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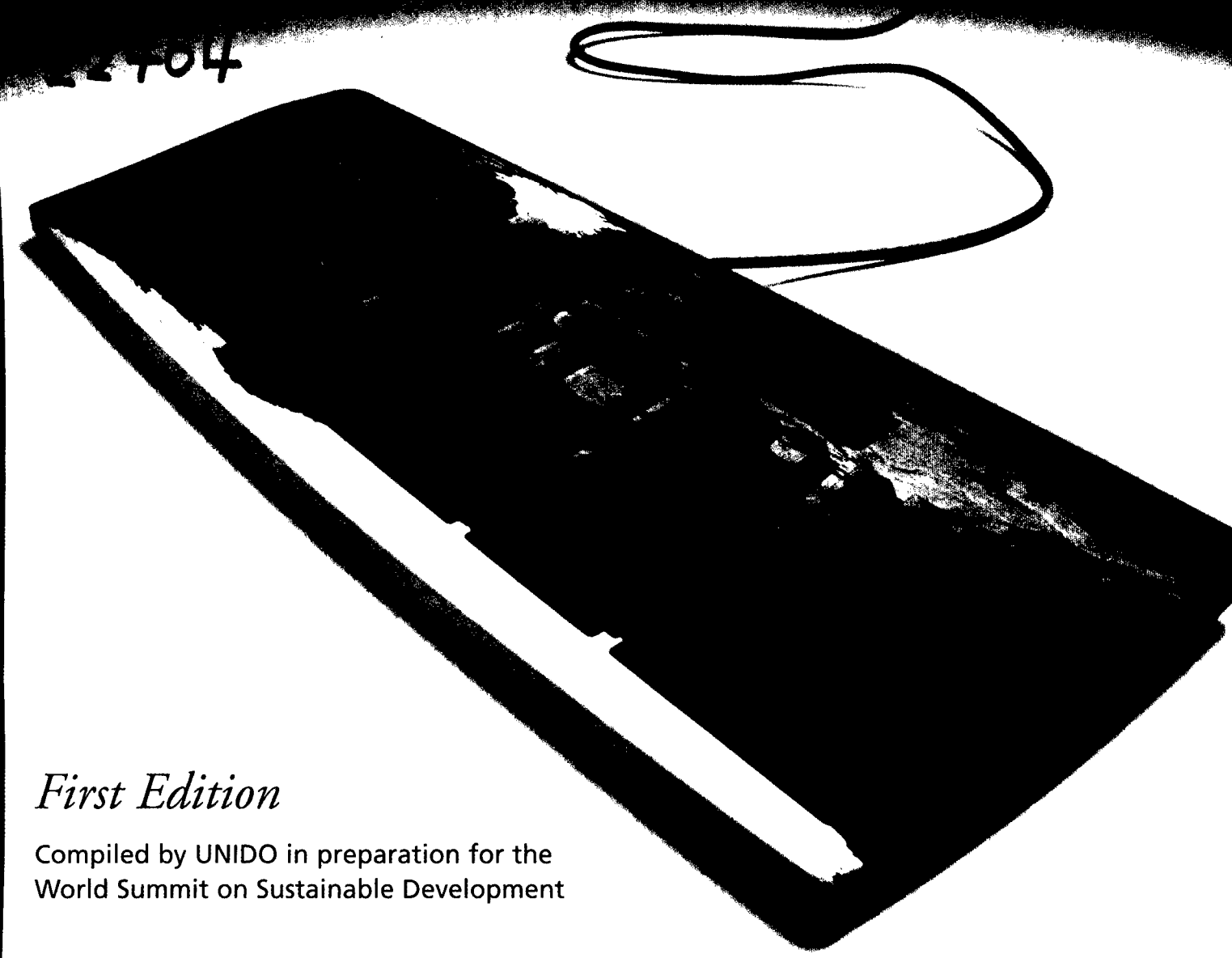
UNIDO and the World Summit on Sustainable Development

Developing Countries' Industrial Source Book



First Edition

Compiled by UNIDO in preparation for the
World Summit on Sustainable Development

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

economy environment employment

Developing Countries' Industrial Source Book

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January 2002

The views expressed in this publication do not necessarily reflect the views of the secretariat of the United Nations Industrial Development Organisation

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Electronic versions of the 18 national overviews are available on the UNIDO homepage (www.unido.org)

I. INTRODUCTION

UNIDO is responding to the challenge of sustainable industrial development by serving as a global forum and by providing technical cooperation services. In its global forum role, it is identifying state-of-the-art advances in industrialization that have the potential to enhance the contribution of industry (manufacturing) to sustainable development. In its technical cooperation role, it is building capacities in public and private sector institutions to deliver services to industry, particularly small and medium size enterprises, with special attention given to Africa and the Least Developed Countries.

UNIDO is actively involved in the preparatory process for the World Summit on Sustainable Development. Amongst other activities, it has supported the preparation of national overview reports on the contribution of industry to sustainable development in 18 Member States of the Organization. These reports are intended as inputs into the national assessment reports that these Member States are preparing for the Summit and as examples for other Member States on how they could assess the contribution of industry to sustainable development since the Earth Summit in Rio, 1992.

Other activities for the preparatory process include support for and involvement in regional events leading up to the five regional prep-com meetings for the Summit, an assessment in ten developing countries of the drivers for the uptake of environmentally sound technology over the past ten years, a report on the potential for small and medium size enterprises to improve the environmental and social performance in response to global supply chain pressures and facilitation of a special issue of the Journal of Cleaner Production that reports on various international technical cooperation programmes designed to encourage the utilization and transfer of environmentally sound technology.

The purpose of this document is to inform all parties about available information that could be used in preparing and reviewing national assessment reports for the Summit. The document contains the outline used for preparation of the overviews of industry's contribution to sustainable development, a list of the countries and contacts in which UNIDO has supported the preparation of industry reports, executive summaries of the 18 industry reports, selected regional documents (an executive summary of a UNIDO-funded report on industry's contribution to sustainable development in Africa, industry statements from the UNEP regional industrial meetings and UNIDO interventions at four regional prep-com meetings), a review of the industrial content in 15 finalized national assessment reports, and statistical data on sustainable industrial development for most developing countries and in particular for the 18 countries covered by the industrial overviews.

