on competitiveness that can be caused by conforming with environmental requirements, especially in those sectors that are sensitive to certain environment-related inputs. Equally, Governments need to ensure that special and differentiated provisions are included for developing countries with regard to international agreements on trade, environment and development. This is particularly important for countries that lack the capacity to monitor the environment and assess conformity, or that generally lack an enabling infrastructure that assists companies to comply with more stringent environmental requirements. Preferential access to financial and technology transfer arrangements can also help companies to secure efficiency gains more quickly, thereby offsetting costs that are associated with conforming to higher environmental standards.

Additionally, companies need to pursue innovation and become more responsive to a changing global marketplace that values not only the end products, but also the production process itself. While consumer preferences for environmentally friendly and socially responsible goods have provided the impetus for these changing market dynamics, advancements in science and a growing awareness and concern of food safety and human health have, over time, resulted in more stringent national regulations. Consequently, environmental leaders in the private sector must upgrade their performance continuously and be proactive in their environmental compliance strategies in order to maintain competitiveness.

Identifying policy measures to enhance competitiveness within a sustainable development framework therefore depends on adequate access to information with regard to environmental standards and requires a thorough understanding of the costs and benefits of environmental compliance. Policy instruments and private sector initiatives aimed at encouraging innovation and technology transfer can facilitate the ability of companies to secure efficiency gains and access new markets and, consequently, to offset the adverse impacts that can arise from environmental compliance. However, such instruments and initiatives must be complemented by open lines of communication between the public and private sectors so that appropriate measures can be identified that allow for a mutually supportive relationship between environmental standards and competitiveness.

Introduction

This study is divided into six chapters. Chapter I provides a general overview of the definitions and theoretical perspectives with regard to environmental standards. The relationship between these standards, competitiveness and trade are discussed in chapter II, which, in addition, highlights a conceptual framework for examining the different types of standards that impact competitiveness, as well as a model for estimating quantitatively the impact on output, exports and imports of compliance with environmental standards.

Chapter III offers a review of findings obtained during the preparation of rapid assessments on the impact of environmental strengthening on the competitiveness of key economic sectors in the region. This is complemented by sector-specific analyses in the Arab region on the agro-food industry, and the textile and garment industry, which are presented in chapters IV and V, respectively. Chapter VI provides some conclusions, lessons and recommendations aimed at strengthening policies with regard to the relationship between environmental standards and competitiveness in key economic sectors. Given that the sustainable management of water and energy resources is a regional priority, the case studies offered throughout this report focus on compliance with standards and regulations associated with those environmental sectors.

I. GENERAL OVERVIEW

Environmental standards can impose additional costs to production and can represent obstacles to growth. Alternatively, they can provide a framework for environmentally sustainable economic development and offer benefits to competitiveness. A positive outcome is dependent upon the appropriate definition, effective application and clear enforcement of standards in the local and international marketplace. Moreover, it requires open lines of communication between the public and private sectors, as well as access to information by civil society institutions. These criteria are comparatively harder to attain in most developing countries, including those in the Arab region. Nevertheless, conformity with environmental standards can provide a competitive edge for industries seeking to enhance their productivity and to increase their market share in a globalized world economy.

Most environmental standards are developed by international expert committees, and are subsequently adopted or adapted to meet the needs, interests and circumstances of a given country or company. As such, environmental standards are usually based on scientific precepts aimed at minimizing risks associated with potential environmental hazards, including those in the related areas of health and safety. Consequently, the adoption of environmental standards as technical regulations is justified by their demonstrated ability to protect consumers, employees and employers, in addition to preserving natural ecosystems. Accordingly, while the cost of compliance with environmental standards can vary, the cost of non-compliance is likely to result in environmental degradation, damage to human health, loss of natural resources and economic decline.

Environmental standards can equally be based on more cautious attitudes towards risk, consumer preferences or protectionist public policies. However, care must be taken when environmental standards are adapted as technical regulations. This is because, despite their utility as instruments for environmental protection, environmental regulations can also be used as a tool for disguised trade protectionism due to their tendency to restrict the use of certain production methods. Moreover, within the context of environmental standards, a related concern is associated with the degree of regulation in terms of production and process methods of imports under international trade rules. These rules require that differentiation between similar products be based on the final characteristics of a given product, rather than on its production process. The growing number of environmental, health and safety regulations that have been adopted in recent years begs the question as to whether these measures are justifiable under existing international trade rules or non-tariff barriers to trade that impede market access and adversely impact competitiveness.

Niche markets created by consumer preferences for environmentally friendly goods offer a mixed bag for producers in developing countries. Ecolabels and other certification schemes provide manufacturers with the opportunity to tailor their goods and services to a segment of the market whose preferences and willingness to pay for compliance with a fixed set of standards have been revealed. This specialization provides a competitive edge for companies able to access those markets and, moreover, it reduces the time and cost of having to research what the market wants. However, ecolabelling schemes also create the possibility for voluntary environmental standards to be incorporated into national regulations or regular corporate practices. An effective escalation in the stringency of environmental standards results which thwarts the ability of companies to market themselves and secure a competitive edge based on their existing environmental credentials. Additionally, it increases the cost of compliance for other firms that only seek to meet the minimum standards required for market entry. Consequently, environmental leaders in the private sector must upgrade their performance continuously and be proactive in their environmental compliance strategies in order to maintain competitiveness.

Accordingly, despite the inherent opportunities, compliance with increasingly stringent environmental standards does create challenges that often involve changes in production and process methods. Moreover, these changes often trigger additional, corollary requirements, including supplementary costs associated with ensuring access to adequate information, availability of technical expertise, and adherence to reporting and conformity assessment systems. The sum of these costs is often perceived to be beyond the capacity of individual companies, particularly SMEs. However, a greater understanding with regard to the costs of meeting environmental standards and the benefits generated by these standards though efficiency gains and productivity improvements can help to inform the debate concerning the adoption of certain environmental

standards. This in turn can assist decision-makers to adopt mechanisms that provide for a mutually supportive relationship between environmental standards and competitiveness within a framework that seeks to promote economic growth and within the context of achieving sustainable development.

A. WHAT ARE ENVIRONMENTAL STANDARDS?

The term standard is generally used to refer to a measure with which conformity is sought. A standard can be voluntary or mandatory. However, in a strictly legal sense, standards are voluntary measures until they are promulgated into national law as technical regulations, and thereafter rendered mandatory. Private companies can require suppliers to demonstrate conformity with environmental standards that exceed those adopted into national law. These privately mandated standards are still considered to be voluntary, given that it remains the prerogative of the producer to satisfy the preferences of potential clients. However, in an increasingly interdependent and competitive market, the differentiation between voluntary and mandatory standards is becoming increasingly blurred for producers who must meet consumer preferences or else risk being forced out of the marketplace.

Standards focus on a product, a process or production related requirements, as well as procedures associated with the application of those requirements, including, for example, terminology, symbols, labelling requirements and packaging.[1] These specifications typically include procedures to ascertain conformity with specific standards. While environmental standards can be defined as measures that have implications for the management of the natural environment, they can also include measures that pertain to the man-made environment and/or environmental health and safety. For the purposes of this study, an environmental standard relates to measures that have implications for the management of the natural and man-made environments, including related effects associated with protecting the health and safety of humans, animals and plant life. While this definition is broader than the one used by the World Trade Organization (WTO), Arab countries are concerned by the larger impact of environmental, health and safety standards on their competitiveness, trade and market access. Consequently, this wider definition provides a more effective scope for examining environmental standards in the Arab region.

B. HOW DO ENVIRONMENTAL STANDARDS RELATE TO COMPETITIVENESS?

The degree of competitiveness at a national or corporate level is determined by an ability to increase income despite challenges posed by the international marketplace. The ability to foster cost-effective strategies in terms of price, production and export of goods and services is therefore fundamental to efforts aimed at increasing competitiveness, particularly in those countries that have adopted export-led growth strategies and trade liberalization policies. Consequently, there is a need to understand whether environmental standards and efforts to ensure environmental quality ultimately increase or decrease competitiveness.

Traditional economic theory purports that competitiveness is achieved at the expense of environmental protection and that economic growth is constrained by national regulation. Most developed countries experienced industrialization and rapid economic growth prior to the era of environmental awareness that began in the late 1960s. As such, energy-intensive manufacturers and polluting industries were able to develop under lax environmental regimes that were largely uninformed with regard to the effects of environmental pollution. The simultaneous rise of income and understanding of environmental impacts prompted the formulation and adoption of environmental standards, albeit with staggered enforcement on previously existing enterprises. Companies in developed countries, which were established after the promulgation of such standards, have benefited from growing within structured environmental regulatory frameworks that minimize both uncertainty and costs associated with environmental compliance. Moreover, a number of high-income countries provide incentives, subsidies and research support aimed at assisting and encouraging firms to invest in clean technologies and environmentally friendly production processes.

[1] These requirements are detailed in the definition of standards provided in the Agreement on Technical Barriers to Trade of the World Trade Organization (WTO), which is equally referred to as the Standards Code. See annex I of the Agreement.

By contrast, environmental standards and technical regulations in many developing countries are still being formulated. Institutional capacity for monitoring and enforcing existing environmental regulations is weak, and access to information and instruments for assisting companies to comply with national or international environmental standards remains limited. Additionally, there is little differentiation in most developing countries between old and new companies, or between small and large companies when it comes to formulating and applying environmental regulations. Economic growth is therefore sought within a weak environmental framework that policymakers have hesitated to strengthen.

Consequently, some experts continue to echo the arguments of the past that claim that lax environmental regimes offer a competitive edge to countries and companies with poor environmental performance records, particularly those seeking to attract foreign direct investment (FDI). This is equally the position voiced by various business associations, labour unions and environmental groups in the United States of America and Europe, which argue for the need to establish a "level playing field" that is based on harmonized environmental standards between developed and developing countries. According to this perspective, the adoption of common environmental standards and their uniform enforcement avoid losses to competitiveness associated with the cost of compliance with more stringent environmental standards in developed countries, and prevent developing countries from maintaining lax environmental regimes as a means for enhancing their competitiveness.

Within that context and from the opposing viewpoint, several distinguished intellectuals and non-governmental organizations (NGOs) from developing countries issued a statement in 1999 regarding the relationship between trade, environment and competitiveness. The statement strictly opposed the negotiation of any linkages between environmental (and labour) standards and trade agreements, including those of WTO, on the basis that such measures were unrelated to trade and were being advanced owing to the "competitiveness concerns" and protectionist policies of developed countries.[2]

The statement underscores a perceived injustice that requires developing countries to meet the same environmental standards that are being applied in the North, which is prejudicial to the South given that the economies of developed countries have grown in the absence of strict environmental controls. Furthermore, developing countries were being compelled to pay for the previously poor environmental performance of the North, which remains the major source of threats to the global environment today.

Leading analysts still argue that binding the South to the same environmental standards as the North adversely impacts the competitiveness and potential for economic growth of developing countries. This argument does bear some weight. Developing countries need to be accorded special and differential treatment in mechanisms aimed at achieving global environmental targets and at applying higher environmental standards.

Fortunately, this practice is already in place in several multilateral agreements on environment and trade. However, the argument is also based on the following three assumptions: (a) conformity with more stringent environmental regulations increases production costs; (b) manufacturers in developing countries are ill-informed and ill-equipped to come into compliance with standards adopted in the North, which can further increase such costs; and (c) exporters in the South are price-takers and do not have the ability to translate increased production costs into equivalent sales at higher prices. These conditions could therefore result in smaller profits, less income and lower competitiveness, particularly relative to companies already in compliance with the environmental standards being required.

However, these assumptions concerning the relationship between environmental standards and competitiveness are not necessarily true, particularly when effective mechanisms are put into place to encourage innovation, improve information dissemination and promote technology transfer in a free market

[2] "Third World Intellectuals and NGOs Statement Against Linkage (TWIN-SAL)" (CUTS Centre For International Trade, Economics and Environment, Jaipur, India, 1999), which is available at: www.cuts-international.org/linkages-twinsal.htm.

system. Indeed, the argument can be overturned with the following three points, which will be raised throughout this study:[3]

(a) While conformity with environmental standards can increase production costs, the size of the cost change attributable to environmental compliance can be small relative to total production costs, thereby limiting the implication for output, exports and competitiveness;

(b) Given the business instincts of entrepreneurs, higher input costs caused by new environmental requirements can be offset by seeking out lower cost alternatives, and by implementing efficiency gains and productivity improvements in order to maintain, or even reduce, the cost of production in a free market system;

(c) While competition in the international marketplace is rife, manufacturers in developing countries with strategic vision can comply with stronger environmental standards and still reap a profit by attracting consumers, particularly in niche markets, who are willing to pay more for environmentally friendly products or specialized goods.

Furthermore, the argument that weaker environmental regimes attract greater foreign investment inflows has not been observed throughout the world and has been increasingly discounted in academic circles. For instance, the enforcement of environmental standards in Arab and African countries is weak compared to other regions, yet FDI in these regions remains nearly stagnant. Conversely, foreign investment in the manufacturing sector has blossomed in countries in Eastern Europe and Turkey that have been obliged to adopt the acquis communautaire as a precondition for membership into the European Union.[4] This experience echoes the conclusions of recent studies that find that lax environmental regimes have little influence on foreign investment decision-making, particularly when compared to other criteria for assessing foreign investment opportunities.[5] Indeed, some studies find that the application of common standards, including environmental standards, among trading partners and within multinational companies actually improves efficiency and facilitates trade, which in turn increases competitiveness, even in such cases where the standards are more stringent than those required in the local market.[6]

Moreover a recent study provides empirical evidence that environmental performance does not compromise economic growth.[7] The study finds a positive correlation between environmental quality and gross domestic product (GDP) per capita, based on an examination of more than 70 countries. However, unlike the Environmental Kuznet's Curve, which postulates that environmental quality improves as a result of increased national income, this study uses environmental indicators and statistical tools to demonstrate that improvements in environmental performance, including, for example, energy efficiency, are among the factors that can contribute towards increasing economic growth and national income. This provides additional support to various studies which argue that "economic competitiveness and environmental performance are compatible, if not mutually reinforcing".[8]

The same argument is put forward by the World Bank in studies conducted on the cost of environmental degradation in several countries in the Middle East and North Africa (MENA) between 2002

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[3] For more details on these principles, see chapter II on the Larson Model, which is the methodology of the MedPolicies Initiative of the Mediterranean Environmental Technical Assistance Programme (METAP).

[4] The entire body of European laws is known as the acquis communautaire. This includes all the treaties, regulations and directives passed by the European Commission as well as the rulings of the Court of Justice.

[5] For example, see J. Sachs and A. Warner, "Economic reform and the process of global integration", *Brookings Papers on Economic Activity*, No. 1 (1995).

[6] For an early example, see W. Moomaw, "Going around the GATT: private green trade regimes", *Praxis Journal of Development Studies* (1997).

[7] D. Esty and M. Porter, "Measuring national environmental regulation and performance", *Global Competitiveness Report 2001-2002* (Oxford University Press, Oxford and New York, 2002), pp. 78-100.

[8] Ibid., p. 78.

and 2004.[9] These studies show that the deterioration of water, land and coastal resources, as well as air pollution in the MENA region cost those countries two to five per cent of GDP on an annual basis. As such, poor environmental performance results in loss of national income. Effective management of the environment through the appropriate adaptation and enforcement of environmental standards can therefore prevent losses to GDP and provide opportunities for improving national competitiveness.

C. IMPLICATIONS FOR ARAB COUNTRIES

Environmental standards and competitiveness can go hand in hand with efforts aimed at increasing economic growth and achieving sustainable development. The challenge for Arab countries is to ensure that environmental regulations adopted at a national level are appropriate to local conditions and are consistently enforced; and that environmental standards required in export markets are not discriminatory and are applied in the least trade-distorting manner and in accordance with a scientific approach to standards setting. Within that context, Arab countries need to support efforts aimed at strengthening environmental regimes for the purpose of protecting public health and welfare, and to mitigate problems that arise when environmental measures are adopted that are protectionist in nature or when conformity with a particular standard is excessively costly.

Furthermore, developing countries, and particularly SMEs in developing countries, tend to have a harder time complying with more stringent environmental measures, whether these are issued domestically or internationally. This is especially true in Arab countries where SMEs are typically smaller than their counterparts in other regions. Moreover, SMEs in the Arab region tend to be concentrated in industries that are being subjected to an increasing number of environmental, health and safety standards, including the agro-food industry, the textile and garment sector and wood-based furniture manufacturing. The proliferation of environmental standards has policy implications for Arab countries where SMEs tend to represent the largest share of employment, and provide important contributions to national income, output and exports. Consequently, environmental regulations and standards that potentially increase the cost of production or limit market access for SMEs can directly affect competitiveness, national income and public welfare.

The challenge of formulating a regional policy approach for assisting SMEs is complicated by the fact that the size and capacity of SMEs varies between Arab countries. For example, while a given SME in Yemen typically employs up to 10 persons, its counterpart in Lebanon employs up to 50 workers; in Morocco, any company with fewer than 200 employees is considered an SME; and in Jordan, a small firm employs 4-10 workers, while a medium firm can comprise up to 25 employees. Nevertheless, while the size of SMEs differs among Arab countries, their scale remains starkly different compared to those in developed countries. For example, companies with up to 500 employees can be considered SMEs, depending on their balance sheet, in Germany, the United States of America and by the International Organization for Standardization (ISO). Similarly, while the European Commission (EC) defines SMEs as companies with fewer than 250 employees, this definition encompasses companies with annual turnovers of up to €50 million, which far exceeds the scale of small and medium-sized industries in the Arab region.[10]

The difference in size between SMEs in the North and South has profound implications for their relative competitiveness. By necessity, SMEs operating at a larger scale in developed countries have largely adopted differentiated human resource capabilities, and structured financial monitoring and reporting systems. Conversely, SMEs in the Arab region tend to be small, family-owned businesses with weak management structures and poor financial systems.[11] This limits the capacity of Arab SMEs and constrains their ability to secure information and invest in solutions for complying with constantly changing

[9] See country studies on the cost of environmental degradation prepared by the World Bank under the auspices of the Mediterranean Environmental Technical Assistance Programme (METAP).

[10] See the European Commission Recommendation of 6 May 2003 concerning the definition of micro, small and medium-sized enterprises, notified under document number C(2003)1422.

[11] ESCWA, "Trade and environment challenges and opportunities for SMEs", which was presented at the METAP High Level Meeting on Economic Tools for Environmental Sustainability (Beirut, 25-27 June 2003).

environmental requirements. Nevertheless, smaller SMEs also tend to have flexible and direct management structures, which give them the advantage of being able to make quick decisions and respond to change rapidly when presented with opportunities for increasing competitiveness.[12] The main task of policymakers in Arab countries is therefore to understand the special needs and characteristics of SMEs in the region and to take those factors into consideration when engaging in trade negotiations and in formulating environmental standards that may impact the competitiveness of local SMEs.

Within the framework of WTO and the context of analysing the relationship between environmental standards and competitiveness, Arab countries must address the implication for imports and exports. As national trade and development strategies continue to pursue more open markets, SMEs and large-scale manufacturers will need to assess the cost of compliance with foreign environmental standards, in addition to those applied domestically. This is as a result of the national treatment clause of the General Agreement on Tariffs and Trade (GATT 1994), which requires member countries to apply and enforce standards in a way that does not discriminate between domestic products and imported goods.

This requirement can be translated as an obligation by Arab countries that are signatory members of GATT to force local manufacturers to comply with the same product standards required of imports in terms of health, safety and the national environment. This has important budgetary implications for customs, inspections, and environmental monitoring and enforcement in a region with relatively weak environmental regimes. Arab policymakers and trade negotiators must therefore adopt strong positions on the special and differentiated treatment of developing countries with regard to the enforcement of environmental standards. Moreover, they need to seek out technical assistance and preferential arrangements for technology transfer, access to information and financial support that can assist the private sector to comply with environmental standards required both domestically and internationally.

[12] Ibid.

II. ENVIRONMENTAL STANDARDS, COMPETITIVENESS AND TRADE

The relationship between conformity with environmental standards, competitiveness and trade is multifaceted. Initially, it was thought that stringent environmental measures would adversely impact competitiveness, that trade liberalization would harm the environment, and that progress in one area would only lead to losses in the others. Current thinking has changed as efforts are made to pursue integrated approaches to trade, environment and international competitiveness within a sustainable development framework. However, in order to identify win-win-win solutions, a conceptual framework is needed that clarifies the different types of standards that exist and their relationship to competitiveness and trade. Once standards are identified, methods for assessing the costs of conformity with environmental standards are presented as policy support tools that can help to inform decision-making on the impact of environmental compliance on international competitiveness and trade.

A. UNDERSTANDING STANDARDS

Environmental, health and safety standards evolve from a complicated process that determines the way that standards are prepared, applied and enforced. National standardization bodies in most Arab countries are mandated to formulate standards and technical regulations. However, countries recognize that WTO agreements prefer that national standards find their inspiration in the work of international standard-setting bodies. As international standards are formulated, national Governments can adopt the same standard as a technical regulation, or establish a more rigorous standard, provided that it is scientifically justified based on a local risk assessment. Environmental regulations that are less stringent than those adopted by international bodies are discouraged by WTO for fear that this could create a "slippery slope" situation, whereby environmental standards become increasingly diluted by Governments as a means to increase national competitiveness. While there is growing evidence in the literature that this relationship is not entirely true, these provisions are maintained to ensure that standards and standard-setting mechanisms are applied in a manner that facilitates trade along with furthering sustainable development.

Developing countries are encouraged to contribute to the work of international standard-setting bodies and some Arab countries have become increasingly active in this regard. Nevertheless, the human and financial resources needed to contribute effectively to the scientific and highly technical deliberations within these bodies remains limited. Accordingly, while the capacity of national standard-setting bodies in many Arab countries is improving, most Arab countries tend to be reactive rather than proactive concerning the formulation of international standards and their subsequent adoption or adaptation by trading partners.

Notifying trade partners of the expected approval of a new standard or technical regulation and disseminating information with regard to its provisions to relevant stakeholders, particularly the private sector, is fundamental in ensuring the transparency and effectiveness of the standard-setting process. WTO stipulates that countries must notify the Organization's Secretariat concerning any proposed regulation for adoption that could have trade implications, thereby allowing other members the opportunity to request clarifications or changes to the proposed law. While this presents an opportunity to contest potentially discriminatory environmental regulations adopted in destination markets, the sheer number of regulations notified to WTO makes it impossible for a developing country to examine the implications for competitiveness of every proposed regulation notified by its trading partners. Furthermore, Government representatives to WTO are often not the persons best suited to determine whether a regulation presents a potential obstacle to trade for national manufacturers and exporters. Consequently, open channels of communication between the public and private sectors are needed to vet the possibility that a proposed environmental measure could present a non-tariff barrier to trade. Unfortunately, institutional mechanisms for facilitating proactive consultation on potential threats to trade and competitiveness are limited in most developing countries, particularly in the Arab world. This situation encourages countries as well as companies to have a reactive, rather than proactive approach to environmental compliance.

As a standard is adopted into law, procedures are established for its monitoring, application, testing and enforcement. Institutions must also be made responsible and accountable for its enforcement. For some voluntary standards, a certification system can be established and entrusted to the private sector through an accreditation scheme. However, Arab and developing countries face particular challenges in this area owing

to the limited availability of human and financial resources available to conduct these tasks. These constraints can prove increasingly problematic as disputes regarding national treatment and provisions governing special and differential treatment emerge as a source of contention between Governments. The settlement of these and related disputes depends upon whether they are raised within the framework of inter-governmental agreements or under private contract law.

B. CONCEPTUAL FRAMEWORK

Environmental standards are a common instrument used by Governments to manage domestic production and consumption. Standards can be voluntary or mandatory when adopted as technical regulations required by Governments. Moreover, the private sector uses environmental standards to differentiate between products and to establish preferred production methods. As such, the application of standards related to the environment is complicated in view of the fact that environmental standards often address issues that are related to the process of producing a product rather than limited to its final characteristics. This not only influences the way in which a standard is applied, but also the way it can be monitored and disputed. Accordingly, a simple conceptual framework is proposed below to assist in the identification of environmental standards that concern key economic sectors in the region. Examples are provided to demonstrate the implications of these different types of standards on output and exports in the region.

1. *Product standards*

Product standards establish rules concerning the characteristics of a final product. Such characteristics are visible and/or are able to be accurately tested in the final product. Environmental product standards could include recycled packaging requirements; maximum residue limits for pesticides; or use limits for dyes, heavy metals or other environmentally unfriendly inputs that can leach into soils or water sources during use or disposal. Additionally, environmental standards often have implications for human health. Product standards adopted as technical regulations need to be equally enforced on domestic products and imports.

For example, the European Union (EU) adopted regulations in 2002 on the maximum amount of cadmium that can be found in phosphate-based fertilizers. The regulation came into effect for all EU countries on 31 December 2004. Cadmium has been found to be carcinogenic; and cadmium compounds in fertilizers have implications for the environment and human health due to the possible leaching of cadmium into groundwater or agriculture products. Jordan and Morocco are among the main suppliers of raw phosphate and phosphate fertilizers to the EU, with Algeria, Egypt and Tunisia equally active exporters to Europe in this sector. While nearly all phosphate fertilizers contain some traces of cadmium, the new cadmium content thresholds represent a product standard that required Jordan and Morocco to make investments in new technologies and production processes in order to maintain access to the EU market. An innovative decadmiation technology developed by Groupe Office Chérifien des Phosphates in Morocco, as well as alternative processes instituted by the Jordanian Phosphate Mines Company, were initially costly to adopt, but allowed both countries to remain competitive in the European market.[13] This is despite the fact that there is significant production of phosphate-based fertilizers in the EU, represented by the European Fertilizer Manufacturers Association, which was also required to come into compliance with the new rule.

2. *Process and production methods*

Standards that address process and production methods (PPMs) relate to the ways in which products are produced, processed, handled or disposed. Within that context, they often establish guidelines or rules associated with the manufacturing of a specific good, including the inputs and outputs of the production process. These can include wastewater effluent standards, air emission thresholds for specific compounds or particulates, or hazardous waste handling and disposal requirements. Conformity with PPMs cannot normally be seen or tested in the final product. Consequently, international trade rules established under

[13] For more information, see the study undertaken within the framework of METAP MedPolicies Initiative, entitled "Impact of proposed cadmium content regulations on the phosphate fertilizer industry in Southern Mediterranean countries" (METAP, the World Bank and ESCWA, June 2003).

GATT do not allow countries to adopt technical regulations that discriminate between like goods that are imported and domestically produced based on PPMs, except as they may relate to the application of sanitary and phytosanitary measures. This prevents the environmental regulations of one country to be extra-territorially imposed on products produced in another country. Alternatively, NGOs, private associations and companies have been active in the area of establishing voluntary environmental standards and systems to certify environmental performance as means of targeting consumers who favour products that are produced in a more environmentally friendly manner. Both mandatory and voluntary environmental PPMs can have important implications for competitiveness.

For example, supermarkets and other food retail outlets in Europe established EurepGAP in 1997.[14] EurepGAP members require fresh food suppliers to comply with a set of Good Agricultural Practices (GAP), which includes provisions on food safety, worker health and safety, environmental protection and animal welfare. Given that these production standards and procedures cannot be regulated by the EU, this private initiative provides a way for retailers to secure products only from producers that demonstrate conformity with these more stringent voluntary standards that retailers and their client base espouse. However, the voluntary aspect of the standard is debatable since non-compliance with the GAP effectively excludes agricultural producers from accessing many large supermarket chains in Europe.

