THE POTENTIAL IMPACT OF RECENT INDUSTRIAL POLICY CHANGES IN EGYPT ON THE ENVIRONMENT

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LIST OF ACRONYMS

ACI:	Achieving Compliance in Industry
CAAs:	Competent Administrative Authorities
CDM:	Clean Development Mechanism
CPA:	Competition Protection Authority
CP Strategy:	Cleaner Production Strategy
CT:	Clean Technology
DANIDA:	Danish International Development Agency
ECO:	Environmental Compliance Office
EEAA:	Egyptian Environmental Affairs Agency
EMU:	Environmental Management Unit
ENCPC:	Egypt National Cleaner Production Center
EOS:	Egyptian Organization for Standardization and Quality
EPAP:	Egyptian Pollution Abatement Project
EST:	Environmentally Sound Technologies
FEI:	Federation of Egyptian Industries
GAFI:	General Authority for Free Zones and Investment
GOFI:	General Organization for Industrialization
IDA:	Industrial Development Authority
IMC:	Industrial Modernization Centre
MOI:	Ministry of Investment
MSEA:	Ministry of State of Environmental Affairs
MTI:	Ministry of Trade and Industry
MWRI:	The Ministry of Water Resources and Irrigation
NGO:	Non-Governmental Organizations
OECD:	Organization for Economic Cooperation and Development
RBOs:	Regional Branch Offices
UNDP:	United Nations Development Programme

INTRODUCTION

While the pollution effects of manufacturing on the environment in Egypt have been addressed in several studies and reports,[1] the analysis of the impact of industrial policies on the environment has received much less attention,[2] if any. In fact, it is not known if industrial policy formulation in Egypt takes the environmental dimension at all into consideration. In that area, Egypt is no different from a typical developing country where industrial policy attention is directed towards traditional objectives of higher value added, employment, investment and export promotion.

Increased awareness that sustainable development of an economy and its healthy integration in the global economy can only be achieved through protecting the environment, however, is directing attention towards the potential impact of industrial policies on the environment and how to improve the situation. It is no longer enough to focus on industrial growth then wait for environmental laws and institutions to mitigate the unavoidable negative impact on the environment. Such impact can, to a large extent, be avoided if the environmental dimension is accommodated in the industrial policy formulation from the outset. The issue has recently been receiving attention in a number of countries such as the Philippines, Chile, China, Pakistan, Thailand and Singapore.[3]

This working paper is an attempt to explore this area of research for the case of Egypt. It raises a number of questions: To what extent do our industrial policies actually encourage enterprises to protect the environment or discourage them from destroying it? What is the nature of the relation between the industrial and environmental camps? Are industrial policies consistent with environmental policies in Egypt? Do the recent policy changes introduced actually improve or worsen the environmental situation? Can recommendations be made to keep the desired developmental impact of industrial policies while maintaining the present status of the environment as a minimum? Can Egypt benefit from other countries' experiences

[1] Reports by the Egyptian Environmental Affairs Agency (EEAA), NGOs concerned with the environment and UNIDO studies on measurement of pollutants of different industries in Egypt as well as World Bank studies assessing environmental conditions in Egypt (World Bank 2003; World Bank 2005).

[2] Nothing beyond scattered interest in EEAA reports about extending economic incentives to enterprises to comply with clean production.

[3] Studies on Chile, Pakistan, China, Slovak Republic, Indonesia, the Philippines, and the US (UNEP 1999; UNIDO 2000; Chinese Academy of International Trade and Economic Cooperation 2000; UNIDO 2002; World Bank 1993; UNIDO 1999 and NCEE 2001). Other sources are UNIDO (2004, 2005a).

in that area? The questions are of importance to policy makers and business community alike, especially now that the private sector is in close partnership with the government more than any other time in the past.

The paper has four objectives: 1) to explore the general impact of industrial policy formulation in Egypt, from the 1970s to the end of the 1990s, on the environment through a snap shot multi-dimensional evaluation of manufacturing industries in 2005; 2) to pinpoint some of the inconsistencies between industrial policies and environmental policies in Egypt, and the ones within industrial policies themselves, as far as the impact on environment is concerned; 3) to explore the impact of some of the most recent industrial policy changes on the environment and indicate whether they seem to lead to an improvement or deterioration in the environmental conditions; and 4) to assess the present relation between industrial and environmental institutions and policies and make recommendations on how to strike a balance between industrial development objectives on the one hand and environment protection on the other, benefiting from other countries' experiences.

The methodology of this research is generally unorthodox as it relies more on qualitative than on quantitative analysis. Data and information are derived mostly from personal interviews[4] with fifteen key industrialists and environmentalists as well as field visits to ten different-sized enterprises from textiles, food, auto components and fertilizer industries. Detailed information on industrial and environmental policies came from relevant official governmental institutions.

As far as taxonomy and coverage are concerned, the environment in this research includes both the external and internal environmental dimensions, i.e., pollution, depletion and misuse of resources as well as the working environment conditions within plants. As far as industrial policy is concerned, this research adopts the broad definition of industrial policy as any measure, policy or program aimed at increasing growth and improving competitiveness of the economy as a whole. However, the analysis focuses on the impact of such policy on the manufacturing industry alone.

The four objectives of the study are addressed in Sections one through four respectively, with Section four also presenting the main conclusions of the analysis. The study also includes two appendices (A & B) with relevant additional information and analysis.

[4] All interviewees chose to remain anonymous.

1. Exploration into the General Impact of Industrial Policy Formulation in Egypt, from the 1970s to the End of the 1990s, on the Environment

The objective of this section is to infer the impact of industrial policy formulation in Egypt, during the period from the 1970s to the end of the1990s on the environment through an assessment—from an environmental angle— of the status quo of Egyptian manufacturing industry in 2005. The rationale for choosing this specific period for analysis is that the seventies mark the beginning of worldwide interest in the impact of industry on the environment. This means that industrial policies in Egypt before the 1970s are of no relevance to the analysis in this research even if they had a negative impact on the environment. The choice of one year (2005) for the snap shot of Egyptian industry is triggered by the availability of a recent and comprehensive data set of all aspects of Egyptian manufacturing through the Ministry of Trade and Industry,[5] plus the fact that the industrial scene, at any point in time, always reflects the cumulative impact of policies; as it takes decades for the industrial scene to be developed.

The assessment includes a number of dimensions: 1) Sectoral composition, and geographical and size distribution of manufacturing industries in 2005; 2) Water, energy and land pricing; 3) Technology, transportation and logistics; and 4) Environmental management system and role of industrial institutions.

a. Sectoral Composition, Geographical and Size Distribution of Egyptian Manufacturing Industries

Table 1 below presents the structure of the Egyptian manufacturing industry in 2005 through a number of enterprises and gross value added distributions. Chemicals, building materials and metals and all traditional polluting industries[6] combined represent 26 percent and 33 percent of the number of enterprises and gross value added, respectively. The continuing predominance of basic consumer goods such as textiles, food and leather leaves the Egyptian industrial scene in 2005 very similar to that in the 1960s and 1970s except for the shift toward more garment production in textiles and the engineering industries emerging as an important

[5] No comparable complete data set was found for 1970s except in the case of sectoral composition, and a comparison between the two periods (1970s) and (2005) is presented in the following analysis.

[6] Especially in the case of old facilities, newer larger scale facilities for cement and fertilizers in particular are believed to be less polluting on grounds of using newer technology.

sector,[7] accounting alone for 20 percent and 29 percent of the number of enterprises and gross value added, respectively. With most activities involving value added in engineering being on the polluting side (such as the case of auto components and moulds) and the textile value chain suffering from poor integration, with the worst performance seen in its upstream segment, particularly the highly polluting dyeing and finishing industry, one concludes that the sectoral composition in Egyptian manufacturing has seen little real change over time, specifically compared to the 1970s,[8] and is still biased towards resource depleting and polluting industries.

Table 1. Sectoral Composition by Number of Enterprises and Gross Value Added Distribution (2005)

Sectoral percentage distribution by	Basic metals	Paper & printing	Construction materials	Wood & furniture	Basic chemicals	Engin. industries	Food, beverages & tobacco	Textiles & leather	Others	Total
Number of enterprises	2	6	7	9	11	20	20	23	2	100
Gross value added	9	3	6	1	15	29	25	11	1	100

Source: Calculated by the author on the basis of data from Ministry of Trade and Industry (2005a).

Figure 1 shows the geographical distribution of different types of manufacturing enterprises among regions in Egypt. A very clear concentration of enterprises is observed in Greater Cairo irrespective of the sector in question. Table 2 indicates an even stronger concentration of industrial activities in Cairo (53 percent of textiles and leather, 49 percent of paper industries, 36 percent of basic metals, and 23 percent of chemicals, etc.). The absence of real incentives to guide enterprises to designated areas and the concentration of services in Cairo are the main reasons behind the observed concentration. The negative environmental impacts of such concentration and closeness to residential areas and the resulting health-hazardous emissions are obvious.[9]

Focusing on one specific industry—textiles—it is observed from Table 3 that the vast majority of enterprises throughout the textile value chain are heavily concentrated (from 80 percent to 90 percent) in the four main governorates with the highest population

[7] The item capital equipment and consumer durables, the one including the current engineering sector, accounted for no more than 10 percent of gross value added in the 1970s (Ikram 1980).

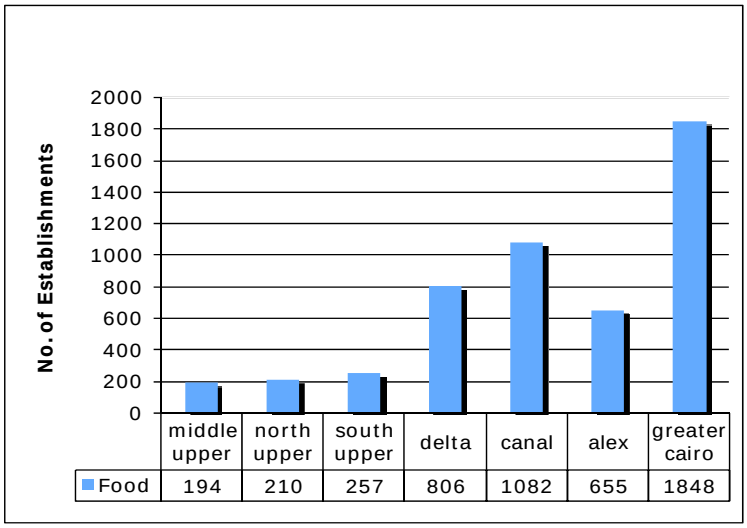
[8] The reference for the 1970s sectoral composition is Ikram (1980).

[9] World Bank (2002).

concentration.[10] To make the environmental impact worse, the most polluting upstream line of activities within the textile chain (namely dyeing, printing and finishing) has the heaviest concentration level of all (92 percent in the four governorates combined, with 45 percent in Cairo alone).

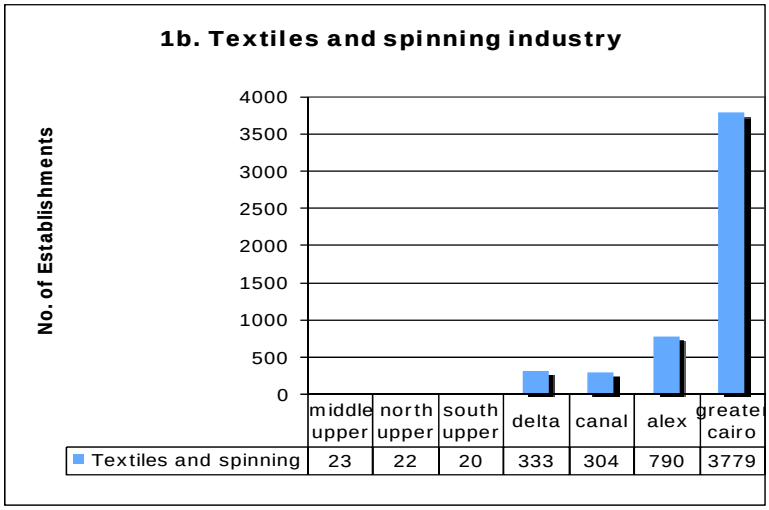
Figures 1 (a, b, c). Geographical Distribution of Enterprises by Sector among Different Regions (2005)

1a. Food Industries



Source: Calculated by the author on the basis of GOFI (currently IDA) 2005.