UNIDO will distribute the first edition of the *Developing Countries Industrial Source Book* at the second session of the global Prep-Com, 28 January- 8 February 2002 in New York City, USA.

UNIDO anticipates that the end result of its support to the preparatory process would be (1) a resolution in the final document of the WSSD that acknowledges the centrality of industry to sustainable development and (2) an enhanced mandate for international organizations to accelerate the uptake of environmentally sound technology that is supportive of the global efforts both for socio-economic development and environmental protection.

II. OUTLINE FOR A NATIONAL INDUSTRIAL OVERVIEW

As mentioned in the Introduction, UNIDO is actively involved in the preparatory process for the World Summit on Sustainable Development and at the national level has supported the elaboration of 18 national industrial overviews. This exercise followed a similar effort carried out in 1998 in which 25 developing countries where analyzed on the light of their achievements on industrial development in particular and in sustainable development in general, in the Rio + 5 revision process of the implementation of commitments of Agenda 21. The 18 national industrial overviews followed the outline given below and are on average 20 to 30 pages long. Contact details of the experts hired by UNIDO to prepare these overviews are provided next.

OUTLINE FOR A NATIONAL INDUSTRIAL OVERVIEW TO BE USED AS INPUT FOR NATIONAL ASSESSMENT/REPORT FOR WSSD

I. Broad Trends in Sustainable Development

Sustainable development (SD) involves the simultaneous pursuit of economic, social and environmental objectives. Here one should summarize for all sectors and Agenda 21 themes what has happened in the past ten years in the pursuit of sustainable development as characterized by the National Commission on Sustainable Development or its equivalent. Here the UN work on Indicators of Sustainable Development might be of use. Explicit reference should be made to industry and its contribution to SD.

II. The Manufacturing Industry and Sustainable Development

This section would describe the association between the development of (manufacturing) industry on the one hand and on the other hand its contribution to sustainable development. Identification of causal links would be the best option. However, the more likely case of tracing association/correlation between industrial development and SD in general would be an acceptable substitute.

The paper would assemble data (some of which is available in UNIDO's Industrial Statistics) on five key dimensions of manufacturing that have implications for the economic, social and environmental dimensions of sustainable development over the past ten years. These are:

1. manufacturing growth - growth rates, MVA/capita, MVA/GDP
2. sectoral composition by international standard classification
3. technological change
4. scale of manufacturing operations - SME share of total
5. location

Quantitative and qualitative evidence should be presented about the impact of changes in these five variables on the economic, social and environmental conditions

III. Policies Directed at the Development of Industry

Such policies would first be assessed with a view to whether or not they have achieved their stated goals (which might only indirectly or partially have to do with the broad range of SD objectives). Then, the same policies might be examined in view of their intended or unintended consequences for economic, social and environmental sustainability. Examples for each one of those dimensions are: (i) effects on aggregate economic growth, (ii) potential regional-economic or distributional consequences, (iii) environmental impacts of various kinds.

IV. Policies Directed at Industrial Environmental Management

Such policies would first be assessed with a view to whether or not they have achieved their stated goals (which might only indirectly or partially have to do with the broad range of SD objectives), considering both achievements and failures. Then, the same policies should be examined in view of their intended or unintended consequences for economic, social and environmental sustainability. Examples for each of these dimensions are: (i) effects on the competitiveness of the manufacturing sector; (ii) effects on employment, both negative and positive; and (iii) effects on reducing overall environmental degradation/natural resource utilization in light of other economic activities (human settlements, transport, agriculture).

V. Policies and Programmes Aimed at Technology Change, particularly EST

Upgrading of technology in manufacturing is essential for improving the contribution of industry to sustainable development. More particularly, the application of environmentally sound technologies is probably the major factor that explains the successful delinking of growth and pollution. (ESTs "are not just individual technologies, but total systems which include know-how, procedures, goods and services, and equipment as well as organizational and managerial procedures; "ESTs include pollution control technologies as well as cleaner production processes.)

As above, this section should identify and briefly assess policies that have contributed to or hindered technology transfer, particularly in regard to EST. Specific case studies and examples of the transfer of EST should be included if available. Case studies on the impact of the application of EST not only on environmental performance, but also on economic and social performance should be included if they exist. In addition, describe if possible how the application of EST has stimulated in general industrial innovation and learning.

VI. Experience with Integrated Policies and Programmes.

This section should describe any efforts in the country to explicitly pursue sustainable industrial development. Potential efforts would be integrated national policies and planning that explicitly address the complementarities and trade-offs among the three dimensions of sustainable development, preparation of an industrial dimension in national sustainable development strategies (identified participation by industrial sector and Ministry of Industry) and specific programmes or projects that are concerned with all three dimensions of sustainable development.

VII. Major Constraints and Obstacles in Enhancing the Contribution of Industry to Sustainable Development

This section should briefly describe specific constraints in a country, such as a particular policy, restricted access to a known technology and finance for specific activities. Avoid generalizations.

VIII. Priorities and Future Actions

Does the country see sustainable development as an integrated approach to development or does it still remain essentially an environmental agenda? What does the future hold? Identify other matters seen as important by the country.

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Report prepared under UNIDO project NC/PAK/97/018

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Report prepared under UNIDO project NC/PHI/97/020

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III. EXECUTIVE SUMMARIES OF NATIONAL INDUSTRIAL OVERVIEWS

The countries from which executive summaries are presented are Bolivia, Cameroon, Chile, China, Colombia, Côte d'Ivoire, Czech Republic, Egypt, Ethiopia, Indonesia, Nigeria, Pakistan, Philippines, Sudan, Tunisia, Turkey, Vietnam and Zimbabwe. These summaries illustrate the overall content of the national overviews, including relevant statistical information provided by the experts.