3. *Conformity assessment*

While a company, process, good or service can be in compliance with national or international environmental standards, demonstrating conformity with those requirements involves the additional step of securing documentation or a certificate to that effect. This entails the conduct of a conformity assessment, which is also based on a set of standards that elaborates the procedures necessary for securing certification in a certain area. Certifications of conformity can only be issued by accredited institutions whose approach to accreditation is normally in accordance with a set of international standards established by ISO or related organizations. The validity of the certification process therefore depends on the use of accredited testing facilities to support the analysis. Moreover, certification is often an iterative process that involves regular monitoring and follow-up to ensure continued conformity with the associated standards. As such, the assessment of conformity with environmental standards requires access to a set of institutions able to provide services in support of the certification process on a regular basis. This infrastructure is not well developed in the Arab region. Consequently, local companies must rely on international certification agents or invest in internal testing facilities to conduct conformity assessments, which increase the cost of compliance.

Some Arab countries are seeking to redress this problem. For example, Saudi Arabia announced plans in March 2005 to accredit at least 74 private laboratories in order to improve efficiency in testing, analysis and quality control of a range of locally produced and imported products. This is expected to cut production costs for local companies, avoid food safety problems and better protect public health.[15] Similarly, Government institutions in Jordan are seeking to expand their accreditation infrastructure and strengthen certification procedures for food-related products.

However, while regional capacity for certification and accreditation increases in such areas as agro-food and textiles, progress is lagging in other sectors. For example, the electrical and electronic components industry is growing in the region, particularly in Morocco, Tunisia and Saudi Arabia, with exports often destined for Europe or other Arab countries. In 2003, the EU adopted two environmental directives that could directly impact the competitiveness of the industry. Directive 2002/95/EC restricts the use of certain hazardous substances in electronic equipment and states that, as of 1 July 2006, these items sold in the EU cannot contain lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls or polybrominated diphenyl ethers.[16] This product standard could prove problematic for Arab exporters given that many of

[14] EurepGAP began as an initiative of retailers belonging to the Euro-Retailer Produce Working Group (EUREP), which subsequently developed widely-accepted standards and procedures for the global certification of Good Agricultural Practices (GAP).

[15] "Saudi Arabia plans to accredit 74 private laboratories", *Arab News* (6 March 2005).

[16] See Article 4 of the European Commission Directive 2002/95/EC of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

these substances are used in electronics manufacturing, particularly lead which is commonly used in batteries.[17] Directive 2002/96/EC establishes a framework for regulating the recycling of waste electrical and electronic equipment (WEEE) within the EU and sets various targets, including a deadline of 13 August 2005 for member countries to establish a mechanism to ensure that the collection, treatment, recovery and environmentally sound disposal of WEEE (other than those purchased by private households) is provided and paid for by producers.[18] This is based on the "polluter pays" principle and requires manufacturers of WEEE, including those outside the EU, to be responsible for its take-back and disposal. Manufacturers will need to demonstrate compliance with these two regulations if they are to access the European market.

The implications of these directives are likely to be significant for manufacturers and exporters to the EU. Accordingly, the Underwriters Laboratories Incorporated (UL), which is based in the United States, launched a new programme in November 2004 aimed at assisting companies to comply with the first EU directive. The service includes assistance in planning and restructuring production processes in order to come into compliance with the new regulation in time for its implementation. Additionally, UL provides conformity assessment certification in this area. This type of multifaceted, value-added provision of conformity assessment services in the region remains lacking in several sectors. For that reason, such companies as UL and Veritas have established branches and representatives in the Arab region to extend their service reach, albeit often at comparatively higher costs. Enhanced technical capacity in the region could reduce these costs and potentially increase the competitiveness of local industries in this sector.

4. *Dispute resolution*

Dispute resolution has important implications for the way in which environmental regulations and standards are interpreted and justified in the international trading system. Within that context, WTO has established the Dispute Settlement Understanding (DSU) aimed at resolving disputes regarding the interpretation of an environmental regulation, which members can access as a means of settling such conflicts. However, DSU remains largely inadequate for the private sector, given that only member countries of WTO and, specifically, their Governments can decide if a dispute is worth raising in DSU. This remains the case despite the fact that trade is mostly conducted between private actors. Moreover, the decision to contest an issue within DSU is usually political and often depends on the nature of international relations with concerned trading partners and other issues on the international agenda, in addition to the claim under dispute. Furthermore, the mandate of DSU is limited to technical regulations adopted by Governments, and does not extend to voluntary standards that can be imposed by private commercial entities. Consequently, companies, particularly SMEs in developing countries, are often left to resolve problems related to the application or imposition of environmental standards by themselves and under private contract law, especially those that are required by importers and which are more stringent than those enforced by Governments.

Several consultations and disputes have been raised within the framework of DSU that focus on environmental regulations. Some have centred on whether a regulation is discriminatory or adequately based on scientific precepts; while others have examined whether an adopted regulation represents the least trade-distorting measure for achieving its goal. For example, the EC, Egypt, Saudi Arabia and other countries initially imposed a ban on the import of products containing genetically modified organisms (GMOs), based on the precautionary principle and concern that GMOs could have adverse impacts on human health and the environment. While the United States and other countries quickly contested the ban, the restriction was allowed on a temporary basis under the Sanitary and Phytosanitary (SPS) Agreement and as the EC sought to establish a scientific justification for the embargo. However, with time and an inability to establish such a justification for the ban, the EC was forced to withdraw the measure and allow the importation of GMO foods. Other countries followed suit. Nevertheless, the GMO debate continues within the framework of the WTO Committee on Trade and Environment on whether countries can require that foods containing GMOs be labeled as such, given that labelling schemes could adversely impact consumer perceptions regarding the

[17] Note, however, that the annex to the Directive provides an exception for the presence of lead used for soldering purposes.

[18] See Article 9 of the European Commission Directive 2002/96/EC of 27 January 2003 on waste electrical and electronic equipment (WEEE). Within that framework, mechanisms are set to be put into place to ensure that private households also recycle electronic items.

safety of the food despite the lack of scientific evidence supporting this claim, which in turn could influence product competitiveness.

Negotiations on the labelling of GMOs is also being pursued under the Cartegena Protocol of the United Nations Convention on Biodiversity with a view towards preventing any potential conflicts with decisions taken within the framework of WTO. This raises another aspect of dispute resolution related to the environmental standard-setting process, namely, the potential for dispute caused by trade-related environmental measures adopted within the framework of multilateral environmental agreements (MEAs) that could be inconsistent with rules established under WTO. Given that international agreements have equal standing in international law, countries need to take care that policies and positions advanced in trade and environment circles are consistent. This is because lack of clarity and the potential for conflict on the interpretation of trade and environment relationships can also lead environmental standards to influence decisions on market access and competitiveness.

Another component of dispute resolution involves consumer protection and the ability of consumers to contest the actions of a company or country. For example, the EU Directorate-General for Health and Consumer Protection and the Organization for Economic Cooperation and Development (OECD) have launched work on voluntary dispute resolution measures, which focuses on individual and collective consumer dispute resolution mechanisms.[19] While consumer protection societies and national agencies in the Arab region are increasingly active in this area, most of their work is focused on awareness raising; and they rarely address issues related to legal recourse or liability.

5. *Matrix*

As an illustrative tool, the matrix in table 1 provides a framework for illustrating the various types of environmental measures discussed above. Additionally, the table can be used for classifying environmental standards that affect specific sectors, thereby facilitating policy analysis and discussion with regard to environmental measures of particularly concern for the region.[20]

TABLE 1. CONCEPTUAL FRAMEWORK FOR CLASSIFYING ENVIRONMENTAL STANDARDS

	Product standards	Process and production methods	Conformity assessment	Dispute resolution
Regulatory measures	▪ Environmental health and safety laws	▪ Compliance with domestic environmental laws	▪ Laboratory accreditation ▪ Product testing and certification	▪ WTO dispute settlement ▪ Bilateral negotiations
Voluntary measures	▪ Industry standards and specification	▪ Ecolabelling ▪ Fair trade ▪ Niche markets	▪ Ecolabelling certification ▪ Importer testing	▪ Private contract law ▪ Liability schemes

C. THE MEDPOLICIES INITIATIVE

An examination of the relationship between environmental standards, trade and competitiveness involves not only the identification and classification of measures that impact key economic sectors, but

[19] Within that context, the Organization for Economic Cooperation and Development (OECD) organized the Workshop on Consumer Dispute Resolution and Redress in the Global Marketplace (Washington D.C., 19-20 April 2005). More information is available at: www.oecd.org/document/33/0,2340,en_2649_34267_34409185_1_1_1_1,00.html.

[20] A summary of some of the most challenging environmental standards faced by Arab exporters in those three industries is available in an ESCWA document, entitled "The impact of environmental regulations on production and exports in the food processing, garment and pharmaceutical industries in selected ESCWA member countries" (E/ESCWA/ED/2001/14, 25 October 2001), p. 45.

equally an assessment of the scale of impact that compliance with environmental standards has on output and exports. In order to conduct such assessments, the MedPolicies Initiative of the Mediterranean Environmental Technical Assistance Programme (METAP) supported the development of the Larson Model, which is a partial-equilibrium economic model that was devised by B. Larson in 1998 when the project was housed at the Harvard Institute for International Development (HIID). ESCWA has collaborated with the secretariat of METAP at the World Bank since 2001 in order to implement the MedPolicies Initiative (see box 1).

Box 1. The MedPolicies Initiative

The MedPolicies Initiative is a project of the Mediterranean Environmental Technical Assistance Programme (METAP) that is financially supported by the World Bank. METAP itself is a partnership between the European Union (EU), the European Investment Bank (EIB), the United Nations Development Programme (UNDP), the World Bank and several bilateral donors that seeks to increase environmental technical capacity in the countries of the Southern Mediterranean.

The MedPolicies Initiative has conducted regional and national capacity building in the area of trade and environment since 1997, following a meeting of METAP national focal points and regional experts that resulted in the decision to examine trade and environment relationships within the framework of international competitiveness. The project was implemented by the Harvard Institute for International Development (HIID) from 1997 to 2000, and was subsequently awarded to ESCWA in 2001 to ensure greater regional ownership of the project. In 2002, ESCWA extended the scope of the project to include its member countries from the Gulf region. Currently, the Commission is continuing to build upon the Initiative through a variety of trade and environment capacity-building activities.

During phase I (1997-1999), the MedPolicies Initiative worked with teams of local experts in Cyprus, Egypt, Jordan, Morocco, Syrian Arab Republic, Tunisia and Turkey to complete country case studies on the impact that compliance with specific environmental regulations (actual and proposed) could have on the cost of production in selected export sectors. The second part of the analysis assessed how these production cost changes could affect production levels and exports.[a/] The Larson Model was developed during this period and subsequently became the basis for MedPolicies trade and environment impact assessments.

During phase II (1999-2000), the project supported lead analysts in Egypt, Jordan, Lebanon, Morocco, Syrian Arab Republic and Tunisia to prepare rapid sensitivity analyses to identify the impacts of environmental regulatory changes across several key trade-oriented sectors in one country. The objective of these rapid assessments was to conduct a screening analysis of several sectors to highlight quickly which sectors could be most sensitive in terms of production and trade to environmental regulatory changes in the future. The information was used to help Governments and the private sector forecast possible impacts associated with proposed environmental policy changes in domestic and foreign markets. More than 180 scenarios were generated in the countries under study, thereby exposing the sensitivity of key sectors to cost changes associated with environmental policy changes.

During phase III (2001-2004), the project sought to increase the capacity of decision-makers in the Arab region by examining the impact of environmental standards on trade and competitiveness within a policy context. Regional training, national consultations and advisory services were provided to increase understanding and encourage inter-ministerial and public-private sector dialogue on trade and environment issues. Policy notes were prepared by local analysts based on training received to inform policy discussions on a specific topic identified as a priority issue by national stakeholders. A strategic environmental assessment of the impact of conformity with more stringent environmental standards on the textile and garment sector in Morocco was also conducted by ESCWA during this phase, with the cooperation of the Blue Plan and the financial support of the Bank-Netherlands Partnership Programme.[b/]

It is anticipated that METAP will continue to support the work of the MedPolicies Initiative with the forthcoming launch of phase IV in 2005. In the interim, ESCWA is continuing to build upon the work of the MedPolicies Initiative through complementary projects at regional and global levels.

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a/ See METAP MedPolicies Initiative, "Trade and environment and international competitiveness in the Mediterranean region: selected case studies" (Harvard Institute for International Development, 2000).

b/ For a complete set of work conducted under the METAP MedPolicies Initiative from 1997 to 2004, see METAP MedPolicies

Initiative, "Trade and environment for sustainable development" (ESCWA, the World Bank and METAP, 2005).

1. *The Larson Model*

The Larson Model is a simple, empirically tractable economic forecasting policy tool that estimates the percentage change in output, exports and imports from compliance with an environmental requirement. The utility of the Model within the framework of the MedPolicies Initiative is that it provides an easy approach to estimate the magnitude of an impact of a proposed policy change on the competitiveness of a given sector, as manifested by a change in production and exports. This information can then be used to highlight challenges and opportunities posed by conformity with environmental requirements, and to identify the necessary complementary measures that could be necessary to alleviate the potential negative effects on competitiveness of an environmental, health or safety standard.

This type of trade and environment policy assessment therefore seeks to answer the specific question of the impact of conformity on output, exports and imports. However, this type of micro-level analysis can be used to support sustainability impact assessments, strategic environmental assessments or sector environmental assessments that widen the scope of analysis to include the implications of environmental conformity on various social, economic and environmental indicators. As such, the Larson Model provides an empirical basis for estimating impacts and costs, which has led the World Bank to identify the MedPolicies methodology as a strategic planning tool for upstreaming and integrating environmental and socio-economic issues into development planning, decision-making and implementation processes.

(a) *Understanding the Model*

The basic logic of the Larson Model begins with the premise that compliance with a stricter environmental standard increases production costs—at least initially—as firms adjust to a policy change. Profit-maximizing firms in competitive markets will then response to cost changes by altering production decisions, including the amount or types of inputs used and/or the amount of outputs produced and sold. This response to the regulatory change can prompt adjustments in production processes or changes in production levels as producers seek to minimize costs and maximize profits. This in turn leads to changes in exports and/or imports in the given sector, which in turn can be mitigated by efficiency gains or the transfer of some additional production costs to consumers who are willing to pay more for a product complying with a higher environmental standard.

In order to implement the basic methodology, information that is based on available data and other available sources needs to be developed. This information must seek to answer five main questions, namely:

(a) What is the policy change?

(b) How and by how much does the policy change raise costs to business, particularly initial costs?

(c) Does such a change affect fixed costs, average production costs or a specific input cost?

(d) By how much could output levels adjust to such cost increases?

(e) How will these output changes translate into changes in trade flows?

(f) How will the answers to the above change if the policy change provides stronger incentives for industries to become more efficient in their operations and/or if these industries are able to impart some of the regulatory costs to buyers in national and international markets?

Consequently, there are three levels of analysis that result from applying such a methodology. The first set of findings estimates the impact of conformity on output and exports in a "simple case" scenario in the absence of secondary responses. The second level of analysis is based on the concept of "efficiency

improvements", which is derived from the induced-innovation literature of the past few decades that postulates that altered regulations can provide incentives for firms to search for innovative ways to reduce costs and increase profitability. Efficiency improvements are one possibility for reducing costs and improving competitiveness. While this model is not designed to estimate changes in efficiency, the methodology allows analysts to investigate how the results of the analysis change when efficiency improvements occur.

Besides efficiency improvements, it is also possible that by complying with the regulatory change, businesses can impart some of the additional production costs to their buyers in the form of high prices for their product. This results in the generation of a third set of findings derived from "international price adjustments". However, the details of the specific market will determine if producers are able to pass on some of the additional costs to buyers of their products. In the "large-country" case, a country or group of exporters could influence the price of a product in the international market and therefore could be able to transfer some additional costs of production to consumers without suffering a loss in sales. In the "niche market" case, markets with highly differentiated products and tastes, including those supported by consumers preferring "green" products, could be willing to pay more for products of more stringent environmental standards, which allows small and large producers to transfer some additional production costs to consumers.

Accordingly, once a specific policy change is identified for analysis, six variables form the basic components of the Larson Model: (a) the additional cost imposed by the policy change; (b) the profitability of the sector; (c) the current level of output; (d) exports as a share of total output; (e) the input elasticity of the sector; and (f) the supply elasticity of the market as it responds to output price changes.

The difficulty in applying the Larson Model arises from the lack of reliable information with regard to the internal functioning of a sector or firm, and to the cost of complying with a specific policy change in the Arab region. This is not a "weakness" of the methodology; it is simply a reality in environmental policy analysis. Governments regularly prepare and adopt regulations that impose costs to businesses in areas where accurate figures for such costs are not well known in advance. Consequently, effective cost-benefit analysis is not available to support sustainable development decision-making. This is almost always the case with Government regulations, except in cases where there are direct taxes or changes in tariff schedules proposed, including, for example, in the water and electricity sectors.[21] Use of the information that is available in applying the Larson model can help to better inform the decision-making process.

(b) *Applying the Model*

There are two ways to examine the impact of environmental requirements on trade and competitiveness by using the Larson Model, which have been applied by the MedPolicies Initiative. The first involves a rapid assessment of a country's key economic sectors to changes in production costs owing to an unspecified environmental policy change. This type of analysis is useful when estimating the sensitivity of different sectors to changes in the cost of commonly used inputs that have environmental implications based on their consumption or use during the production process. For example, a policymaker in Egypt could use such an analysis to determine the respective impacts on the output and exports of that country's five major economic sectors that could arise from a 20 per cent, 50 per cent or 100 per cent increase in water costs. Alternatively, this approach can be used to determine the sensitivity of a single sector to cost changes associated with different types of inputs, including water, energy or labour.

The second type of application looks at the impact on output and exports of conformity with a specific standard or technical regulation on a sector or firm. For example, such an analysis could assess the impact on output and exports of air emission standards in Jordan that could influence the cost of fuels used in that country's cement industry. This approach is useful when discussing the implications of a specific regulation on a single sector, and where information is available regarding the costs and investments needed to comply

[21] For more details on the Model, see B. Larson, "Evaluating the impact of specific environmental regulations on exports", *Land Economics* (2000), pp. 534-549; B. Larson et al., "The impact of environmental regulations on exports: Case study results from Cyprus, Jordan, Morocco, Syria, Tunisia and Turkey", *World Development*, Vol. 30, No. 6 (2002), pp. 1057-1072; METAP MedPolicies Initiative, "Estimating the impact of environmental regulations on trade: a guide to applying the Larson Model - the methodology of the METAP MedPolicies Initiative" (METAP and ESCWA, October 2002); and METAP MedPolicies Initiative, "Information note on the Larson Model: The trade and environment methodology of the METAP MedPolicies Initiative" (METAP and ESCWA, June 2003).

with the measure. Additionally, the model's straightforward spreadsheets can be used to stimulate policy discussion between Government decision-makers and private sector stakeholders regarding the costs of adopting a specific regulation on the competitiveness of a local industry. Moreover, this approach is useful when seeking to estimate differences in compliance costs between large firms and small and medium-sized producers. These two applications of the Larson Model will be demonstrated through case studies presented in the following chapters.

III. ESTIMATING THE IMPACT OF MORE STRINGENT ENVIRONMENTAL STANDARDS ON KEY EXPORT SECTORS IN SELECTED ARAB COUNTRIES

There are several ways to estimate the impact on competitiveness of conformity with more stringent environmental standards. Policymakers can look at the cost of conformity with a specific standard on a company or a national economic sector. Alternatively, they can focus on the sensitivity of different economic sectors to changes in environmental policies. In order to determine the sensitivity of key economic sectors in the Arab region to cost changes associated with compliance with stronger environmental regulations, the MedPolicies Initiative conducted a series of rapid assessments on trade and environment in seven Arab countries, namely: Algeria, Egypt, Jordan, Lebanon, Morocco, Syrian Arab Republic and Tunisia. The assessment resulted in an analysis of the sensitivity of 30 export sectors and 22 import sectors to cost changes related to three or more of the following input cost categories: water use, wastewater disposal, chemical use, energy and electricity use, labour and capital. This chapter exposes the application of the rapid assessment tool to assess the impact of changes in an input cost across sectors; and the sensitivity of a specific sector to changes in the cost of different inputs. A summary is then provided of the lessons drawn from the various assessment scenarios.

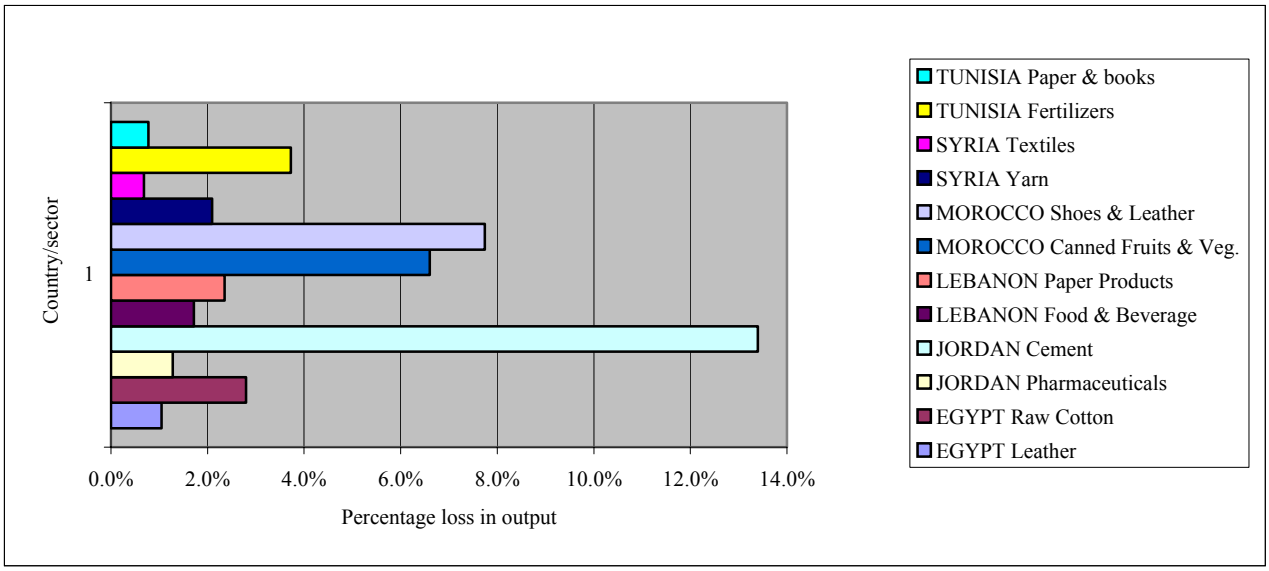
The logic of the rapid assessments is that it provides a quick insight into the sensitivity of different sectors. However, as an aggregate-level analysis, it is unable to differentiate impacts between large firms and SMEs. Additionally, as in the case of applying any empirical model, the findings are only as reliable as its data; and efforts to secure accurate information on water and electricity costs as a share of total production costs at the firm level is often not available. Indeed, surveys of local business owners and syndicates often reveal limited knowledge of disaggregated production costs, even though there is sound understanding of figures relating to profitability, output and export levels. Consequently, demonstrating the importance of disaggregating costs to entrepreneurs and fully accounting for production cost became an indirect capacity-building component of the rapid assessment activity. Specifically, decision-makers became better informed on the potential for increased profitability and competitiveness that could be generated by efficiency gains.

A. ASSESSING THE IMPACT OF CHANGES IN ENERGY AND ELECTRICITY COSTS

Environmental policies can impact energy and electricity use in a number of ways. National standards establishing thresholds for oxides of sulphur (SO_x), oxides of nitrogen (NO_x) and particulate matter less than 10 microns (PM_{10}) that are translated into technical regulations have implications for the types of fuels that can be used to support manufacturing activities. For example, environmental taxes can be imposed to discourage certain types of energy use, or tariffs can be restructured in a manner that changes energy consumption levels. Additionally, air emission thresholds for certain industries can require firms to invest in filters or cleaner production methods. National obligations implemented within the framework of MEAs, including the Kyoto Protocol, can equally impact energy and electricity prices and costs and affect sector competitiveness.

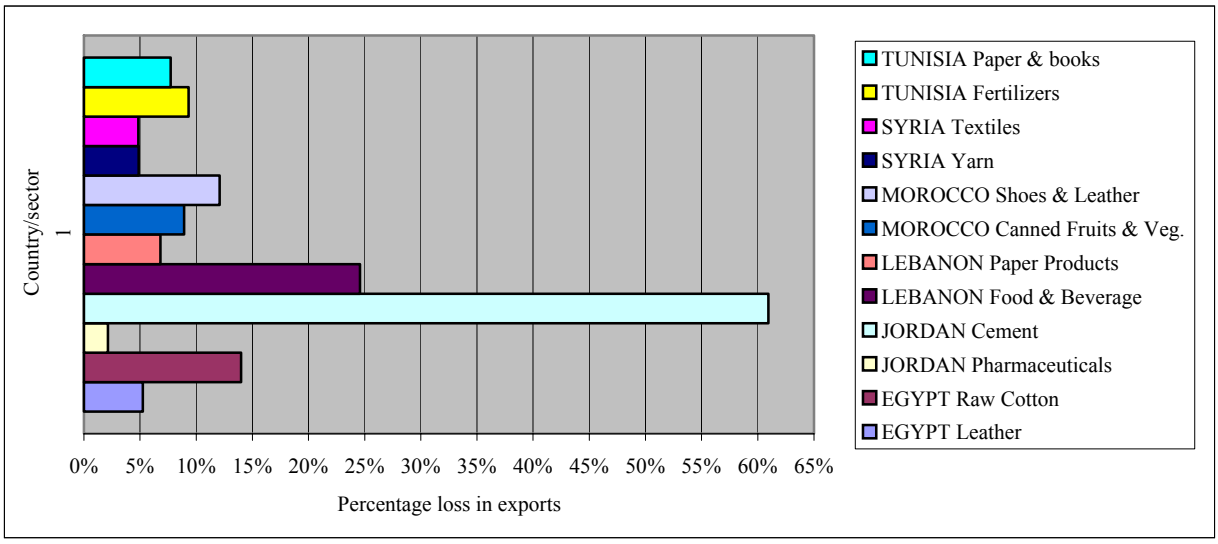
In order to estimate the sensitivity of different economic sectors to changes in energy and environmental costs arising from more stringent environmental policies, a rapid assessment was conducted of the potential impact on the output and exports of certain sectors caused by a 100 per cent increase in energy costs. While a doubling of energy costs in the short-term is an extreme policy situation, this theoretical increase was used to provide a basis for exploring the sensitivity of key sectors to energy price shocks in a simple case scenario. The results presented in figures 1 and 2 reveal several important findings.

Figure 1. Impact on output of 100 per cent increase in energy/electricity costs on selected sectors



Source: B Larson, "Rapid assessment summary notes", which was a PowerPoint presentation given the METAP High Level Meeting on Economic Tools for Environmental Sustainability (Beirut, 25-27 June 2003).

Figure 2. Impact on exports of 100 per cent increase in energy/electricity costs on selected sectors



Source: B. Larson, "Rapid assessment summary notes", which was a PowerPoint presentation given the METAP High Level Meeting on Economic Tools for Environmental Sustainability (Beirut, 25-27 June 2003).

First, it is evident that while the impact of increases in energy costs has adverse impacts on output, the impacts are much more pronounced with regard to exports in the same sector. Most firms could easily adjust to and overcome a 1-4 per cent decrease in production levels caused by higher energy input costs through efficiency improvements or the transfer of some additional production costs to consumers in the local market. However, the loss of price competitiveness associated with the higher production costs could generate a 5-15 per cent loss in exports, which is more difficult to mitigate. Accordingly, when factoring the impact of environmental standards on competitiveness, decision-makers must assess the impact of proposed

policy measures on production levels as well as on trade flows, particularly in countries promoting export-led growth strategies.