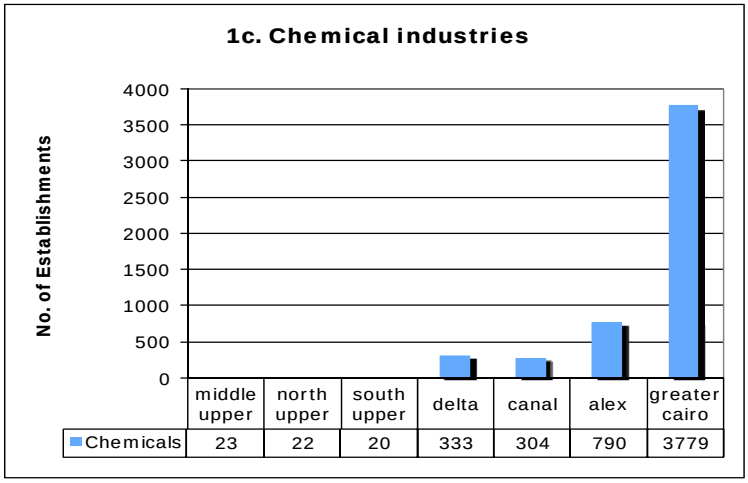
1b. Textiles and Spinning Industry



Source: Calculated by the author on the basis of GOFI (currently IDA) 2005.

[10] Kassem and Abdel Latif (2005).

1c. Chemical Industries



Source: Calculated by the author on the basis of GOFI (currently IDA) 2005.

Table 2. Percentage Distribution of Enterprises per Industrial Sector among Individual Governorates (2005)

Governorate	Food	Textiles	Wood & furniture	Paper	Chemicals	Building materials	Basic metals	Engineering industries
Dakahleya	6.6	3.0	5.8	1.8	3.7	6.8	2.9	8.9
Sharqia	17.7	4.9	21.7	8.4	12.5	16.3	9.0	13.9
Alexandria	8.2	13.4	4.8	9.7	13.1	6.5	11.8	6.8
El-Beheira	4.6	1.6	1.1	0.8	1.7	3.8	0.6	0.9
Cairo	19.8	53.3	20.0	48.7	23.1	22.1	36.0	36.5
Giza	11.2	7.1	6.7	12.3	15.1	14.7	11.0	11.4
Qalioubeya	5.6	11.2	4.1	5.5	19.3	6.3	22.1	8.9
Others	26.3	5.5	35.8	12.8	11.5	23.5	6.6	12.7

Source: Calculated by the author on the basis of GOFI (currently IDA) 2005.

Table 3. Geographic Concentration of Different Textile Enterprises in Egypt's Four Main Governorates (2005)

Governorate	Main segments of the textile value chain									
	Cotton spinning & weaving		Wool & synthetic fibers		Dyeing, printing & finishing		Knitting		Garments	
	Num*	%**	Num*	% **	Num*	%**	Num*	% **	Num*	%**
Cairo	132	21	21	30	35	45	301	57	277	60
Alexandria	4	1	10	14	17	22	151	28	72	16
Qalioubeya	305	48	8	11	16	21	11	2	29	6
El-Gharbeya	128	20	18	25	3	4	15	3	11	2
Total of four governorates	569	90	57	80	71	92	478	90	389	84
Total	**631**	**100**	**71**	**100**	**77**	**100**	**531**	**100**	**460**	**100**

Source: Calculated by the author on the basis of GOFI (currently IDA) data (GOFI 2005).
* Number of enterprises. ** Percentage of total number of enterprises.

The distribution of industrial zones is no better than that of manufacturing enterprises. According to Table 4, as of June 2005 Egypt had a total of 87 industrial zones with utilities and services representing 40 percent of the total land allocated. Some of these zones are very old and go back to the 1960s such as Mehalla El-Kobra. Other important industrial zones of more recent origin (established in the 1980s) include the new cities of 6 of October and 10th of Ramadan.[11]

Table 4. Number of Industrial Zones in Egypt

Affiliation	Non-producing	Producing	Total
Governorates	23	41	64
New Cities	1	14	15
Free Parks	-	6	6
Economic	-	2	2
Total	**24**	**63**	**87**

Source: IDA (2006).

Around 64 percent of all producing industrial zones are located inside governorates (close to residential areas). Also, most industrial zones including the new cities (6 October and 10th of Ramadan) were not designed with infrastructure suitable for industrial purposes, or with minimization of negative environmental impact in mind.

As far as size distribution is concerned, Table 5 reveals the predominance of small enterprises in all sectors: approximately 71 percent in foods, textiles and chemicals, to name a few. All Egyptian industrial enterprises face problems in terms of environmental compliance due to inadequate infrastructure, limited space, old technologies, and expensive environmental investments such as in the case of converting old boilers to natural gas. However, environmental compliance in smaller scale production facilities is more difficult and more costly than in the case of large enterprises because they are more likely to lack the awareness, know-how, capital, scale of production and space for minimizing their environmental impact. Small enterprises are typically located in heavily populated areas, and more often than not tend to use the municipal drainage system for industrial wastewater; elsewhere, their wastewater forms polluted ponds that cause serious health hazards.[12]

[11] Ministry of Trade and Industry (2005a).

[12] Sakr (2003).

The environmental problem caused by the bias of Egyptian manufacturing industries towards smaller sized enterprises is further exacerbated by Egypt's continuous encouragement of the establishment of such enterprises[13] through special incentives and price advantages for land, and lower interest rate loans from the Social Fund for Development. Another problem lies in the existence of a huge informal sector (not accounted for in the above figures), existing mostly in the form of workshops and micro and small enterprises. It represents no less than 70 percent of food industries and 45 percent of printing. Informal enterprises are even more difficult to trace. They do not comply with traditional laws let alone expensive environmental constraints imposed by environmental authorities.

Table 5. Percentage Size Distribution of Enterprises by Sector (2005)

Sector	Small enterprise	Medium enterprise	Large enterprise
Mining	73.9	21.7	4.4
Food, beverages & Tobacco	71.6	20.3	8.1
Textiles & leather	71.0	21.3	7.7
Wood & furniture	67.7	25.1	7.2
Paper & printing	71.9	21.0	7.1
Basic chemicals	68.5	23.4	8.1
Construction materials	73.6	17.4	9.0
Basic metals	64.8	23.3	11.9
Engineering industries	70.5	21.0	8.5
Other manufacturing	83.9	13.4	2.7

Source: Calculated by the author on the basis of GOFI (currently IDA) data, 2005 (MTI).

b. Water, Energy and Land Pricing

Until the recent changes in 2007, addressed in Section III below, government subsidies have kept energy prices considerably lower than international market prices since the early 1960s.[14] This led to abusive consumption and thus fast depletion of resources. The energy intensity, defined as total primary energy consumption per unit of GDP, has in the period 2001-2003 increased about 1.5 percent per year, which is much higher than its comparable values in neighborhood countries (Algeria, Morocco and Tunisia). Furthermore, compared with OECD and Europe, Egypt uses twice as much energy per unit of GDP.[15]

[13] Seen as a major, if not the main, vehicle for job creation.

[14] World Bank (2005).

[15] UNDP (2005).

Within manufacturing, two sub-sectors (building materials and basic metals) account each for about 25 percent of total energy consumption in industry, with another three sub-sectors (chemicals and petrochemicals, textiles, and food industries) accounting for another 40 percent of total consumption. Energy subsidy for manufacturing was highest for the petroleum fuels (the most polluting to the environment). Partly due to subsidy and partly due to long established habits, industry—particularly small enterprises—is still relying primarily on petroleum fuels (80 percent) despite the ample availability of natural gas and its well known positive impact on the environment. The whole situation led to serious environmental damage.

According to Table 6 below, water, electricity and land pricing indicate that, generally speaking, there is no clear pattern by the government for pricing these inputs at the regional level. Other than the case of water pricing, objectives of promotion of industrial growth and/or preservation of resources or protection of the environment are blurred and not reflected by input prices.

Tables 6 (a, b, c). Water, Land and Electricity Pricing in Governorates, New Cities and Free Zones

Table 6a. Governorates

Governorate	Water LE/ M^3	Electricity LE/ KW	Land LE/ M^2
Assiut	0.3	0.15	Free + 150 for infrastructure
Qena	0.85	0.22	Free, 25 for infrastructure
Monoufeya	0.5	0.13	250-550
Damietta	0.75	0.18	21-150
Dakahleya	0.8	0.18	10
Port Said	0.5	0.18	14-20
Alexandria	0.62	0.18	400-600
Cairo	0.75	0.18	80-200
Qalioubeya	0.75	0.18	300

Source: GOFI (currently IDA) 2005, MTI.

Table 6b. New Cities

City	Water LE/ M^3	Electricity LE/ KW	Land LE/ M^2		
			Old price	Current price	Land for small enterprises, area 300/M^2
15th of May	0.95	0.19	165	125	50
New Cairo	1.25	0.18	195:250	95	50
6th of October	1.2	0.2	165	95	50
New Borg El Arab	0.8	0.18	100:120	70	50
El Noubaria	0.5	0.18	90	90	50
10th of Ramadan	0.75	0.18	140	95	50
New Salhia	0.9	0.18	125:160	95	50
El Sadat	1.27	0.19	90:120	60	50
New Damietta	0.75	0.19	150:280	125	100

Source: GOFI (currently IDA) 2005, MTI.

Table 6c. Free Zones

Zone	Water LE/ M^3	Electricity LE/ KW	Land M^2 LE (Right of use without ownership)
Nasr City Free Zone	n.a.*	0.18	21.75
Alexandria Free Zone	1.15	0.18	21
Damietta Free Zone	1.1	0.18	10.5
Adabiah (Port-Tawfik) Free Zone	1.65	0.18	18
Ismailia Free Zone	0.85	n.a.*	10.5

Source: GOFI (currently IDA) 2005, MTI.
** n.a: not available.*

The problem is particularly seen in the case of land pricing where high variability is observed not only between governorates, new industrial cities and free zones but also within each one of these three groups. Until very recently, land prices in new cities, in particular, were very high in comparison to neighboring countries[16] and also close to those of land in old governorates. Despite recent attempts (before 2005) to decrease land prices in new cities, prices remained relatively high. In contrast, small enterprises get lower land prices irrespective of the region, with land is given for free in Upper Egypt.

Such land pricing system indirectly favors governorates over other areas, which has a double negative impact on the environment, as it not only encourages establishing industrial

[16] Studies show that benchmarking Egypt to neighboring countries, the price range in cities where there is high demand is between 10 US$ and 81.6 US$ depending on the location of the industrial city as well as location within the city itself while in Tunisia, for instance, prices ranged from 5.6 US$ to 12.5 US$.

projects near residential areas as opposed to the desert, but it also encourages locating industrial establishments on fertile agricultural land[17] since most governorates are located in or near the Nile valley.

One final comment in relation to land is that the cost borne by the government for securing basic infrastructure (water, electricity, telephones, natural gas, wastewater and industrial waste) is at best equivalent to half of the declared prices per square meter,[18] which encourages haphazard waste disposal because the system allows enterprises to go for the option of receiving the land without infrastructure.[19]

c. Technology, Transportation and Logistics

As far as technology is concerned, manufacturing industries in Egypt, with a few exceptions, are generally associated with low and old technologies, the main reasons being:[20] low levels of R&D in general (no more than 0.6 percent of GDP), private sector lacking technology culture;[21] low quality and quantity of R&D of relevance to industry by public institutions and limited budget allocated to industrial research in the Ministry of Trade and Industry (MTI) institutions (between 1993-1999 only 0.58 percent of government R&D budget went to MTI).[22]

Of more specific relevance to the environment is the adoption of cleaner production technology. Interviews and field visits revealed that this new trend is still very limited because it is costly and not yet properly understood by the vast majority of enterprises. In fact, the common understanding among enterprises, particularly small ones, is that environmental investments (beyond recycling) have no economic return and thus enterprises have no interest in such investments unless forced by laws or environmental requirements of exports. The new modern trend adopted worldwide whereby lower costs of production can be achieved when

[17] Since governorates are already crowded, expansion of activities often takes place at the expense of agricultural land.

[18] As per the statements of the representative of the New Communities Authority at GAFI.

[19] In that case, enterprises promise to extend infrastructure at own expense but they often do not, and with prevalence of the informal sector it will go undetected by authorities.

[20] More details on technology level can be found in UNIDO (2005b).

[21] The private sector lacks a 'technology culture', preferring to import technology and doing little to adapt, improve and assimilate it. In terms of enterprise-financed R&D per capita, Egypt was one of the weakest performers in the 1990s.

[22] While 28 percent, 21 percent, 16 percent, 15 percent, 15 percent and 9 percent went to the Ministries of Agriculture, Scientific Research, Electricity, Health, Petroleum and Higher Education.

cleaner production techniques are adopted, is still new to the community of manufacturing enterprises, particularly small ones. There are serious efforts in that direction though, as further discussed later on.