1. BOLIVIA

Industry and Sustainable Development in Bolivia – Achievements and Prospects

Based on the report by Messrs. Carlos Paredes Cadima and Carlos Aguirre B.

Executive Summary

I. Broad Trends in Sustainable Development in Bolivia

During the 1990's, Bolivia adopted an extensive and important normative framework destined to explicitly define sustainable development concepts and practices. These actions constituted some of the first initiatives of their nature in Latin America, thus granting the country an ample and well recognized leadership role in these issues.

The Bolivian economy grew rapidly during the first years of the 1970's, only to to slow down at the end of the decade (Table 1). Due to adverse external circumstances, profound political changes and hyperinflation (controlled by a drastic stabilization plan), growth did not resume until 1986. Since then, the Government has concentrated on economic stabilization, ignoring the needs for improving the performance of productive sectors and integration into the global economy.

The international crisis of 1998 caused a strong contraction of the demand, which resulted in a fall of the prices of primary commodities to levels that had not been seen since 1929. As a result, the Bolivian economy, in which 80 per cent of the exports are primary commodities or low value-added manufactured goods, declined. More recently, the crisis of the economy in Argentina and the events of September 11 in the United States, are seriously affecting the national economy in a way that the growth rate for 2001 will only be slightly above 1 per cent.

Even though the stabalization plan has improved macro economic conditions, Bolivian society faces a signicant social challenge: reduction of poverty. The Human Development Index is 0.648, placing the country in the 104th place in the world. In 1992 (the 2001 census is still being processed), 70 per cent of the population had unfulfilled basic needs and 37 per cent lived in extreme poverty.

In the environmental area, success was obtained in the forestry sector, with the application of a new law that controls indiscriminate cutting of forests and with a voluntary certification covering 1 million hectares. While emissions of ozone depletion substances have been

reduced through project funded under the Montreal Protocol, emissions of CO_2 continue as high as in the past. Pressures on arable and grazing land have led to a rapid increase in desertification and erosion, the latter now affecting 40 per cent of the country's surface.

II. The Manufacturing Industry and Sustainable Development

Although MVA grew at an annual average of about 4 per cent in the 1990s, the share of the manufacturing sector in the GNP has changed little over the period 1989 – 2000, fluctuating between 16.2 per cent and 17.1 per cent (Table 2). The last few years have wintessed a downturn in the sector as a consequence of the general economic crisis, the number of operating industrial establishments declining by about 15 per cent, partly as a consequence of shortages of imported inputs. Direct foreign investment (DFI) in the sector decreased to US$ 73.6 million (in 1999, the figure was US$ 151.7 million); domestic investment decreased as well. Strikes also affected the sector.

A conspicuous change has taken place in the structural composition of the sector. In 1985, the food processing industry accounted for almost half of MVA, with another 20 per cent in such traditional industries as beverages, textiles, clothing and footwear. The largest branch in 1999 was petroleum refining, which had increased its share from 7 per cent in 1985 to 36 per cent. In 1999, food processing only accounted for 21 per cent, and the share of textiles and footwear was almost negligible; among the traditional industries only beverages had increased its share, to 13 per cent. From the point of view of industrial development, the continued heavy dependence on a single – although more advanced - sector remains a serious weakness.

The effects of the sector on the environment have not been studied systematically. But its negative impact is likely to be considerable (see also VII):

- So far, industrial enterprises have paid little attention to dealing with air pollution, waste water and solid waste;
- The sector is heavily dominated by small and micro-firms (the two categories account for more than 95 per cent of the total number of enterprises); these enterprises will be even less aware of their environmental impacts, and have little capacity to deal with these;
- On average, the technologies used are 50 years old;
- The rapidly growing petrol refining industry is potentially a strong polluter.

III. Policies Directed at the Development of Industry

Since 1985, when Bolivia adopted a free market economic policy, it has relied primarily on the private sector for industrial development. However, the State has not been a totally absent actor. It has focused on improving infrastructure and supported export promotion efforts with such measures as market identification. In effect, export growth of improved value added products have been possible due to the joint efforts of the State and enterprises.

With the Plan Nacional de Competitividad y Desarrollo Industrial (1997) the Government embarked on the transformation of the economy to create new structures adequate to cope with the emerging scenario called globalization. The National Plan responds to the need to stimulate the progress and qualification of the Bolivian industry and to increase industrial competitiveness in domestic and export markets.

In view of the country's potential for development of agro-based industries, the Plan Nacional de Desarrollo Agro-industrial was established in conformity with the overall development plan. It assigns priority to rural development and poverty alleviation through income/job creation in the lesser-developed departments and municipalities in the country. In this context, the decentralization of decision making is important. A clear delineation of competences at different government levels, an expansion of local institutional capacities and a mechanism that ensures smooth interaction between the different decision-making levels are essential if the contribution of this policy to industrial development is to be maximized.

Another important element in the efforts to improve the performance of the manufacturing sector is the "National System of Quality, Metrology, Accreditation and Certification". Several university and non-university laboratories are in the process of being certified, and GTZ and the Organization of American States support human resource training.

IV. Policies Directed at Industrial Environmental Management

The Law on the Environment requires the Government to establish pollution control norms for the industrial sector. The Government decided to establish a generic norm for all industrial subsectors in 2000 and this process is underway with the Environmental Norm for the Industrial Manufacturing Sector (RASIM) project supported by the Government of Denmark, the Inter-American Development Bank and UNIDO. In January 1999, an unit for the environment was created within the Vice ministry of Industry and Trade to prepare environmental policies, formulate technical norms and approve environmental impact assessments prepared for new projects.

The Federation of Private Enterprises of Santa Cruz organized a Forum for Sustainable Development and the Environment in 1993. Since then, the private sector has established different mechanisms for participation: The National Chamber of Industries created an office of Environmental Affairs, later converted into a Unit for the Environment, to act as a counterpart and as a linkage mechanism among their associates and with public and international organizations on issues related to environment and sustainable development of the sector. Its activities cover training requirements, legal assistance, cleaner production, management and information. It also created the "Centre for the Promotion of Sustainable Technologies". The Association of Small Industries has introduced environmental issues in their work programmes.