Second, while sensitivity to energy cost changes is normally perceived to be high for such heavy industries as cement and fertilizer production, light manufacturing industries are also vulnerable to changing cost structure associated with different energy or electricity products. Accordingly, while it is estimated that the cement sector in Jordan could suffer a setback in output of 13 per cent if its energy (and water) costs were to double,[22] light manufacturing industries in Morocco are equally sensitive to increasing energy costs, with the output of shoes and leather goods as well as canned fruits and vegetables suffering a 6-8 per cent decline in the case of doubling energy costs.

Third, public policies regarding energy and electricity pricing could also have implications for the competitiveness of different industries in the region. For example, energy subsidies deter industries from engaging in more energy-efficient practices and therefore generate adverse environmental impacts associated with inefficient energy consumption. However, these subsidies also insulate sectors from price shocks associated with environmental policies affecting energy consumption. For example, the cultivation of cotton in Egypt is sensitive to changes in energy costs, particularly as compared to energy use in yarn and textile production in the Syrian Arab Republic. This can be partially attributed to the fact that energy represents 8 per cent of raw cotton production costs in Egypt, while, owing to subsidies, the yarn industry expends a modest 2.3 per cent and 3 per cent of production costs on energy and electricity, respectively. A review in 1997 of the energy and natural resource policies in Egypt estimated that electricity and domestic petroleum products were priced at approximately 80 per cent and 90 per cent of their international prices, respectively.[23] Moreover, Egypt has engaged in an aggressive policy to improve air quality in urban areas, which has had secondary effects on the cost of energy use. Consequently, despite energy price volatility, producers in Egypt enjoy much lower energy subsidies than their Syrian counterparts, which has implications for competitiveness. Industry subsidies also render the yarn industry in the Syrian Arab Republic considerably more profitable than long staple cotton cultivation in Egypt, which also has implications for the ability of the sector to respond more easily to a doubling of its fuel and electricity bills or compliance with more stringent air emission standards.

B. THE FURNITURE SECTORS IN EGYPT AND PALESTINE

Another way to examine the impact of environmental standards on key economic sectors involves determining the sensitivity of a specific sector to cost changes associated with its major categories of inputs. For example, figure 3 illustrates the sensitivity of the furniture production and exports in Egypt to a 100 per cent increase in the cost of its major input categories.[24] Wood and labour represent, respectively, 40 per cent and 30 per cent of total production costs in the industry, while capital, chemicals and energy represent 15 per cent, 10 per cent and 5 per cent of total production costs, respectively. There are a number of SMEs operating in this sector, and the industry enjoys average profits of 43 per cent. However, while the sector is targeted for growth within the national development plan, a modest 10 per cent of total output was exported in 1999.

[22] Note that the impact on the cement industry in Jordan actually represents a doubling of energy and water costs for the sector, given that information regarding disaggregated share of water and energy costs in total production was not available. Together, water and energy account for 48 per cent of total production costs in the sector; and the latter is estimated to account for the greater share of those costs.

[23] The World Bank, *Staff appraisal report: Arab Republic of Egypt*, Report No. 17065 EGT (the World Bank, 17 November 1997), p. 1.

[24] See METAP MedPolicies Initiative, "Impact of environmental regulations on trade and competitiveness: a screening analysis for the Arab Republic of Egypt" (METAP and ESCWA, June 2003).

Figure 3. The impact on output of the furniture sector in Egypt[a/]

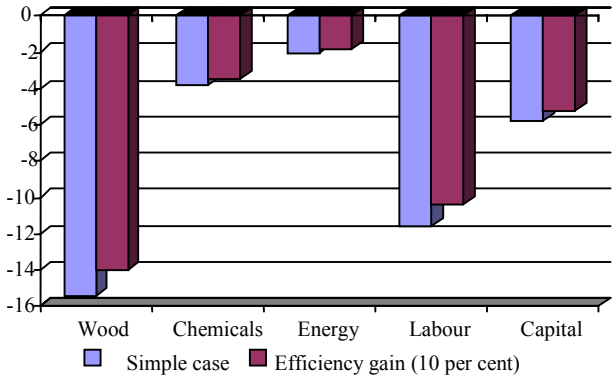
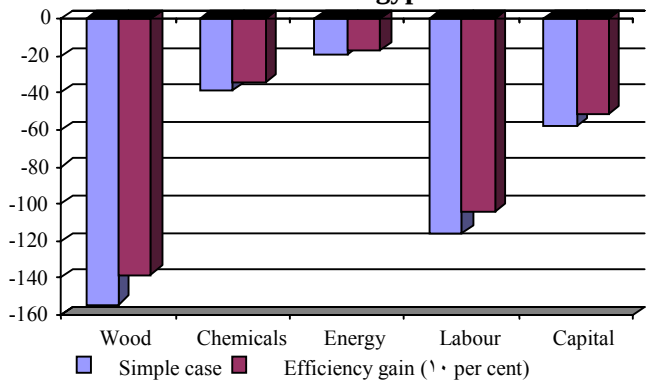


Figure 4. The impact on exports of the furniture sector in Egypt[a/]



Note: a/ Percentage change in output or exports is caused by a 100 per cent increase in the cost of the specific input noted on the horizontal axis.

The assessment shows that the furniture sector is particularly sensitive to changes in the cost of wood and labour. However, that sector could overcome changes in its energy costs, particularly after efficiency gains are achieved in the use of energy inputs. While wood and cork are produced in Egypt, most of the wood used by the industry is imported from Europe, particularly Germany and Italy. Consequently, international standards being adopted in Europe on sustainable forestry practices could have implications for the costs of that sector's major input category. Environmental regulations on the use and disposal of chemicals applied for the preservation or treatment of wood could equally have implications for the sector, particularly in terms of its export competitiveness. Policies associated with the management and handling of chemicals in Egypt need therefore to include arrangements for assisting the furniture sector come into compliance with those measures; failure to do so will put the sector's competitiveness at risk.

A similar rapid assessment of the sector was made in Palestine.[25] The furniture industry is one of the largest industrial sectors in the Gaza Strip, employing 8 per cent of the industrial workforce in the territory. The industry consists of a number of family-owned bamboo, wood and metallic workshops. Bamboo and metallic furniture production are the most water polluting. In 2000, there were 383 firms operating in the sector in the West Bank and Gaza Strip. However, a field survey revealed that only 184 of these remained open in 2003 and, moreover, that a modest 27 firms of that total maintained the capacity to trade in the sector. Given the difficulties faced by the sector, the Environmental Quality Authority in consultation with other ministries requested that an assessment be made of the possible impact that proposed industrial effluent standards could have on the industry. An assessment was therefore undertaken with focus placed on the bamboo furniture sub-sector.

The production of bamboo furniture involves washing, cutting and soaking bamboo sticks for three days in large water containers.[26] The bamboo sticks and cylinders are bent and shaped to form frames for various furniture products by a combination of heating and cooling processes using water in barrels. The frames are then filled using the previously shaped slices, plates and strips of bamboo. Water in the barrels used for soaking, cleaning and shaping is renewed either daily or several times a week. The remaining wastewater is released into the sewage system or in some cases in ponds located near agricultural land.

The draft Palestinian Environmental Law of 1999 contained proposed standards for the disposal of industrial effluent into sewage networks. The regulation sought to balance environmental interests with

[25] METAP MedPolicies Initiative, "Impact of proposed wastewater effluent standards on trade and competitiveness in the Gaza Strip: Furniture industry", which was an unpublished rapid assessment policy note prepared by METAP and ESCWA in December 2003.

[26] The bamboo is imported from Europe and Southeast Asia.

economic development constraints. However, an analysis of wastewater emitted from a typical bamboo furniture manufacturer revealed that the average producer operated below the maximum pollution thresholds established in the would-be environmental regulation (see table 2). Consequently, the findings illustrated that no cost of compliance for the industry was projected, despite the fact that no industries in the sector treat their wastewater and that a very modest 0.1 per cent of production costs is spent on water.

TABLE 2. RESULTS OF WASTEWATER ANALYSIS FROM A TYPICAL BAMBOO FURNITURE WORKSHOP: COMPARATIVE WASTEWATER STANDARDS IN EGYPT, PALESTINE AND YEMEN
(*Milligrams per litre (mg/l)*)

Parameters	Results of the analysis	Proposed wastewater standards in Palestine (into sewage networks)	Industrial wastewater standards in Yemen (into sewage networks)[a/]	Industrial wastewater standards in Egypt (not into sewage network)[b/]
Total Solids (TS)	1 900	3 000	..	..
Total dissolved solids (TDS)	1 800	2 500	2 000	1 200
Suspended solids (SS)	100	500	1 100	30
Biological oxygen demand (BOD)	200	500	800	30
Chemical oxygen demand (COD)	406	2 000	2 100	40
NO_3	10.92	30	..	..
NH_3	4	45	..	..

Sources: a/ Public Agency for Water Resources in Yemen, "Water specifications for Yemen: commercial and industrial wastewater" (in Arabic), 1999; b/ United Nations Environment Programme (UNEP), Arab Industrial Development and Mining Organization (AIDMO) and the League of Arab States (LAS), "Guidelines for acceptable industrial standards for pollutants in Arab countries" (in Arabic), 1997.

Note: Two dots indicate no standards for listed parameters.

These findings exposed an important lesson for economic and environmental planners, namely, that decision-makers need to be proactive in terms of assessing the potential impact that their regulations could have on key industries, rather than assume that regulations automatically equate with reduced competitiveness. For example, in this particular scenario, some of the wastewater parameter thresholds proposed by the Environmental Quality Authority seem to be high, particularly for BOD and COD, compared to other countries. However, the standards are reasonable when comparing Palestine to Yemen. Nevertheless, given that there is no separate industrial pre-treatment unit in place in the area and that the existing municipal wastewater treatment plant is not functioning properly, the release of industrial effluent into sewage networks is not an indication that wastewater will be properly handled. Consequently, more rigorous standards are necessary to meet environmental quality goals in the absence of the necessary infrastructure.

C. THE SUGAR SECTORS IN MOROCCO AND THE SYRIAN ARAB REPUBLIC

Within the context of examining the impact of environmental standards on competitiveness, it is certainly important to concentrate on the affect on production and exports. However, it is equally key to estimate the implications that stronger domestic environmental regulations could have for the competitiveness of local industries, which are bound to face increased import competition given more trade liberalization. Additionally, stronger environmental regulations have important implications for food security policies in the Arab region, given that many countries subsidize the cultivation of major food items in order to reduce dependence on food imports. For example, Egypt, Lebanon, Morocco, Saudi Arabia and Syrian Arab Republic are engaged in sugar production to satisfy local demand. Separate rapid assessments to cost changes and import were therefore conducted on the sensitivity of the sugar industry in two of these countries, namely, Morocco and the Syrian Arab Republic.

Figure 5. The impact on output of the sugar sector in the Syrian Arab Republic

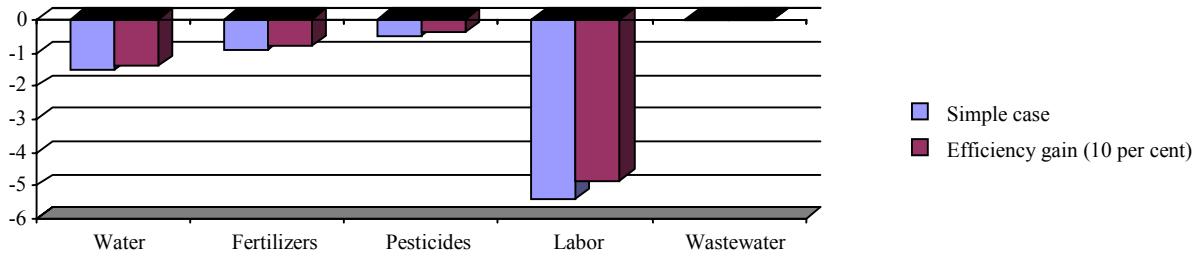
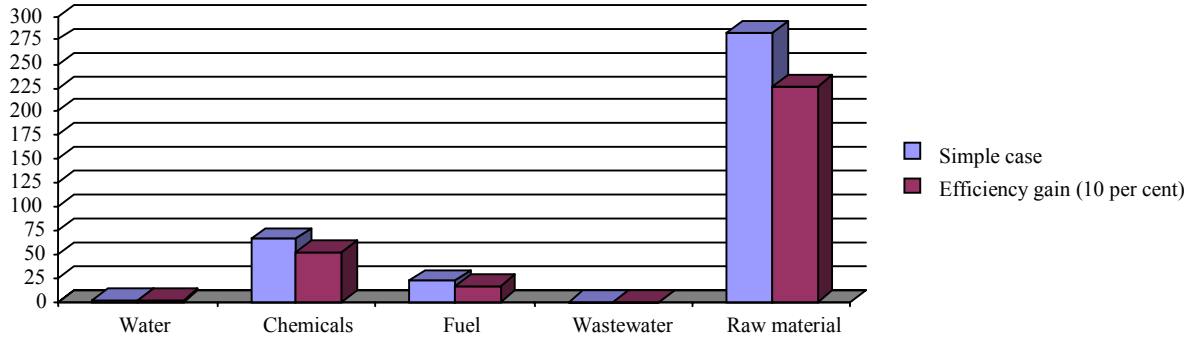


Figure 6. The impact on imports of white sugar in the Syrian Arab Republic



Sugar manufacturing in the Syrian Arab Republic dates back to 1948 when the Government set up its first factory in Homs to respond to a rising international price of sugar. There are currently five sugar factories in operation, which cumulatively produce some 100,000 tons of white sugar per year. However, owing to low quality inputs and other factors, domestic production costs are reported to be $800 per ton of white sugar, which is more than 300 per cent the international sugar prices.[27] Sugar beats are the main input for the Syrian sugar industry and represent 64 per cent of production costs; chemicals amount to 15 per cent of total costs; and energy, water and wastewater management represent 5 per cent, 0.5 per cent and 0.2 per cent, respectively. Wastewater is generated when water is used to transport and wash the beets prior to processing, which results in effluents with high organic materials and suspended solids. While the industry is not profitable or competitive, it is able to operate as a result of subsidies and of inadequate appraisals of the raw materials. For example, farmers are remunerated according to the weight of delivered sugar beats prior to washing. This increases the incentive to keep soils and stones mixed in with the beats, which in turn increases waste flows and degrades land resources. If water were not subsidized, this would generate additional costs to production given that these excess materials need to be washed off, which consumes more water resources than would normally be necessary. These subsidies imply that while the adoption of more sustainable environmental policies could generate a 100 per cent increase (or more) in the cost of water, fertilizer and pesticide, these additional costs could not significantly impact production levels in the sector as initial costs are already low (see figure 5). However, if the cost of chemical inputs or sugar beets doubled, the industry would not be able to ward off competition from imports, unless the Government maintained a strong protectionist regime in favour of local producers (see figure 6).[28]

Sugar producers in Morocco are better equipped to ward off import competition than their Syrian counterparts. The sector has been liberalized since 1997 and some refineries have been privatized, which has contributed to efficiency improvements in that field. The sugar industry in Morocco depends on sugar cane

[27] The world price of refined sugar in 2000-2001 was $0.109 per pound or approximately $240 per ton. United States Department of Agriculture (USDA), "Sugar: world markets and trade" (USDA, 2002), which is available at: www.fas.usda.gov.

[28] For more information, see METAP MedPolicies Initiative, "Rapid assessment on trade and environment for Syria" (METAP/HIID, 2001).

and sugar beats as raw materials, some of which are imported. However, several refineries have installed systems that allow water contained in these inputs to be recycled and used as part of the production process. This generates water savings for the industry, thereby reducing the effect that a potential doubling in water input costs could have on the sector. Consequently, the share of water in total production costs is less than 1 per cent. However, energy costs as a share of total production costs are estimated at 15 per cent. The sector is therefore sensitive to changes in environmental policies that could increase the cost of energy inputs. Indeed, a doubling of energy costs could reduce output by more than 15 per cent and increase imports by approximately the same amount. Additionally, while the sector is moderately profitable and enjoys a profit margin of some 7 per cent, the sector remains highly sensitive to import competition, particularly if the cost of raw material inputs increases, as illustrated in figures 7 and 8 below.[29]

Figure 7. The impact on the output of the sugar sector in Morocco

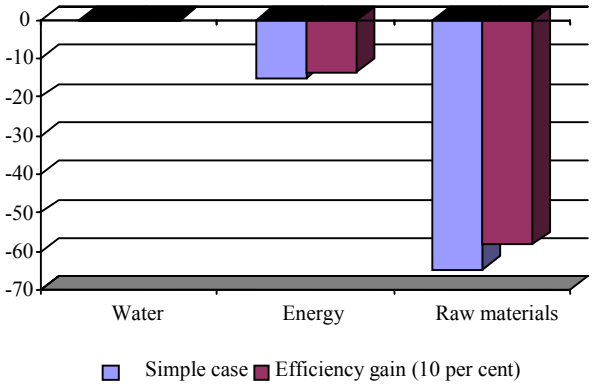
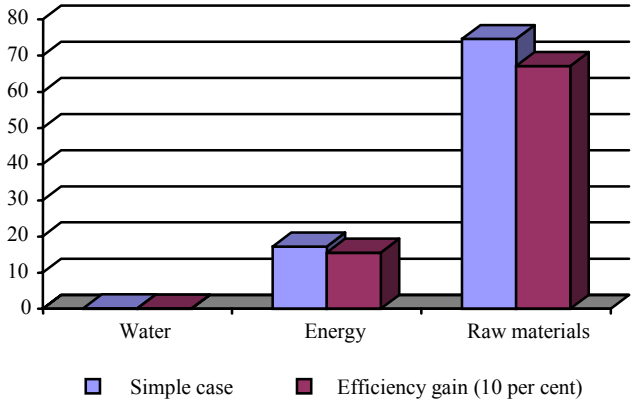


Figure 8. The impact on sugar imports in Morocco



D. SUMMARY OF RAPID ASSESSMENT FINDINGS

The variety of sector and input-specific scenarios assessed by applying the Larson Model has allowed for a series of conclusions to be drawn regarding the impact of more stringent environmental standards on the competitiveness of key economic sectors in the region. These findings are summarized below.

1. *Competitiveness is not affected by gradual strengthening of environmental standards*

Given that minor cost changes do not significantly alter output levels, a good number of economic sectors in most countries examined are not very responsive to modest changes in input prices that are caused by changes in environmental policies. Consequently, large changes to output levels of more than 10 per cent are not envisaged if environmental regulations increase a specific input cost by 20 per cent or less.

The policy implication of this finding is that the gradual strengthening of environmental standards—or the gradual enforcement or compliance with such standards—is achievable in most sectors without adversely affecting domestic competitiveness. However, the ability to adjust to gradual change can be a challenge for some SMEs or firms operating on the verge of bankruptcy. Nevertheless, the sensitivity of international competitiveness of exports or imports in a certain sector can be more sensitive to cost changes, particularly in a highly competitive markets.

[29] For more information, see METAP MedPolicies Initiative, "Rapport d'evaluation rapid sur le commerce et l'environnement: le Maroc" (METAP and ESCWA, September 2000).

2. *Output and exports are not significantly affected by increases in water and energy input costs*

Most economic sectors in the countries examined can absorb small increases in the cost of water or energy inputs. Consequently, an increase in water or energy input costs by 10 per cent, which could result from compliance with a more stringent environmental pollution standard, is not generally expected to reduce output or exports by more than 1 per cent. This is valid for most key sectors and industries, including, among others, textile, agro-food, metal-based, pharmaceutical and paperboard.

This finding provides important information that decision-makers can use when considering or proposing the adoption of stronger environmental regulations related to water use, water pricing, energy subsidies and/or air pollution control. The data and model used in generating this finding can also be helpful tools for private sector decision-makers as they consider various environmental investment options. Nevertheless, the capacity for adjustment can be more diffuse when sectors are disaggregated to the firm-level or when the impacts on only SMEs are considered, particularly non-exporting SMEs.

3. *Higher labour costs have a larger impact than increases in water and energy input costs*

Given that labour costs represent a comparatively large share of total production costs in most sectors examined, higher labour costs are likely to have a larger impact on output, exports and inputs than increases in water and energy costs. Consequently, increasing the wage bill or occupational health and safety standards could impose large negative effects on competitiveness.

This finding indicates that strengthening labour standards or increasing wages can have large impacts on competitiveness for the region, despite the advantages that such policies could provide for poverty alleviation and sustainable development. Within the context of international trade negotiations, this finding also encourages Governments in the region to address natural resource management and environmental issues in terms of sustainable development before discussing labour issues, which could impose greater shocks for competitiveness.

However, the finding assumes that firms are generally unable to improve quickly labour productivity and offset higher labour costs. This is not a totally accurate assumption, given that larger, modernized exporting firms have the capacity to undertake such timely improvements in the case of flexible labour markets. Moreover, with the aim of improving labour productivity, mechanisms to improve technology transfer or training programmes can serve to mitigate or overcome negative impacts to competitiveness that are associated with strengthened labour standards.

4. *Environmental regulations on primary inputs have a larger impact on output, exports and imports*

Environmental regulations that target primary inputs of key economic sectors are likely to have significantly negative effects on output, exports and imports. This is because production in most key economic sectors in the region depends on a key primary input, which is usually obtained locally. Examples in this context include leather or cotton for textiles, olives for olive oil, and sugar beets for sugar. Accordingly, domestic environmental regulations or international environmental standards that affect the cost of these primary inputs could have serious effects for local production of value-added products.

This finding suggests that as decision-makers seek to adopt and encourage compliance with stronger environmental standards, consideration must be given to the entire production chain and the costs associated with access to primary products and production processes. Nevertheless, in the absence of locally available inputs, firms are likely to import substitutes and intermediate goods that could prove less expensive than local products within an increasingly open trading system.

IV. ENVIRONMENTAL STANDARDS AND THE FOOD INDUSTRY IN THE ARAB REGION

The agro-food sector has significantly evolved during the past decade. Production methods have changed owing to technological advancements and more diversified product ranges, which have emerged to target new markets. Moreover, consumers have become more sophisticated and are demanding higher quality and more specialized goods in line with their increased purchasing power. Changes in lifestyle and growing concern with regard to personal health, food safety and the environment have also pushed producers to create new products and adopt innovative approaches for meeting consumer demand.

The agro-industry in the ESCWA region is influenced by these changing trends in the global marketplace. However, supply-side issues remain the dominant concern of Governments, particularly those that view the development of local agro-industries as a source of employment, income and food security in the region. Agriculture is a significant source of employment and remains an important contributor to GDP in a number of Arab countries, including, among others, Egypt, where agriculture is at 17 per cent of GDP; Lebanon, at 12 per cent; and the Syrian Arab Republic, at 26 per cent of GDP. Furthermore, food security and self-sufficiency in the light of ongoing regional conflicts and the threat of trade sanctions remain a policy priority for several countries, particularly those in the Gulf region that have used these reasons to justify the expansion of their agricultural sectors, despite growing water scarcity.

On the demand side, population growth in the ESCWA region continues to increase demand for agricultural and processed agro-food products. While purchasing power has increased among segments of Arab society, awareness concerning food safety and more environmentally friendly modes of production is not as prevalent as in developed countries. Consequently, domestic regulations and environmental requirements that are imposed in export markets are having a greater effect on changing agro-food production patterns in the region than local consumer preferences.

Environmental measures associated with trade in agricultural and agro-industrial products are impacting exporters that seek access to regional and international markets. Intensive debate on market access, non-tariff barriers to trade and agricultural subsidies have dominated trade negotiations in this area. Of particular concern for the region are the increasing number of sanitary and phytosanitary measures that are being adopted in the countries of the EU and the United States. These countries, among other industrialized States, are imposing new standards on product characteristics, on process and production methods, and on labelling requirements, all of which have implications for food safety. For example, these standards have been felt dramatically in the fisheries sector in Egypt, Oman and Yemen.

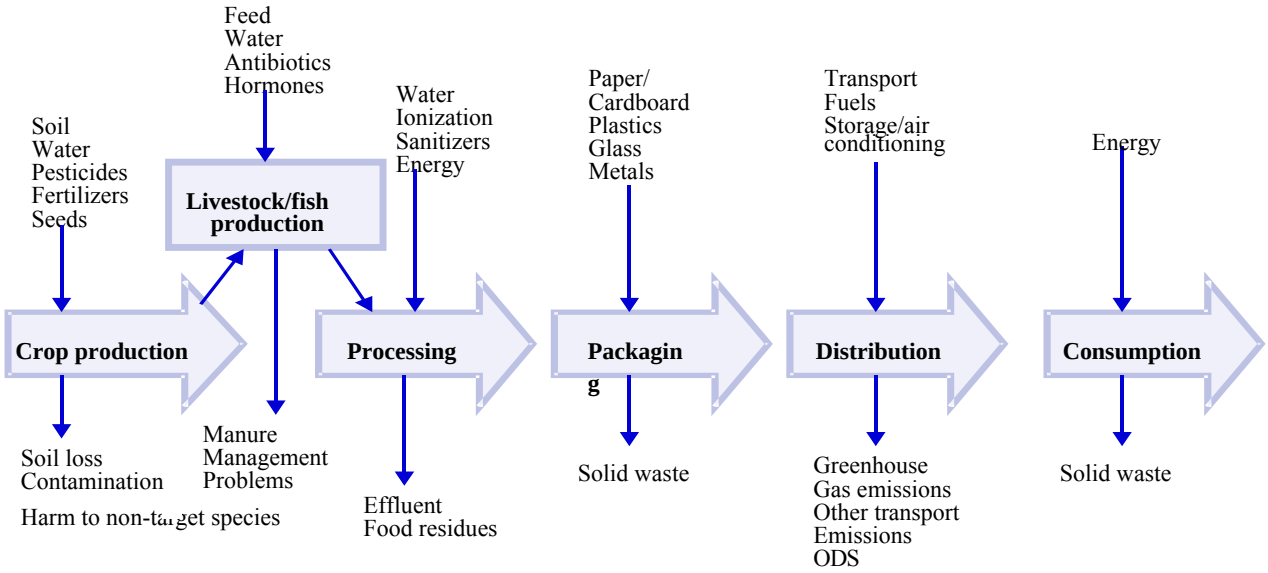
Agro-food sectors in the Arab region facing environmental, health and food safety measures in regional and international markets include fresh fruits and vegetables; packaged and processed foods, including canned fruits and vegetables; dairy products; and fresh, processed and frozen meats. Agro-industries in the region that support the food sector that are also subject to environmental standards include fertilizer manufacturers, feed importers and seed suppliers.

A. STRUCTURAL ISSUES AFFECTING ENVIRONMENTAL COMPLIANCE IN THE FOOD INDUSTRY

Within the context of trade liberalization, important changes in food production and consumption trends require decision-makers to examine environmental challenges and opportunities facing the agro-food sector from a holistic perspective. In Europe, particularly the United Kingdom of Great Britain and Northern Ireland, agro-food policies are formulated within a “farm to fork” framework that takes into consideration environmental, health and food safety issues from the life cycle approach to the food industry. Commitment to this approach to food policies increased with the appearance of various diseases in the early 2000s, particularly foot-and-mouth disease (FMD) and Bovine Spongiform Encephalopathy (BSE), commonly referred to as mad cow disease. These diseases almost decimated the livestock and meat processing industry of Great Britain, as well as increased concerns with regard to pesticide residue limits and genetically modified organisms (GMOs).

The agro-food life cycle begins with crop production and includes processing, packaging, distribution, consumption and the disposal of waste (see figure 9). In some ESCWA countries, the cycle has come full circle with treated wastewater being used to irrigate crops. Accordingly, environmental standards adopted to regulate water quality and water use have direct implications for agricultural production, as do other standards associated with the use of downstream and upstream inputs and outputs of the agro-food cycle. The storage and transport of agro-foods are equally impacted by environmental standards, given that, in compliance with global standards, refrigeration systems must seek to reduce the release of ozone-depleting substances (ODS), including chlorofluorocarbons (CFCs); and countries must seek to reduce carbon emissions associated with energy-intensive refrigeration methods and the trucking industry.