Transportation and logistical problems are relevant to this analysis because they are responsible for considerable resource waste, misuse and depletion, which fall under the umbrella of environmental damage. Among all manufacturing industries, food industries are the most affected by and subject to such problems. Inadequate infrastructure for local transportation and transportation to ports (trains, Nile transportation and roads) and poorly equipped ports and airports with critical needs to handle food processed exports (such as cooling facilities) lead to considerable waste and decay of products.[23] A similar argument applies to long clearance procedures for shipments of imported inputs. Logistics of crop handling, cooling and transportation from field to plant locations also involve significant waste of products.[24] Overuse of fertilizers by farmers and environmental problems caused by burning rice straw when it has potential for paper industry,[25] simply because its transportation is a problem, are examples of transportation and logistical problems leading to deterioration of the environmental condition.

d. Environmental Management System and Role of Industrial Institutions

The environmental management system in Egypt uses a number of tools that range from command regulations to voluntary actions, and economic incentives and deterrents (Table (1A) in Appendix A). The most commonly used are the command tools, but they prove to be ineffective in many incidences because enterprises have technical problems preventing compliance. Economic instruments are of a limited variety, with the effective and most popular among industrialists being grants and soft loans delivered through various donor programs. Such incentive system, however, is unsustainable because it relies completely on external resources with no input from the government.

As far as industrial institutions' contribution to environmental protection is concerned, it is observed from Table 2A in Appendix A that the concerned industrial institutions, at least until 2005, played a very weak role. Their role ranged between the effective but hardly visible

[23] Ecorys (2005).
[24] More on the issue in (Abdel-Latif 2007).
[25] IMC (2004).

such as in the case of the Tebbin Institute, to a modest role of increasing awareness as in the case of ECO. It has also been observed through interviews with industrialists that industrial environmental institutions (such as ECO) are seen as different—and distant from—pure industrial organizations such as chambers of industry. EOS has the environment on its mandate but seems to focus on other activities within its mandate.

The weak role of industrial institutions on the environmental front is further aggravated by the absence of collaboration between the industrial and environmental camps, both generally and in specific projects. For example, all chambers of industry have on their mandates specific roles related to environmental compliance but these roles are not activated. Moreover, although the implementation of the National Cleaner Production Strategy (Appendix A) involves clear roles for MTI and the Federation of Egyptian Industries (FEI) on the industrial side, besides the role of the Egyptian Environmental Affairs Agency (EEAA), the activities thus far undertaken by different parties to implement the strategy have not been coordinated through the proposed institutional set-up.

It is important to note that EEAA and other environmental institutions do not have the authority to enforce their laws and regulations (Appendix A)[26] partly because of their legal structure (operating within the framework of a ministry without a budget and a number of NGOs), the disintegrated environmental management system, and the limited availability of resources. Most serious, however, is the practical fact that social considerations[27] prevent enforcement even where laws allow it.

Irrespective of the role of EEAA and industrial institutions of relevance to environmental issues, field visits to ten different sized enterprises from textiles, food, auto components and fertilizer industries revealed that incidences of highest environmental compliance are highly correlated with large enterprises particularly ones that are export-oriented or joint ventures. Enterprises exporting to western countries, in particular, have the highest level of compliance because it is an un-negotiable pre-condition for accepting the enterprise as a potential supplier (i.e., exporter).

[26] A full list of environmental laws, regulations and institutions are presented in Tables (3A), (4A) and other parts of Appendix A.

[27] Loss of jobs and closing down of factories overrides environmental considerations. This has been repeatedly tested in times of economic difficulties.

Joint ventures with multinational companies have a high level of environmental awareness irrespective of export orientation because it lies in the cultural basis of these gigantic enterprises. Finally, social responsibility on the part of many Egyptian businessmen has been detected in field visits and interviews as an important driver for environmental compliance. This last feature became even more important beyond 2005 as will be seen in the sections below.

The overall conclusion of the analysis in this section is that industrial policy formulation in the 1970s to the late 1990s has had a negative impact on the environment that was only partially mitigated by weak environmental institutions, limited incentives and poorly implemented laws. Poor implementation of environmental laws is particularly critical as it is the implementation of laws and not the script of the laws that has the tangible impact. Unfortunately, as per all interviewees, poor implementation of environmental laws continues to date, thus contributing its own share of deterioration of the environmental condition irrespective of industrial policies.

2. POLICY INCONSISTENCIES OF NEGATIVE IMPACT ON THE ENVIRONMENT

This section attempts to illustrate the negative impact on the environment caused by policy inconsistencies among industrial policies, as well as between industrial policies and environmental policies. This is done through briefly presenting specific cases of such inconsistencies.

Before starting the analysis though, it is important to indicate three long established features of the Egyptian economy that lie to a large extent behind the policy inconsistencies in general: 1) the predominance of social objectives over economic objectives; 2) the multiplicity of laws and institutions in charge of various economic aspects; 3) the absence of a long term vision, explicitly incorporating the environmental dimension, for industry or for the economy as a whole.

The predominance of social objectives has been an intrinsic undisputable feature of the Egyptian economy starting from the 1960s. Its main implication as far as the environment is concerned is that, practically speaking, no enterprise[28] could ever be closed down because it is

[28] An explicit commitment has actually been made by former Prime Minister Atef Ebeid along those specific lines. It was said in the context of enterprises already struggling due to high priced imported inputs induced by increasing price of the dollar at the time.

not complying with environmental regulations because such closure would mean loss of jobs at a time when unemployment prevails and creation of jobs is a priority at the economic and political levels. The enterprises know that and thus have no real motive to comply if they can find a back door to avoid paying environmental fines upon inspection.[29]

The multiplicity of laws is a big problem and a source of serious inconsistencies. There are laws that go back to the 1940s and 1950s that are still being applied even though they lost relevance to the status of a modern economy. Over the years and in the absence of proper comprehensive planning, Egypt has been passing laws in different domains without accounting for potential inconsistencies. The problem is accentuated by the fact that the institutional system is set up in such a way that bureaucrats have a lot of room for subjective interpretation of the different articles of the law, that is why problems typically emerge during implementation.

Finally the relation between industrial institutions and environmental institutions, the implementation of the Cleaner Production Strategy, and the problems faced by industrialists indicate that at least until very recently they were working in two separate camps. With such setup, no long term strategy of the industry or the economy can properly take the environmental dimension into account.[30]

The cases illustrating policy inconsistencies are collected in three groups: a) Poorly exploited win-win scenarios; b) Delays in implementation causing serious damage to environment; c) Continuous leakage to the informal sector causing serious damage to the environment.

a. Poorly Exploited Win-Win Scenarios

Three sources of win-win scenarios (Table 7), natural gas, electricity and the Clean Development Mechanism (CDM) are analyzed.

[29] Galal (2002).
[30] EPAP (2003).

Table 7. Win–Win Scenarios of Natural Gas, Electricity and CDM

Source	Advantage on the industrial side	Advantage on the environmental side
Natural gas	relatively cheap source of energy	Environmentally-friendly source of energy
Electricity	Huge companies can generate electricity as a by-product	Environmentally-friendly source of energy
CDM	Upgrading of facilities of enterprises at no cost	Upgrading focused on reducing CO2 emissions

While the advantages of natural gas for manufacturing are being emphasized by the government and rhetoric favoring the shift away from petroleum based fuels towards natural gas, we observe that—at least until the most recent developments of energy subsidy reduction—the government's natural gas policy orientation seems rather vague and contradictory and does not seem to have sustained industrial growth within a cleaner environment as its top priority.[31] Examples of policies leading to a bias against use of natural gas are: higher subsidization for polluting petroleum fuels; active governmental engagement in signing long-term fixed price, natural gas export agreements to Israel and EU countries thus depleting Egypt's reserves, when only a limited segment of industry has completed the shift to natural gas; and finally, practical disincentives are discouraging enterprises from actually proceeding with the shift towards natural gas. For example, while price of natural gas per unit for all regions is unified, prices of installation of pipelines is left to the individual assessment of each one of the eight companies given monopoly by the government to do the job in different zones. Costs for minor connections are often seen by enterprises as exaggerated due to monopoly power.[32]

Another environmentally friendly source of energy is electricity. Interviews with enterprises revealed that the government is adopting a distorted policy that significantly discourages companies from generating electricity if their production facilities allow it. Huge companies capable of generating electricity as a by-product of their productive operations are highly discouraged to do so because as the government charges them LE 0.18 per kilowatt hour, it purchases their own extra generated electricity for LE 0.02 per kilowatt hour.[33] In

[31] More details on energy consumption in industry can be found in UNDP (2005).

[32] Also, enterprises located at a certain distance from the main station have to pay for the pipes extended from the main station to their location even if there are other factories on the way, unless the group of factories along the same road present themselves as one case and share the expenses. The latter option is left to companies to decide and negotiate. Given that such joint negotiations are not easy, companies located far away often prefer to wait and not make the shift to natural gas hoping that others will start first, thus reducing their own cost of pipelines.

[33] Based on personal interviews with businessmen/enterprises.

addition, unlike other countries, Egypt does not give any kind of subsidy for electricity from new and renewable sources such as biomass electricity to encourage its production.

Although the direct positive impact of the CDM on the environment and the economic benefit to industrial growth is guaranteed, companies attempting to benefit from CDM have been introduced to the opportunity through EEAA and not the General Authority for Free Zones and Investment (GAFI) or any other industrial authority.[34] They also do not seem to be getting any special treatment from GAFI. For instance, according to officials in EEAA, companies are subject to the same restrictions and registration procedures as any regular project. There is even an additional complication by the Ministry of State of International Cooperation that the foreign investor has to provide proof that the project is not financed within the grant offered to Egypt by his country, which is seen by all parties as a very vague request that is very difficult to obtain.

b. Delays in Implementation Causing Serious Damage to Environment

Three examples are presented to illustrate the point: a) relocation of leather tanneries from old Cairo to Badr City; b) slow market exit of companies due to complex and lengthy procedures: Law (#159/1981) & (#17/1999); c) the "to be" privatized companies lost between MTI and Ministry of Investment (MOI) with MOI interested in highest sale price and not environmental requests by EEAA.

Tanneries, using primitive technology with devastating effects on the environment, are currently located in the heart of Cairo close to touristic attractions and monuments. The expansion of the tannery industry over the years has accentuated the problem by increasing concentration of hazardous waste and exerting more pressure on the already ill-equipped and old sewerage system and infrastructure. The need for urgently relocating the tanneries has been recognized by all stakeholders over two decades ago. A detailed relocation plan accommodating environmental requirements has been prepared over a decade ago along with needed fund provisions from donor agencies. To date,[35] however, the relocation has not taken place because of missing coordination between local institutions specifically, the Governorate of Cairo, which owns the land on which the tanneries are currently located and the authorities responsible for issuing licenses for new tanneries. The Governorate does not want to

[34] It is only in 2007 that GAFI has been reported to have a seminar on CDM.

[35] There was a recent announcement in newspapers in December 2007 raising the issue once more. How far it went, however, is not known to the author.

compensate the tannery owners for leaving lands on which they are currently located. Being totally isolated from the MTI, it is looking at the issue purely as a land dispute with tannery owners.[36]

The result is freezing of the status quo and continuous deterioration of the environmental condition in the area. To make the situation worse, permits are being issued to old and new tanneries to operate in other locations within Cairo, i.e., a back door for a cheaper move with no environmental obligations is open. Operating in a circle of its own, EEAA is continuing to fine tanneries in Old Cairo for environmental damage even though—given the present limited space—it is physically impossible for operating tanneries to comply with the environmental regulations.

As far as market exit is concerned, bankruptcy procedures in Egypt, governed by the provisions of either the Code of Commerce Law (#17/1999) for partnerships or the Companies Law (#159/1981) for corporations, are considered very lengthy and complex,[37] leading to lingering of troubled companies status for years not allowing assets and human capital to be allocated to more productive use. The indirect impact on the environment is negative because it allows continuation of production processes that can barely break even and have no interest or available financing for improved technology of production, let alone pollution abatement technology.

The "to be" privatized companies are the public enterprises that are scheduled or offered for privatization but are not yet sold by the Ministry of Investment. The unsettled status of the enterprises added to their accumulated debt keep overall technical status and technology of production frozen with no improvement or upgrading, which has a negative impact on the environment.[38] A sample of such companies is presented in Table 8 for the case of public up-stream segment[39] of the textile industry. At least 75 percent of all equipment is obsolete, which means old technology, old equipment and as a result serious damage to the environment.

[36] IMC (2005).

[37] An interviewed businessman stated that market exit is more problematic than market entry because of the inflexibility of labor and bankruptcy laws in addition to tax and social insurance requirements.

[38] Most problems reported by EEAA came from this type of companies, especially the older ones.

[39] As of 2005, the public sector represented on average 90 percent, 60 percent and 40 percent of spinning, weaving and dyeing facilities, respectively.

Table 8. Technical Status of Machines in the Public Upstream Segment of the Textile industry (2003)

Activity	Average Age 5 Years (%)*	Average Age 5-10 Years (%)*	Average Age 15 Years (%)*
Cotton spinning	5	23	72
Cotton weaving	2	6	92
Cotton finishing	7	6	87
Wool spinning	-	-	100
Wool weaving	-	10	90
Wool finishing	11	3	86
Clothing	7	23	70
Medical cotton	1	14	85

Source: CEFRS (2003).
* Each measured as percentage of total number of machines.