V. Policies and Programmes Aimed at Technology Change, particularly EST

The proposal of a "Short Term Pilot Plan for Innovation", prepared by the National Academy of Sciences, at the request of the private sector, during the "National Dialogue 2000", constitutes an important policy initiative. The policy creates the basis for a "National Innovation System" through the execution of a set of specific actions to mobilize the national capacities around sustainable development objectives. This purpose of the effort is to create and strengthen national capacities in science, technology and innovation, make maximum use of existing experience and replace strategies and instruments that are no longer useful.

The National Chamber of Industries (NCI) created in 1993 a commission on the environment that initiated discussions about environment with affiliated enterprises. In this framework it determined that technology improvement was key for the search of sustainable production and processes.

The NGO GEARENA, together with NCI and the National Academy of Sciences, and the "America's Initiative Fund," developed the project "Fellowships for Research in Mitigation or Prevention Measures of Negative Environmental Impacts in the Industrial sector". The project provided 36 fellowships to final year students for undertaking enterprise assessments , of which 21 were completed. This project is now being continued by the "University – Industry Links" Project, which has financing from the Centre for the Promotion of Sustainable Technologies (CPTS) and the support of the NCI and Association of Small Industry.

In 1995, the NCI, with financing from USAID, initiated the "Programme for the Prevention of Environmental Pollution in Bolivia". It introduced preventive concepts and practices in more than 20 medium and large enterprises. About 50 workshops, seminars, courses were conducted, and a centre for information was established in the League for the Defence of the Environment, which is now supporting the Environmental Information Service of the Chamber. At present, CPTS, created in 1998, continues the work initiated by the Programme.

VI. Experience with Integrated Policies and Programmes

There is no explicit policy for industrial development which is based not only environmental controls and obligations (as is the case today), but also contains incentives that are necessary to encourage the sector to search for sustainable options. In spite of this situation, there are institutional policies, such as those of the NCI, that addressed this latter objective.

However, the need for compliance with environmental norms will force both public and private enterprises to develop new policies and integrated strategies in the short term. Several institutions have initiated the estalbishment of capacities in this field and many are now preparing environmental strategies and impact studies, which constitute a basic step for environmentally sustainable industrial production.

VII. Major Constraints and Obstacles in Enhancing the Contribution of Industry to Sustainable Development

The main characteristics of the manufacturing industry with a direct relation with the different dimensions of sustainability, are the following:

a) *Localization*: Manufacturing is concentrated in urban or semi urban areas along the axis La Paz (34 per cent of the total number of establishments), Cochabamba (22 per cent) and Santa Cruz (23 per cent). Most firms are small and lack adequate infrastructure and environmental protection services;

b) *Technology and innovation:* Most firms use obsolete technologies with a corresponding excessive use of energy and materials. According to a recent survey, 22 per cent of the enterprises did not believe their production processes met international standards and 18 per cent believed that they did not meet national standards;

c) *Policies and environmental norms*: Enterprises have in general not been consulted about the design and formulation of legal norms that affect them. Therefore, they do not understand the norms or how to meet them. Nearly 15 per cent of enterprises have difficulties in the handling legislation related to environmental matters;

d) *Environmental licences:* Only around 10 per cent of all firms have obtained an environmental licence and an even smaller number (between 1 and 3 per cent) are implementing the measures proposed in their environmental license. The reasons for this situation are the lack of knowledge about environmental legislation, the complexity of the existing procedures and the technical and financial limitations of the firms.

e) *Data collection:* The human and technical capacity of enterprises and environmental authorities to monitor and analyze emissions, water discharges, and generation of solid wastes is very limited.

f) *Incentives*: The manufacturing sector has few incentives to improve its competitive and innovative capacities and has even less incentives to improve its environmental performance. Only 30 per cent of enterprises have requested credit from traditional sources for investments in technology development and modernization projects.

g) *Human capital:* Entrepreneurs recognize that the first problem that affects their productivity is the absence of qualified personnel. Only 8 per cent of firms have a unit dedicated to human resources development.

VIII. Priorities and Future Actions

The Bolivian "scenario of transition" considers five dimensions that are closely interlinked: economic growth, social equity, environmental management, culture and governance. None of them can guarantee sustainable development by themselves. Economic growth is mainly the results of productivity improvements. It is here that the industrial manufacturing sector is of key importance. The social dimension of the scenario stems from the need for generating conditions of growth that respect the individual and at the same time provide him/her with conditions and opportunities to participate actively in society. The environmental dimension plays a central role in the scenario, not only in terms of sustainability of production and medium or long-term patterns of consumption, but also as a factor that can be decisive in market access, and thus an element that directly influences the competitiveness of a country and its enterprises. The cultural dimension means that human groups should be able to maintain their identities and inheritance, and covers the whole complex pattern of human relations that characterise society, providing it with a distinctive touch and contributing to diversity. The fifth dimension, governance, refers to the capacities for implementing a strategy for change.

The key role of manufacturing in development has several aspects. The reversal of the import/export gap and Bolivia's place in a global economy require a transformation of the sector, through the elimination of institutional obstacles, increased competitiveness and productivity, and a new, higher value-added products. Whether this will be realized depends to a large extent on new technologies. Although the entry barriers for some new technologies are high in terms of capital and knowledge, there are others that Bolivian firms can afford and that can be exploited in support of agro-industrial value added chains, environmental and health improvements.

Table 1.