Figure 9. The agro-food life cycle



Another noticeable structural change affecting the agro-food industry in recent years is the increasingly sophisticated and complicated components of the cycle. Upstream, the mechanization of ploughing, investments in more water-efficient irrigation systems, and advanced harvesting methods have contributed towards improving agricultural productivity. Improved distributions of seeds, pesticides, fodder and organic fertilizers have also allowed for the introduction of new cultivations in different geographic areas. While change has not been felt equally throughout the ESCWA region, these developments provide opportunities for improving the competitiveness of agricultural products, provided that they are in compliance with environment, health and food safety standards.

Downstream, there have been significant improvements in the processing and conservation of agro-food products. Packaging and labelling requirements have subsequently become more developed. Furthermore, a large number of new products are entering the international marketplace every year. The marketing and distribution of new products has become increasingly sophisticated along with the emergence of ecolabelling certification and advertising schemes, and the multiplication of supermarkets, restaurants and other retail food outlets. At the international level, trade liberalization is increasing the global food trade and raising concerns with regard to food security and even biosecurity in a global marketplace. This has rendered conformity with environmental standards all the more important for both Governments and industry. Additionally, improved access to information and communication technologies and better dissemination of information regarding potential food safety threats have facilitated monitoring, reporting and enforcement of environmental compliance.

Consequently, farmers are no longer at the centre of the food supply chain; environmental standards are applied and enforced throughout the value-added food chain in many parts of the world. Indeed, as early as 1990, agriculture operations in France, for example, represented barely 26 per cent of total value-added in

the food chain, while the share of agro-industry stood at 21 per cent and the remaining 53 per cent was held by distribution channels, including restaurants and hotels. Similar structures in the agro-food industry are currently being witnessed in ESCWA member countries.

1. *International standard-setting processes*

Food-related regulations are commonly adopted based on standards developed by technical committees, which are established under Codex Alimentarius (Codex), or by mechanisms under such international conventions as the International Convention for the Protection of Plants (ICPP) and the International Office for Epidemics (IOE). The harmonization or approximation of standards across international borders is a means to facilitate trade. It facilitates customs procedures and compliance with conformity assessment requirements, in addition to reducing costs. Furthermore, it facilitates understanding between private firms that are able to work using shared or commonly understood norms.

In 2005, Codex had 172 members, representing an increase of 26 countries since 1994. As of March 2005, ISO had published 656 voluntary standards related to the work of the Technical Committee on Food Products. This corresponds to nearly a three-fold increase since 1994 when there were only 237 commodity food standards. While Morocco and Oman are currently the only Arab members on the Committee, seven other Arab countries maintain observer status, namely: Algeria, Egypt, Libyan Arab Jamahiriya, Qatar, Saudi Arabia, Syrian Arab Republic and Tunisia. The Coordinating Committee for the Near East (CCNEA) on Codex is currently hosted by Egypt.[30] CCNEA is responsible for harmonizing standards with a view towards facilitating intraregional trade. However, six Arab countries and territories are not represented on CCNEA, namely: Comoros, Djibouti, Mauritania, Morocco, Palestine and Somalia. Of these, Mauritania and Morocco are represented on the regional committee for Africa. This fragmentation of the region and lack of full representation limit the potential to develop an Arab approach to Codex standards or the formulation of regional positions with ISO standard-setting processes.

WTO strongly encourages countries to base national sanitary and phytosanitary measures on standards that have been formulated by these international standard-setting bodies, thereby avoiding non-tariff barriers to trade. However, WTO does not require harmonization with international standards. Indeed, the Organization specifically notes that countries can adopt environmental, health and safety standards that are more stringent than international standards, provided that these are scientifically justified and are the least trade-restrictive option. Governments are discouraged, however, from adopting standards below international standards for fear that this could create an uneven playing ground where manufacturers move from one country to another where less rigid environmental regimes exist.[31] Nevertheless, local conditions, and special and differentiated treatment for developing countries is recognized as justifications for less stringent regulatory and environmental enforcement regimes.

WTO addresses agriculture and the agro-food sector under two sets of agreements that seek to avoid the use of standards as hidden barriers to trade. The first set is the SPS Agreement, which acknowledges that Governments have the right to take the sanitary and phytosanitary measures necessary for the protection of human health. However, the SPS Agreement requires member countries to apply these measures only to the extent required to protect human health. Moreover, it does not allow for bias whereby different requirements are applied to different countries where the same or similar conditions prevail, unless there is sufficient scientific justification for such discrimination. The second set is the Agreement on Technical Barriers to Trade (TBT), which seeks to ensure that technical regulations and standards, including packaging, marking and labelling requirements, in addition to analytical procedures for assessing conformity with such technical regulations do not create unnecessary obstacles to trade.[32]

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[30] The Coordinating Committee for the Near East (CCNEA) was established by the Food and Agriculture Organization (FAO) and the World Health Organization (WHO).

[31] Within that context, there is limited evidence that multinational companies base their location decisions on local environmental considerations to any significant degree, as compared to other determining factors.

[32] See the Agreement on Technical Barriers to Trade, annex I, para. 2.

In view of facilitating international trade, the SPS Agreement encourages the use of standards established by Codex, ICPP and IOE. The standards of these international organizations provide the acceptable benchmark against which national standards and regulations can be evaluated, based on scientific findings and principles. This is important given that WTO does not allow for the adoption of regulations based purely on perceived or anticipated risk. For this reason, many countries in Europe and elsewhere suggest that a precautionary principle needs to be applied when determining the stringency of standards, particularly those that could pose potential risks to human health and the environment. However, there is ongoing debate within Codex on whether its code of ethics needs to be revised to reflect more clearly two key perspectives, namely: (a) that standards must not be used as non-tariff barriers; and (b) that food exports must comply both with standards mandated in destination markets and, equally vital, with standards required in the country of origin, thereby protecting developing countries from unsafe food imports. Furthermore, there is a similar debate within the SPS Committee of WTO regarding the export of domestically prohibited goods.

2. *Labelling, genetically modified organisms and consumer choice*

A plethora of new labelling regimes have emerged in the food sector over the past decade under the mantra of providing consumers with improved access to information, thereby encouraging them to make more informed consumption choices. While food labels were formerly limited to such detailing items as ingredients, expiry date, nutritional information and recyclable content, voluntary and mandatory labelling schemes have now emerged that inform consumers if a product is "eco-friendly", "organic" or "free from genetically modified organisms". In principle, greater access to information supports more effective consumption decisions in a free and competitive market. However, there is increasing concern that labelling regimes are being created in a manner that unfairly discriminates among producers. Moreover, the sheer number of labelling systems in the market is beginning to generate more confusion among consumers than competitiveness for producers.

(a) *Ecolabels and organic agriculture*

Many different ecolabelling schemes have been established across the world, each with their own requirements. For example, the use of the term "organic" differs between the United States and the EU, as does the stringency of the definitions for products in those two markets. Additionally, several NGOs have launched their own ecolabels that represent different values on environmental protection, human health and workers safety. Some ecolabels also include requirements regarding fair trade and fair prices for commodity exports within the framework of their environmental labelling scheme, which incorporates issues of environmental protection, poverty alleviation and sustainable development under one logo. Countries in the Arab region have equally sought to adopt national standards on organic production. Within that context, Tunisia has long-standing legislation on organic agriculture, and Lebanon finalized its National Standards for Organic Production in March 2004.

The number of ecolabels and definitions of organic produce on the market has complicated rather than simplified consumer choice. Moreover, the globalization of the food trade has hindered consumer awareness throughout the world in terms of information on the various components of ecolabelling schemes in different countries. Seeking to rectify this confusion, the International Federation of Organic Agriculture Movements (IFOAM) seeks to establish a set of basic standards for organic labelling regimes throughout the world that highlight the minimum necessary requirements for products to qualify as organic. This could help to ensure that ecolabels associated with organic production are applied in a standardized manner so that varying definitions of organic production does not unfairly skew competitiveness.

In the Arab region, conformity assessment of organic production poses another challenge for local producers. However, a number of Arab countries have made significant progress in that area. Specifically, the Egypt Centre for Measuring Organic Products has been accredited by the EU to certify organic produce; Tunisia has become a base for several inspection and certification bodies; and a number of agricultural exporters in Egypt, Morocco and Tunisia have been certified as EurepGAP trading partners.

Another structural problem facing the development of organic agriculture in the Arab region is limited access to inputs that are also certified to be organic. For example, the lack of organic fertilizer has constrained the ability of producers of olive oil in the Syrian Arab Republic from securing ecolabels. Equally, in Tunisia, where land dedicated for organic production increased from 300 to 16,818 hectares between 1997 and 2001, access to relevant information and materials is still limited, particularly as related to integrated pest management, production of organic fertilizers and adequate responses to diseases in plants and animals.[33] These challenges arise in Tunisia despite the establishment of several institutions, including, most prominently, the National Commission for Organic Agriculture, which oversees the national strategy for promoting that sector, including subsidies for equipment and certification; the Bureau of Organic Agriculture within the Ministry of Agriculture; the Technical Centre for Organic Agriculture; the National Agency for Investment Promotion in Agriculture; and regional agricultural extension service providers. Focus has been placed on organic production in the areas of olive oil, date palms, various vegetables, almonds, aromatic and medicinal plants, jojoba and wine; and olive oil and dates, in particular, have witnessed a boost in export.

Another challenge for Arab countries is that local demand for organic products remains limited. However, despite this obstacle, there were more than 26 million hectares of land certified for organic production under IFOAM definitions in 2004, divided among 36 countries each with more than 50,000 hectares in certified organic land. Organic agriculture generated in excess of $25 billion in revenues in 2003.[34] These figures indicate that opportunities exist in the sectors if Arab producers are able to comply with certification requirements.

(b) *Genetically modified organisms (GMOs)*

The debate regarding the use of labels to inform consumer choice is also central to discussions regarding GMOs. Modern methods of food production and advances in biotechnologies have forced countries and consumers to rethink their perceptions of risk regarding food safety and environmental protection, and to balance these views with interests that seek to increase agricultural productivity and food security. While advocates claim that genetically modified seeds are an environmentally-friendly approach to agriculture that reduces the need for pesticides and fertilizers, many developing countries argue that such seeds threaten the sustainability of ecosystems and the livelihoods of farmers, given that GMOs could interbreed with other crops to create new species that overpower and replace local plants. This has led two particularly contentious issues to be raised within the framework of the Categena Protocol of the United Nations Convention on Biodiversity, namely, GMO labelling and liability regimes.

Furthermore, despite a lack of scientific evidence to suggest that GMOs are any different chemically from other foods, GMOs are perceived by some as posing risks to human health.[35] Consequently, WTO principles on non-discrimination between like products and the science-based approach to standard-setting prohibits WTO member countries from banning the import of foods containing GMO-derived materials.

Nevertheless, scientific arguments have not been able to persuade many risk-averse consumers, particularly those in the EU, into changing their negative perceptions with regard to foods containing GMOs. While the EU was forced to withdraw its ban on the import of genetically modified products under WTO rules, the EC instituted a strict labelling and traceability regime in April 2004 that requires foods containing

[33] M. Ben Khedher and H. Nabli, "Organic Agriculture in Tunisia" (Technical Centre for Organic Agriculture, 2001).

[34] See the press release of 30 May 2005 by the International Federation of Organic Agriculture Movements (IFOAM), entitled "36 organic mega-countries: organic sector calls for strict liability under the Cartagena Protocol on Biosafety", which is available at: www.ifoam.org/press/press/Organic-Mega-Countries.html.

[35] For example, the European Food Safety Agency's Scientific Panel on Genetically Modified Organisms (GMO Panel) concluded on 4 March 2005 that 1507 maize does not have an adverse effect on human and animal health or on the environment in the context of its proposed use. This conclusion is available at: www.efsa.eu.int/press_room/press_release/828_en.html.

GMOs to label themselves as such.[36] In July 2004, maize NK603 became the first GMO product approved for entry into the EU market under the new labelling scheme.[37]

The implications of instituting labelling schemes for products derived from GMOs is important for Arab countries for several reasons. First, labelling is an effective instrument for informing consumers regarding a product's characteristics, thereby allowing them to make more personalized consumption choices. However, a mandatory GMO labelling requirement could differentiate between goods that are considered like products under the WTO principle of non-discrimination. This can undermine the competitiveness of Arab products that are unable to determine whether they contain genetically modified materials or demonstrate that they are "GMO-free", particularly in markets where consumer perceptions of risks associated with GMOs and food safety are especially strong.

Second, genetically modified products, including various types of maize, are being used as animal feed, which has implications for the food testing, traceabilty and the agro-food cycle.[38] The capacity to monitor, trace and adequately report on the components of the food cycle is likely to prove challenging for developing countries, particularly in those countries where farmers are not aware as to whether the feed they are providing to their livestock is derived from GMOs.

Third, the ability to test and certify whether a product contains or does not contain GMOs remains in its early stages of development. In February 2004, ISO released a technical corrigendum to a standard it proposed in 2004 for detecting GMOs in foods, based on new methods of analysis for identifying GMOs.[39] Conformity assessment on GMOs is therefore an evolving science, and the technical infrastructure needed for research, testing and certification of products based on their potential GMO composition is generally beyond the technical and financial reach of most Arab countries. Accordingly, the establishment of effective infrastructure to monitor, separate and test for genetically modified products is fundamental in terms of ensuring the effectiveness of national policies on GMOs.

Consumer International reports that approximately a third of all the countries in the world have now adopted some sort of voluntary or regulatory labelling mechanism to inform consumers with regard to the presence of possible genetically modified components. Argentina and the United States, which are among the world's largest GMO manufacturers, have established only voluntary labelling schemes. Canada, which is a strong proponent of the GMO industry, is expected to propose GMO labelling standards in 2005 in response to public interests expressed during recent elections.

Consumer awareness of GMOs in the Arab region is growing. While Saudi Arabia initially banned the import of foodstuff containing GMOs in December 2000, it subsequently revised that decision in favour of a strict labelling regime that became effective on 1 December 2001, thereby facilitating its eventual accession to WTO.[40] The labelling requirement consists of a triangle with text stating "Contains genetically modified product(s)" in Arabic and English, which is printed in an ink to differentiate from the main product

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[36] The European Commission Regulation No. 1830/2003, which concerns the traceability and labelling of GMOs and the traceability of food and feed products produced from GMOs, came into force in 2004.

[37] Genetically modified organisms (GMOs) are defined by the European Commission Directive 2001/18/EC of 12 March 2001 on the deliberate release into the environment of GMOs, which repealing the earlier Council Directive 90/220/EEC. See "GMOs: Commission authorises import of GM-maize for use in animal feed" (European Commission, Brussels, 19 July 2004), which is available at: europa.eu.int/comm/dgs/health_consumer/library/press/press341_en.pdf.

[38] See the European Commission (EC) Regulation No. 1829/2003 on genetically modified food and feed. For example, in November 2004, the EC's Regulatory Committee recommended the authorization of the import of Bt-maize, which has been genetically modified to resist corn rootworm, provided that it is appropriately labelled and only used for animal feed. However, it is not authorized for cultivation designated for human consumption. EC, "Draft decision on genetically modified maize MON 863 to be referred to Council" (29 November 2004), which is available at: europa.eu.int/rapid/pressReleasesAction.do?reference=MEX/04/1129&format=HTML&aged=0&language=EN&guiLanguage=en.

[39] International Organization for Standardization (ISO), "Foodstuffs - Methods for the detection of genetically modified organisms and derived products - Protein based methods - Technical Corrigendum 1" (ISO, 2005).

[40] Ministry of Commerce in Saudi Arabia, Decree No. 1666 (December 2001).

tag.[41] Moreover, genetically modified products exported to Saudi Arabia must have been approved for human consumption in their country of origin and must be accompanied by a health certificate issued by a governmental GMO licensing body to that effect. GMO derived foods must also be in compliance with the legal and ethical rules and specifications of Saudi Arabia.

While Algeria also seeks accession to WTO, it maintains a ministerial order since December 2000 that prohibits the import, distribution, commercialization and utilization of genetically modified plant material. Egypt and Sudan have expressed hesitation regarding the import of genetically modified products. However, these two countries have curbed their opposition to the use of GMOs for political reasons.[42] In Morocco, the Livestock Division and the Plant Protection Division of the Ministry of Agriculture issued an internal memo in August 1999, which sought to prohibit the import and distribution of GMOs and food derived from such organisms. While this memo was never fully implemented, it was used to halt temporarily two shipments of corn in 2000 and 2001. The first meeting of the national Biotechnology Committee in 2001 resulted in a joint recommendation submitted to the Prime Minister of Morocco aimed at establishing clearer rules for the import and marketing of biotechnology products. While there are no detailed regulations regarding biotechnology products, the Government of Morocco has since accepted the import of feed corn shipments. However, it is not allowing entry for seeds that are known to be genetically modified.

The Yemeni Association for the Protection of Consumers has organized a scientific meeting on genetic engineering. A recent survey of Lebanese farmers, agricultural extension service providers and experts revealed that while local farmers have little information regarding the costs and benefits of using GMO seeds, most persons interviewed are in favour of knowing whether a product has components derived from GMOs.[43] Other Arab countries have articulated positions on GMOs within the framework of the Cartagena Protocol.

B. Environmental standards affecting Arab food exports in the European and American markets

Arab food exports to Europe and the United States remain limited. This can be attributed largely to market access issues related to high tariffs and to measures that favour national producers, which adversely impact the competitiveness of Arab exporters. Where product competitiveness can overcome tariff barriers, non-tariff barriers related to environmental, health and food safety have become second-tier obstacles. However, labelling, sorting, packaging and testing requirements based on international standards and codes of good practice have proven problematic for some Arab producers. Moreover, new food safety regulations adopted by the EC and the United States call for better communication between players along the food chain, which is not always the case in the Arab agriculture and agro-food sectors. To date, only Morocco and Tunisia have succeeded in exporting various foods to Europe in significant quantities, including fish products. Most non-agricultural food exports remain those traditionally demanded by the Arab diaspora in those markets.

1. *Measures adopted by the European Union: selected issues*

The EC has built up a significant body of laws on food safety, animal health, animal welfare and plant health. These laws are binding in all countries of the Union and apply equally to those countries that are not members of the EU, but that export animals, animal products, plants and plant products to the EU. The number of environmental, health and safety regulations adopted by the EC has also dramatically increased over the past several years.[44] The General Food Law, which established the European Food Safety Authority

[41] This labelling requirement prohibits the less precise, albeit more standard statement: "This product may contain GMO ingredients".

[42] For more information, see The Centre for Food Safety, "Genetically engineered crops and foods: worldwide regulation and prohibition" (Washington D.C., February 2005).

[43] For more information, see ESCWA, "Towards a policy framework for genetically modified organisms (GMOs) in the ESCWA region: Assessing the case of Lebanon" (E/ESCWA/SDPD/2005/WP.1, 14 February 2005).

[44] D. Cadogan, "Phthalates and the European regulatory framework" (European Chemical Industry Council, November 1999), which is available at: www.ecpi.org/technial-papers/ECPIseminar-nov99/cadogan.ppt.

(EFSA), came into force on 1 January 2005 and instituted the general principles and requirements in the area of food in the EU.[45] The Law references the precautionary principle as a means to ensure the health of European citizens; however, it also recognizes that such a policy can give rise to trade barriers and consequently recognizes the need to ensure uniform application of the principle throughout the EU.[46] Moreover, the EC has articulated its commitment to the use of science-based risk assessment and management of foodstuff, in line with WTO principles.[47] As such, some measure of compromise is expected within the framework of European food safety measures in cases where conflicts arise between the application of the precautionary principle and science-based defense of environment, health and safety regulations.

(a) *Traceability*

The General Food Law establishes specific requirements governing the traceability of food products, the withdrawal of dangerous food products from the market, the responsibilities of food operations, as well as requirements associated with the import and export for food and feed. Guidelines for implementing the regulation were agreed between the EC and the EU member countries on 31 January 2005.

Traceability requirements are meant to keep a record of all food, animal feed and food-producing animals in the EU, thereby facilitating access to relevant information and responding to food safety emergencies in timely and effective ways. The rules mandate that certain information be collected from all operators along the food chain, including farmers, processing sector, transport, storage, distribution and consumer retail outlets, and be kept for five years. This information has to be made available immediately to public authorities upon request.[48] However, the guidelines equally state that traceability requirements do not have extraterritorial jurisdiction, and are therefore only applicable to importers and food operators within the EU. Consequently, while importers are required to declare the information noted above and the immediate source of their imports, the same information is not required of food operators outside the EU. As such, the rule does not necessarily complicate the food trade between Arab countries and the EU, except in cases of private contractual relations between importers and exporters where importers could require additional information regarding the source of ingredients and handling methods to better maintain their records in the event of a problem or food emergency. This is because while traceability requirements do not establish a liability regime, they do provide clearer ways to identify the source of problems. Indeed, the EC guidance on traceability itself states that the increasing complexity of relationships in the industry is creating a situation whereby, rather than individual responsibility, a "greater joint responsibility" throughout the food chain could become the norm in the event of problems.[49]

(b) *Rapid Alert System*

The Rapid Alert System for Food and Feed (RASFF) in the EU is an intergovernmental information network that quickly exchanges and disseminates notifications on products deemed to be dangerous by member countries, with the aim of protecting consumer health.[50] The System applies to food and feed products produced internal within the EU, as well as to imported products. The EC serves as the central

[45] See the European Commission Regulation No 178/2002 of 28 January 2002 on the general principles and requirements of food law, which established the European Food Safety Authority and lay down procedures in matters of food safety.

[46] Ibid., para. 20.

[47] The European Commission, "Food safety - From the farm to the fork", which is available at: europa.eu.int/comm/food/intro_en.htm.

[48] See the press release of 31 January 2005 by the European Commission, entitled "Traceability of food products: new EU guidelines to facilitate implementation", which is available at: europa.eu.int/rapid/pressReleasesAction.do?reference=IP/05/113&format=HTML&aged=0&language=EN&guiLanguage=en.

[49] The European Commission, "Guidance on the implementation of Articles 11, 12, 16, 17, 18, 19 and 20 of Regulation (EC) No. 178/2002 on General Food Law: Conclusions of the Standing Committee on the Food Chain and Animal Health" (20 December 2004), p. 7, which is available at: europa.eu.int/comm/food/food/foodlaw/guidance/guidance_rev_7_en.pdf.

[50] While the European Commission has maintained a rapid alert network since 1979, the system has subsequently been updated and expanded to reflect evolving policies on food and feed, most recently with the promulgation of the General Food Law.

coordinating body of RASFF and is responsible for gathering, sorting and disseminating all food safety notifications received from EU members regarding non-compliance of products with established regulations. Timely information on notifications is available on a weekly basis on the RASFF website.[51]

While RASFF provides an important tool for managing and disseminating information on product notifications, its confidentiality clause prevents the name of manufacturers or specific brand names of notified products from being divulged. As such, notifications regarding a non-complying product are identified by country of origin. This discriminates against producers and exporters of like products from the same country that are in compliance with EC regulations. Additionally, as a given country becomes associated with a food safety problem, testing and compliance of all similar products from that country tends to become more rigorous, which can impose an additional burden on exporters. The Food and Drug Administration (FDA) in the United States maintains a similar system for providing notifications on imports, namely, the Operation and Administration System for Import Support (OASIS). By contrast to RASFF, however, OASIS does provide details on producers whose products were detained or prevented from entering the United States for various food-related violations.[52]

In 2004, RASFF raised 82 alerts against products originating from the Arab region. Out of these, 34 per cent were due to unacceptably high levels of aflatoxins in kernels and groundnuts, while 21 per cent were cited because of the presence of carcinogenic colorants, namely, Sudan I and Sudan IV. During the first quarter of 2005, 7 out of 19 notifications were due to aflatoxins, which demonstrates that the problem persists. Additionally, Salmonella has been a recurrent problem, particularly in nut and sesame pastes. However, the total number of notifications on products from Arab countries has fallen in number over the past several years.

(i) *Aflatoxins*

Aflatoxins are mycotoxins that are produced by certain species of fungi in or on foods and feeds, which develop at high temperatures and humidity levels.[53] The EU maintains very nearly a zero-tolerance policy on aflatoxins, based on scientific evidence it commissioned assessing the carcinogenic effects of these mycotoxins. The difficulty of complying with EU regulations is due to environmental factors in the country of origin, which are influenced by geography, agronomic practices and the susceptibility of certain commodities to fungal invasion during pre-harvest, storage and processing periods. Specifically, peanuts and pistachio nuts from Egypt, India, Iran and Syrian Arab Republic have faced repeated difficulty in accessing the EU market owing to the concentrations of aflatoxins in those nuts. Moreover, within the framework of the SPS Committee of WTO in March and October 2004, the maximum levels for aflatoxins and other mycotoxins found in coffee and other goods were raised by several developing countries, including, for example China and Columbia.

In Egypt, aflatoxin concentrations in kernels exported to Europe posed a significant challenge in 1999 when the EC suspended the import of peanuts from Egypt. In order to comply with EU requirements, two Ministries in Egypt, namely, the Ministry of Agriculture and Land Reclamation and the Ministry of Foreign Trade, issued Ministerial Decree No. 2/2000, which covers all stages of production, processing, sampling and exporting of peanuts, including sampling procedures that must be followed for export certification. Additionally, the decree establishes the legal limit for aflatoxins in peanuts in the domestic market at 5 milligrams per kilogramme (mg/kg) aflatoxin B1 content and at 10 mg/kg total aflatoxin content. The legal limits in the EU are more stringent at 2 mg/kg aflatoxin in B1 content and 4 mg/kg total aflatoxin content.[54]

[51] The European Commission, "Food and feed safety: Rapid Alert System for Food and Feed (RASFF) - Introduction", which is available at: europa.eu.int/comm/food/food/rapidalert/index_en.htm.

[52] For more information on these detentions of food products from Arab countries, see "The impact of environmental regulations on production and exports in the food processing, garment and pharmaceutical industries in selected ESCWA member countries" (E/ESCWA/ED/2001/14, 25 October 2001), pp. 21-23.

[53] The technical name of these fungi is Aspergillus.

[54] Within that context, the European Commission Regulation No. 1525/98 amended the earlier European Council Regulation No. 194/97. Note that in 1997, countries of the Gulf Cooperation Council (GCC) also adopted maximum limits for aflatoxins in foods and animal feeds under Gulf Standard No. 841/1997.

An EU mission to Egypt in September 2001 assessed the certification system put into place by the Government and offered several recommendations for improving the testing of foodstuffs intended for the EU. Despite the measures taken by the authorities of Egypt in response to these recommendations, peanuts from that country continue to face difficulties in satisfying maximum aflatoxin thresholds. Iran faces similar difficulties accessing the EU market. In 1997, the EU imposed special conditions on the import of Iranian pistachio nuts that were revised with special provisions governing the import of these nuts in 2003. The implication for Iranian exports has been significant, particularly given that pistachio nuts are that country's chief export good, surpassing even textile and carpet exports in recent years.

Given this significant impact on export, the Codex Committee agreed to take up the issue of sampling for aflatoxins in various types of nuts, including almonds and pistachio nuts, at its twenty-seventh session in July 2004.