What is more negative is the fact that responsibility for the environmental damage is lost between the MTI, which is no longer responsible for these enterprises by virtue of its mandate, and the MOI whose interest in these enterprises is restricted to the sale of the enterprises at the highest price possible. The MOI is generally not willing to accommodate the environmental commitment requested by EEAA from new potential buyers,[40] as it tends to reduce the value of the enterprise, and add to the already imposed social responsibilities on buyers concerning redundant labor in the enterprises offered for sale. Also, until privatization takes place, debt accumulations prevent public enterprises from introducing any improvements in their production process, let alone reducing dangerous emissions or introduce waste treatment facilities.

c. Continuous Leakage to the Informal Sector Causing Serious Damage to the Environment

Despite all the governmental statements on the dangers associated with the informal sector and its negative impact on both people's health and the environment,[41] the present institutional set-up (specifically market entry and exit regulations) is actually encouraging the existence of the informal sector and the continuation of poor performing companies from the formal sector.

Smaller enterprises and workshops not located in industrial zones or new cities but rather in different governorates go through a different process of registration for new activities

[40] Based on interviews with EEAA officials.

[41] These enterprises tend to ignore all basic regulations, let alone expensive environmental measures.

than the one provided through GAFI.[42] It involves municipalities and the system allows for a serious backdoor to the informal sector. Once an enterprise applies for a license to operate, it can actually start operating even before its application has been fully accepted. This means that bad investments with detrimental effects on the environment can operate with an "application to have a license" indefinitely, even if the actual license is ultimately rejected or never finalized.

When this deficiency in the registration system is combined with the fact that 92 percent of land and real estate in urban areas and 87 percent in rural areas are informal[43] (i.e., not officially registered), it is easy to see how projects can start in the informal sector without being discovered by the authorities. Again the impact on the environment is seriously negative both directly and indirectly.

3. Exploring the Potential Impact of Some of the Most Recent Industrial Policy Changes on the Environment

Given the large scope of the definition of industrial policy adopted in this paper, the analysis of the potential impact on the environment covers some and not all recent policy changes. It covers: (a) the most important trade and business environment policy changes in the period 1997-2006; and (b) the most important institutional changes in the last few years (2004-2008), the sixth five year plan (2007-2011), in addition to a glimpse at the most recent energy policy changes in 2007.

a. Recent Fiscal, Trade, Investment and Business Environment Policy Changes

Table 9 presents a list of the most important policy changes in the period (1997-2006) addressed in the paper. While the detailed analysis of the positive and negative impacts of each industrial policy on the environment is presented in Appendix B, only the main conclusions of the analysis are presented here.

[42] The overall process in GAFI has improved considerably ever since the one-stop-shop has been created in 2003 and further simplified and improved starting January 2005. Licensing procedures are now completed within 72 hours and the process has been significantly streamlined (GAFI 2006).

[43] The source (UNIDO 2005b) is a study prepared for IMC by UNIDO. Even if by 2006 those percentages are less, the problem remains because this is an area where hardly any policy intervention has existed.

Table 9. Recent Policies and Strategies for Improving Fiscal, Trade, Investment and Business Environment in Egypt (1997-2006)[44]

Policy	Main Features
Fiscal Policy	***1) New Tax Law #91/2005***[45] involving substantial reduction in tax rates, unification of tax rates, cancellation of surcharges and all previous tax exemptions. The law also aims to simplify procedures and regain trust between tax payers and tax authorities. ***2) Removal of sales tax off capital goods in 2006***—a long overdue disincentive to the purchase of all equipment applied to all manufacturing industries except food industries.
Trade and Investment Policies[46]	***1) Decree #770/2005 issuing the executive regulations to implement the Import and Export Law 118/1975***[47]—a new Executive Regulation for the implementation of Import and Export law #118/1975. While based on the same articles that were passed 30 years ago, it attempts to accommodate recent factors and Egypt's commitments to the World Trade Organization (WTO). The new regulations are to be implemented in coordination with 18 other Presidential Decrees, Prime Ministerial Decrees, Ministerial Decrees and Laws issued in different years. ***2) Customs changes (2004):*** Cuts in customs duties, from 14 percent to 9 percent. Simplification of customs procedures. Consolidation of dutiable items from 13,000 to 6,000. Cutting the number of tariff bands from 27 to 6. ***3) Free zones and export promotion law #155/2002***—the main component of which being an export subsidy fund to encourage exports of different products. ***4) Trade Agreements 1998-2005***—Egypt signed three regional trading agreements (COMESA (1998), GAFTA (1998) and Aghadeer Protocol (2004)) in addition to eight bilateral trade agreements (the most important being the one with the EU (2001) and the most recent being the one with Turkey (2005)); all in addition to the QIZ Protocol (December 2004). **5)** ***Investment Laws 1997-2005***—the investment guarantees and incentives law #8/1997[48] amended by laws #196/2000 and #13/2004, and the special economic zones law #83/2002. Law #8 involved a number of tax holidays later cancelled by the new tax law. A new Presidential Decree #30/2005 gives the Prime Minister the authority to make exceptions if projects are strategic for Egypt.
Legal, Regulatory and Business Environment	***1) Intellectual Property Rights Law (IPR)—#82/ 2002***—Always pushed for by donors as being key to attracting investment. ***2) Labor Law #12/2003 Amended by Law #90/2005***—issued in replacement of the old law that has been operational from the 1960s. ***3) Competition Law #3/2005 and Executive Regulations 2005***—More than a decade in the making, Egypt's first competition law (anti-trust law) was finally passed in 2005. It aims at ensuring that all commercial activities are undertaken without impairing free competition in the market. ***4) Consumer protection law 2006***—focuses on the establishment of a Consumer Protection Agency responsible for receiving complaints and investigating cases of consumer rights violation.

Source: Retrieved from detailed analysis in Appendix B.

[44] Policy changes between 1997-2002 were obtained from Handoussa et al. (2003) and Sakr (2003).

[45] Attalla (2005).

[46] World Trade Organization (2005).

[47] Ministry of Trade and Industry (2005b).

[48] Ministry of Investment (2005a).

All recent policies tend in principle to have a positive impact on the environment through encouraging exports and new investments, both leading to better environmental compliance of enterprises and introduction of new technology. Table 10 presents examples of policies/specific articles of undisputed positive impact on the environment.

Table 10. Examples of Policies with Potential Positive Impact on the Environment[49]

Policy	Specific Clause/Clauses with Positive Impact on the Environment	Reasoning
Tax law (# 91/2005)	An improvement to the business environment thus encouraging new investments.	New investments are in general associated with newer technology (lower negative impact on the environment).
	Simplification of tax procedures, reduction and unification of tax rates and cancellation of previous commitments.	All these changes encourage informal enterprises to become formal.
	Organization of depreciation categories and giving special rates to newly acquired equipment.	Renewal of equipment is easier.
Labor Law (#12/2003)	Sets maximum levels for pollutants not only complying with Egyptian environmental laws but also with international standards.	A positive contribution towards the creation of a culture that appreciates the preservation of the environment. It was even recommended that the relevant clause be removed from the environmental law since it would be redundant.
Trade Agreements (recently signed and activated)	Encourages trade with countries where environmental compliance of trade partners is a binding constraint for exports (the case of the EU and the US).	Integration in the global economy and preoccupation with environmental issues go hand in hand, thus Egypt's obligation to comply by virtue of signing the agreements is most likely to have an overall indirect and direct positive impact on the local environmental condition.
Documents required for investment	Environmental Impact Assessment (EIA) as a mandatory document in the investment application file.	Forces all new projects to take the environmental impact of their projects seriously.

Source: Retrieved from detailed analysis in Appendix B.

However, not accounting for the environmental dimension in policy formulation leaves room for exceptions, clauses of potential negative impact, undiscriminating incentives and implementation problems. Table 11 presents specific examples of such problems. The overall conclusion of the analysis here is that even though most new policies actually tend to have a positive impact on the environment due to the problems listed below, the analysis is still not conclusive regarding the impact on the environment for almost all policies addressed.

[49] Retrieved from detailed analysis in Appendix B.

Table 11. Specific Examples of Policies with Potential Negative Impact on the Environment

The Source of Potential Negative Impact on the Environment	Specific Policy	Reasoning
Exceptions "the back door"	Presidential decree (# 30/2005)	The PM can authorize any investment project even if not approved by GAFI and/or EEAA.
	Ministerial Decree (# 770/2005) *Executive Regulations- for import & export law*	Exceptional entry of potentially harmful substances upon approval of Minister of Trade and Industry.
Undiscriminating Incentives between polluting & non-polluting projects	Export subsidy fund	Support linked to value of exports without any linkage to R&D or steps towards environmental compliance by enterprises.
	Free zone advantages and investment laws	All incentives are horizontal. Egypt is encouraging all investments without any reservations on polluting sectors.
Specific articles with potential negative impact on the environment	Removal of sales tax off capital goods and equipment in 2006	Encourages acquisition of new technology but not applying the decision to food industries has a negative impact on the environment.
	Ministerial Decree (#770/2005) *Executive Regulations- for import & export law*	Only ozone depleting products/inputs are mentioned. Decree allows for importation of used production lines and equipment without restrictions on how old they are.
Good policies with potential implementation problems	Labor law (#12/2003) amended by law (#90/2005)	Protection from exposure to harmful effects provided by law is significantly reduced by the deficiencies of the dispute settlement system.
	Competition Law (#3/2005)	A single authority in charge CPA, limited resources and tools to investigate, lack of precedents, subjective definitions for violation can lead to abuse of anything "BIG."

b. Recent Institutional Changes, Sixth Five Year Plan,[50] 2007 Energy Subsidy Reductions

b.1. Recent institutional changes

1) Industrial Development Authority (IDA)

IDA was introduced in 2006 to replace the General Organization for Industrialization (GOFI) as a public organization, reporting to the Minister of Trade and Industry. The new institution was introduced mainly to solve problems of industry in relation to land availability and pricing, such as the multitude of authorities in charge of land allocation and pricing, the absence of one entity responsible for developing the lands to serve industrial purposes, the

[50] Ministry of Economic Development (2006).

existence of many unexploited annexed lands and designation of lands without infrastructure or with an infrastructure not suitable for industrial purposes. Another major objective of IDA is to promote and administer the establishment of industrial parks with cheap land and suitable infrastructure to attract local and foreign investments.

The establishment of IDA is a step forward at the environmental scale, because keeping all new manufacturing facilities out of residential areas is at the core of the mandate of the institution, and so is the explicit coordination with EEAA (among other relevant institutions) to make sure environmental compliance is respected. However, in spite of all good intentions and legal clauses, three specific points shed doubt on IDA's effectiveness at the environmental front:

1) The presidential decree whereby IDA is created has less legal power than "a law", which means that the maze of existing laws can impede the ability of IDA to enforce environmental compliance, or any kind of enforcement for that matter, if conflicting with other existing laws no matter how old.

2) Although IDA took serious steps to control the entry of polluting and contaminating chemicals, the backdoor leakage of the Customs Authority is weakening its role. According to officials interviewed in IDA, only cases referred to IDA by Customs are investigated and monitored by the institution. If Customs were to legally or illegally allow harmful substances in the country, IDA cannot stop or monitor its use especially if heading towards the informal sector.

3) As per the technical specifications of the first industrial park established, IDA's role is limited to indicating level of pollutants as decreed by EEAA, i.e., make sure environmental regulations are enforced. IDA, however, does not impose the establishment of specific environmental facilities such as the case of water treatment unit to accompany dyeing and finishing textile facilities. Interestingly enough, this is going to be done but it is the initiative of the industrial park developers/owners and not the deed of IDA.

2) Egypt's National Cleaner Production Center (ENCPC)—An MTI/UNIDO Initiative[51]

[51] UNIDO (2006), EPAP (2004a). ENCPC is originally a UNIDO implemented project financed by the Austrian government, initiated upon the request of the then Ministry of Industry and Technological Development. With the creation of the technology development unit within MTI, ENCPC was integrated into the network of technology centers as a horizontal, cross-cutting entity supporting various industrial sectors.

Established in 2006, the Center is intended to provide cleaner production related services to industry and foster dialogue between industry and government as well as support investment and business cooperation to diffuse quality and productivity enhancing transfer of environmentally sound technologies (ESTs). This is expected to provide national industries with the necessary tools that will facilitate access to national and regional markets with environmentally sound products. ENCPC is also to play an important role in coordinating already existing national cleaner production efforts and promote partnership between public and private institutions in Egypt.

ENCPC aims at attracting enterprises by showing them opportunities for cutting their costs of production upon adoption of simple techniques and/or using cleaner technologies of production, i.e., emphasizing the win-win scenario of both industrial growth and environmental protection with special emphasis on the needs of exporters. One of the aspects proven successful to stimulate involvement by enterprises is the closing loops of material cycles use of industrial waste fractions as secondary raw-materials in other industrial processes or sectors.