Economic structure		**1980**	**1985**	**1990**	**1995**	**2000**
Economic behaviour	GNP per capita (current US dollars)	831	805	741	906	994
	% of investment in GNP	16.6	19.5	12.5	15.2	18.2
Trade	Trade balance of goods and services (millions of US dollars)		-83.2	70	-410.1	-624.3
Financial situation	External debt (millions of US dollars)			3.778.70	4.366.4 (96)	4.249.10
	Debt service (millions of US dollars)			335.20	345.80 (96)	111.90 (1st semester)
	Debt service / GNP			4.70	4.30	3.60 (99)
	Direct foreign investment (millions of US dollars)				392.7 (96)	1.000
	Total of ODA per capita			96.9	79	69.9
Consumption patterns and production						
Generation and use of energy	Generated energy (GWh)			2.411 (92)	3.002.4	3.951.9
	Annual energy consumption (GWh)			1.820.1 (92)	2.345.3	3.223.4
	% of consumption of renewable sources			56	42.7	49.9
Generation and managemen t of wastes	Volume of solid residues transported into the sanitary fill of La Paz (ton /year)				135.497.53 (98)	155.601.36
Transport	Transport index (1990=100) :					
	- National / International air			95.4 (91)	123.8	156.6 (99)
	- Train			122.8 (91)	130.1	150.5
	- Road			115.7 (93)	133.8	190.8 (99)

Table 2. Structure of GNP (in %)	1995	1996	1997	1998	1999
GNP at market prices	100	100	100	100	100
Goods	**45.6**	**46.0**	**45.0**	**45.2**	**45.2**
Agriculture	15.4	16.0	15.1	15.1	15.4
Oil and natural gas	4.3	4.1	4.1	4.0	4.2
Metallic and non metallic minerals	5.9	5.8	5.8	6.1	5.8
Manufacturing industries	17.0	16.9	16.6	16.6	16.7
Building and public works	3.1	3.1	3.4	3.4	3.3
Basic services	**10.9**	**11.1**	**11.4**	**11.6**	**11.8**
Electricity, gas and water	1.6	1.6	1.7	1.9	2.0
Transport, storage and communications	9.3	9.4	9.7	9.7	9.8
Other services	**35.2**	**34.6**	**35.1**	**34.9**	**34.5**
Trade	8.9	9.0	8.9	0.9	8.7
Other services	16.2	15.9	16.3	16.3	16.2
Public administration	10.1	9.6	9.9	9.7	9.6
Rights and duties on imports	**8.3**	**8.4**	**8.5**	**8.4**	**8.3**

Source: Instituto Nacional de Estadística, 2000

2. CAMEROON

Industry and Sustainable Development in Cameroon: Achievements and Prospects

Based on the report of Jean Claude Tekeu and Samuel Noumsi

Executive Summary

I. Broad Trends in Sustainable Development in Cameroon

The national industrial sector has some 500 industrial units and accounts for almost 95 percent of national industrial production. According to 1998/1999 statistics, this sector employed about 60 000 people mostly (90%) unskilled workers and paid out about CFAF115 billion (US$201 million) that year in salaries. During this same period, this sector realized a turnover of CFAF1008 billion (US$1762 million) and produced about CFAF500 billion (US$874 million) in added value. Despite the importance of this sector to the national economy, it has many structural weaknesses that hamper its development: (i) obsolescence of production equipment in more than 62 percent of industrial plants; (ii) difficulties in acquiring raw materials and semi finished products; (iii) low domestic demand which has led to under utilization of the available production capacity. In addition, the sector as a whole has a rather low profit margin and although his impact on the economic and social development of the country is positive, it heavily contributes to the degradation of the environment.

Although this sector has a positive impact on the economic and social development of the country, we should not forget that it also plays a role in the protection of the environment or on the other hand in the degradation of the environment.

Some studies on industrial pollution have been carried out in Cameroon. Unfortunately, all such studies have been done in a subsidiary manner, and mostly as part of programmes whose objectives were not necessarily geared toward the reduction of such pollution. However, the positive impact of the manufacturing sector on the sustainable economic and social development of the country should not stop us from examining the impact of industrial waste on the environment. This waste contributes towards the degradation of the different ecological systems on which these same industries depend for raw material.

II. The Manufacturing Industry and Sustainable Development

The industrial sector in Cameroon is mainly made up of small sized undertakings. Only 9 percent have more than 500 workers and more than 32 percent of industrial concerns have less than 20 employees. Statistics, since 1990/1991, show that approximately 218 enterprises employ 98 percent of the workers in the industrial sector and account for more than 97 percent of industrial production; 40 percent of them belong to the bakeries, timber, chemical and mechanical sectors.

About 80 per cent of the industries are concentrated in the coastal zone due to the existence there of the necessary infrastructure (roads, energy, telecommunications) and of the main seaport, while the other 20 percent are distributed in the rest of the country. However, the construction of major highways linking the coast to the centre, the West and the North West provinces as well as the extension of the electricity network, have helped decongest the coastal zone and made it possible for industries to locate conveniently in other regions of the country.

Valued added, estimated at CFAF283.4 thousand million in 1990/91, dropped to 218 thousand million in 1992/93 as a result of the persistent crisis. Subsequently, value added grew to CFAF500 thousand million in 1998/99.

Imported inputs are increasing and reached about 40 percent of all the inputs used in 1998-99. However, the rate of exportation (defined as the ratio of sales abroad over the total of sales) has also increased from 1993 to 1998 (mainly due to the devaluation of the CFAF), but it has dropped to 34 percent in 1998-99.

During the 98/99 financial year, manufacturing industries together realized some CFAF1310 thousand million in total production. The most important productive sectors were beverages and tobacco (18 per cent), building materials (12 per cent), petroleum products (12 per cent), wood industry (11 per cent), food processing (9 per cent), and textiles and dressmaking (7 per cent). These sectors of activity alone, in 1998/99, accounted for 69 percent of industrial production, estimated at CFAF1310 thousand million. The same sectors produced 79.5 percent of the value added, estimated at CFAF 400 thousand million.

III. Policies Directed at the Development of Industry

Since the independence in 1960, Cameroon has adopted a strategy of "planned liberalism". Strategies and operational objectives have been set every five years and economic policies, in particular industrial development policies, are defined by the President.