(ii) *Sudan dyes*

Sudan I, II, III and IV are industrial dyes that are normally used to colour plastics and other synthetic materials. However, Sudan dyes are also used illegally to enhance the colour of foods. Their use in foods is banned, given the risks that they pose to human health. Specifically, the International Agency for Research on Cancer has established these dyes to be carcinogenic and possibly genotoxic when ingested.[55] In response to the increasing number of cases of Sudan I and IV being found in spices and seasonings, the EC adopted emergency measures under Decision 2003/460/EC to regulate the presence of Sudan I in chili and chili products. In January 2004, the EC subsequently extended the measures to include all Sudan dyes and curry powders under Decision 2004/92/EC.

Some exports of curry powders and the traditional "sojok" spices from Lebanon have been denied entry into the EU market in recent years owing to the detection of high levels of Sudan I and IV. In February 2005, the United Kingdom experienced a significant Sudan I scare when that banned colorant resulted in a significant recall of food products, including Worcester Sauce. That country suffered another food safety setback in May 2005 when Para Red, which is a similar industrial dye with proven genotoxic carcinogen effects, was found in nearly 70 products commonly found in the EU market. The information regarding the source of the problem was promptly disseminated through RASFF.

In the Arab region, there is a growing awareness and concern regarding food safety issues, including the illegal use of Sudan I and Para Red.[56] Saudi Arabia has instituted a similar mechanism as RASFF at the national level whereby all the local chambers of commerce and industries of food safety are alerted of threats of products sourced from specific companies, based on testing conducted by national quality testing laboratories.

(c) *Fisheries*

Fisheries are a strategic industry for many countries in the European and Arab regions. Subsidies for the fishing industry have become a matter of contention among trading partners, which, at the request of the EC, have led to negotiations under the Doha Development Agenda within the framework of WTO. Moreover, there is concern regarding the sustainability of the sector, given the tendencies to overexploit fishery resources to meet the demands of this growing industry.

[55] The European Commission, "Food and feed safety: chemical safety of food - fraudulent practices - Sudan Dyes", which is available at: europa.eu.int/comm/food/food/chemicalsafety/fraudulent/sudan_background_en.htm.

[56] The illegal use of Sudan I and Para Red in foods was a leading story in a prominent daily newspaper in the Gulf in May 2005, entitled "Red alert on dye used in at least 69 food products", *Khaleej Times* (13 May 2005).

Complementing its environmental policies, the EC has adopted extensive food safety regulations for fish and fish processing aimed at protecting the health of European consumers. This includes an import licensing regime for certifying importers and managing trade in the sector. Compliance with these measures has proven problematic for several Arab countries, particularly those that do not have the human, technical or financial resources to meet the EC standards. The application of these measures resulted in the EU ban on fish imports from Egypt in 1999, as well as a moratorium on fish imports from Saudi Arabia and Yemen, which can be partly attributed to non-compliance with EC sanitation and storage requirements. During 2003, Spain regularly issued notifications to RASFF to prohibit the entry into the EU of shrimps and prawns from Morocco, based on the non-compliance with sulphite regulations. More recently, however, these imports from Morocco have not faced such obstacles. The resolution in this case could partly have resulted from an unrelated, high-level settlement regarding the licensing of Spanish fishing fleets in Moroccan territorial waters.

The situation in some Arab countries is slowly being remedied, owing in part to a sizable technical assistance package that the EU provided to Egypt and Yemen aimed at modernizing the fishery sectors of those two countries (see table 3). The value of Yemen fish exports enjoyed an increase of $69 million in 2004 to reach $250 million, which reflects the competitiveness of the Yemeni industry in the EU and other foreign markets.[57] Additionally, this assistance resulted in four Egyptian establishments securing approval to export to the EU in 2005. However, these Egyptian companies are required to submit their certifications for a review.

By stark contrast, Morocco has more than 650 fish processing plants and freezing vessels authorized to export to the EU, which illustrates the capacity of the region to conform to EU regulations when effective management and investments exist. The competitiveness of Morocco in the fish sector can be attributed to an aggressive fisheries development action plan instituted by the Government for the period 2003-2007. The plan includes the adoption of specific legislative measures on the protection of marine resources from all forms of pollution, the promulgation of a fisheries code, and measures aimed at increasing value-added and employment opportunities in the sector. This linkage between trade, environment and socio-economic development in the plan exposes a vision for enhancing the competitiveness and sustainability of the sector. Morocco is now cooperating with Yemen with the aim of sharing Moroccan experiences and building the capacity in Yemen in the areas of research, training and quality control.[58]

TABLE 3. ARAB ESTABLISHMENTS CERTIFIED TO EXPORT FISH PRODUCTS TO EU
(*As of March 2005*)

Country[a/]	Number of establishments	Type of establishments	Date the decision came into effect	Date of expiry
Egypt	4	Processing plant	24/11/2004	Mid-2005
Mauritania	100 53	Freezer vessel processing plant	24/02/2005	None noted
Morocco	333 333	Freezer vessel processing plant	29/09/2004	None noted
Oman	24	Processing plant	31/03/2004	None noted
Tunisia	31 75 2	Freezer vessel Processing plant Plant processing only[b/]	24/01/2005	None noted
United Arab Emirates	9 1	Processing plant Plant processing only[b/]	24/02/2005	None noted
Yemen	22	Processing plant	17/03/2004	None noted

[57] As cited in *Asharq Al-Awsat* newspaper on 11 January 2005 of a speech by M. Al-Sugheiry, the Undersecretary of Fishery Resources in Yemen.

[58] "Morocco, Yemen probe fisheries cooperation", *Arabic News* (2 January 2003), which is available at: www.arabicnews.com/ansub/Daily/Day/030201/2003020115.html.

Source: Compiled by ESCWA, based on the EC Veterinary website, which is available at: forum.europa.eu.int/irc/sanco/vets/info/data/listes/list_all.html.

a/ No other Arab companies were listed as certified for fisheries exports to the EU on the EC website.
b/ Plant processing only or partial materials derived from aquaculture (farmed products).

Table 3 shows that while Oman and Yemen each have approximately two dozen companies certified for export to the EU, other important fish producers in the Gulf region, including Saudi Arabia and Kuwait, have none. This could reflect issues regarding the export competitiveness of the industry in non-Gulf markets. However, a government official from Saudi Arabia reported in 2004 that the EU and Saudi Arabia were consulting on mechanisms to improve systems and regulations aimed at lifting the existing ban on Saudi fishery exports to the EU.

2. *Measures adopted by the United States: selected issues*

The FDA in the United States oversees the monitoring and inspection of all food products in the American market, with the exception of most meat and poultry, which are regulated by the Food Safety and Inspection Service (FSIS) in the Department of Agriculture.[59] All food products must comply with health and safety standards established under the Federal Food, Drug, and Cosmetic Act (FDCA). This Act prohibits movement in interstate commerce of adulterated or misbranded foods, drugs and cosmetics. The FDA must approve food additives and colorants. The Federal Insecticide, Fungicide, and Rodenticide Act directs the Environmental Protection Agency in the United States to register all pesticides used in the country and to establish safe residue tolerances for chemicals. However, the FDA is responsible for inspecting foods to determine their compliance with pesticide regulations.

(a) *Bioterrorism and food safety*

The threat of bioterrorism and the need to protect the national food supply became prominent issues in the wake of the terrorist attacks of 11 September 2001. This resulted in the adoption of the Public Health Security and Bioterrorism Preparedness and Response Act of 2002, commonly referred to as the Bioterrorism Act, and in related amendments to the FDCA. Under the new regulations, which came into effect on 12 December 2003, the FDA must receive at least a five-day prior notice of food imported or offered for import into the United States.[60] Failure to respect this deadline results in the summary barring of entry of any food shipment into the United States. Before these new regulations, import documentation was provided at the port of entry.

The information provided to the authorities includes much of the same data requested by the EC within the framework of their new traceability requirements. However, the difference between the two regimes is that the approach in the United States is conducted within an integrated, proactive system that allows the FDA to coordinate with the Bureau of Customs and Border Protection (CBP) to review, evaluate and assess information before a food product arrives. Consequently, a shift in resources can be arranged to target inspections, intercept contaminated products and ensure movement of safe food to market in response to the information received.

The complication for exporters in the Arab region relates to understanding the requirements and to concern in terms of perception. Within the context of the latter, some exporters maintain that the documentation is a form of "import profiling", which discriminates Arab products from those originating from other regions, particularly with regard to inspection and assessing conformity with environmental, health and safety standards. Furthermore, complying with the requirements is relatively complicated given that compliance policy guidelines were originally released in December 2003, and were subsequently revised

[59] In addition to monitoring food products, the Food and Drug Administration (FDA) verifies drugs, cosmetics, medical devices and electronic products that emit radiation.

[60] See the Food and Drug Administration (FDA), section 307, added section 801.

in June 2004, August 2004, November 2004 and March 2005.[61] Since February 2004, the FDA has been receiving some 160,000 prior notice submissions on a weekly basis.[62]

(b) *Labelling*

The FDA is responsible for ensuring that all foods sold in the United States are properly labelled. Before offering foods for distribution in the United States, the exporter must therefore be familiar with the national laws and regulations as they apply to product labelling, thereby minimizing potential legal actions or delays. Specifically, the labels must be in English and contain information on ingredients, nutrition, serving size, daily reference value for dietary standards, country of origin, the name of the manufacturer and/or importer, and the address and product name.

(i) *Controversy and consultation regarding organic labelling*

Controversy regarding federal organic food standards emerged in 2004 when the Agriculture Marketing Service issued clarifications to national standards that put to test the credibility of the American definition of organic production. The rules allowed products to be labelled organic even if they contained dairy products from cows that had been given antibiotics or growth hormones; were derived from livestock that had been fed non-organic fish meal, which can contain synthetic preservatives or heavy metals; or contained certain prohibited pesticides.

The clarifications were contested based on the fact that the National Organic Standards Board, which is an advisory panel of experts, was not consulted regarding the proposed changes as the law requires. Public protest resulted in the rescinding of these rules. Commitment to stakeholder participation during the standard-setting process was also reaffirmed. This provides a lesson to national decision-makers of the importance of consulting with public stakeholders regarding measures prior to their formal adoption.[63]

(ii) *Irradiation*

Irradiation is a method of treatment that can help to lengthen food freshness and eliminate the need to apply chemical fumigants to control pests. The technique is sometimes used on spices, fruits and vegetables, as well as meat and poultry products. However, potential environmental and health risks associated with food exposed to radiation has prompted the FDA to require the labelling of irradiated food with a relevant statement and the international symbol for irradiation.[64] The cost of irradiation treatment typically increases production costs by $0.02-0.03 per pound (/lb) of fruit or vegetable, and $0.03-0.05/lb for meat and poultry products. However, these costs are projected to drop as the use of irradiation becomes more widespread.[65]

Table 4 provides a comparative listing summarizing some of the major requirements in the European and US markets governing foodstuff.[66]

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[61] The Food and Drug Administration (FDA), "Compliance policy guide" (FDA, December 2003), which was subsequently revised in June 2004, August 2004, November 2004 and March 2005. More information is available at: www.cfsan.fda.gov/~pn/cpgpn5.html.

[62] The Food and Drug Administration (FDA), "FDA and CBP announce revised compliance schedule for enforcement of the prior notice interim final rule and contingency plan for prior notice system outages" (12 August 2004), which is available at: www.fda.gov/bbs/topics/ANSWERS/2004/ANS01304.html.

[63] M. Burros, "Agriculture Dept. rescinds changes to organic food standards", *The New York Times* (27 May 2004).

[64] This symbol, which is called a radura, consists of concentric circles.

[65] The Food and Drug Administration (FDA), "Food irradiation: A safe measure" (FDA, January 2001), which is available at: www.fda.gov/opacom/catalog/irradbro.html.

[66] For more information on European standards, see "Expanding Exports Helpdesk" at export-help.cec.eu.int/, which is an online resource aimed at assisting developing countries to access information on the European market, and includes such technical and sanitary requirements as marking, labelling and health.

TABLE 4. MAJOR REGULATIONS APPLIED IN THE EUROPEAN AND AMERICAN MARKETS TOWARDS INTERNATIONAL IMPORTS

	US requirements	EU requirements
Language labelling	English label	The official language(s) of the member state. It is also allowed to use another language, provided it can easily be understood by consumers or other means depicting the content (e.g. pictures). Multi-language labelling is allowed throughout the EU
Production and expiry date	Required	The shelf life is indicated by the words "Best before…" when the date includes an indication of the day, 'or by "Best before end of…" in other cases. The date has to be given in order of day-month-year'
Country of origin	Required	Required
Manufacturer's/importer's name	Required	The name or business name and address of the manufacturer, packager or vendor established within the Community
Ingredients	Required on all foods that have more than one ingredients	The list of ingredients, in descending order of weight. The following ingredients require a specific statement on the label: GMO's, packaging gases, sweeteners, aspartame and polyols, quinine and caffeine
Net weight	Required	Required
Colorants	Specific ingredient labelling for colors are required to be certified by the FDA	
Food additives and coloring	All food additives and coloring are to be listed as ingredients	Council Directive 89/107/EEC provides for the establishment of EU harmonized positive lists—lists of what is permitted—of a wide range of food additives. All food additives not included in the positive lists are prohibited except for those new food additives that receive a temporary two year authorization by Member States. Processing aids and flavoring fall outside of the scope of this directive
Pesticide and other contaminants	The standard level of tolerances for pesticides, herbicides and fungicides that can be contained in agricultural products is regulated by the Environmental Protection Agency (EPA)	The legislation on pesticides and contaminants is partially harmonized in the EU. Enforcement of both 'EU and remaining Member State rules is done at the Member State level. EU harmonized levels are in force for nitrates in lettuce and spinach and for aflatoxin in peanuts, nuts, dried fruits, cereals and milk' (Commission Regulation 194/97, as amended)
Alcoholic beverages	In order to export alcoholic beverages to the US, the agent in the US must be a registered permit holder with the ATF (Bureau of Alcohol, Tobacco and Firearms)	

TABLE 4 (*continued*)

	US requirements	EU requirements
Labelling of GMO's	No mandatory requirements	The words "produced from genetically modified…" or "genetically following the ingredient have to be used to indicate the presence of the GM soy and corn proteins and all GM additives and flavorings that are currently on the market
Packaging	General requirements for food packaging materials are that the material does not in any way impart flavor, color, odor, toxicity or other undesirable characteristics to the food thus rendering it adulterated. Food containers or packages must be free from any poisonous or deleterious substance which my cause the contents to be injurious to health. As for packaging materials such as vinyl containers of plastic may be subject to regulations	Container sizes have been prescribed for butter, fresh cheeses, salt, sugar, breakfast cereals, pasta, 'rice, dried fruits and vegetables, coffee, frozen fruits and vegetables, fish fillets, fish fingers, ice-cream, preserved fruits and vegetables and products sold in metal containers'. (Council Directive 80/232/EEC)

Source: Compiled by ESCWA.

C. ENVIRONMENTAL MEASURES IN ARAB COUNTRIES AFFECTING TRADE IN AGRO-FOODS: SELECTED ISSUES

Measures governing trade in foods in Arab countries are diverse and varied. The Arab countries in the Mediterranean region tend to conform with European requirements, while food standards in Arab countries in the Gulf region are often inspired by those adopted in the United States. Differing environmental, health and food safety standards are among the factors stymieing intraregional trade. Moreover, such differences raise the concern that standards and conformity assessment procedures in some countries are being used to protect national producers or to create obstacles to trade. However, progress in harmonizing standards and conformity assessment procedures is being sought by the League of Arab States (LAS) at the regional level, by the Gulf Cooperation Council (GCC) at the sub-regional level, and through other regional and bilateral agreements on economic cooperation. A review of some environmental and food safety measures in selected Arab countries is presented below.

1. *Standard-setting and conformity assessment*

The Arab Centre for Standardization and Metrology, which is housed in the Arab Industrial Development and Mining Organization (AIDMO), aims to harmonize Arab standards for the purpose of reducing technical barriers that impede intraregional trade. The Centre is organized in three sections that focus on standardization, quality and metrology.[67] Additionally, efforts are being taken to establish a regional accreditation body aimed at building capacity in various areas of accreditation throughout the Arab region, including the accreditation of testing facilities issuing food safety certificates. Moreover, AIDMO convenes the High Consultative Committee on Standardization for Arab countries to address these issues at the region level.

Standards are equally set at sub-regional and national levels in the Arab region. Within that context, the Gulf Standardization and Metrology Organization (GSMO) serves as a central standards authority for GCC member countries. Given Yemen's standing in some GCC technical committees, its application to join the Organization is currently under review.

[67] More information on the Arab Industrial Development and Mining Organization (AIDMO) is available at: www.arifonet.org.ma/Aidmo/ ftproot/aidmo.pdf.

Harmonization of standards in the Gulf region has become increasingly important, particularly since the establishment of the GCC Customs Union in January 2003. The principle of mutual recognition of national standards and specification among GCC countries has since been accepted, pending the adoption of fully-harmonized standards. As of October 2004, there were 1,699 GCC standards mostly relating to food products. Out of these, 331 or 20 per cent are mandatory.[68] Most national standards of GCC member countries are based on those issued by GSMO. However, countries have turned to the Saudi Arabian Standards Organization (SASO) for leadership in formulating and harmonizing standards in the region.

SASO is the national organization responsible for setting standards for commodities and products, including standards governing labelling, packaging and conformity assessment. These standards in Saudi Arabia, which are related to foodstuff, are based mainly on Codex Alimentarius and, to some extent, on European and American standards modified to reflect local conditions. While standards are set by SASO, the Ministry of Commerce Laboratories in Saudi Arabia is responsible for testing food imports at various ports of entry. The Environmental Control Department within the Ministry of Municipal and Rural Affairs is responsible for testing foodstuffs at the points of sale for compliance with product safety standards. The Quality Assurance Department within SASO serves as the national accreditation body and is managed separately from its standard-setting operations.

While Gulf standards exist and are mostly prepared with technical support provided by SASO, GCC member countries maintain some additional country-specific standards. For example, the General Organization for Standards and Quality Control in Qatar is responsible for setting standards, and coordinates with SASO to that end. Almost all the standards in Qatar are based on those developed by GSMO. However, there are also 26 standards specific to Qatar, some of which relate to food safety. Additionally, standards in Qatar include import prohibitions on ivory, asbestos and other products in view of its obligations under multilateral environmental agreements and its policies to protect the environment and human health.[69]

The main regulatory measures that food operators encounter when exporting to the Gulf are GMO labelling requirements, shorter shelf life standards, strict production and expiration date regulations, Arabic labelling and the slaughter of livestock under shariah. Saudi Arabia and other GCC countries are also progressively enforcing their sanitary legislation. This could pose a challenge for some Arab exporters, for whom compliance with standards adopted in the Gulf region could become as problematic as those in the EU and the United States.

In Egypt, the Organization for Standardization and Quality within the Ministry of Industry has sole responsibility for establishing, adopting and publishing food standards and codes of practice. However, it is the responsibility of the Ministry of Health and the Ministry of Trade and Foreign Economy to enforce the regulations. In cases where no national regulations exist, products need to demonstrate conformity with standards set by ISO or the EC. Moreover, in the absence of EC standards, Codex standards can be applied, as can national standards from France, Germany, Japan, the United Kingdom or the United States. This causes some complexity in the standardization regime of Egypt, particularly in terms of imports.

All food exported to Egypt are subject to mandatory tests at the point of entry. These include laboratory tests and analyses by the Ministry of Health; veterinary inspection of dairy, fish, meat and poultry products by the Ministry of Agriculture; inspection of plant and animal products by the Central Administration for Plant and Veterinary Quarantine; and assurance of compliance with labelling and product standards by the General Organization for Export and Import Control (GOEIC) at the Ministry of Foreign Trade and Industry. While inspection is centralized under GOEIC, it operates through a committee system whereby representatives of the relevant institutions submit the results of their analyses to GOEIC. A product rejection by any of these authorities results in a rejection by GOEIC. Moreover, sanitary certificates are required of food imports, including certification that agricultural imports are not contaminated by radioactivity.

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[68] World Trade Organization (WTO), *Qatar: Trade Policy Review*, p. 28, which is available at: www.wto.org/english/tratop_e/tpr_e/s144-3_e.doc.

[69] Ibid., p. 10.

The Syrian Arab Republic maintains similar requirements regarding radioactivity in foods. The time and cost of securing these certificates is a challenge for Arab food exporters seeking entry into the Egyptian and Syrian markets. Table 5 provides a comparative matrix of some of measures adopted in selected Arab countries.

TABLE 5. COMPARATIVE MATRIX OF FOOD SAFETY REQUIREMENTS IN SELECTED ARAB COUNTRIES

	Bahrain	Egypt	Kuwait	Lebanon	Morocco	Oman	Saudi Arabia	United Arab Emirates
Language labelling	Arabic language is mandatory other languages may be used but in addition to Arabic	With the exception of the production and expiration dates, information printed in English (or other foreign language) is not allowed	Labelling of foodstuffs must be clear and in Arabic and English	Arabic or French or English	Arabic language is mandatory other languages may be used but in addition to Arabic	Bilingual labels - Arabic and English	Labels of prepackaged foodstuffs and the attached labelling shall be in Arabic language.	
Sticks on labels	Stickers, if used, must not obliterate label terminology and must be self destructive on removal				They are accepted if they were on the product initially		Stickers - must not interfere with label terminology and be self destructive on removal. Stickers covering existing labelling information are in violation	Sticker may be used but must not obliterate label terminology and be self destructive on removal. Stick-on labels covering required label features are not permitted
Production and expiry date	Required	Required	Required	Required	Production and expiry date	Required	Required	Required
Country of origin	Required		Required	Required	Required	Required	Required	Required
Manufacturer's/ importer's name		Name and address of manufacturer Name and address of importer	Required	Required	Name and address of the manufacturer, the packager, or the importer		Name and address of the manufacturer, packer, distributor, importer, exporter	
Ingredients		Required	Required	Required	List of all ingredients sorted by decreasing weight at the time of packing		Required	
Net weight		Required	Required	Required	Net weight in kilograms			Metric net weight labelling is required

TABLE 5 (*continued*)

	Bahrain	Egypt	Kuwait	Lebanon	Morocco	Oman	Saudi Arabia	United Arab Emirates
Storage temperature	For all products, storage temperature must be placed with the refrigeration statement on the boxes to fully clarify the type of product being handled	Storage temperature must be placed with the refrigeration statement on the boxes to fully clarify the type of product being handled	Required	Required	Indication of any special storage conditions		Storage temperature must be placed with the refrigeration statement on the boxes to fully clarify the type of product being handled	Storage temperature must be placed with the refrigeration statement on the boxes to fully clarify the type of product being handled
Colorants				Required				
Food additives and coloring		Acceptable artificial colors are not always allowed in all food products						
Pesticide and other contaminants		If the product contains preservatives, the percentage of each preservative should be indicated. Regulations governing pesticides, pesticide registration and use are the responsibility of the Ministry of Agriculture			Pesticide imports, manufacturing, storage, and marketing are subject to strict government control		For preservatives permitted for use in food products, common name or EEC number and a statement "Preservative for use in Food Products" in case of preservatives containers	
Slaughter requirements	Ritual: Islamic Halal Slaughter requirements apply	If the product is meat or poultry, the following statement must appear: "slaughtered according to the Islamic ritual" or "halal slaughtered"				Ritual: Islamic Halal Slaughter requirements apply	Islamic Halal Slaughter requirements apply	Islamic Halal Slaughter requirements apply

Source: Compiled by ESCWA.

2. *Labelling, packaging and shelf life*

Egypt maintains restrictive labelling requirements for imports of food products. Labels must be printed only in Arabic, with the exception of numerals for the purpose of marking information on production and expiry dates. The shelf-life requirements for food products in Egypt differ in many respects from the standards used in other countries. Chiefly, dates tagged under "best used by" are not acceptable in Egypt; and shelf-life limitations are strict.

Among member countries of the GCC, regulations for labelling pre-packaged foodstuffs derive from Gulf Standard 9/1995, which was initially prepared by Kuwait. Within that framework, pre-packaged food product labels must be in Arabic or include a translation of the label into Arabic; contain the product name, packer's name, and country of origin or manufacture; and list the ingredients, shelf life and instructions,

where applicable, for the consumer. SASO sets the shelf-life requirements, including production and expiry dates, for all food products. In 1993, this shelf life for selected products was reduced and in some cases halved by two standards, namely Standard 702/1993 in Saudi Arabia, and Gulf Standard 150/1993. Moreover, packaging and container requirements were issued in 1997 under standard 1149/1997 in Saudi Arabia. These standards in the Gulf region tend to be uniformly enforced, which facilitates trade, encourages fair competition and provides an example of effective harmonization of standards.

D. CASE STUDY ON MAXIMUM RESIDUE LIMITS FOR PESTICIDES

Pesticides include insecticides, herbicides, fungicides and rodenticides, which have a variety of implications for environmental sustainability and food safety. Excessive application of pesticides can degrade land resources and leach into water bodies. Pesticide residues found in fresh and processed foods can have adverse effects on human health. Moreover, the accumulation of these substances along the food chain generates secondary effects whereby soils and water contaminated with pesticides impact subsequent agricultural cycles, while the bioaccumulation of noxious chemicals increases risks to human health. The acceptable daily intake of certain pesticides, which establishes the maximum residue levels (MRLs) for pesticides in foods, is assessed by sampling pesticide residues in crops grown using Good Agricultural Practice (GAP), evaluating daily residue intakes for various population groups, and collecting data from relevant toxicological tests.

Many countries have put in place legislation setting MRLs for pesticides in various commodities that draw upon standards established by Codex. To date, the EC has set more than 17,000 MRLs for 133 pesticide substances in various foods.[70] This includes four directives that establish standards for fruits and vegetables, cereals and cereal products, products of animal origin and products of plant origin. However, differences in standards between EU member countries complicated conformity, particularly for importers and intraregional trade. This led to a political agreement by the Agricultural Council of the EC in April 2004 aimed at harmonizing regulations across the Union and at simplifying compliance with MRL standards instituted within the framework of these four directives.[71] Moreover, the EC pays special attention to traceability issues relating to the monitoring and management of pesticides along the food chain, in addition to the reliability of conformity assessment facilities in developing countries. Consequently, compliance with MRLs set by the EC requires that laboratories and testing facilities outside the EU be accredited to analyse products according to internationally approved specifications and procedures.

Saudi Arabia and other member countries of the GCC have developed positive lists of pesticides and other contaminants. The lists are largely adapted from Codex standards and include the following:[72] (a) Gulf Standard 382/1994, entitled "Maximum limits for pesticide residues in agricultural food products - Part 1" that establishes MRLs for ten pesticides in foods, agricultural commodities and animal feed;[73] and (b) Gulf Standard 383/1994, entitled "Maximum limits for pesticide residues in agricultural food products - Part 2" that establishes MRLs for an additional nine pesticides in that field.[74]

In Egypt, regulations governing pesticides, pesticide registration and use are the responsibility of the Ministry of Agriculture. The Division of Pesticide Residues and Environmental Pollution, an office of the

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[70] The European Commission, "Introduction to EC pesticides residues legislation", which is available at: europa.eu.int/comm/food/fs/ph_ps/pest/intro_en.pdf.

[71] The European Commission, "Pesticides: Byrne welcomes Council support on establishing common maximum residue levels" (26 April 2004), which is available at: europa.eu.int/rapid/pressReleasesAction.do?reference=IP/04/543&format=HTML&aged=0&language=EN&guiLanguage=en.

[72] Agriculture and Agri-Food Canada, "Agri-food trade service", which is available at: atn-riae.agr.ca/info/info_africa_e.htm.

[73] These ten pesticides are malathion, bromophos, diquat, fenchlorfos, pyrethrins, quintozense, parathion, orthophenyl phenol, methidathion and fentin.

[74] These nine pesticides are dimethoate, chlorfenvinphos, crufomate, diazinon, dioxathion, diphenyl, diphenylamine, ethoxyquin and folpet.