The unique feature of being a permanent institution owned by Egyptian industry and not just a classic donor project that ends with the ending of funding, makes the impact of ENCPC on the environment of a more effective and long term nature. MTI has directed ENCPC to be a demand-driven institution charging enterprises fully for their services.

The operation of the Center is rather new but, as already stated above, the positive impact on the environment is guaranteed. It is questionable though if the demand-driven approach and fully paid charges for services without any subsidy is a good idea given: one, the limited awareness of environmental importance in Egypt; and two, the smaller the scale of production the higher the potential for environmental damage and Egypt's enterprises are more on the smaller side than on the larger side. This is confirmed by the observation that the majority of ENCPC clients are large companies. Faster and more comprehensive results could be reached if services are promoted and subsidized to a certain extent as proven by experiences of other countries.[52]

[52] According to ENCPC officials and UNIDO studies, all other similar UNIDO initiatives have involved subsidy at some level or another to encourage enterprises to adopt cleaner production.

3) Establishment of an Industrial Unit within EEAA

The establishment of an industrial unit within EEAA, Ministry of State of Environmental Affairs (MSEA), on February 2004 is a positive development to narrow the gap between industrial practices and environmental protection. Besides formulating industrial environmental policies, the unit is also responsible for promoting greater awareness of environmental management systems and cleaner production through strong coordination with local and international stakeholders. According to interviewed enterprises, the spoken language of the two sides started to get closer, which improved implementation of environmental regulations by enterprises, to the maximum extent allowed by the technical limitations of the enterprise.[53]

4) Evolution of the Environmental Compliance Office (ECO)

The upgrading of ECO from an office status to "a special Unit" [54] status within the Federation of Egyptian Industries, effective January 2008, has a generally positive impact on the environment. It manifests a continued interest in environmental issues by a key local industrial institution as the DANIDA funded ACI (Achieving Compliance in Industry) project phases out. The approach of ECO is similar to that of ENCPC. It attempts to convince enterprises to look at pollutants as a waste of valuable inputs for production rather than harmful pollutants. Environmental compliance is thus positive for investors as it helps them reduce cost through making maximum efficient use of resources. This approach is important and useful in its own right, and also because it pushes for a change of the on-going traditional beliefs that environmental investments have no economic return.

ECO's upgrading is also an improvement in the relations between industrial and environmental institutions. However, the real positive impact of the upgrading of ECO (considering its limited scale of operation and thus impact) will only be felt if the revolving fund of approximately LE 80 million provided by DANIDA is replaced. According to the office, efforts are currently being made to provide new sources of funds from EEAA, FEI (Federation of Egyptian Industries) and a number of national and international institutions. This however, remains to be seen.

[53] EPAP (2004c).

[54] At a minimum, it grants more visibility by industrialists and access to funds within the FEI framework.

b.2. Overall future economy orientation as seen by the government: The sixth five year plan

The sixth five year plan (2007-2011) is very ambitious and relies heavily on manufacturing industries to lead growth. Manufacturing industries are expected to grow at a higher annual rate than the economy as a whole (8.8 percent as opposed to 8.4 percent by 2011), and at a much higher rate than agriculture (target annual rate of growth in agriculture by 2011 being 3.9 percent as opposed to 8.8 percent in industry). The plan also puts a lot of weight on the participation of the private sector. Its contribution to investment in manufacturing is expected to account for 89 percent in 2007 and increase to 96 percent by 2011 and total contribution to employment throughout the five year plan is estimated at 3 million jobs.

Table 12 below presents the planned sectoral composition within manufacturing. The weights of individual industries are kept unchanged following the actual situation in 2006/2007 but with considerable increase in production over the five years (over 100 percent). While the full potential impact of the planned sectoral composition on the environment cannot be analyzed in the absence of information on the planned distribution of investments within each sector, some initial impressions can be drawn on the basis of the planned unchanged sectoral composition. It is important to note though that such information is not available in the plan documents as only the collected group divisions (as in Table 12) are presented. The plan restricts itself to broad lines, which is logical given that investments are not to be implemented by the planner but are rather to come from the private sector.

Table 12. Planned Sectoral Composition in Egypt's Sixth Five Year Plan

Sector	Target 2007/2008 (LE billion)	Target 2011/2012 (LE billion)	Relative importance (%)	Planned (%) rate of growth over whole period
Textiles and clothing	39.0	79.6	30.9	104
Chemicals	33.0	67.2	26.1	103.6
Engineering	20.6	41.7	16.2	102.4
Food	19.1	39.0	15.1	104.2
Metals	14.8	30.1	11.7	103.3
Total	126.5	257.7	100	103.7

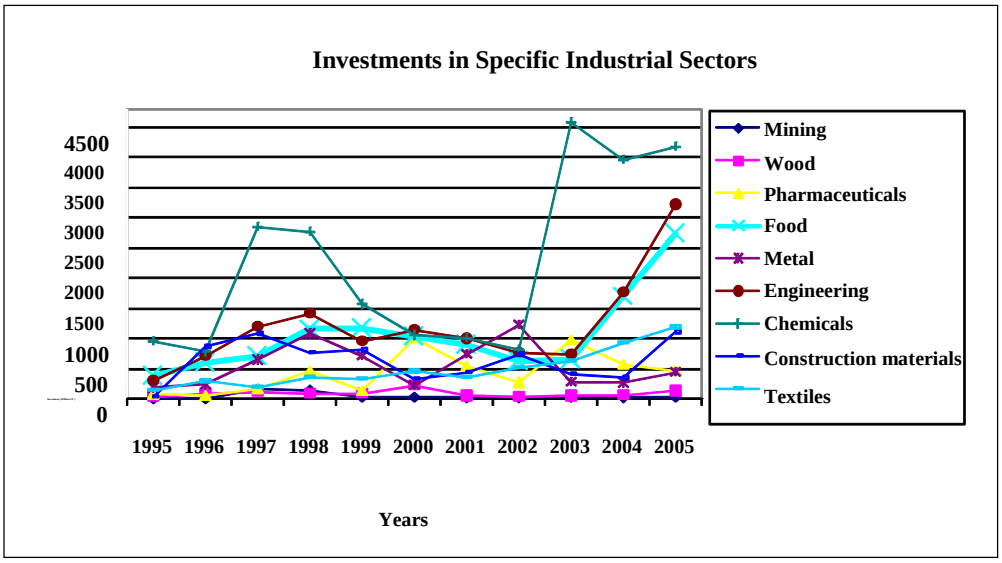
Source: Ministry of Economic Development 2006 (Plan documents, chapter five).

The first overall look indicates that maintaining the same relative contribution of each sector to total industrial output seems to have a neutral effect on the environment, in the sense that it does not worsen the existing situation by increasing the share of some highly polluting

industries such as chemicals and metals. However, a closer look clearly reveals that the plan could actually lead to a serious deterioration in the environmental conditions for the following reasons:

1) Investment in chemical industries has been higher and increasing faster than all other manufacturing industries particularly starting from the beginning of the century, as seen in Figure 2. Between 2002 and 2003 alone, it increased by 475 percent. It accounts on average for 40 percent of all new investments in any given year within the last decade particularly starting from 2003. For the government to target the same relative weights of production distribution in light of such a trend is devastating to the environment.[55]

Figure 2. Annual Investments in Different Manufacturing Industries (1995-2005)



Source: Author's analysis on the basis of GAFI (2006).

2) This first impression is further confirmed by the deteriorating environmental conditions in Egypt detected in the most recent Human Development Report (UNDP 2008). Egypt is ranked 28th out of the 30 most polluting countries emitting CO2. Emissions of CO2 increased by 110 percent between 1990 and 2004. There is also an increase in Egypt's worldwide share of CO2 emissions from 0.3 percent in 1990 to 0.5 percent in 2004. Along the same lines, the per capita share of CO2 increased from 1.5 percent in 1990 to 2.3 percent in 2004. Although

[55] Large chemical industries defend themselves on grounds of using clean technology and the fact that the nature of the industry has changed completely. Two facts remain though: 1) environmental standards in Egypt are more lenient than those in Europe so the long term impact on the environment is still there; 2) chemicals consist of a huge number of small enterprises producing plastics and other chemical products and do not comply, thus significantly endangering the environment. The same applies to metal products.

manufacturing industries are not solely responsible for this environmental deterioration, the fact that the government plans to continue with the on-going trend simply means that industrial institutions and policies do not include the environment in their calculations. In fact, the environmental impact is not referred to at all in the industry section.

3) The offering of new licenses for establishing new cement factories and expanding existing ones despite overall environmental deterioration clearly indicates the governmental support for this line of activities as opposed to diversifying away from polluting industries towards less polluting industries as done in other developing countries that have taken the impact of environmental deterioration on sustainable development seriously.

4) As seen in Figure 3, and as opposed to specific statements in the 2007-2011 plan whereby the Egyptian industrial map is to be reshaped and new factories are to be located in new industrial cities (chapter five, page 99), future cement factories are to be mostly located in the delta area, which further confirms the impression that beyond the rhetoric in governmental discussions, the environmental dimension is at least not a priority on the plan if not completely absent. In fact, at the time of writing this working paper serious problems are already taking place due to initiation of a new cement factory in Damietta.

Figure 3. Suggested Locations for New Cement Factories in Egypt

Source: Ministry of Economic Development (2008).

5) Finally, the section on the environment in the same sixth five year plan is very passive and weak, and does not link back to industry or introduce new economic incentives beyond the lower tariffs on the environmentally friendly equipment. It settles for allocating budgets to reduce water and air pollution and solid wastes. The same approach of cleaning up the industrial mess instead of tackling the problem from the root.

b.3. Energy subsidy reductions

Energy has always been subsidized in Egypt at the consumer level as well as the industrial level. This subsidy has been the main reason behind attracting investment—local as well as FDI—to sectors that are energy intensive (such as fertilizers, cement and iron) more than others, creating a skewed investment pattern that is unhealthy because it is based on an economic deficiency. In addition, it is causing a huge burden on the government. The situation became worse over time as international energy prices gradually increased.

For years, calls have been made for gradual elimination of subsidy so as to reach economic prices of energy but it has always been opposed by industrialists on grounds of reduction of competitive advantage and potential closing down of enterprises and loss of jobs. The topic has been a political taboo. In 2007, the issue was revisited through joint discussions between the Ministries of Trade and Industry, and Petroleum and Electricity whereby a new pricing policy for energy to alleviate the burden on the national budget and reduce operating inefficiencies is adopted. Accordingly the government will save LE 15 billion over the next three years.

Under the new schedule, approved by the Supreme Energy Council, natural gas prices for heavy industrial users will increase from $1.25 per million Btu to $2.65 per million Btu, with an average increase of $0.45 per annum. Electricity prices for heavy users will also rise by approximately 60 percent over the coming three years.

Beyond 2010, the price of natural gas and electricity for these users will be set according to a formula linking cost and world market prices. However, prices will not be allowed to rise more than 15 percent per year. The revised energy pricing strategy targets 40 enterprises that are the country's largest consumers of energy, primarily cement, steel, fertilizer and aluminum producers. Together these companies account for 20 percent of Egypt's industrial production and 70 percent of the LE 4 billion in energy subsidies allocated to industry last year. Energy subsidies for other industries are also to be phased out over the

coming six years. An initial assessment of the impact of revision of energy prices on the environment is positive primarily because it is a step towards full-cost pricing of scarce resources. Moreover, the vast majority of energy intensive industries addressed in the first phase are environmentally polluting, and the cost pressure on enterprises is expected to rationalize the use of energy, and discourage abuse not to mention gradually shifting the economy away from heavy energy consuming industries towards others, which are of a less depleting impact on reserves. A closer look, however, reveals that the environmental condition is not necessarily going to improve. In fact, it might even get worse. The main reason is that revisions of energy prices are primarily triggered by sky high oil prices and increasing subsidy burden on the government. The environmental impact (or rationalization of use of Egypt's scarce natural resources) as such was not explicitly stated in the equation thus leaving the impact of the decision haphazard whether on the positive or negative side.

One major issue of concern is that subsidies of natural gas and electricity (the most important non-polluting energy sources) are being revised in isolation of a comprehensive announced revision plan of prices and subsidies of all energy sources including other much more polluting ones. Even the most recent increase in the price of mazot[56] seems to come as a piecemeal policy reform measure in the right direction, but causing confusion in industry because it is not announced with a plan for all complementary measures to shift enterprises to cheap and less polluting sources such as natural gas.