The institutional framework consists of a set of ministries and organizations aiming at supporting and financing the industrial development of Cameroon, such as the Centre for the Promotion and Support to SMEs (CAPME), the National Investment Corporation, the Cameroon Development Bank, the Industrial Zones Development and Management Authority, the National Standardization Committee, the National Office for Industrial Free Zones, the Investment Code Management Unit. Unfortunately, some of these institutions have stopped operating because of poor management.

Five main periods in the evolution of the industrial policy of Cameroon can be identified:

- In the years 1960-1971, the objective was to replace local production by imports and to increase exports by fostering state owned enterprises.
- From 1972 to 1982, the priority was to enhance the competitiveness of local enterprises to access export markets. Huge investments were needed and as private investments were not sufficient, the state invested massively (in particular in agro-industry and heavy industries). The partially sate owned enterprises represent about 40% of the value added of the manufacturing sector.
- In 1982-86, the objective was to intensify industrial development by fostering regional industrialization and encouraging local producers However, problems due to bad management of public enterprises (that represent a loss of around 48,000,000,000 FCFA) become more and more numerous.
- In the years 1986-1995, Cameroon goes through a deep economic crisis affecting the export-oriented sector. The budget deficit increased and the balance of payments growth rate became negative. In 1989, structural adjustment programmes were implemented to reduce the deficit and the place of the state in the productive sector (many state-owned enterprises were privatized). In addition, the transformation of

local products to increase the value of exports was fostered; however, this has not been translated into regulatory measures.
- Since 1996, Cameroon is recovering and the economy is growing. Various initiatives tend to associate the private sector to the industrial development of the country.

However, none of the industrialization objectives set over the years were fully achieved because of the economy and the poor management of the public sector.

IV. Policies Directed at Industrial Environmental Management

Until the 1992 Rio Earth Summit, how to address environmental issues had never been really defined. The environmental regulatory framework was unclear and incomplete. Most of the regulations dealt with health and safety of workers and neighborhood but the impact of industrial activity on the environment was not really taken into account. Besides, institutional support was also very weak due to a lack of coordination and common strategic plans. As a consequence, action plans elaborated were unfortunately never been put into practice in an effective and efficient manner.

The period following the Earth Summit witnessed a decisive change in the institutional framework for environmental management in Cameroon. Institutional structures were set up, amongst others the National Advisory Commission for the Environment and Sustainable Development, whose mission is to assist and advise the government in drawing up and implementing sustainable development polices and strategies. An Environmental Inter-ministerial Committee was charged with assisting the government in the formulation and implementation of environmental protection policies.

In accordance with Agenda 21 of the 1992 Summit, the Cameroon government decided to completely overhaul the regulatory and legal framework governing environmental management. The new legal framework provides a structure for industrial development that takes into account environmental considerations. However, its effectiveness depends of the implementation of these legislative and regulatory instruments. Therefore, Cameroon drew up a National Environmental Management Plan (NEMP) to define policies, objectives and strategies for sustainable development. Four main objectives were set:

- The rational management of space, ecosystems and resources;
- The valorization of raw products through industrial development and the improvement of infrastructure;
- The creation of favourable conditions for human capacity development;
- The improvement of living standards in urban areas.

The NEMP fosters an ecologically sustainable industrial development based on the use of clean technologies and the valorization of natural resources as well as by-products and wastes. The ultimate objectives are: (i) environmental protection (ii) human capacity building (iii) creation of favourable conditions and (iv) an increase in industrial value added.

The implementation of this ecologically sustainable industrial development policy includes a programme of activities based on the recycling of by-products, the optimization of industrial processes, waste treatment methods, the development of industrial pollution control as well as an environmental audit of the local industrial sector. In all, the plan of action has some twenty pilot projects. This plan of action, estimated to cost some CFAF4100 million, was intended to

span a ten-year period (1996-2005). However, due to lack of funds, this ecologically sustainable industrial development programme, as well as the National Environmental Management Plan, have not been really implemented yet and have consequently not yielded the expected results. This is especially true as regards environmental degradation by the manufacturing sector where the pollution situation is not very clear owing to the absence of follow-up and consequently to lack of statistics on industrial pollution. The main obstacles to the success of this policy are the fragmentation of its implementation and activities, a five-year project approach that lacks a global and long-term vision and the duplication and overlap of the missions of certain institutional actors.

V. Policies and Programmes Aimed at Technical Change, particularly EST

While there are a number of institutions, especially in the public sector, that could play a role in technology transfer, it is not evident that these have done so successfully, let alone that they have been involved in transferring EST.

Some enterprises have received technical assistance for the implementation of environmentally sound technologies under the Multilateral fund for Implementation of the Montreal Protocol. For instance, the refrigeration-manufacturing sector had its production equipment renovated within the framework of the Montreal Protocol. Two enterprises in this sector had their production equipment renovated in order to eliminate ozone – layer depleting substances, the Société Union Camerounaise d'Entreprises and the Société Anonyme de Fabrication des Appareils Electro-menagers et Climatiseurs. Technical assistance aimed at eliminating 77 and 17.5 metric tonnes respectively of CFC 11 and 12 for a total cost of 1 493 182 U.S. dollars in the first enterprise and 8.5 and 45.6 metric tonnes of CFC 12 and CFC 11 respectively for CFAF833 638 000 in the second one. Apart from the physical reconversion of the factory through the supply and installation of new equipment, the project also enabled the transfer of skills through training of personnel in new technologies such as quality control and management, operation and maintenance of new machines and equipment, laboratory control and safety.

VI. Experience with Integrated Policies and Programmes

The industrial sector has a system of strategic planning, which, unfortunately, has never been implemented in a concerted and efficient manner. Similarly, an environmental protection policy has been developed in a haphazard manner, mostly within a legislative and statutory institutional framework for investments. As a consequence, the environment has been severely damaged by the industrial sector. This degradation is difficult to assess owing to the absence of reliable and exhaustive statistics.