Central Agricultural Pesticides Laboratory (CAPL) in the Agricultural Research Centre (ARC), is charged with analysing pesticides and chemical contaminants in foods. Moreover, CAPL makes recommendations to the Ministry of Agriculture on matters pertaining to pesticide legislation and regulations. Egyptian standards for pesticide residues in food are derived from standards by the Food and Agriculture Organization (FAO) and the World Health Organization (WHO). It is a criminal offense in Egypt to sell food or bottled drinking water containing pesticides, heavy metals or mycotoxin in excess of the MRLs set by these Organizations for those products.

In Morocco, pesticide imports, manufacturing, storage and marketing are subject to strict Government controls laid out in Law 42-95 of January 21, 1997. While imported food products are not systematically controlled for pesticide residues, the Plant Protection Inspector or Fraud Repression Controller in the Ministry of Agriculture is authorized by law to request, if deemed necessary, that laboratory analysis be made for certain products or for products originating from certain countries. That Ministry refers to Codex standards when establishing regulatory tolerance limits for MRLs.

The complexity of establishing pesticide MRLs and conforming with them is compounded by the fact that new pesticides emerge regularly on the market, which requires constant updating and review of existing standards. The Working Group on Pesticides of OECD reported in February 2005 that the Governments of Canada and the United States had agreed to use standard OECD guidelines for collecting data on new pesticides and, where feasible, to establish by 2014 common monographs aimed at supporting risk assessment decisions on pesticides. Using common data supports the decision-making process and contributes to the goal of harmonizing the regulatory environment.[75] Within that context, countries in Europe and the Asia and Pacific region are equally expected to participate in this initiative. However, in the Arab region, efforts aimed at harmonizing pesticide MRLs is currently limited to member countries of the GCC.

1. *Assessing the impact of pesticide MRLs in greenhouse tomatoes in Lebanon*[76]

Agricultural producers in Lebanon are seeking to increase their market access and international competitiveness in view of the increasing competition in traditional markets. Europe has been a traditional destination market for food products from Lebanon. However, in order to be competitive, the Lebanese agricultural sector has to conform to environmental, health and safety standards adopted by the EC, including European pesticide MRLs. Lebanese producers have complained of the difficulty in meeting those limits.

In 2002, the Lebanese Standards Institution (Libnor) issued a national standard for pesticide residue limits. This standard was formulated with the assistance of a technical committee, which comprised representatives from relevant ministries, business associations and syndicates, and research institutes and universities. Subsequently, a second committee, which was established to follow up on the standard, includes Libnor, the Department of Plant Protection and the Pesticide Committee within the Ministry of Agriculture, the Lebanese Agriculture Research Institute, the Industrial Research Institute and the American University of Beirut.

While this Standard is based on Codex MRLs, certain pesticides not mentioned in Codex are included in the EC guidelines. Consequently, the Lebanese Standard includes these additional European standards in the annex to the final document. As such, conformity with the national standard approximates conformity with MRLs set by the EC for the same range of pesticides. However, the Standard remains a voluntary measure and requires a ruling by the Council of Ministers in Lebanon to become a formal decree. Similar decisions have been issued by the Ministry of Agriculture, which has banned the use and import of more than 100 types of pesticide for the purpose of protecting the environment, public health and occupational safety.

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[75] Organization for Economic Cooperation and Development (OECD), "A vision for the future: a global approach to the regulation of agricultural pesticides", *Environment, Health and Safety News*, No. 17 (OECD, April 2005), p. 9.

[76] This sub-section is based on an unpublished policy note prepared by A. Saade for METAP and ESCWA, July 2003, entitled "The impact of conformity with European Union maximum residue limits for pesticides on Lebanese greenhouse tomato exports".

(a) *The costs and benefits of compliance*

Agricultural producers in Lebanon are ill-informed with regard to the appropriate pesticide usage techniques and harvesting methods. This can be partly attributed to a lack of public extension services and the semi-exclusivity of extension services provided by private agro-chemical companies. This has resulted in a tendency to overuse agricultural chemicals, including pesticides, fertilizers, fungicides, insecticides and herbicides. This is a particular problem in greenhouse production facilities where the temperature and environment tend to attract pests and encourage weeds. Producers spray pesticides to ensure a certain yield. However, past a certain point, the marginal increase in pesticide use has no additional effect in terms of safeguarding crops from pests, or of generating a larger or higher quality harvest. Additionally, over-application of pesticides adversely impacts soil quality and groundwater supplies, thereby causing environmental degradation and losses to agricultural productivity in the long term. It is estimated that inadequate information with regard to pesticide use leads farmers in Lebanon to apply seven times more pesticides than the optimal requirement.

Furthermore, the limited training available on pesticide use does not adequately convey information on the specific waiting periods required between the application of pesticides and the harvesting of the crop. This waiting period has important implications for human health and MRL testing, particularly given that agricultural products that are picked soon after pesticides have been sprayed contain higher residue levels than those picked several days later. Accordingly, while the appropriate use of agricultural chemicals can help to increase agricultural yield, the overuse of pesticides and improper harvesting methods prevent farmers from meeting national MRLs for pesticides and from entering markets where residue limits are rigorously enforced.

The implications of conformity with national and European MRLs for pesticides are significant for local farmers and exporters. For example, tomato production is a potentially lucrative business in Lebanon. There is significant domestic demand for high quality tomatoes throughout the year, and the export market towards Europe offers important potential for growth. In 1999, it was estimated that some 19,000 hectares of agricultural land in Lebanon was dedicated to growing greenhouse tomatoes, yielding an output of 87,658 tons.[77]

Information relating to production costs varies between small and medium-sized producers, as well as among districts across Lebanon. However, on average, Lebanese greenhouse tomato farmers produce 12 tons of tomatoes annually. Total production costs are estimated at $184 per ton, with pesticides and fertilizer costs representing 5.7 per cent and nearly 15 per cent of production costs, respectively.[78] Consequently, based on the average wholesale price of $301 per ton (1998 price), these farmers enjoy a profit of approximately 44 per cent.

Despite these encouraging figures, a very modest 1.3 per cent of tomatoes are exported, while tomato imports represent some 5 per cent of domestic production. Weak export sales can be partly attributed to the inability of Lebanese producers to meet and demonstrate conformity with product standards, including MRLs. An analysis using the Larson Model of the impact of conformity with pesticide MRLs for greenhouse tomatoes grown in Lebanon reveals an important finding. The assessment is based on the following two assumptions:

(a) A nationwide training programme can be conducted on appropriate pesticide use and harvesting methods within the framework of conforming with national MRL standards. The cost for such a programme that targeted all the farmers, representing approximately 7,300 greenhouse tomato producers, is estimated at $75,000, or $10 per farmer;[79]

[77] Ibid., citing data by Methyl Bromide Project in the Ministry of Environment, Lebanon, 2002.

[78] These figures are based on information provided in a handbook published by ESCWA, entitled *National Farm Data Handbook for Lebanon* (E/ESCWA/AGR/1999/1, 13 January 1999.

[79] This estimate is based on the conduct of a similar information-based training programme conducted within the context of phasing out the use of methyl bromide in Lebanon, in accordance with the terms of the Montreal Protocol.

(b) Pesticide use could be reduced by a conservative 23 per cent, which represents equivalent savings of $29 per ton of output.

The findings show that the cost of instituting a training programme on appropriate pesticide use and MRLs is more than offset by the cost savings generated by reduced expenditures on pesticides, estimated at more than $2.5 million nationwide. Additionally, the market opportunities resulting from compliance with MRL standards for pesticides reveals the potential of increasing output by 3.6 per cent (or 3,517 tons) and of expanding exports by more than 280 per cent (3,135 tons). Cost saving generated by reduced pesticide expenditures could also allow local producers to compete more effectively with imports and to reduce tomato imports to less than 1.5 per cent of national production levels.

Consequently, compliance, training and enforcement of the national MRL standard could generate a win-win scenario that improves competitiveness in the local market, increases agricultural exports, protects the health of local consumers, and prevents the degradation of land and water resources caused by the over-application of pesticides. The Government of Lebanon has recognized the importance of assisting farmers to achieve conformity with environment and health standards, particularly for agricultural products destined for export markets. This has been elaborated in the Export Plus Programme, which is managed by the Investment Development Authority of Lebanon (IDAL). An integral part of the Programme is aimed at assisting farmers come into compliance with standards in destination markets, and ensuring conformity assessment with those standards with the help of private international companies. Additionally, the Programme conducts workshops on packaging, sorting and grading; and subsidizes the use of refrigeration trucks to support agricultural exports. IDAL estimates that national agricultural export sales increased by 16 per cent from 2001 to 2002, and that Lebanon has enjoyed a 30 per cent increase in revenue owing to the qualitative upgrading of agricultural exports and to conformity with foreign agro-food standards.

V. ENVIRONMENTAL STANDARDS AND THE TEXTILE AND GARMENT SECTOR IN THE ARAB REGION

The textile and garment sector has witnessed dramatic changes over the past decade. Trade in garments has expanded at a much faster rate than trade in textiles, and the direction of trade of these two industries is increasingly moving in opposite directions. While almost all clothing exports are destined for developed market economies, only half of global trade in textiles goes to these countries. Industrialized countries are therefore the major markets for clothing exports originating from developing countries. By contrast, demand for ready-made clothes in developing countries remains relatively low, and the industry continues to be highly protected. Consequently, consumer preferences and product regulations in industrialized countries are influencing the management and marketing of textiles and garments on an international scale. This is presenting new competitive challenges and opportunities for developing countries, particularly SMEs. This trend is reinforced by the fact that production processes have become increasingly globalized and specialized across companies and countries in order to overcome international competitive pressures. Changing global patterns of trade and market requirements can have significant impacts on enterprises that fail to adjust quickly to evolving conditions.

While the United States and the EU remain the largest markets for garments and other clothing commodities with a combined share of 73 per cent of the total global garments trade, apparel production centres are shifting in favour of countries with lower production costs and strategic geographic locations. Arab countries, particularly those in the Mediterranean region, have historically had these advantages owing to their comparatively low wage rates, indigenous production of some raw materials and proximity to the European market. However, this competitive advantage has proved vulnerable. The end of the Multifibre Agreement in 2004 and the accession of China into the WTO have heavily tilted the global balance of trade in favour of Asian exporters. Equally, a number of countries, including Mexico, Turkey and Ukraine, which have the advantage of minimal lead times, present tough competition for Arab exporters. Moreover, multinational corporations (MNCs) and industrialized countries are imposing more stringent environmental, health and safety requirements on textile and garment suppliers and on sub-contractors, which in turn are compelled either to increase production costs or to reduce short-term profit margins. Arab countries therefore have to identify ways of differentiating themselves from other manufacturers and of improving production efficiency if they are to remain competitive in the international market.

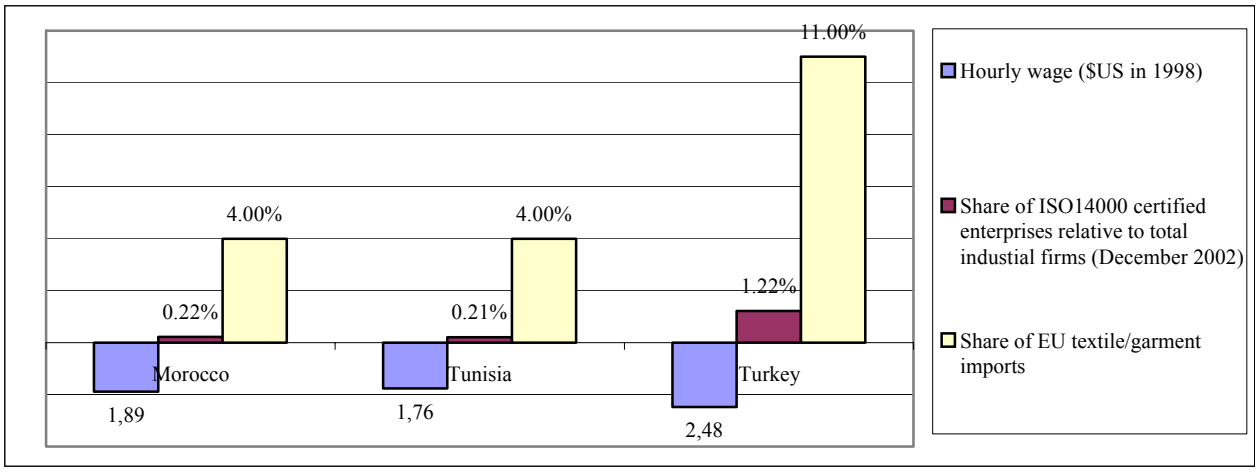
Production costs can be maintained or reduced through efficiency gains made possible by improvements in management, technology, labour productivity, input choices, waste reduction and economies of scale. These savings can offset additional costs that can result in the short term from adjustments or investments needed to improve environmental performance. While compliance with more stringent environmental requirements can be considered optional in some cases, producers are increasingly conscious that non-compliance with these requirements makes them less marketable to firms and consumers searching for safer and more environmentally friendly products. Indeed, in such markets, a price premium can even be secured to offset higher production costs and maintain competitiveness if conformity with higher environmental, health and safety standards is monitored and demonstrated.

For example, retailers in the United Kingdom have been found to base their purchasing decisions from source countries on a list of three main criteria, namely: delivery and reliability, quality, and price.[80] Other factors in descending order of importance are size standards, fashion and styling, fabric and fabrication, developed manufacturing base and exclusivity. While price remains important, it was not the sufficient factor in terms of securing export orders. Moreover, while any region could be seen as satisfactory on price, quality, technology, flexibility and responsiveness to small order quantities, purchasers were more interested in fostering business links with partners that exhibited favourable lead times and were responsive in terms of communication, trust, satisfaction of contractual obligations and compliance with environmental, health and safety standards.

[80] On a 10-point scale, delivery and reliability, and quality scored 9.2 and 9.0, respectively, while price was ranked third at 8.8.

Furthermore, trade figures show that countries complying with more stringent environmental regulations and standards are still able to access and remain competitive in foreign markets. Figure 10 below compares the hourly wage rate of Morocco, Tunisia and Turkey to their share of EU imports in the textile and garment sector. While Morocco and Tunisia have lower wages and are geographically closer to major EU markets, including France, Spain and the United Kingdom, Turkey's share in EU imports is nearly three times that of the other two countries. Furthermore, Turkey has the highest number of firms that are ISO 14000 certified, which can be used as an indication of corporate commitment to improving environmental management systems. This is in addition to the fact that Turkey is obliged to come into compliance with the acquis communautaire by virtue of its Customs Union with the EU and pursuant to its efforts to secure EU membership. Compliance with the environmental regulations set forth in the acquis is not required of Morocco and Tunisia. Consequently, despite the higher wages and the compliance with more stringent environmental, health and safety standards, Turkey has been able to remain more competitive than Morocco and Tunisia in the European market. This lesson has not been lost on textile and garment associations in Morocco or Tunisia, which are actively engaged in providing training and technical assistance to assist local manufacturers to improve their environmental performance.[81]

Figure 10. Comparison between manual labour costs, ISO 14000 certifications and shares



in the European market for Morocco, Tunisia and Turkey

Sources: K. Laraki, "Etude sur le commerce, l'environnement et la compétitivité des PME dans les industries du textile et de la confection en Afrique du Nord: cas de la pollution des eaux au Maroc" (METAP, the World Bank, BNPP and ESCWA, February 2004), which was based on data available at: europa.eu.int/comm/enterprise/textile/statistics.htm#time_labour_costs; and relevant statistics on ISO 14000, which are available at: www.iso.ch/iso/fr/iso9000-14000/iso14000/iso14000index.html.

Other Arab countries are becoming aware of the benefits to competitiveness that can be reaped from complying with stronger environmental performance. For example, in 1997 a very modest seven companies in Egypt were ISO 14000 certified; that number increased to 195 in 2004. While this still represents less than 1 per cent of industrial enterprises in Egypt, it shows that an increasing number of firms understand that effective environmental management systems can improve competitiveness and productivity. At the regional level, Jordan and the Syrian Arab Republic come in second and third place with 39 and 34 certified firms, respectively. Turkey currently has 240 certified firms, which represents more than 175 per cent increase

[81] For example, activities on clean production, environmental technology transfer, and trade and environment are being conducted by the Centre Technique du Textile-Habillement (CTTH) in Casablanca, Morocco. The CTTH website is available at: www.ctth.ma.

from the previous year. By contrast, in 2004, Japan was home to the highest ISO 14000 certified firms, at more than 13,400 companies; and Spain, Germany and the United States have 4,860, 4,144 and 3,553 certified firms, respectively.[82] Moreover, there is increasing understanding in the region regarding the opportunities presented by ecolabelling regimes and the benefits of establishing environmental codes of conduct. However, progress in these areas remains limited compared to engagement in environmental management certification systems, including those offered by ISO, and the Eco-Management and the Audit Scheme (EMAS) in the EU.

While evolving global patterns of trade and the internationalization of sourcing and outsourcing arrangements can lead to new opportunities for Arab textile and garment suppliers, there is a need to find whether SMEs are able to adapt to this changing environment. There is a particularly strong need to consider the implications of competitiveness and the effects of trade liberalization and environmental strengthening on SMEs, given their contribution in most Arab countries to employment, income generation and output. However, needs and policy responses can vary across the Arab region. For example, Tunisia has among the smallest companies in the sector with less than 50 employees per enterprise, compared to companies in Egypt, Morocco and the United Arab Emirates, which have on average 150 employees. However, the size of the companies in Egypt dropped by almost 18 per cent between 1995 and 2000, falling from 224 to 185 employees in the sector; and the opposite phenomenon was observed in Morocco where the size of textile and garment firms increased by almost 19 per cent during the same period. While the companies operating in the sector in Lebanon are small-scale with fewer than 50 employees, their counterparts in Jordan tend to be comparatively larger, reaching sometimes in excess of 250 workers. Consequently, policy responses need to depend on the scale and capacity of private enterprises to adjust to market changes, as well as the ability of public and private service providers to meet the needs of both large and small companies.

Moreover, while competitiveness in the textile and garment industry is characterized by the ability to deliver quickly value-added products and services along with higher environmental performance at a reasonable price, the ability to meet these criteria and negotiate satisfactory contracts is highly dependent on the power balance along the supply chain, which often puts smaller firms at a disadvantage. Furthermore, SMEs often do not have the capacity or the resources to make the necessary investments to improve environmental performance; nor do they have the economies of scale to satisfy large-scale orders that can require the delivery of multiple products and services simultaneously in order to secure higher profit margins. Additionally, SMEs tend to have insufficient capital to modernize their operations, and lack specialized employees who are able to innovate or accommodate rapidly new production or product requirements without external assistance. As such, SMEs are under considerable pressures to reduce costs, improve efficiency and find collaborative approaches aimed at satisfying client requirements in order to avoid loss of contracts to larger and lower-cost suppliers. In assessing the relationship between environmental standards and competitiveness it is therefore important to determine whether environmental requirements have different impacts on larger and smaller firms operating in the sector.

A. Environmental aspects of the production process

There are several steps involved in the production of textiles and garments, each of which varies according to the primary material being used during the production process. Each stage in the production process gives rise to particular types of waste and environmental impacts, which are briefly summarized below.[83]

(a) *Cotton-based garments*: These involve the cultivation and conversion of cotton into yarn. Pesticides, fertilizers and chemicals used during the production of raw cotton can adversely impact land and water resources, as well as leave traces in the finished product that can have implications for human health. The spinning of yarn is usually mechanized and generates significant noise. Fibres released during the

[82] International Organization for Standardization (ISO), *The ISO Survey of ISO 9001:2000 and ISO 14000 Certificates - 2003* (ISO, 2003), p. 7, which is available at: www.iso.org/iso/en/iso9000-14000/pdf/survey2003.pdf.

[83] For more information, see METAP MedPolicies Initiative "Background note on the environmental aspects of textile processing" (METAP and ESCWA, December 2004).

spinning process can have adverse effects for occupational health in the absence of appropriate ventilation systems. The sizing, scouring and bleaching of cotton fabric is often a water intensive process that generates wastewater effluents with high levels of biological oxygen demand (BOD) and suspended solids. Sized cloth, which is often referred to as grey goods, requires starching that must be subsequently removed during the finishing stage, thereby further contributing to BOD levels. Kier boiling, which is an alkaline heating process at high temperatures, is undertaken to remove natural waxes and impurities from fibres, which also results in the release of wet waste at high temperatures. The dyeing and printing of textiles prior to finishing releases high levels of BOD, chemicals and solids into waterways. In addition, certain dyes have been found to leach into groundwater or are absorbed by human skin, both of which constitute health hazards. Compliance with regulations and requirements concerning the appropriate use of dyes is therefore an integral component of production decisions;

(b) *Wool-based garments*: The production of garments from wool involves another set of processes. A significant amount of water effluent, BOD, grease and oils are generated during the scouring, dyeing, carding, fulling and washing process. While oils in the wool facilitate the cohesion of fibres, they have to be washed out of the cloth during the finishing phase. Detergents, bleaches and dyes used prior to fishing also release chemicals and other impurities into water systems. Dyes and treatments particular to wool finishing can equally react to human skin and cause allergies. However, the production of wool-based garments is not as prevalent in the Arab region as clothing made of cotton and synthetic fibers, and leather;

(c) *Garments from synthetic fibres*: Synthetic fibres have no natural impurities. Examples include polyester, acrylics, rayon, acetate and nylon. Normally, only light scouring and bleaching is required prior to dyeing and printing for synthetic cloth. These stages involve the release of chemicals and effluents. Polyester processing tends to release higher levels of BOD than other synthetics. Water proofing of synthetic fibers involve the use of oils and solvents that can also be released in wastewater. The advantage of synthetic materials is that they can be manufactured using the same types of machinery used for cotton or wool garment finishing.[84] However, this requires producers to consider the different waste streams that result from two different categories of inputs;

(d) *Leather-based garments*: The production of leather goods presents a variety of challenges for the environment and human health. The tanning process first requires treatment of the hide, which involves washing, soaking and dehairing, and the use of lime and salts for pickling and degreasing. Chromium-based compounds are commonly used during the tanning stage, after which dyes are applied to produce coloured leather products. Azo-dyes have traditionally been used. The resulting sludge waste contains heavy metals, volatile compounds, and high levels of BOD and total suspended solids.[85] Industrial wastewater effluent standards usually differentiate between effluents generated from leather garment production as compared to the production of other types of textiles and garments due to the sectors different waste characteristics.

Consequently, the environmental friendliness of a product cycle is based on some of the following factors: (a) quantities and qualities of dyes and chemicals used; (b) water and energy use efficiency rates; (c) the recycling, treatment and disposal of wastewater and solid wastes, including packaging; (d) pollution prevention mechanisms; and (e) compliance with user specifications with respect to the presence of harmful substances in the final product. The different cost structures and production characteristics of each product type influence the way in which environmental requirements impact each sub-sector and product line.

Moreover, the ways to address the impact of environmental considerations on trade and competitiveness differ between countries and companies, and depend on national regulations as well as the requirements of clients and customers. As such, it is increasingly common for MNCs, traders and exporters to apply uniform guidelines or codes of conduct with respect to their business operations in order to facilitate monitoring and management of production process. While these rules are voluntary, they are often more stringent than those required by regulations in some countries. Non-compliance with common guidelines

[84] For a more detailed review of waste generated by the textile industry, see N. Nemerow, *Industrial water pollution: origins, characteristics and treatment* (Addison-Wesley Publishing Company, 1978), pp. 310-325.

[85] Ibid., pp. 334-340.

can complicate production processes and increase production costs, particularly when manufacturers serve more than one client. The alternative of responding to the preferences of each client on an individual basis, however, is often inefficient. Consequently, compliance with international codes of conduct is often a prerequisite to securing contracts with large textile houses and a good way for companies to standardize the management of their production process.

B. ENVIRONMENTAL REQUIREMENTS AFFECTING THE TEXTILE AND GARMENT SECTOR

Environmental requirements affecting the textile and garment industry can be linked to a given product, process or disposal process; or it can pertain to users. Most countries impose regulatory limits on the presence of harmful substances in textiles and clothing. These include formaldehyde; fluorescent bleaching agents; softeners that can cause allergies; pesticide residues; antiseptics; mold inhibitors in cotton and in wool fiber, including pentachlorophenol (PCP); residues of heavy metals; and chemical treatments, including fire retardants.

The challenge facing manufacturers is that environmental, health and safety regulations are constantly evolving as new science and findings emerge concerning the potential positive or negative effects of different chemicals and chemical compounds. For example, stain repellents are a popular feature in clothes, particularly in shirts and trousers. They are equally commonly found in such home furnishings as curtains, carpets, bedspreads and upholstery. Perfluorooctane sulphonate (PFOS), which is a member of the fluorochemical family, was a common stain repellent used in manufacturing fabrics. In 2000, the Environmental Protection Agency in the United States determined that the chemical was toxic owing to its tendency to bioaccumulate in human and animal tissue, thereby posing risks to human health. The use of PFOS subsequently dropped dramatically and new formulations, including the more environmentally friendly nanotechnology-based treatments and the use of ultraviolet light, have since emerged to take its place. The ways in which environmental regulations drive market innovations and the importance of access to information regarding new industry developments is evident from this case, particularly given that nanotechnology-based treatments were first used in 1998 and were only commercialized in 2001. Similarly, Scotchguard, an established manufacturer of stain repellent in the United States since 1956, began to phase out its traditional product line that used florochemical polymers in 2000, and subsequently re-launched its brand in 2002 based on a reformulated chemical composition that is environmentally friendly.[86]

1. *Restricted substances*

Differences in environmental, health and safety regulations and requirements increase the cost of monitoring and managing conformity assessment procedures. Additionally, they pose challenges for companies seeking to work in a socially conscious and environmentally friendly way, particularly in the context of an international market that is increasingly concerned with health, fair trade and clean production.

In view of promoting more sustainable corporate business practices, the Business for Social Responsibility (BSR) launched an initiative in 2001 to compile a list of restricted substances in finished apparel products. The list was based on consultation with BSR members, industry leaders, public stakeholders and a worldwide review of legislation and regulations concerning the sector. This resulted in the release of a list of restricted substances, their limits and testing methods in January 2002.[87] The list was subsequently updated in May 2004 and includes a primary and supplementary list of restricted substances, in addition to a list of best practices identifying substances that are currently not regulated, but which are limited through voluntary restrictions adopted by some companies.[88] Table 6 catalogues the main restricted substances in the list by BSR in terms of their potential environmental and health effects.

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[86] Textile Intelligence, Performance Apparel Markets, "Stain protective apparel: consumers splash out on easy-care clothing," *Textiles Intelligence*, 4th Quarter (2004), p. 28.

[87] Business for Social Responsibility (BSR), "Restricted substances in apparel products: substances, limits, legislation and test methods" (BSR, 31 January 2002).

[88] Business for Social Responsibility (BSR), "Restricted substances list for substances in finished apparel products", Version 2 (BSR, May 2004), which is available at: www.bsr.org/rsl.

While BSR has identified substances that are or need to be restricted in the apparel sector, the organization has compiled the list for informational purposes only. BSR does not issue certificates demonstrating conformity with testing methods or limits. In the cases of companies wishing to demonstrate conformity with a set of regulatory or voluntary environmental measures, there is the option of adopting codes of conduct or pursuing certification under one of various ecolabelling or fair trade labelling schemes.