While mazot subsidy reductions theoretically create a motive to shift to less polluting sources such as natural gas, the ambiguity as to how and when exactly the natural gas subsidy will be removed off all industries in the next few years still creates uncertainty that tends at a minimum to maintain the status quo for the environment. There is a natural bias for enterprises to remain with polluting energy sources especially that the physical network for natural gas installations has not been extended to all regions within Egypt yet and is creating disincentives of its own (as already explained in Section II above). This argument applies particularly to small enterprises (especially informal ones). If such scenario takes place, the core of the efforts of ECO and ENCPC in guiding Egyptian manufacturing towards cleaner production is exhausted. At the time of writing this paper, however, further revisions of energy prices are taking place, and there seems to be more to come. The extent to which

[56] Announced at the time of writing this paper.

relative prices at the end will deepen the present bias towards cheap polluting energy sources or correct it remains to be seen.

Another critical issue relates to the industry most directly affected by the decision to raise natural gas prices, the nitrogen fertilizer industry where natural gas represents 90 percent of inputs and 60 percent of costs of production. The industry is facing a puzzling situation which raises big question marks as to the impact of the decision on the depletion of Egypt's natural gas resources. The new policy implicitly applies only to the companies that sell to the domestic market (two public companies: Abou keer and Talkha with 65 percent and 35 percent domestic market shares, respectively). The vast majority of companies (private ones and FDI) are located in the free zones and have confidential agreements with the government whereby natural gas prices are fixed for periods between five and ten years.[57] With such agreements binding, the impact of the new policy is indifferent on the environment if not negative. In fact, the room for favorable agreements at the expense of Egypt's scarce resources can always be justified on the grounds of encouraging investment especially FDI in light of Presidential Decree (#30/2005) giving the PM authority to make exceptions. If this is added to Egypt's recent long-term agreements for exporting natural gas to Israel and other countries at fixed prices, it is really questionable where the Egyptian economy is heading.

Table 13 wraps up the analysis of the impact of all the recent policies analyzed on the environment by assessing their effect on increasing compliance with environmental standards, improvement of geographical and size distribution of manufacturing enterprises, depletion of natural resources, substitution of less polluting sources of energy for more polluting ones and finally having an environmental vision in the overall orientation of the economy. Although improvements are witnessed on some fronts, the overall impact of recent industrial policies leans towards leaving the environmental situation unchanged if not leaning towards some deterioration.

[57] This has been stated by all enterprises in the field interviewed and confirmed by an official who chose to remain anonymous.

Table 13. Overall Impact of Recent Changes in Industrial Policy on the Environment[58]

Area of Intervention	Environmental Situation	Reasoning
Compliance with environmental standards	Improved	Policies encouraging exports and investment.
Geographical distribution	Improved	IDA generally prohibits establishment of new enterprises close to residential areas.[59]
Size distribution	Unchanged	Country's orientation is still generally geared towards small enterprises although larger enterprises have been receiving some attention in the presidential program.
Depletion of natural resources	Overall picture still not clear—situation could get worse despite recent positive development	(-)[60] long term export of natural gas; (+) move towards full-cost pricing and rationalization of use of natural gas; and (-) selective high prices impact at the present stage. (?) Other energy prices not finalized.
Substitution of polluting energy sources with more environmentally friendly ones	Overall picture still not clear	(?) Relative prices of different energy sources are still not finalized; (-) if the increase in natural gas prices faced by all is more than the increase in other polluting petroleum fuels, it is bad for environment (lean towards cheaper sources).
Environmental vision/overall orientation of economy	Same	No environmental vision incorporated in sixth five year plan or industrial strategy.

4. HAS THE RELATIONSHIP BETWEEN INDUSTRY AND THE ENVIRONMENT IMPROVED IN EGYPT?

The relation between industrial institutions and policies and environmental institutions and policies in Egypt has evolved over the years from: ***phase one (until 1994)***:[61] a one-player scenario with industrial institutions and policies focusing on industrial growth irrespective of environmental impacts and no one on the other side to protect the environment; to ***phase two (1994-2003)***: a two-player scenario where environmental institutions and policies try to mitigate the negative impact on the environment of industrial growth and expansion of industrial facilities triggered by industrial policies.

The most important feature of this second phase is the passive role of the industrial institutions and policies as far as the environment is concerned. The industrial focus is on increasing value added, employment and exports with private and foreign investment as the main vehicle. Beyond the rhetoric, this formula implicitly and explicitly leaves out the environmental clean up to be handled by the environmental authorities.

[58] Some of the issues addressed in the table are beyond the scope of this paper and are not addressed in the main text. They are still mentioned, however, because of their importance (presidential program and Egypt industrial development strategy).

[59] However, at the end, the government has the upper hand decision in the provision of licenses according to B2 item 3.

[60] (-), (+), (?) negative, positive, and still unknown impact on environment, respectively.

[61] The introduction of the key environmental law.

The ultimate aim is to take industry and the environment from ***phase two*** to ***phases three and four: Phase three*** where the industrial institutions and policy and environmental institutions and policy are mutually reinforcing, jointly acting to achieve the same objectives of industrial growth without jeopardizing the environment, i.e., sustainable growth, rather than passively acting separately to achieve conflicting goals; and ***Phase four***, the last destination where not only policies on both sides support each other but also the Egyptian institutional framework is corrected to achieve the most effective economic and environmental management through proper separation of environmental legislation from execution activities. At this point, in 2008, Egypt is beyond ***phase two*** but not quite in ***phases three and four*** as further explained below.

Table 14 lists the main features of ***phase three*** as reflected by developed country experiences and new directions of the least developed countries (LDCs) trying to correct the imbalance. One point emphasized in countries that are taking the combination of environmental welfare and sustainable development seriously, is the danger of overlooking that the "environmental" objectives of sustainability of natural resources and protection of public health are also economic objectives equally important to the long-term economic viability and competitiveness of a nation.[62]

Phase four is the stage where the responsibility of environmental control of enterprises becomes the responsibility of the Ministry of Trade and Industry and EEAA returns to its original role (as per law #4, 1994)[63] as a coordinating and policymaking body not involved in micro environmental management of enterprises. This is meant to hand over the responsibility of actual supervision of enterprises to the institution also responsible for observing the economic performance of the same enterprises. This automatically puts environmental objectives on par value with other objectives by the same institution, mainly value added, employment and exports. This approach follows the experience of a number of countries that were keen on separating legislation from execution in what concerns the environment.[64]

[62] UNCTAD (1996).
[63] EAA (2005).
[64] Based on interviews with environmental experts.

Table 14. Main Features of Phase Three as Reflected by Other Countries' Experience

PHASE THREE: **Industrial policies incorporating environmental dimension**
Core feature: A national industrial policy incorporating the environment aims at changing the composition of the manufacturing sector progressively toward a less polluting mix, and to improve the efficiency and quality of processes used. It must incorporate environmental objectives on par with the more conventional economic objectives (e.g., increased employment, value added, import substitution and export promotion).
An environmentally responsive industrial policy should also include: • Effective integration of environmental objectives with economic and social objectives and special planning at all levels from the nation to the community; • Fiscal and facilitative incentives for local and foreign investment in key industries, which are less polluting and more consistent with the sustainable use of local natural resources; • Incentives to new or expanded industry in all sectors to adopt more efficient processes and achieve cleaner production, as measured against global benchmarks; • Incentives for firms to adopt and be certified to international standards of good environmental management; • The promotion of industrial ecology, including incentives for firms to process wastes for reuse and for industrial estates to encourage co-location of complimentary industries; • A focus on small and medium enterprises and the creation of mechanisms to help them select and adopt least-cost process and pollution control technologies and appropriate environmental management techniques; • Market-oriented tariff and trade policies to achieve the most competitive and efficient uses of resources (i.e., without protection or subsidy); • Full cost-pricing of resources to incorporate environmental costs and realistic concession agreements for natural resources; • Requirements that new investments fully identify their environmental consequences and be continually self-reporting with transparency to their surrounding communities; • The means to inform and train financial and insuring institutions on industrial environmental objectives and the reduction of lending risk through cleaner production and better environmental management.

Source: collected from various reports on Chile, the Philippines, Indonesia, the US, Pakistan; and UNIDO studies.

The detailed analysis in this study showed that, generally speaking, at least until 2004 the environmental dimension was not incorporated at all in industrial policies in Egypt, even though sustainable growth—clearly recognizing industry as its engine—cannot be realized in the absence of preservation of resources and environmental compliance. From 2004 onward, recent industrial policies seem to have a potential positive impact on the environment thanks to increased environmental awareness, global integration, export orientation, encouraging foreign investment and new technologies through an improved business environment, and conscious efforts to improve the geographical distribution of enterprises away from residential areas.[65] Environmental compliance over entire value chains as clear pre-requisites for exporting final products to the EU and the US markets played a particularly significant role in

[65] Maby and McNally (1998).

transforming export-oriented manufacturing enterprises focused on these markets. While the potential improvement in environmental compliance applies at the enterprise level (micro level), the global impact on the environmental condition in Egypt (macro level) remains unknown and could even lean toward deterioration.[66]

Some specific positive developments in the period (2004- to date) towards reconciling relations between the industrial camp and the environmental camp have taken place such as:

1. In the new export import executive regulations (decree (#770/2005)), combining the suspension of asbestos importation with the prevention of importation of brake pads made of asbestos kills the motive for opening back doors for smuggling asbestos by local pad producers to be able to compete with the cheap finished imported product.

2. Institutional developments such as the establishment of IDA, ENCPC, an industrial unit within EEAA, and upgrading of ECO, all generally narrow the gap between the two sides with most initiatives taken on the industrial side.

3. Attempts by different institutions on the environmental side as well as on the industrial side to approach environmental protection from the angle of the economic benefits and lower costs of production associated with cleaner production and reprocessing of wastes, instead of the traditional argument for waste treatment out of social responsibility. A leader in that area, despite its limited scale of activities thus far, is ENCPC.

4. More cooperation between Ministries of Trade and Industry, Investment, Health, Labor Force and Housing with EEAA to avoid unnecessary redundant inspections on enterprises and overlap of responsibilities.

5. Social image and social responsibility featured by environmental compliance emerging as an important characteristic of a successful business practice in Egypt; and

6. Finally, a recent agreement between EEAA and the Ministry of Economic Development, whereby the environmental dimension is to be incorporated in the mechanism for putting plans at the national level. This specific point falls under the preparation for ***phase four***.[67]

[66] A conclusive answer cannot be provided here as it requires deeper research beyond the scope of this paper, and also needs to allow more time for on-going energy re-pricing to be completed.

[67] Based on interviews with environmentalists.

However, all this does not achieve yet the desired full shift to *phases three and four* for the following reasons:

1. The environmental dimension is still not incorporated in the industrial policy formulation from the beginning but rather comes as a byproduct; recent industrial policies still leave room for dangerous back doors inducing a negative impact on the environment as seen in the analysis;
2. The gradual change of the sectoral composition towards less polluting industries is still not on the map at all, despite the fact that the present composition actually leans towards polluting industries and environmental reports indicate deterioration in environmental conditions;
3. Policies do not involve any special incentives for investment in less polluting industries. In fact, treating all investments, export markets, etc., as equal creates implicit incentives to go toward cheaper solutions costly to the environment;
4. All local agencies are comfortably settling for soft loans and grants in donor programs to clean up industry without introducing additional economic incentives like other countries to promote drastic large-scale changes;
5. The persistence of many policy inconsistencies of unfavorable impact to the environment;
6. The weakness of dispute settlements and low compensations on environment and health felonies undermine all efforts for moving forward;
7. The most recent energy subsidy reduction, though a step in the right direction in the sense that it allows gradual full cost pricing for resources, it still leaves big question marks on the ultimate impact on the environment and the overall government orientation, given confidential agreements of some fertilizer companies for fixed natural gas prices and the long term fixed low price export agreements of natural gas to Israel and other countries.

Four specific areas that need considerable attention by Egypt to speed up the shift to third and fourth phases are: 1) a clear distinction between short-run and long-run environmental policies making sure that the short-term ones do not contradict but rather support the long term ones; 2) a clear distinction between policies, programs and incentives encouraging environmental compliance for large enterprises and those for small enterprises, because while the former group has increased competitiveness and environmental compliance

going hand in hand and mutually reinforcing, the latter has the two objectives contradicting as increased competitiveness is associated with the domestic market where environmental compliance makes no difference and is in fact considered a burden; 3) since Egypt has many potential industrial cluster areas, there is room for significant reduction in environmental cost compliance through collective actions which solves a significant portion of problems faced by small enterprises; and finally 4) land use policies explicitly taking the environmental dimension into consideration is a necessary starting point for addressing the environment within national economic policy planning.

In conclusion, Egypt is moving forward but very slowly and still has a long way to go to reach an environmentally responsive industrial policy. This working paper is but a scratch on the surface for the research possibilities and policy recommendations in this area.