VII. Major Constraints and Obstacles in Enhancing the Contribution of Industry to Sustainable Development

Ecologically sustainable industrial development is based on the need to reconcile economic and social development with environmental preservation. Therefore, industrial development, in its conception, must develop:

- legislation and regulations, which make the treatment of industrial effluents and wastes compulsory; instituting the polluter, pays principle;

- training of human resources capable of selecting, setting up and managing clean and appropriate technologies;
- a rigorous follow-up of international agreements with the aim of identifying penalty provisions for countries;
- industrial waste valorization mechanisms;
- tax and other incentives to industrial operators working for environmental protection;
- setting up an industrial information mechanism on technological evolution and the opportunities offered in this area; and
- creating optimum conditions of funding for industrial activities that use appropriate technologies.

The sustainability of industrial activities through the optimum management of resources and the competitiveness of operating industries would promote the creation of lasting jobs. The incorporation of environmental management in industrial development can only have a positive impact on employment.

Finally, the enforcement of environmental protection policy will increase the inflow of foreign investments with cleaner technologies that will reduce environmental degradation. These adapted technologies, when introduced, will also help in reducing the poor use of natural resources.

VII. Priorities and Future Actions

The Earth Summit and the prescriptions of Agenda 21 created a new interest in environmental concerns, and led to the programming of development actions in general and industrial development in particular within the framework of environmental protection. This new orientation was given concrete form through the renovation of the existing institutional, legal and regulatory framework and a global planning which endeavours to reconcile development with environmental protection and fosters favourable conditions for ecologically sustainable industrial development. This will lead, by the end of 2001, to the formulation of an integrated industrial development programme based on the ecologically sustainable industrial development principles contained in the National Environmental Management Plan.

From the foregoing, it seems that Cameroon needs to build a more exhaustive and ambitious action plan for sustainable development. The following recommendations can be made:

1) Carry out a study on industrial pollution as well as its impact on the environment;
2) Create optimal conditions for the funding of cleaner industrial activities through the enactment of enabling instruments within the general legal framework for environmental management;
3) Promote, within the country, the recycling and marketing of usable industrial wastes; and
4) Promote a regional approach for the management of waste in order to attain critical mass and thus achieve economies of scale.

3. CHILE

Development of Manufacturing Industry and Sustainable Development.

Based on the report prepared by Mr. Osvaldo Urzúa

Executive Summary

I. Broad Trends in Sustainable Development in Chile

The strategy adopted by Chile for economic development in the last few decades - unilateral trade liberalization, implementation of large-scale structural reform to attract foreign capital and privatization of state-owned companies - brought about an important economic push in the country. The GDP grew at an average annual rate of 6.6 per cent between 1984 and 1989 and this dynamic trend has continued over the last decade, reflected in an annual average growth rate of 6.3 per cent.

The main economic sectors, according to their contribution to GDP, are trade (18.7 per cent), industry (16.1 per cent) and mining (11.2 per cent). The activities related to natural resource extraction (mining, forestry and fishing) are very important, contributing 18.4 per cent of the GDP. In spite of efforts towards diversification, ten primary products represent 70 per cent of export activity. Likewise, 57 per cent of exports are made up of extracted natural resources, 32.2 per cent of processed natural resources and only 10.8 per cent of manufactured goods.

Employment rates have increased at a rate of 1.7 per cent annually over the last decade, creating 60.1 per cent growth in average labour productivity, equivalent to an average annual rise of 4.8 per cent in the last ten years. The main sectors generating employment are services (35 per cent), trade (19 per cent), industry (14 per cent) and fishing and agriculture (14 per cent).

From a demographic perspective, Chile has a population of 15.2 million, distributed throughout 13 administrative regions. About 85 per cent of the population is urban and 15 per cent rural. Population is highly concentrated in the three principal regions – Greater Santiago, Concepción and Valpariso/Vina del Mar, accounting for 70 per cent of the total.

According to the UNDP human development report[1](2000), Chile reduced the gap separating it from the ideal for human development between 1990 and 1998 by 22 per cent, placing Chile first in Latin America in spite of an uneven distribution. Although poverty levels have been reduced during the last decade, from 38.6 per cent of the population under the poverty line in 1990 to 20.6 percent in 2000, income inequality is still high.

Regarding industry-related environment, air quality is a serious problem in several urban centres, particularly in the Santiago Metropolitan Region. There has been a loss of agricultural land due to urban expansion and manufacturing sector activity, especially around the cities of Santiago and Rancagua. Finally, but not less important, mining activity has contaminated the mines' surroundings and the water courses and has reduced the availability of future resources.

[1]Human development refers to the process of broadening people's capabilities, regarding which there are six main factors: equality, enhancement, cooperation, sustainability, security and productivity.

II. The Manufacturing Industry and Sustainable Development

During the decade 1990-2000 the Chilean manufacturing sector experienced an average annual growth of 5 per cent, lower than the 6 per cent shown by the domestic economy. This has resulted in a drop in its contribution to the GDP, which fell from 18.7 per cent in 1990 to 16.1 percent in 2000. In spite of this, during the period under analysis the manufacturing industry's overseas sales grew at an average annual rate of 11.6 per cent, making it the leading sector in Chilean foreign trade with a contribution of 46 per cent of exports in 2000.

In employment terms, the manufacturing sector employs 14.3 per cent of the working population, with an average annual growth rate of 0.2 per cent in the last decade, considerably lower than the 1.7 per cent shown by the domestic economy. It should be pointed out that only 26.6 per cent of the workforce employed in the manufacturing industry in 1996 was women, while the national average for female participation in employment was 32 per cent.

The main manufacturing branches are foodstuff production (principally seafood and agricultural products), the forestry industry and paper and pulp production, chemical products, oil refinery and non-ferrous metals production.