TABLE 6. ENVIRONMENTAL EFFECTS AND HEALTH RISKS OF RESTRICTED SUBSTANCES IN APPAREL PRODUCTS

Description	Environmental effects	Health risks
Azo-dyes	W	C
Sensitizing disperse dyes	W, S	A
Flame retardants	A, W	I,
Formaldehyde	A	C, A
Pentachlorophenol (PCP)	P, W	T
Organotin compounds (combines tin with organics)	A, W	E
Polyvinyl chloride (PVC)	P, T	T
Phthalates	A	O
Nickel	W, S	C, A
Metals, including antimony, arsenic, barium and selenium	W, S	V
Mercury	A, W, S	N, C
Cadmium	A, W, S	C
Lead	W, S	N, C, I, V
Chromium VI	W, S	C, A, S
Asbestos	A, W, S	C, O
Dioxins and furans	A, W, S, B, P	C, B
Pesticides	A, W, S	C, S

Key to abbreviations used in environmental effects	
A	Air pollution
B	Bioaccumulates
P	Environmentally persistent
S	Soil pollution
T	Results in toxic waste
W	Water pollution

Key to abbreviations used in health risks	
A	Allergic reaction
B	Bioaccumulates
C	Suspected carcinogenic amines
E	Endocrine disrupters
I	Immune system
N	Damaging to nervous system and brain
O	Suspected harmful to body organs
S	Corrosive to skin
T	Toxic
V	Various negative effects on human health

Source: Business for Social Responsibility (BSR), "Restricted substances in apparel products: implementation resources" (January 2002), which is available at: www.bsr.org/CRResources/Environment/RSLImplementationResources.pdf.

2. *Corporate codes of conduct*

Codes of conduct can serve a useful purpose for companies seeking to affirm their policy in such areas as environmental performance and social responsibility. Codes can be instituted by an individual firm or between trading partners. International codes of conduct have also been established to espouse principles that are commonly shared by various businesses, organizations and stakeholder groups. Codes of behaviour help to establish uniform policy guidelines aimed at supporting the management and monitoring of firm operations. Moreover, they can improve the image of the firm in the eyes of its clients by demonstrating commitment to a shared set of principles. This can in turn improve the marketability and competitiveness of the enterprise.

A code of conduct normally covers the following points:

(a) A statement of principles, which includes an explanation of the purpose of the code;

(b) Identification of the legal responsibilities, which generally establishes local standards or higher company standards and obligations;

(c) Employment considerations, which typically encompass a clear and detailed statement regarding wages, working hours, entitlements and deductions. Statements are also usually made regarding child labour, forced labour, disciplinary arrangements and workers freedom of association;

(d) Health, safety and welfare considerations, which establish management responsibilities, including first-aid, fire prevention and safety training. Some codes can become very detailed and set standards for occupational health, sanitary arrangements and canteens for staff;

(e) Environmental management guides, which establish policies on environmental performance and the control of the environmental impacts of business activities and response preparedness in the case of environmental accidents;

(f) Monitoring, inspection and assessment, which clearly establishes the party responsible for monitoring the code and reporting on implementation;

(g) Sanctions, which sets out what actions, if any, will be taken in cases of failures with regard to compliance with the listed measures.

While firms operating in any sector can adopt codes of conduct, they are more common among international firms operating in the textile and garment sector owing to general public awareness and concern regarding labour conditions and the environment. For example, the Clean Clothes Campaign established the Code of Labour Practices for the Apparel Industry Including Sportswear in 1998, which is based on the core labour standards espoused by the International Labour Organization as well as other standards.[89] Equally, the Apparel Industry Partnership Workplace Code of Conduct is an initiative in the United States that is supported by public and private sector partners, and that resulted in the establishment of the Fair Labor Association. The United Kingdom maintains a code of conduct with respect to its Ethical Trading Initiative. Furthermore, the proposed code of conduct for enterprises in the EU seeks to establish policies on the social and environmental behaviour of firms operating in developing countries. An important clause in the draft code states that "no company should profit from any competitive advantage resulting from disregarding basic labour laws and social and environmental standards" and, moreover, that there is "increasing evidence that corporate social responsibility is linked to good financial performance".[90]

Several international clothing and sportswear companies, including Gap, Nike and Reebok, have also instituted their own corporate codes of conduct that include provisions on the environment, wages and other occupational health and safety issues.[91] A sample environmental code of conduct is provided in box 2, which can help companies to formulate their own environmental policy guidelines.

Box 2. Sample environmental code of conduct for a firm

Environmental Policy Statement

THE COMPANY is a clothing manufacturer whose operational requirements include design, development, manufacture and the full range of support engineering services and maintenance. Manufacture can include various laundry processes. THE COMPANY recognizes its responsibilities for the environment and is committed to working towards minimizing the environmental impacts of its activities.

THE COMPANY accepts that it can only achieve its business objectives if the operational performance of its activities, along with the products it supplies, reflects the changing environmental priorities of the society it serves.

[89] Clean Clothes Campaign, "Code of labour practices for the apparel industry including sportswear" (February 1998), which is available at: www.cleanclothes.org/codes/ccccode.htm#ii.

[90] Committee on Development and Cooperation, "Report on EU standards for European enterprises operating in developing countries: towards a European code of conduct" (EC, 17 December 1998), which is available at: www.cleanclothes.org/codes/howit.htm.

[91] Clean Clothes Campaign, "Company codes of conduct", which is available at: www.codesofconduct.org/company.htm.

Where appropriate, THE COMPANY will endeavor to exceed the requirements of all relevant legislation.

THE COMPANY will work towards the prevention of pollution and improvement in environmental performance by:

- Working with its customers, suppliers and sub-contractors to minimize the impact of its operations on the environment;

Box 2 (*continued*)

- Conserving water, energy and natural resources;
- Reducing and, where possible, eliminating wastes, emissions and other nuisance produced by the company;
- Promoting the recycling and reuse of waste material and ensuring that the methods of disposal for unusable waste are appropriate;
- Minimizing the risks of environmental accidents and, in conjunction with the appropriate authorities, ensuring an emergency response capability to deal with accidental pollution.

It is the responsibility of all employees, visitors and contractors of THE COMPANY to fully support this policy through their active participation and cooperation. Failure in this respect can result in loss of employment or the cancellation of contracts.

This environmental policy will be displayed at all COMPANY sites and may be distributed to all interested parties.

Signed

Managing Director

Date

3. *Fair trade and social labels*

While codes of conduct usually establish principles and policies that a firm has decided to follow, it does not certify compliance with a set of internationally recognized standards. Consequently, labelling regimes offer a more aggressive alternative for companies that seek to demonstrate conformity with certain requirements. Fair trade and social labels tend to focus on minimum wages and human rights issues related to the organization of labour. For example, Worldwide Responsible Apparel Production (WRAP) offers a global labelling scheme on workers rights. While some of these regimes also incorporate requirements regarding occupational health and safety as well as environmental performance, most focus on ethical issues related to the workplace.

4. *Ecolabelling*

Ecolabels provide information and certification on those goods that are produced in an environmentally friendly way. The criteria related to issuing ecolabels depend on the type of certificate. Typically, they ascertain to various extents the health effects of a final product, including the absence of carcinogenic azo-dyes, allergenic dyes, fire retardants and heavy metals; the environmental soundness of the production process, including wastewater disposal and air pollution; and the absence of such chemicals as bleaches, detergents, formaldehyde, pesticides and dyes. Within the context of the production of garments, both the fabric and such accessories as zippers, buttons and curtain hooks need to comply with environmental requirements.

While ecolabelling is voluntary in nature, it remains market-based instrument owing to the choice it provides to consumers and the niche market opportunities it offers to producers. The EU and several of its

member countries have instituted ecolabelling schemes that establish rigid standards for textile products. For example, in March 1992, the EC instituted a region-wide ecolabelling programme, namely, Ecolabel, which aimed at promoting the design, production, marketing and use of products with a reduced environmental impact during their entire life cycle; and at providing consumers with better information with regard to the environmental impact of products. In April 1996, the EC established its ecological criteria for the award of the Ecolabel to T-shirts and bed linen. Other ecolabelling programmes in Europe are national, with such examples as the Nordic Swan and Bra Miljöval in the Scandinavian countries that award ecolabels for textiles; are run by NGOs, including the Good Environmental Choice in Sweden; or are privately operated programmes that are managed by textile certification institutions with a worldwide application, including the Oeko-Tex Standard 100 and Toxproof in Germany.

Additionally, some companies have instituted their own self-certified environmental friendly production lines.[92] However, these are not considered ecolabels; rather, they are marketing instruments and brand names that are used by manufacturers to convey environmental messages and increase competitiveness in niche markets, thereby securing a price premium.

(a) *Organic cotton for cotton-based textiles*

Cotton is the world's most important natural fibre and represents the main input in the manufacture of cotton textiles and garments. Moreover, it is cultivated in some 80 countries, and its cultivation and processing impose significant burdens on the environment. Specifically, cotton is among the most pesticide-intensive crops, which has encouraged some farmers to depend on herbicides for its production. Many of these chemicals are highly toxic and carcinogenic organochlorine compounds that, furthermore, tend to bioaccumulate in the soil, the environment and human skin, thereby augmenting risks to human health for workers and end users. In a deliberate effort aimed at reducing human exposure to pesticides and other chemicals, genetically modified cotton is being grown in several countries, including Brazil and India. However, such cultivation has caused a commotion in the environmental community and among biosafety experts owing to the ease with which genetically modified cotton cross-pollinates with natural cotton, and its tendency to overrun traditional cotton fields.[93]

Organic cotton is produced without the use of chemical fertilizers, pesticides, growth hormones, defoliants or genetically modified seeds. The term relates to the cultivation of cotton and not to its processing. Only cotton that has been inspected and certified in accordance with strict definitions by an accredited institution, including, for example, IFOAM, is entitled to carry an organic label. Integrated pest management and other organic production methods are ways to reduce the use of pesticides and chemicals during cotton cultivation, and to secure organic labels for cotton used for textile and garment production.

Egypt is renowned for its cotton. Until recently, raw cotton was the main cash crop of that country and contributed the largest share of national exports. However, this export share has dwinded over the past two decades due to the emergence of new markets producing cotton for export and to the fall in the global price of cotton. Efforts aimed at increasing agricultural productivity and output through the use of pesticides have proven ineffective. There is a common misconception among farmers that the application of additional pesticides can increase productivity and output, when the contrary is actually the case.

In the 20 years following the opening of the Aswan High Dam, pesticide use in cotton cultivation increased dramatically, while average cotton yield remained stable at approximately 900 kg per acre. However, the adverse effects related to the over application of pesticides was felt in other economic sectors in Egypt, including aquaculture and fisheries along the Nile River where pesticides were detected in fish catches. The Government has since encouraged the cultivation of organic cotton, which can reduce domestic

[92] Within that context, examples include Steilmann, Otto Versand, Hess Natur and Green Cotton.

[93] See, for example, OsterDowJones Commodity Wire, "Regulation: Brazil govt body allows 1 per cent GMO contamination on cotton seed lots" (18 November 2004), as posted on the European NGO Network on Genetic Engineering (GENET), which is available at: www.gene.ch/genet/2004/Nov/msg00073.html.

environmental impacts and secure a price premium in international markets seeking organically certified cotton for the manufacture of textiles and knitwear.

A success story resulted with the adoption of biodynamic methods of pest control based on the use of pheromones. By 1999, nearly 80 per cent of areas cultivated by cotton had used this method. The result was an increase in the average yield of raw cotton by nearly 30 per cent to 1,220 kg per acre. The Centre for Organic Agriculture in Egypt operates an inspection and certification scheme according to the EU Regulation 2092/91 on the labelling of organic cotton; and is accredited by the Ministry of Agriculture in Egypt following support provided by IFOM and the Egyptian Biodynamic Association (EBDA). This organic cotton has been sold in various countries, including Switzerland and the United States. Moreover, certified organic cotton can secure prices of 1.5 to 2 times above non-organic cotton price levels.[94] More than 150 local cotton farmers have switched to organically certified production methods, which has boosted competitiveness and productivity in the sector.[95] This experience provides an opportunity to transfer lessons learned to other cotton and textile/garment producers in the region, particularly Sudan and the Syrian Arab Republic.

C. ASSESSING THE COST OF COMPLIANCE WITH REGULATIONS GOVERNING AZO-DYES

Azo-dyes are a class of synthetic dyes used as coloring agents in the textile and leather industries. They represent more than 65 per cent of synthetic colorants and in excess of 3,000 types of azo colorants are commonly used in the industry due to their effectiveness in retaining colour. However, products containing certain azo-dyes have been found to release arylamines that pose cancer risks. Consequently, legislation banning the use of carcinogenic azo-dyes has been adopted in several countries.

Germany and the Netherlands were among the first countries in Europe to enact legislation restricting the use of these substances in 1994 and 1996, respectively. India was ahead of most countries regarding compliance with some azo-dye regulations by banning the use of 112 azo-dyes in 1986. However, this ban in India did not include all azo-dyes that were subsequently banned in Europe and was first legislated under national laws on the protection of the environment, given the implications that azo-dyes pose for the treatment of wastewater effluent.[96] By contrast, the initial ban in Germany was instituted as part of a national consumer protection policy. Amendments to the German consumer protection law issued in 1995, 1996 and 1997, strengthened the prohibition on azo-dyes. Currently, fines are imposed on importers for non-compliance with the regulation, and the offending products are summarily incinerated.[97] There are similar regulations banning the use of azo-dyes in the United States.

In 2002, the EC banned the use of certain azo-dyes found to be carcinogenic and called on all EU member countries to adopt common rules on azo colorants by 11 September 2003.[98] An extensive risk assessment commission by the EC on azo-dyes highlighted the toxicity of certain azo-dyes to fish and other aquatic organisms. This assessment underscored two prominent findings, namely, that azo-dyes biodegrade slowly; and that harmful releases into wastewater during dyeing processes are unavoidable. Subsequently,

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[94] International Trade Centre, "Product profile: cotton and fibre", which was presented at the Third United Nations Conference on the Least Developed Countries (Brussels, 16 May 2001), and which is available at: www.intracen.org/bsrt/ppcotton.pdf.

[95] K. Merckens, "Application of biodynamic methods in the Egyptian cotton sector," (Egyptian Biodynamic Association (EBDA), Cairo, 2000), which is available at: www.un.org/esa/sustdev/mgroups/success/SARD-27.htm.

[96] In India, azo-dyes were first banned in the Union Ministry of Environment and Forest under section 6(2)(d) of the Environment (Protection) Act of 1986, which should be read with Rule 13 of the Environment (Protection) Rules of 1986. See Gujarat Pollution Control Board, India, *Environmental Protection Act* (1986), which is available at: gpcb.gov.in/publctn2.asp.

[97] The Second Amendment to the Consumer Protection Act of 1994 in Germany prohibited the use of azo-dyes. See "Barriers and related measures", which is available at: www.tradeandenvironment.com/files/unilateral/Unilateralismpart4.pdf.

[98] See the European Commission Directive 2002/61/EC, which is the 19th amendment of Directive 76/769/EEC. More information is available at: www.cbi.nl.

the Commission Directive 2003/03/EC of 3 January 2003 was issued to prohibit the marketing of azo-dyes and the use of chromate-based azo-dyes by 30 June 2004. This effectively led to a region-wide ban on the presence of azo-dyes in processed textile and leather products, including imported goods.

While safe alternatives to azo-dyes do exist, these alternatives are typically more expensive by a factor of 30-60 per cent. Additionally, azo-dyes tend to represent 15-25 per cent of production costs for the dyeing industry. Textile and leather manufacturers have therefore expressed concern that azo-dye bans could adversely impact the cost of their inputs and their export competitiveness. These concerns persuaded the METAP MedPolicies Initiative to conduct an assessment in several Arab countries regarding the impact that azo-dye restrictions could have on output and exports. Some of those findings are presented below.

1. *The impact of restricting the use of azo-dyes in leather products in Jordan*[99]

The Jordan Tanning Company (JTC), which was established in 1957, enjoyed a monopoly on leather importing, tanning, and finishing in that country until recently. Moreover, JTC was the sole source of tanned leather for local manufacturers of leather products. It produced leather goods for the Armed Forces in Jordan; and exported its products to both the Arab region, particularly Iraq, and to Turkey and Italy, which are the world's top producers of leather goods, as well as to France.

In 2002, this monopoly status was removed, thereby resulting in increased leather imports for domestic producers mainly from the Syrian Arab Republic and Turkey. JTC sales dropped by 27 per cent and exports fell by 45 per cent, representing a drop from $1.69 million in 2001 to below $1 million.[100] While JTC remains the only domestic source for tanned and dyed leather in Jordan, the situation left the company struggling to find ways to improve its competitiveness.

Growing awareness concerning the impending EU ban on the use of carcinogenic azo-dyes and consultations with a dye supplier in Germany led the company to seek out a plan to improve the quality and marketability of its products by adopting more environmentally friendly production methods. While Jordan does not regulate the use of azo-dyes, the company took a proactive step to substitute its use of these colorants with alternative dyes in 2001, in anticipation of the EU ban.

At first, the environmental policy change was viewed with hesitation. Dyes at JTC are used in the treatment of raw hides to produce leather as well as during the re-tanning, dyeing and fat-liquoring stages when colouring leather. Pigments are also used during the finishing stage by spraying to mask small defects in the material and to protect final product quality.[101] However, an assessment of the costs and impacts of switching from the use of carcinogenic azo-dyes reveals that the company made the right decision.

In 2001, JTC used azo-dyes worth a total of $31,120; total production costs were $5,561,906; and total sales were $6,154,130. Consequently azo-dyes accounted for less than 1 per cent of total production costs, at 0.56 per cent, while net profits were approximately 10 per cent. Common sense suggests that as long as alternative dyes exist whose use is not substantially more expensive than using azo-dyes, a ban on the use of azo-dyes would have little effect on a company's costs of production and profitability. Indeed, while alternative dyes are estimated to cost 35 per cent more than azo-dyes for the industry, the cost of switching to alternative inputs increases total production costs by a modest 0.2 per cent.

In the case of JTC, switching from azo-dyes to more environmentally friendly alternatives was found to reduce production by some 0.2 per cent in the short term, representing approximately $12,000 in lost sales. However, this estimated decline in production was projected to be offset in the longer term as the company became familiar with the use of alternative dyes, and as efficiency improvements were achieved. For

[99] This sub-section is based on a policy note prepared by Y. Abeda within the framework of the METAP MedPolicies Initiative, entitled "The impact of environmental regulations on trade: the case of the EU Ban on azo-dyes on Jordanian leather exports" (METAP and ESCWA, June 2003).

[100] Ibid., pp. 11-12, as cited in Jordan Tanning Company (JTC), *Annual Report and Statement 2001*.

[101] Ibid., as reported by the Commercial Manager, Jordan Tanning Company (JTC) in March 2003.

example, if the same amount of dyed product could be produced using less alternative dyes, which represent a 30 per cent cost savings, the loss in output would be only 0.16 per cent.

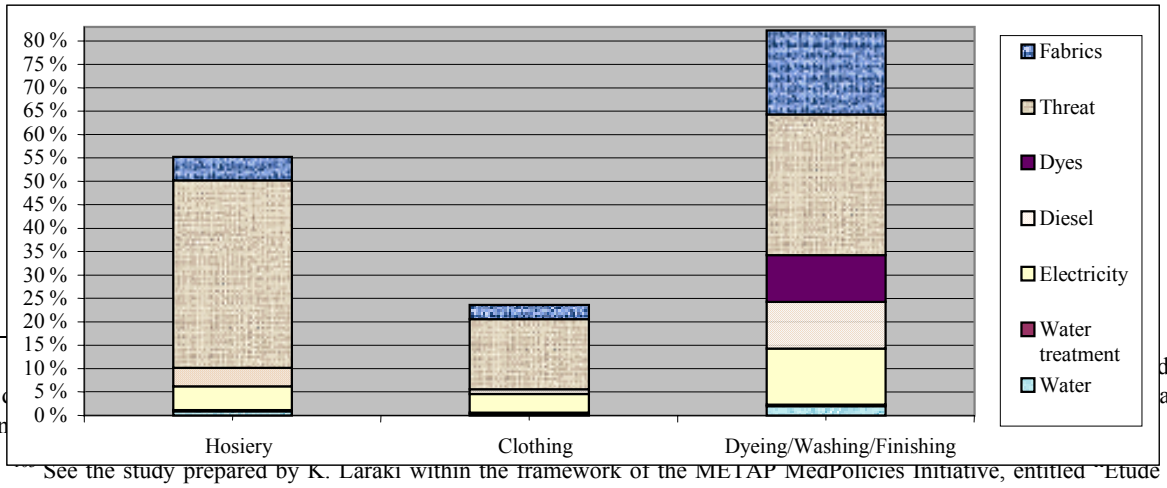
Moreover, with regard to exports, foreign markets in 2001 represented some 15 per cent of total company sales. If the full reduction in output came at the expense of exports, a ban on the use of azo-dyes could reduce exports by only 1.5 per cent, or approximately $12,200 in the short-term. Furthermore, the reality of the regulatory environment in the EU and in other industrialized economies could soon require goods to be produced in the absence of such dyes. Accordingly, non-compliance with the requirement could eventually lead to full loss of export sales (100 per cent impact), rather than a mitigated loss of 1.5 per cent. As efficiency gains are achieved, so too are losses alleviated. As such, the impact of restricting the use of azo-dyes on the company has a very modest negative effect on exports in the short run, and offers the potential to access new markets and increase exports over time.

2. *Implications for the textile/garment sector in Morocco, particularly SMEs*

The textile and garment sector in Morocco is heavily dependent on exports to Europe. While Morocco represents only 4 per cent of European garment imports, Europe accounts for more than 70 per cent of Moroccan exports in that sector. These exports to Europe are threatened by competition from garment exports from other countries, particularly China, India and Turkey, as well as by compliance with new environmental regulations and requirements being imposed by European importers. Within that context, exports from China and India to Europe have already adopted measures to come into compliance with the azo-dye regulations by the EC, which is demonstrated by increasing garment exports from those two countries to the European market, particularly in the wake of the Multifibre Agreement of 2004.

Morocco has not adopted regulations restricting the use of azo-dyes. The line ministries responsible for the environment, industry and trade collaborated with the Technical Centre for Textiles and Garments (CTTH) within the Moroccan Association of the Textile and Garment Industries (AMITH) to conduct a series of studies on the impact of environmental regulations on the export competitiveness of the textile and garment sector. This included a preliminary assessment by CTTH,[102] in addition to a subsequent survey of firms and detailed analysis to determine empirically the impact of azo-dye restrictions and wastewater effluent standards on the industry (see figures 11 and 12).[103] Special attention was paid on the potential impact on SMEs, particularly given that SMEs account for 20 per cent of textile and garment companies and 33 per cent of industrial exports in Morocco.

Figure 11. Principle factors and costs of production (excluding labour and other factors) as a percentage of total production costs for three textile/garment sub-sectors in Morocco

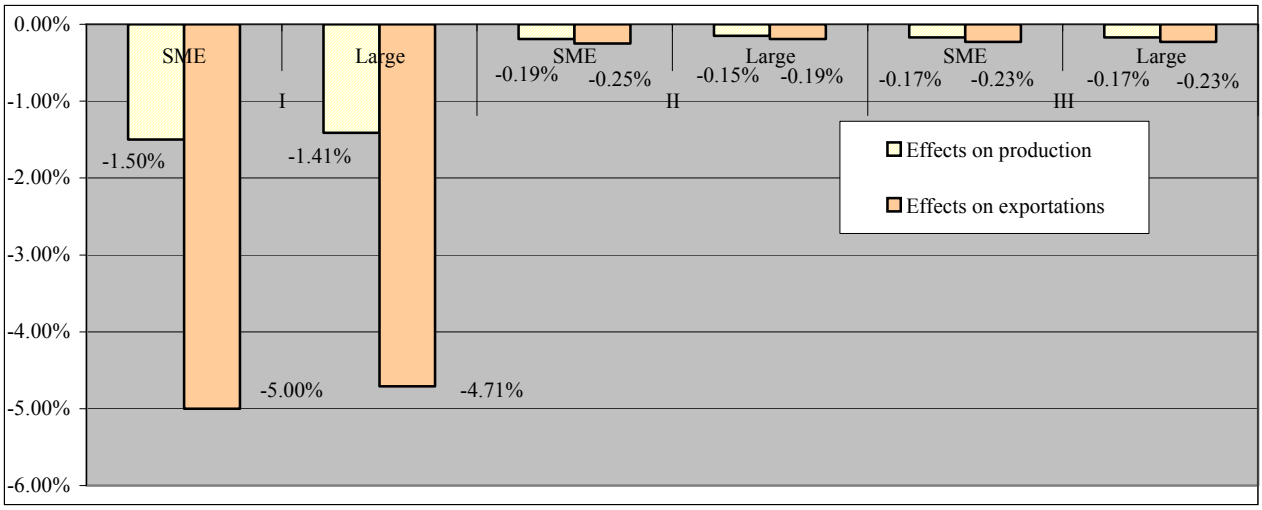


[102] See the study prepared by K. Laraki within the framework of the METAP MedPolicies Initiative, entitled "Etude sur le commerce, l'environnement et la compétitivité des PME dans les industries du textile et de la confection en Afrique du Nord: cas de la pollution des eaux au Maroc" (the World Bank, METAP and ESCWA, and Bank-Netherlands Partnership Programme (BNPP), February 2004).

Source: K. Laraki, "Etude sur le commerce, l'environnement et la compétitivité des PME dans les industries du textile et de la confection en Afrique du Nord: cas de la pollution des eaux au Maroc" (METAP, the World Bank, BNPP and ESCWA, February 2004).

The analysis reveals some important findings, which are illustrated in figure 12 below. First, the ban on the use of azo-dyes could have the greatest effect on the dyeing/washing/finishing sub-sector. The impact on output is -1.5 per cent, while the impact on exports could reach -5 per cent. The impact on the hosiery and clothing sectors is marginal, and is therefore not projected to impact the competitiveness of those industries. This is particularly important for Morocco given that most of its exports in the sector come from the clothing industry. Secondly, the findings reveal that in the case of azo-dye restrictions, there is little actual difference between SMEs and large firms. Consequently, policy measures and technical assistance programmes aimed at facilitating compliance with a ban on azo-dyes need not necessarily be differentiated according to the scale of the enterprise.

Figure 12. Effects of removing the prohibited azo-dyes on the production and exports by branch and size of company (simple case)



Source: K. Laraki, "Etude sur le commerce, l'environnement et la compétitivité des PME dans les industries du textile et de la confection en Afrique du Nord: cas de la pollution des eaux au Maroc" (METAP, the World Bank, BNPP and ESCWA, February 2004).

The findings in figure 12 do not take into account efficiency gains that firms will be able to generate as they become more familiar with the use of azo-dye substitutes. While efficiency gains of 10 per cent can usually be achieved without major difficulties, it is expected that experience quickly gained from using substitute dyes and training programmes provided by such business associations as CTTH can help companies to achieve efficiency gains of approximately 20 per cent. These efficiency gains can reduce the effects on SMEs in the dyeing/washing/finishing branch to -1.2 per cent for production and -4 per cent for exports; and can translate into reductions of production and export impacts at, respectively, -0.15 per cent and -0.20 per cent for hosiery, and -0.14 per cent and -0.19 per cent for the clothing industry. Moreover, efficiency gains in larger firms could further mitigate adverse impacts to output and exports. On the other hand, non-compliance with the regulations banning the use of azo-dyes in the EU, the United States and other industrialized markets could result in a 100 per cent loss of exports.

Accordingly, compliance with the ban on azo-dyes can be addressed by sensitizing the industry in terms of the requirements, and by facilitating information and access to alternative colorants in the local market. Technical assistance needs to be directed towards assisting the dyeing/washing/finishing sector, particularly those firms that are engaged in exports. Policy or programme support need not differentiate between SMEs and large firms, given that both are set to be subject to similar effects on production and exports caused by the restrictions. The effect of the azo-dye restriction is therefore expected to be minimal for the competitiveness of the Moroccan textile and garment sector.