APPENDIX A[68]

Table 1A. Environmental Management Instruments Applied in Egypt[69]

Category	Policy Instruments	Applied
1. Command and control regulation	Industry discharge standards	✓
	Sub-sector specific concentration standards	✓
	Sub-sector specific mass-based standards[1]	✓
	Plant-specific discharge permits	✓
	Substance/technology bans	✓
	Technology control	✓
	Environmental impact assessment	✓
	Enforcement/non-compliance fines	✓
	Negotiated compliance[2]	✓
2. Economic/fiscal	Reduced taxes, duties and fees	
	Grants and duties for CT assessment and implementation	✓
	Remove harmful subsidies	
	Soft and revolving loans for EST investments	✓
	Facilities preparation of bankable projects	
	Financial liability	✓
	Tradable permits	
	Environmental levy	✓
	Fund research and development for CT	
	Green GDP accounting	
	Deposit systems	✓
3. Voluntary programs	Cleaner production programs	✓
	Promotion of ISO14001[70]	✓
	Product labeling	✓
	Industry codes of practice	
4. Transparency and disclosure	Toxic release inventory	
	Corporate reporting[1]	✓
	Corporate environmental performance awards	
	Public participation[2]	✓

[1] Will be initiated in the near future.
[2] Recently initiated.

[68] All tables related to environmental laws and regulations, and institutions have been collected from various official environmental institutions (EEAA 2003; and Environmental NGOs: EEPP 2004a, EEPP 2004b, EEPP/MVE 2004). Analysis was conducted with the help of Doaa Abou Elailah, Senior Environmental Management Specialist, Environics.

[69] Information for Tables 1A, 2A, 3A and 4A have been collected from DGTPE (2007), EPAP (2004b) and UNEP (2004).

[70] Egyptian Accreditation Council (2004).

Table 2A. Industrial Institutions of Relevance to the Environment, up to 2005

Institution	Affiliation	Role related to environmental protection	Role effectiveness[71] on the basis of interviews with environmentalists
Egyptian Organization for Standardization and Product Quality (EOS)	Ministry of Trade and Industry (MTI)	Responsible for issuing standards for industries and for monitoring of pollution as well as representing Egypt in international and regional standardization and calibration including the environment-related standards.	Limited role in environmental area. Focus of activities on harmonization of standards.
Tebbin Institute for Metallurgical Studies		Responsible for preparing environmental studies, providing services and undertaking analysis.	Effective but limited scope and studies not necessarily applied.
Environmental Compliance Office (ECO)	Federation of Egyptian Industries (FEI)	Established in FEI in 2002, financed by DANIDA[72] until 2005, established to serve as a link between industry, EEAA and financial institutions and to aim at achieving an increased level of compliance in industry with environmental regulations through promotion of awareness activities and mobilization of financial support for the implementation of cleaner production.	Limited scope and financing. Publications to increase awareness more than actual tangible role in introducing clean technology at least in its first years.

Table 3A. Environmental Regulations and Main Focus

	Location	Air Emissions	Wastewater	Solid Waste	Hazardous Substance	Hazardous Waste	Work Environment	Emergency Situations
Law #4/1994[73]	•	•	•	•	•	•	•	•
Law #48/1982			•	•				
Law #93/1962 (decree no 44/2000)			•					
Law #12/2003, Labor Law					•		•	•
Law #453/1954	•			•				•
Law #3/1982	•							
Other decrees issued by Ministers and governors	•			•	•	•	•	

[71] Effectiveness in the sense of achieving tangible improvements in environmental conditions and significant shifts of manufacturing enterprises towards cleaner production methods.

[72] A revolving fund is provided through DANIDA whereby soft loans are offered to enterprises for the purchase of equipment necessary to apply cleaner production. Loans reach up to LE 3 million per enterprise at a 2.5 percent interest rate per annum. Loans are repaid over 5 years.

[73] Law no. 4/1994 marks a turning point from an amorphous environmental system to one that has a tangible impact on mitigating, among other major functions, the environmental damage caused by manufacturing.

Table 4A. Industry Responsibilities as Indicated by Environmental Laws and Regulations

Regulatory Tools	Regulated Aspects							
	Location	Air Emissions	Wastewater	Solid Waste	Hazardous Substance	Hazardous Waste	Work Environment	Emergency Situations
Safe allowable limits		•	•				•	
License/permit for specific aspects	•	•	•		•	•		
Technical specifications	•	•	•	•	•	•	•	•
Management conditions	•	•	•	•	•	•	•	•
Prohibition of specific activities/inputs	•	•	•	•		•		•
Safety and pollution abatement conditions		•	•	•		•	•	•
Awareness requirements					•	•	•	•
Documentation requirements	•	•	•	•	•	•	•	•
Safety conditions for the protection of recipients	•			•	•	•	•	•
Planning activities to minimize and prepare for emergencies					•	•	•	•

The National Cleaner Production Strategy (CP Strategy)

An important industry related strategy is the National Cleaner Production Strategy issued in 2004 with the aim of developing an integrated framework for implementation of cleaner production in the Egyptian industry within the overall context of a national policy. While specific division of roles towards implementation of the strategy has been assigned to the Ministry of Trade and Industry, Federation of Egyptian Industries, chambers of industry and EEAA, the activities thus far undertaken by different parties are scattered and have not been coordinated through the originally proposed institutional setup.[74]

Responsible Entities and their Mandates

A number of entities are responsible for the environmental status of industry. These entities interact with each other either through protocols, committees or through the involvement in donor-funded projects addressing industry. Below is a list of the most important ones:

1) Egyptian Environmental Affairs Agency (EEAA) and its Regional Branch Offices (RBOs)

EEAA (established in 1982) is the entity responsible for the environmental protection in Egypt and for the formulation of the environmental management policy framework, setting the required action plans to protect the environment and following up on their execution in coordination with Competent Administrative Authorities (CAAs). The law identified three

[74] EPAP (2004d).

specific roles of EEAA: a regulatory and coordinating role in most activities, and an executive role restricted to the management of natural protectorates and pilot projects. It is also responsible for the preparation of the annual state of the environment report submitted to the President. EEAA has eight RBOs; each has 3-4 governorates within its domain.[75]

2) Governorates and their EMUs

Each governorate has an environmental management unit (EMU) responsible for coordinating its environmental activities. The EMU of the governorate is administratively affiliated to the governorate and technically reports to EEAA.

3) The Ministry of Water Resources and Irrigation

The Ministry of Water Resources and Irrigation (MWRI) is the entity responsible for the planning and management of water resources in Egypt including the Nile, canals, drains as well as groundwater.

4) The Ministry of Health

The directorate of health is responsible for wastewater samples from facilities discharging to surface and marine water, respectively. Results of the samples are sent to the concerned entity to take action.

5) The Ministry of Manpower

It is responsible for ensuring sound work environment conditions and check their appropriateness to the nature of the facilities and its operations and ensure compliance with laws and regulations, emergency plans as well as registers of hazardous substances.

6) Non-Governmental Organizations (NGOs) and Donor Programs

Currently, there are more than 2,000 NGOs in Egypt whose activities are environmentally related. Some of these are more active than others, but collectively they play an indispensable role in raising public awareness towards environmental issues, and in conducting environmental protection and conservation activities. A number of donor programs specialized in the environment have recently been operating in Egypt with some of them already completed.

[75] EEAA (2005a).

APPENDIX B[76]

Table 1B. Detailed Assessment of the Impact of Recent Fiscal, Trade and Business Environment Policy Changes on Egypt's Environmental Condition[77]

Industrial Policy	**Specific item responsible for *positive impact* on the environment**	**Specific item responsible for *negative impact* on the environment**	**Reasoning**
		Fiscal Policy	
New Tax Law (# 91/2005)[78]	An improvement to the business environment thus encouraging new investments.		New investments in general associated with newer technology (lower negative impact on the environment) especially with mandatory condition of EIA[79] form .
	The simplification of tax procedures, cancellation of all previous tax commitments to the tax authority and reduction of tax rates.		Reduction of size of informal sector.
	Reduction of tax rates, organization of depreciation categories and giving special rates to newly acquired equipment.		Renewal of equipment easier.
		Cancellation of tax holidays given to investments in new cities and industrial zones.	No incentive for R&D or cleaner production as such. No incentive for keeping away from residential areas if enterprise can get away with it.
Removal of Sales Tax off capital goods and equipment[80]	Sales tax on capital goods and machinery was cancelled.	The new decision does not apply to food industries.	Given the size and importance of the food industries and the huge size of the informal sector within that sector, making updating of equipment expensive deepens and extends the environmental damage as equipment get older.

[76] Other sources used in this section are the Blue Plan (2003), Ministry of Investment (2005b), Ministry of Trade and Industry (2003), Ministry of Trade and Industry (2004).

[77] Analysis by author for official complete versions of different laws.

[78] Ministry of Finance (2005). The old tax law no. 157/1981 was a major obstacle for manufacturing enterprises. A new tax law no. 91 has been passed in 2005, its main features being: substantial reduction in tax rates; unification of tax rates; cancellation of surcharges; simplification of procedures; adequate and simple categorization for depreciable assets; cancellation of tax exemptions associated with investment law no. 8/1997; and overall regaining of trust between tax payers and tax authorities.

[79] EIA (environmental impact assessment) is a mandatory document in the investment application file.

[80] The sales tax was first introduced in 1991 as part of the fiscal reform to increase government revenues. Until very recently, imports of capital goods and machinery were subject to a 10 percent sales tax, a practice that significantly increased investment costs and had a direct negative impact on the environment because it discouraged updating machinery and production technology.

Trade and Investment Policies[81]			
Decree (#770/2005) Issuing the Executive Regulations to Implement Import and Export Law (#118/1975)[82]	Article (6) of the decree suspends the importation of a specific list of harmful products.[83] Of specific interest to manufacturing is the suspension of all kinds of asbestos.		Asbestos has a very harmful effect on the environment and suspension of its importation will force manufacturing enterprises to seek superior substitutes that are friendlier to the environment.
	Article (7) of the decree states that in principle all imported products should be new. However, in case of used products especially items listed under: waste, parings and scrap of artificial plastics, can only be allowed after the approval of the head of EEAA. Used production lines, machines, apparatuses, equipment and their spare parts shall only be allowed, if, and it is clearly stated, ozone-depleting substances are not used in their manufacturing.	Only ozone depletion sources are accounted for.	Other than the ozone layer depletion material, there are no other conditions in the law that mention for instance that equipment or production lines shouldn't be older than five years or that used lines are allowed only when cleaner production technology is introduced. Absence of such clauses gives room for sneaking in of old technology harmful to the environment.
Export Subsidy Fund[84]		Special approval of Minister of Trade and Investment can make exceptions to article (7).	Room still open for lobbying in favor of harmful goods.
	Government encourages exports by paying back exporters 8 percent of the value of each export transaction.		Further integration with the global economy will necessarily push in its turn for superior techniques of production where environmental considerations are progressively captured (EU puts strict requirements in that area).

[81] Markandya (1995).

[82] The MTI has issued a new Executive Regulations for the Import and Export Law no. 118/1975. It includes new control procedures for inspection and control of imported and exported goods. While based on the same articles that were passed 30 years ago, the manner in which they will be implemented takes into consideration the changes that the world economy has experienced and Egypt's commitments toward the World Trade Organization (WTO). The new regulations are to be implemented in coordination with 18 other Presidential Decrees, Prime Ministerial Decrees, Ministerial Decrees and Laws. They cover a variety of issues including regulations on imports and exports for retail, production of commodities and services, private use, personal use, goods for display as well as government imports and exports.

[83] Goods bearing marks considered sensitive to religious beliefs; chicken offal and limbs; fowl livers; two-stroke motor bicycles not equipped with oil injection pumps; all kinds of asbestos; brake pads made of asbestos; tuna containing genetically treated oils; specific lists of pesticides and chemicals.

[84] Besides duty drawback and temporary admission schemes for imports used in production of goods produced for export, the introduction of free zones and export promotion law no. 155/2002 stand as the most important tools for export promotion in Egypt, particularly the export subsidy fund.

		Support linked only to quantity exported without any linkage to R & D by company or environmental compliance.	Whenever incentives are equally provided to all,[85] there is no motive to adopt specific measures to protect the environment as such, or export to difficult markets.
Free Zone advantages[86]	Encouraging exports and easy purchase of new equipment etc, which generally has an indirect positive impact on the environment, the fact that actual impact remains.	All incentives are offered horizontally for all investments with no differentiation between assembly or high valued added industries, polluting or non-polluting industries and no explicit accounting for environmental concerns.	Ambiguous and could lean towards the negative side if most attracted investments (migrating investments) are on the polluting side.
Trade Agreements[87]	Encourage trade with countries where environmental compliance of trade partners is a binding constraint for export (such as in the case of the EU and the US).	Environmental constraints are much weaker in Arab and African countries.	Integration into the global economy and preoccupation with environmental issues go hand in hand, thus Egypt's obligation to comply by virtue of signing the agreements is most likely to have an overall indirect and direct positive impact on the local environment. In the absence of specific incentives, exporters would go for the easier markets.
Investment Laws[88]		Egypt is encouraging investments in all manufacturing without any reservations on polluting sectors and there are no special incentives favoring environmentally friendly technology or even R&D.	Egypt's eagerness to attract investment could easily have a negative direct effect on the environment if it leads to downward pressure on environmental standards, or over concentration of polluting industries closing down in Europe—even if they come with reasonably "clean" technology— because Egyptian standards are already low compared to the western world.

[85] Such as fiscal incentives (Ghanem and Kouchouk 2004).

[86] GAFI (2004).

[87] Egypt signed three regional trade agreements (COMESA, GAFTA and the Aghadeer Protocol). It has also recently entered into eight bilateral trade agreements, six of which with Arab countries, one with the European Union (EU) and the most recent one with Turkey (December 2005).

[88] Three laws govern investment in Egypt (including FDI): the companies' law no. 159/1981, the investment guarantees and incentives law no. 8/1997 amended by laws no. 196/2000 and no. 13/2004, and the special economic zones law no. 83/2002. Law no. 8 involved a number of tax holidays as incentives but they were cancelled by the recently introduced tax law. A new Presidential Decree no. 30/2005 authorizes the Prime Minister to provide incentives in the form of new tax holidays or energy price subsidies or any exception from general rules and procedures for investment, if the new project involves transfer of high technology to Egypt, significantly improves skills and efficiency of Egyptian workers or boosts Egyptian products to world standards.

		Presidential Decree (#30/2005) giving the authority of exception to the Prime Minister does not specify protection of the environment as one of its criteria.	Polluting and non-polluting investments are seen by all relevant laws as similar with environmental control left completely to EIA, which is not enough especially that GAFI and the Prime Minister have higher authority than EEAA, which means that even if EEAA rejects a project because EIA is not adequate, practically the investment can still be implemented.
Legal, Regulatory and Business Environment			
Labor Law (#12/2003) Amended by Law (#90/2005)[89]	Educating workers about safety processes, harmful emissions and handling of chemicals and their dangers.		A positive contribution towards the creation of a culture that appreciates the preservation of the environment.
	The set levels for pollution in the new labor law not only complied with Egyptian environmental laws but also with international standards. It was even recommended that the relevant clause be removed from the environmental law since it would be redundant.		Slow dispute settlement system in Egypt[90] and low compensations for environmental cases decrease the advantages of the labor law in that area (and other laws as well) as there is no adequate punishment for cases of non-compliance. While exposure to a harmful substance, such as asbestos, could lead to compensations in the approximate ranges of EUR 20 million in Europe or even $200 million in the US, the equivalent amount in the case of Egypt would be a maximum of LE 50,000 and would take 4 to 5 years. It is interesting to note that the US does not even have a legislation that prevents the use of asbestos, but no enterprise would dare use it anyway because the judicial system is very strong and efficient.
	Articles 205, 206 and 207 clearly state that a committee consisting of members from the Ministries of Manpower and Migration, Housing, Health, Water Resources and Irrigation, Electricity, Interior and Environmental Affairs is to handle the process of issuing of license and follow-up later.		A positive development because enterprises used to get redundant surveillance from each of these authorities separately. The process often discouraged new entrants from joining the formal sector in the first place. It is easier to operate within the informal sector, where no compliance with any standards environmental or otherwise apply.

[89] Ministry of Manpower (2005). A new labor law was issued in replacement of the old law that has been operational from the 1960s. The new legislation has a direct strong positive impact on the internal environment or the working environment conditions. Part five of the law, articles 202 through 232, covers all aspects of a healthy work environment from initial equipping of facilities, to procedures for obtaining an operational license, to specification of maximum acceptable levels for air, water and noise pollutions, to monitoring and surveillance, to educating workers on safety issues, to penalties that reach closing down in case of complete non-compliance. The set levels for pollution in the new labor law not only complied with Egyptian environmental laws but also with international standards.

[90] Handoussa et al. (2003).

	The new labor law gives the right to owners to fire workers in case of non-compliance with work standards or more serious felonies, a feature totally missing from the old law.		Environmental problems emerge not only due to technology of production but also because of poor working habits and ignorance. Possible firing in combination with the other articles on safety are likely to lead to more positive attitudes towards the environment in general.
Competition Law (law #3/2005) and Executive Regulations (August 2005)	Law encouraging private investment and FDI on grounds of improving business environment.		New investments generally associated with more advanced technology with less negative effect on the environment.
		Investigation of all illegal violations will be left up to a single authority CPA,[91] which might not have the needed tools or resources to investigate. The newness of the new,[92] the relatively subjective definitions provided for violations and the lack of precedents can lead to implementation problems.	The whole set-up creates uncertainties as to whether or not CPA will be able to fully and effectively implement the law. Such uncertainties can lead to a lot of abuse for all existing large scale enterprises when they are the ones that tend to adopt pollution abatement techniques because their scales of production justify it. Many of these companies are adopting environmental protection measures out of self-control or self-regulation. The fact that these measures are expensive, too much pressure on companies could discourage them from taking the extra step of environmental protection that they can easily do without.
Consumer Protection Law	The existence of an adequate consumer protection law combined with an efficient judicial system and strong awareness by consumers for their rights to healthy products and a clean environment.	The absence of strong dispute settlement weakens the impact of the law (see example in labor law analysis above).	The positive impact, however, can be highly reduced if the focus of activities of the law and its implementing authority ignores the informal sector and focuses on the formal sector and big companies (because it is easier to handle).

[91] OECD (1996).

[92] Practices such as controlling prices, division of markets among a limited group of companies based on geographic or distribution areas; coordination in supply offers or tenders; and restriction of manufacturing or distributing a particular product or service with the aim of driving up its sale price will, for the first time, be put to the test by the law and are new to Egypt.

REFERENCES

Abdel-Latif, Abla. 2007. Governmental export incentives to food processing industries: Assessment and future path. Study prepared for the Food Export Council (unpublished).

Attalla, Abdelhamid. 2005. The new proposed Egyptian Income Tax Law. Cairo, Egypt: KPMG.

Blue Plan 2003. Environmental taxes in southern and eastern Mediterranean countries: The case of Egypt. France: Plan Bleu.

CEFRS (Centre for Economic and Financial Research and Studies). 2003. Awakening a sleeping giant. Presentation at the CEFRS conference on the textile industry. Cairo, Egypt: Cairo University, CEFRS.

Chinese Academy of International Trade and Economic Cooperation . 2000. China: Coordination of Environmental and Trade Policies. 4th Meeting of the 2nd Phase of CCICED.

DGTPE (Direction Générale du Trésor et de la Politique Économique). 2007. *The use of economic instruments for environmental policies*. Letter #19- Tresor-Economics. France.

EEAA (Egyptian Environmental Affairs Agency). 2003. The National Environmental Action Plan. Cairo, Egypt: EEAA.

———. 2005a. Applications of Law 4/1994 Executive Regulations.

———. 2005b. State of the Environment Report. Cairo, Egypt: EEAA.

Ecorys. 2005. Egyptian Processed Food Sector review. Cairo, Egypt: Industrial Modernisation Centre.

EEPP (Egyptian Environmental Policy Program). 2004a. Air Quality Status Report.

———. 2004b. National Air Quality Strategy Framework. Cairo, Egypt: EEPP.

EEPP/MVE (Egyptian Environmental Policy Program, Monitoring, Verification and Evaluation). 2004 .Critical review and analysis of prospects of effectiveness of the National Air Quality Strategy Framework. Cairo, Egypt: EEPP/MVE.

Egypt Environmental Laws and Regulations.

Egyptian Accreditation Council. 2004. Directory of ISO9001 and ISO14001 Certified Organizations.

EPAP. (Egyptian Pollution Abatement Project). 2004a. 1st Year Implementation Plan for the Cleaner Production Strategy. Cairo, Egypt: EPAP.

———. 2003. Report on: Challenges in cleaner production policy in Egypt. Cairo, Egypt: EPAP.

———. 2004b. Report on: Emission inventory in south Cairo. Cairo, Egypt: EPAP.

———. 2004c. Report on: Establishment of the Industry Unit. Cairo, Egypt: EPAP.

———. 2004d. National Cleaner Production Strategy and Action Plan. Cairo, Egypt: EPAP.

GAFI (General Authority for Free Zones and Investment). 2004. Information Centre, March. Cairo, Egypt: GAFI.

———. 2006. Investment data for the period 1995-2005. Cairo, Egypt: GAFI.

Galal, Ahmed. 2002. *The paradox of education and unemployment in Egypt.* ECES Working Paper No. 67. Cairo, Egypt: The Egyptian Center for Economic Studies.

Ghanem, Amina, and Ahmed Kouchouk. 2004. Fiscal incentives for export promotion: the Egyptian case. Unpublished study.

GOFI (General Organization for Industries-currently IDA) 2005. Regional Industrial Database. Cairo, Egypt: GOFI (Currently IDA).

Handoussa, Heba, Nivine Oraby, Diaa Nour El Din, Heba Abou Shnief, and Ziad Bahaa El Din. 2003. Study on creating an enabling business environment in Egypt. Cairo, Egypt: Industrial Modernisation Centre.

Ikram, Khalid. 1980. Economic management in a period of transition. World Bank country report.

IDA (Industrial Development Authority). 2006. Presentation on the strategy of development for the organization of industrialization, QIZ Matchmaking Conference in Cairo, December 2006.

IMC (Industrial Modernisation Centre). 2004. Sectoral study on paper and packaging industries. Industrial Modernisation Center- Policy Support Unit series of sectoral studies.

———. 2005. The relocation of tanneries. *Development options*.

Interviews with a long list of businessmen from different textiles, auto, food and fertilizers, and officials in EEAA, ENCPC, and ECO. All interviewees chose to remain anonymous.

Kassem, Mohamed, and Abla Abdel-Latif. 2005. Study on the Egyptian textile and clothing industry. Presented in the UNIDO Conference in Tunisia.

Maby, Nick, and Richard McNally. 1998. Foreign direct investment and the environment: From pollution havens to sustainable development, WWF-UK Report.

Markandya A. 1995. Reconciliation of environment and trade policies: Synthesis of country case studies, UNCTAD.

Ministry of Economic Development. 2006. Sixth Five Year National Plan.

Ministry of Finance. 2005. The New Tax Law.

Ministry of Investment. 2005a. Law No. 8/1997 on Investment Guarantees and Incentives.

———. 2005b.Quarterly Report. Cairo, Egypt: Ministry of Investment.

Ministry of Manpower. 2005. Labor Law #12/2003 amended by Law No. 90/2005.

Ministry of Trade and Industry. 2003. Quarterly Report. Cairo, Egypt: Ministry of Trade and Industry.

———. 2004. Quarterly Report. Cairo, Egypt: Ministry of Trade and Industry.

———. 2005a. Industrial Zones database. Cairo, Egypt: Ministry of Trade and Industry.

———. 2005b. Decree No. 770/2005 issuing the executive regulations for the Import and Export Law No. 118/1975.

NCEE (National Center for Environmental Economics). 2001. The United States experience with economic incentives for protecting the environment, EPA-240-R-01-001. Washington, D.C.: NCEE.

Newspaper articles. Various issues on news of recent energy price changes.

OECD. 1996. Competition policy and environment. Analytical note.

Sakr, Fathi. 2003. Physical capital and challenges of rapid growth. Cairo, Egypt: Industrial Modernisation Centre.

UNCTAD. 1996 .The relationship of environmental protection to international competitiveness, job creation and development.

UNDP. 2005. Human Development Report: Egypt.

———. 2008. Human Development Report.

UNEP. (United Nations Environmental Program). 1999. Environmental impacts of trade liberalization and policies for the sustainable management of natural resources- a case study on Chile's mining sector.

———. 2004. *The use of economic instruments in environmental policy: Opportunities and challenges*. United Nations Publications, ISBN:92-807-2391-X.

UNIDO. 1999. *Industrial policy and the environment in the Philippines*. NC/PHI/97/020.

———. 2000. *Industrial Policy and the Environment in Pakistan*. NC/PAK/97/018.

———. 2002. *Background paper: National strategies for cleaner technology transfer.* International Forum on Strategies and Priorities for Environmental. Slovak Republic.

———. 2004. Industrial Policy for the Twenty First Century.

———. 2005a. Common Country Assessment, Pollution Paper.

———. 2005b. The white paper for a competitive Egypt: A strategy for integrating into the global economy. A study prepared for IMC by UNIDO.

———. 2006. Market Analysis for the National Cleaner Production Center.

World Bank. 1993. National economic policy and industrial pollution-the case of Indonesia: 1975-89. Workshop on Economic Policies and the Environment.

———. 2002. Report on the cost of environmental degradation in Egypt.

———.2003. Energy/Environmental Review in Egypt. Washington, D.C.: the World Bank.

———. 2005. Country Environmental Assessment. Washington, D.C.: the World Bank.

World Trade Organization. 2005. Trade Policy Review- Egypt.