D. ASSESSING THE COST OF COMPLIANCE WITH DOMESTIC WASTEWATER STANDARDS

Textile and garment production of cotton and leather-based products is a water-intensive process that results in the release of polluted effluents. Environmental problems associated with wastewater effluent from the sector are common in most countries in the region. Textile and leather producers in Egypt release untreated wastewater into the Nile River, which affects downstream users. This led to extensive negotiations and the ultimate agreement to relocate a cluster of tanneries from Misr Al Khadima in Cairo to Badr City, a satellite community outside the capital, thereby reducing the negative effects of the industry on the Nile River. The cost of the resettlement is to be paid for by the proceeds of a land trust, which has been established to collect and redistribute rent from the land where the tanners were based. This course of action was adopted given that most of these local tanners are small, family-owned business in the informal sector that typically do not possess the financial resources to cover the cost of the resettlement themselves.[104] In the Syrian Arab Republic, more than 100 textile dye houses in Aleppo pollute local waterways. Additionally, the tannery industry in Aleppo produces 23,000 tons of raw hides annually, and release untreated chromium salts and animal by-product wastes into local water systems, namely the Quaiq River. Chromium pollution loads in the River exceeds WHO health guidelines and is fully attributable to effluent from local tannery and leather finishing establishments.[105] In addition to generating health costs and causing environmental degradation, this situation has prevented the River from being used for other productive purposes. Wastewater effluent standards are a tool for mitigating these environmental problems.

1. *The impact of wastewater standards for SMEs in the textile and garment*

[104] For more information, see METAP MedPolicies Initiative, "Environment and trade relationships affecting the tanned leather industry in Cairo", *Trade, Environment and International Competitiveness in the Mediterranean Region: Selected Case Studies* (HIID, 2000), pp. 108-130.

[105] Tebodin Consultants and Engineers, "Industrial pollution control: Syria" (the World Bank, June 1997), p. 32.

sector in Morocco

The region-wide challenge of managing wastewater generated by the textile and garment industry prompted the METAP MedPolicies Initiative to assess the impact of proposed wastewater effluent standards on small and medium-sized textile and garment firms operating in Morocco as a case study for the region. The preparation of the study was a collaborative effort in that it brought together stakeholders from relevant ministries, business associations, private firms and Lydec, which is the private company entrusted with the management and treatment of wastewater in Casablanca, Morocco. The findings are based on information collected during the above-mentioned survey of firms that supported the assessment of the cost of compliance with azo-dye restrictions.

The law on water in Morocco provides parameters for controlling industrial wastewater discharges. While the law dates back to 1995, its associated regulations have not yet been adopted. In the interim, private-public partnerships have been established in various industrial poles throughout Morocco to provide water and wastewater services on behalf of the Government. Lydec, which was contracted to provide these services in Casablanca, Morocco, faces substantial challenges in terms of managing wastewater that is emitted by more than 2,000 industrial units linked to a sewage network stretching 3,700 km. The network operates at over-capacity and the saturation of sewers often results in floods during heavy rains. Water treatment facilities are in limited supply and are unable to handle high levels of pollution intensity or treat certain chemical pollutants. Lydec has therefore been actively seeking to assist industrialists to comply with a set of voluntary wastewater discharge standards applicable to the Casablanca region in order to reduce the stress on wastewater infrastructure and reduce pollution released along the Atlantic coast. The voluntary standards are based on those under consideration by the Government for the release of effluents into the water bodies (direct releases) or into sewage networks (indirect releases). Within that context, the standards by Lydec are most closely correlated to the draft national standards for indirect releases. These effluent standards are elaborated in table 7. However, the company does not have the regulatory authority to require compliance or penalize companies that do not comply with the standards.

TABLE 7. COMPARATIVE WASTEWATER STANDARDS FOR MOROCCO (NATIONAL), CASABLANCA AND FRANCE

	Draft Moroccan Direct Value Limits	Draft Moroccan Indirect Value Limits	Lydec standards for Casablanca	Untreated sewage water levels	National standards in France

Temperature	30° C	35° C	30° C	-	30° C
PH	6.5-8.5	6.5-8.5	5.5-8.5	-	5.5-8.5
Total suspended solids (mg/l)	50	600	500	200-600	100
Azote Kjeldahl (mg/l)	30	-	150-200	10-85	30
Total phosphorus (mg/l)	10	10	-	4-50	10
COD (mg/l)	500	1000	1200	200-900	300
BOD (mg/l)	100	500	500	100-400	100

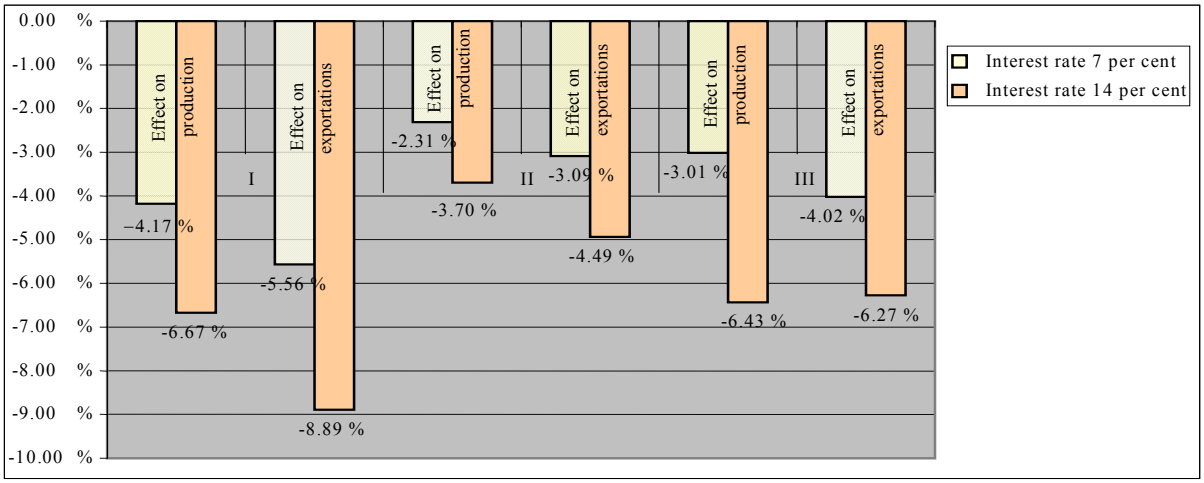
Source: S. Chenguiti, "Cahier des charges de la Lydec - gestion des rejets industriels à Casablanca" (December 2003).

While some large-scale manufacturers in Casablanca and around Rabat have wastewater treatment facilities, none of the SMEs surveyed for the study treat their own wastewater effluents. An assessment was therefore undertaken to explore the cost of investing and operating an end-of-pipe water treatment facility for the pollution loads emitted by the three major sub-sectors in Morocco, namely, hosiery, the clothing industry and the dyeing/washing/finishing sub-sector. Scenarios for two levels of investment were generated, principally one for a small treatment facility costing some $116,000; and another for a larger facility costing $694,000 to treat 500 cubic metres per hour (m^3/h), which could meet the standards more comprehensively.[106] In order to consider policy measures that could provide instruments for supporting investments in wastewater treatment, the average Moroccan interest rate of 14 per cent was used as a baseline. As an additional analytical tool, a comparative assessment was provided with that interest rate reduced to 7 per cent.

The magnitude of the impact on output and exports for SMEs investing in wastewater treatment stations in the three sub-sectors is illustrated in figure 13. The dyeing/washing/finishing sub-sector was forecast to suffer the most if the firms operating in that sub-sector were to invest in the larger treatment facility and pay 14 per cent interest over a seven-year period. Specifically, the negative impact was estimated at -6.7 per cent on production and -8.9 per cent on exports for the sub-sector. SMEs operating in the clothing industry were projected to suffer the second largest impact, with -6.4 per cent and -6.3 per cent impacts on output and exports, respectively, under the same investment conditions. Additionally, the analysis revealed, through a comparison with large-scale companies, that the impact of investing in wastewater treatment facilities for SMEs was greater than that for larger companies, particularly in the dyeing/washing/finishing sub-sector. However, it is possible for economies of scale to be generated if a cluster of SMEs working in the same geographic area and the same sector were to pool their resources together and invest in a shared water treatment plant. Such an initiative requires clarity and agreement regarding the roles and responsibilities of each member of the cluster, thereby ensuring the effective management and operation of the installed facility.

Figure 13. Variation of the impact of installing a water treatment station for SMEs in the textile and garment sector according to the interest rate for an investment of $694,000 (simple case)

[106] In the national currency of Morrocco, these two levels of investments were given as 1 million and 6 million dirhams, respectively. These estimates were provided by Proviro Technologies, which is a company that is specialized in the supply and installation of industrial wastewater treatment stations in Casablanca, Morocco.



Source: K. Laraki, "Etude sur le commerce, l'environnement et la compétitivité des PME dans les industries du textile et de la confection en Afrique du Nord: cas de la pollution des eaux au Maroc" (METAP, the World Bank, BNPP and ESCWA, February 2004).

Figure 13 also shows that a fall in the interest rate from 14 per cent to 7 per cent owing, for example, to a subsidy makes it possible to mitigate substantially the negative effects on production and exports. An investment at this lower interest rate was projected to reduce the impact by approximately 25 per cent for SMEs operating in the three sub-sectors. Given the generally poor access to finance by SMEs and their cash flow problems, decision-makers seeking to encourage cleaner production must therefore seek to formulate credible policy options aimed at reducing rates and facilitating access to credit for SMEs in the sector. Moreover, even if the investment scenario of $694,000 can be justified on strictly technical terms, it is important to recognize that such an investment accounts for 50 per cent of the annual sales turnover of the surveyed SME in the dyeing/washing/finishing branch, and 28 per cent and 36 per cent for hosiery and the clothing industries, respectively. This makes it all the more relevant to consider policy options for mitigating the high interest rates.

Alternatively, limited financial resources could encourage SMEs in the textile and garment sector to invest in the smaller treatment facility, particularly in certain sub-sectors where less sophisticated treatment methods could be sufficient to meet industrial wastewater discharge standards. In addition to the initial investment costs, the expense of managing and operating a smaller facility was found to be approximately one-third of that needed for a larger facility (see figures 14 to 16, which compare the different levels of investment). Typically, a smaller treatment facility was estimated to decrease the impact on exports and production of the three branches by approximately 50 per cent, compared to the larger facility. For example, SMEs in the dyeing/washing/finishing sub-sector that invested in the smaller facility were projected to reduce output by a modest -3 per cent in the short term, compared to -6.5 per cent in the case of investments in the larger facility; and exports, in turn, could fall by -4.5 per cent, instead of by -9 per cent.

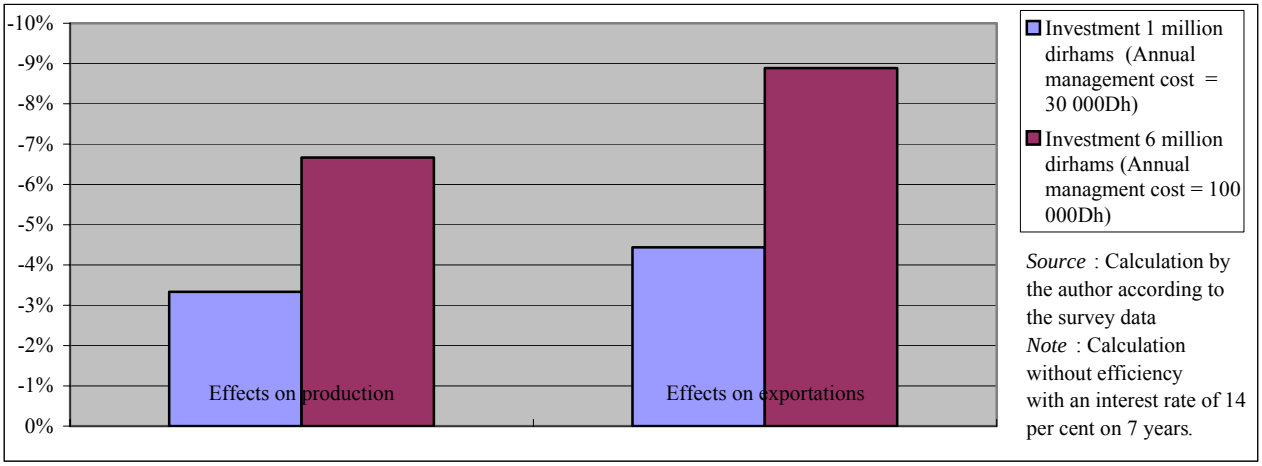
It is important to note that these findings reflect the simple case. They do not take into consideration the efficiency gains that are likely to be generated as firms become more familiar with the use and operations of a water treatment facility; and additional gains that can be achieved as business owners begin to consider other complementary measures to reduce effluents levels and pollution load intensity, including, for example, by recycling or using alternative and less polluting chemicals. Price premiums that can be accorded by MNCs seeking to work with companies more respectful of the environment are also not incorporated into these findings, particularly given that some MNCs will be willing to pay more for local companies that are engaged in cleaner production methods. Moreover, conformity with wastewater discharge standards could be a step towards securing ISO 14000 certification or ecolabels that certify sound environmental management. These types of certification offer the potential to facilitate access to new or niche markets in the textile and garment sector, thereby enhancing the competitiveness of local SMEs.

Consequently, in the case of SMEs operating in the textile and garment sector, it is useful to explore the following: (a) more modest investment scenarios for SMEs; (b) the possibility of establishing clusters of companies sharing common interests and promoting collective action to address wastewater management problems; and (c) the provision of subsidies aimed at encouraging investments in water treatment facilities

and cleaner production methods, which in turn can reduce the strain on sewage networks and facilitate access to environmental management certificates and new potential markets.

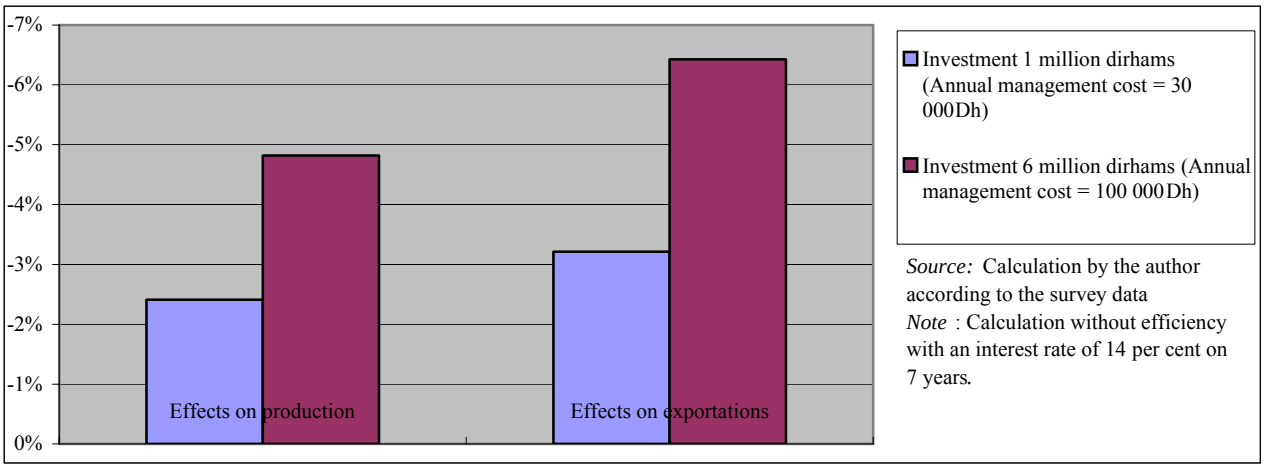
Furthermore, a comparison of the potential effects on textile and garment SMEs in Morocco, which are seeking to comply with environmental standards related to azo-dyes and wastewater effluent, reveals that clean production methods is more suitable and cheaper than end-of-pipe solutions.

Figure 14. Impact of investment in a wastewater treatment station according to the level of investment for SMEs in the dyeing/washing/finishing sub-sector



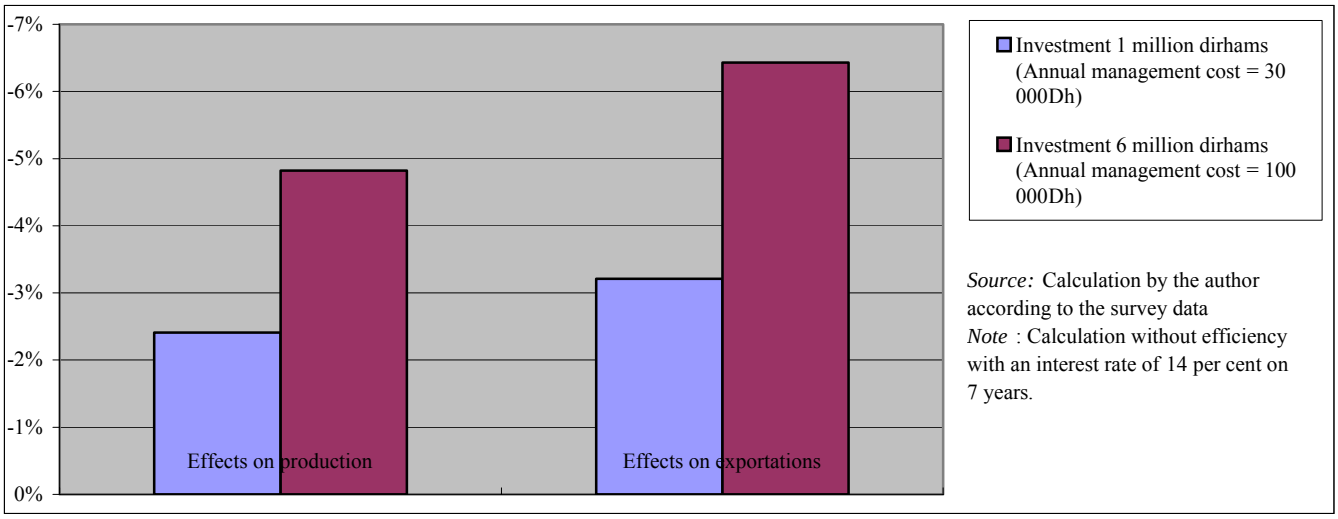
Source: K. Laraki, "Etude sur le commerce, l'environnement et la compétitivité des PME dans les industries du textile et de la confection en Afrique du Nord: cas de la pollution des eaux au Maroc" (METAP, the World Bank, BNPP and ESCWA, February 2004).

Figure 15. Impact of investment in a wastewater treatment station according to the level of investment for SMEs in the hosiery sub-sector



Source: K. Laraki, "Etude sur le commerce, l'environnement et la compétitivité des PME dans les industries du textile et de la confection en Afrique du Nord: cas de la pollution des eaux au Maroc" (METAP, the World Bank, BNPP and ESCWA, February 2004).

Figure 16. Impact of investment in a wastewater treatment station according to the level of investment for SMEs in the clothing sub-sector



Source: K. Laraki, "Etude sur le commerce, l'environnement et la compétitivité des PME dans les industries du textile et de la confection en Afrique du Nord: cas de la pollution des eaux au Maroc" (METAP, the World Bank, BNPP and ESCWA, February 2004).

VI. CONCLUSION

The relationship between environmental standards and competitiveness is complicated. Some analysts consider compliance with environmental requirements as an additional burden, which increases production costs and harms the competitiveness of firms and industrial sectors, particularly those engaged in international trade. Others consider environmental standards a mechanism for improving production efficiency and reducing adverse impacts on the environment where the costs of environmental degradation are paid by society as a whole. This study provides examples where conformity with environmental standards increases costs and reduces exports, as well as other cases where the cost of conformity with environmental, health and safety standards is minimal and where improvement in environmental performance provides opportunities for increasing competitiveness, accessing new markets and improving environmental quality. The question as to whether there is a positive or negative relationship between environmental standards and competitiveness therefore largely depends on the perspective of the policymaker. However, the lesson that can be learned both from this report and from studies conducted under the auspices of the METAP MedPolicies Initiative is not so much that opportunities and challenges exist, rather that it is important to assess the scope and scale of impacts on key economic sectors of conformity with an environmental requirement, thereby informing effectively the decision-making process and the sustainable development policy debate.

A. SUMMARY OF FINDINGS

Findings from the case studies and rapid assessments show that while compliance with environmental requirements often affects output and export levels, the scale of the impact does not necessarily impact competitiveness to a significant degree. Furthermore, the negative impacts can be mitigated following the incorporation of efficiency gains and price premiums that can be secured from accessing new technologies and niche markets. Compliance with environmental regulations can also make the difference regarding the ability of a company to export and access foreign markets. Moreover, improved environmental performance can make it possible to reduce associated costs of environmental degradation that would otherwise be paid for by society as a whole.

The agro-food industry can generally bear modest cost increases of 20 per cent for water, energy and other input categories without suffering significant losses to competitiveness. More efficient and sustainable agricultural production methods, particularly with regard to the use of pesticides, can equally contribute towards increasing agricultural output and exports, as well as towards reducing adverse environmental impacts associated with land degradation and pollution of water resources. Niche market opportunities exist for companies committed to adhering to codes of conduct and best practices for the agricultural sector, as established by public agencies and private initiatives.

The textile and garment sector can adjust to similar changes in the cost of using water and energy inputs that can have implications for environmental performance. However, it is likely that producers of finished goods, including, for example, clothing and hosiery, could experience different effects from those providing specialized services in the sector, including dyeing, washing and finishing, depending on the type of environmental requirement being considered. Consequently, differentiation is needed when examining the impacts of environmental compliance on different sectors and sub-sectors.

Such differentiation is equally needed when examining differences in potential impacts of environmental compliance between large and small firms. While SMEs tend to have greater difficulty securing information and complying with more stringent environmental requirements, their cost of adjustment need not be large in all cases, as demonstrated in the case of conformity with the ban on the use of azo-dyes. In this case, differences in sensitivity to the ban are apparent across sectors, rather than between large and small firms. Nevertheless, SMEs are more vulnerable in terms of such large capital investments as end-of-pipe wastewater treatment systems that require access to technology, know-how and financial assets. Special care is therefore needed to differentiate between the impacts that could be felt by companies of different sizes, as well as by sub-sectors in the same industry, when assessing the cost of compliance with new environmental requirements.

Moreover, the rapid assessments and case studies demonstrate that policymakers could consider strengthening some environmental standards without the fear of generating serious repercussions on local industries. As the case of the furniture sector in Palestine shows, the stringency of the proposed industrial wastewater effluent standards can be increased without generating adverse impacts in the industry. Additionally, stronger environmental regulations related to water use and wastewater management have little impact on heavily protected and subsidized sugar industries, which have no incentive to improve their environmental performance or achieve efficiency gains when the cost of their inputs and the price of their outputs are guaranteed. The industry is more sensitive to changes in energy costs, however, given that energy prices are not as subsidized as water prices. Nevertheless, with growing trade liberalization and economic restructuring, Governments are likely to reduce subsidies and privatize companies as a means to economize resources and encourage more competitive behaviour by firms. As demonstrated by the case of the privatized leather monopoly in Jordan, companies that are strategic and proactive in their behaviour regarding compliance with environmental standards can overcome these periods of economic transition and become more competitive in the long run.

B. LESSONS LEARNED AND RECOMMENDATIONS

Policy measures, an enabling infrastructure and a sound business environment influence how efficiently and effectively a company is able to adapt to a new environmental requirement. Moreover, these factors help to determine the cost of conformity, large or small, with a given environmental measure. Governments are therefore encouraged to assist companies, particularly SMEs, in terms of accessing the information and technologies needed to reduce adverse impacts on competitiveness that could be caused by conforming with environmental requirements in those sectors that are sensitive to certain environment-related inputs.

Additionally, companies need to pursue innovation themselves and become more responsive to a changing global marketplace that places an equal emphasis on the products and the production process. While consumer preferences for environmentally friendly and socially responsible goods could have been the impetus for these changing market dynamics, advances in science and a growing concern with regard to food safety and human health have led national regulations to become more stringent over time. For example, restrictions on the use of azo-dyes in textiles and garments was initially reserved to the realm of ecolabelling and to a limited number of environmentally progressive countries. However, risk assessments and policy consensus regarding the need to protect the environment and human health have led to an outright ban on the marketing and use of azo-dyes across Europe, as well as in most industrialized countries in other regions. This eventual shift of environmental measures from voluntary standards to national regulations is becoming an increasingly common and important trend for companies and countries to consider when formulating strategies aimed at enhancing their competitiveness and environmental performance.

Countries and companies must strive to ensure that environmental regulations in destination markets are adopted for the purpose of protecting human health and the environment, rather than simply to protect local industries. Information sharing and open lines of communication between the public and private sectors can help to identify and monitor the potential application of an environmental measure as an unwarranted technical barrier to trade in a foreign market. Equally, efforts need to focus on strengthening the environmental management capacity of developing countries, thereby ensuring that environmental, health and safety measures imposed on imports are required of local producers for the sake of protecting the health of citizens and national ecosystems. However, when the application of environmental standards is pursued at the global level, Governments must ensure that special and differentiated treatment provisions are included for developing countries, particularly those that lack the enabling infrastructure, hard and soft technologies, and financial resources. Such provisions can assist companies from those countries in terms of complying with more stringent environmental requirements. Preferential access to financing and technology transfer arrangements can help companies to secure efficiency gains more quickly and, consequently, to offset costs that are associated with conforming with higher environmental standards.

Within the framework of international negotiations on trade, environment and development issues, it is useful for policymakers to consider that changes in the cost of labour or primary inputs for most economic sectors will have larger adverse effects on competitiveness than changes in water or energy costs,

particularly if export levels are initially low. Depending on the policy priorities of a country, this information can help to formulate negotiation positions on sustainable development issues, given that measures aimed at protecting the environment and human health are likely to have less of a negative impact on the competitiveness of key economic sectors than those aimed at increasing wages or advancing social reforms.

Lessons learned from international standard-setting bodies reveal that benefits to trade can be reaped by harmonizing standards and conformity assessment procedures among countries. Enhanced technical capacity in the Arab region can improve the monitoring and formulation of standards, and reduce the cost of conformity assessment, which in turn could increase competitiveness. However, despite progress being made in the GCC and other countries in this area, the Arab region remains fragmented and faces difficulty in developing unified standards and positions within Codex and other bodies that address environment-related issues. There are various opportunities for building coalitions among Arab stakeholders, particularly at international negotiations, on environmental standards and aimed at tackling such various issues as mycotoxins, genetically modified labelling, pesticide MRLs and waste recycling. However, the public and private sector must first engage in a national dialogue to identify the prevailing standards-related challenges, and subsequently to assess the scale of these impacts for exports. This information can be used to determine the substance of any negotiations; to forge coalitions with other developing countries; or to resolve such conflicts that could arise from discriminatory or unjustified application of environmental standards through dispute settlement mechanisms.

Enhancing competitiveness within a sustainable development framework therefore depends on adequate access to information relating to environmental standards and on a good understanding concerning the costs and benefits of environmental compliance. Policy instruments and private sector initiatives aimed at encouraging innovation and technology transfer can further facilitate the ability of companies to secure efficiency gains and access new markets. Regular consultation and open lines of communication between public and private stakeholders are a useful way to contribute to the dissemination of information and lessons learned from the practical experiences of counterparts, competitors and consumer groups. This is vital given that, ultimately, "competitiveness is not a study, but rather a process of change that involves private sector initiative, Government initiative and effective dialogue between the two".[107] Assessing the impact of environmental standards on competitiveness is a way to inform and enhance this dialogue and contributes to the preparation of mutually supportive sustainable development policies.

[107] K. Murphy, "Agribusiness sector competitiveness: implementing the right initiatives" (the World Bank Group, 2004), which is available at: lnweb18.worldbank.org/ESSD/ardext.nsf/11ByDocName/AgribusinessSectorCompetitivenessImplementingtheRightInitiatives.