The manufacturing sector is characterized by highly intensive use of natural resources, specifically within the fishing, forestry, agriculture and mining sectors and by low value-added products. (see Annex Table 2). At the international level (see Annex Table 1), the value-added per capita for the manufacturing sector (MVA) has grown considerably over the past few decades lead by the export sector. It is still low, however, when compared with the MVA per capita of developed countries. (some of them 7.6 times higher than the Chilean one). This low MVA per capita can be explained by several factors: increased intensity of production of products based on low value-added natural resources; a relatively low level of education amongst the labour force, especially at a technical and operational level; the limited utilization of modern technology by the industry; and by the high percentage of micro and small size enterprises (MSEs) and small and medium size enterprises (SMEs) producing for the domestic market.

The Chilean manufacturing sector affects the environment in two ways. It places significant pressure on natural resources because of the resource intensity of industrial production. Its contribution to environmental pollution has increased significantly, although it is estimated to be lower than the sector's GDP growth. However, it is difficult to characterize the sector's impact due to the lack of reliable data.

Another problem regarding the manufacturing sector is the high concentration of industry in urban areas, with 76 per cent of the sector GDP located in three regions, 52 per cent in the Santiago Metropolitan Region, 16 per cent in the Bio-bio Region (Capital City Concepción) and 8 per cent in the Valparaiso Region (Capital City Valparaiso).

III. Policies Directed at the Development of Industry

Chile is characterized by being a country whose policies neither protect nor privilege any specific production sector, and as such it does not have policies directed at the development or promotion of the manufacturing sector in particular. However, some general policies can be identified that have had effects on the manufacturing sector's development and growth.

Policies to support foreign trade and the export sector range from equal tariff levels for all imports and differential payment system for customs duties when importing capital goods to the creation of PROCHILE, which supports the export's sector promotional activities in both organizational and economic terms. As a result of these policies, Chilean exports increased by 400 per cent between 1985 and 2000 and have also diversified in terms of goods (industry accounts for 46 per cent of this diversification) and destination markets. There are also incentives for Foreign Direct Investment with the manufacturing sector receiving 13 per cent of the total of US$ 45 billion invested during 1974-2000. The privatization process has been especially rewarding in telecommunications and basic services because it has resulted in more efficient pricing and greater coverage.

Finally, the Government has created specific programmes. It set up the Programa de Fomento Productivo del Servicio de Cooperación Técnica (Programme for the Promotion of Productivity by the Technical Cooperation Service), SERCOTEC, in 1992. The programme supports initiatives that improve competitiveness of micro and small size enterprises and strengthens the development of management capabilities among businessman. During 2000 SERCOTEC worked with 16,700 enterprises, making an investment of US$ 18 million. The Science and Technology Programme, ended in 1995, is based on three different funds and supports economic growth followed by the Technology Innovation Programme.

IV. Policies Directed at Industrial Environmental Management

Three clearly marked periods of governmental policy can be observed. The first one, between 1964 and 1973, concentrated on a register of natural resources and the formation of human resources. The second period, between 1973 and 1989, focused on intensive exploitation of natural resources. The third period, between 1990 and 2000, focused on the development of environmental institutions.

Major policies related to this specific area are the Decontamination Plan for the Metropolitan Region that contemplates a system to measure and reduce industrial emissions considered as fixed sources; the incorporation of the Sistema de Evaluación de Impacto Ambiental (Environmental Impact Evaluation System) or SEIA. It has brought about notable progress in preventative environmental management projects. During 1999, 837 projects with a total investment of US$5.6 billion were submitted for review.

In terms of ISO 14000 certification, few domestic companies have been certified Regarding ISO 9000, 177 have adopted it at the end of 2000, out of which 11 per cent were in the manufacturing sector. However, the average annual growth rate reached 53 per cent between 1995 and 2000.

Finally, the current energy policy, even though it looks to promote and facilitate investment, encourage market competition, foster environmental protection and contribute to social equality, has been focused onto ensuring energy supply rather than on rational and efficient energy use. Effective implementation of this policy is essential for the country because energy consumption is increasing at a rate close to 10 per cent per year.

V. Policies and Programmes Aimed at Technology Change, particularly EST

Between 1992 and 2000, both the Science and Technology Programme and the Technology Innovation Programme sought to develop a National Innovation System, which without doubt influenced the use of new technology to prevent pollution. This system looks at the absorption

of foreign technology, the transformation of domestic technology, the production of human resources and technology dissemination.

Today, there are sixty Science and Technology Centres in the country with the potential to develop new technologies. However, industrial creativity, training, cultural change, information services, support services and public system adjustment are also needed. In general, the level of technological innovation is low and shows limited use of the potential opportunities. The country's production structure is not connected to either the current technological scientific revolution or the new information technology. It is a traditional structure dominated by the commodity export industry.

The on-going Technological Development and Innovation Programme, funded by the Inter-American Development Bank is contributes to the increasing competitiveness of the Chilean economy by supporting technological innovation and development in strategic areas of the domestic economy, especially amongst SMEs.

Amongst the programmes supporting the transfer of environmentally sound technology, the following can be highlighted:

- Letter of Understanding on Technology Cooperation, Canada – Chile: it establishes a work programme in issues related to clean production, verification and certification of environmental technology, public management in the definition of policies and actions within the field of production development and the environment, environmental training and education and diffusion of clean and end-of-pipe technology
- Framework of Bilateral Agreement between the Chilean and German Republics (GTZ): tit clearly expresses the intention to formally update the planning and realization of the project "Rational Energy use", later expanded to include the issue of Clean Production.

VI. Experience with Integrated Policies and Programmes

One integrated programme is the cleaner production promotion policy. Launched in the period 1998-2000, it encourages and facilitates companies' competitiveness and environmental performance. The policy supports the development of preventative environmental management including optimal management of raw materials, water, energy and working conditions. The policy is based on cooperation between the public and private sector with its main tool being the Acuerdos de Producción Limpia (Clean Production Agreements), or APL. Similarly, international cooperation initiatives were started up in the middle of the last decade, firstly with the USAID Environmental Pollution Prevention Project (EP3), then with German Cleaner Production/Rational Energy Use project (PL/URE) and finally culminating in the Canadian Technological and Environmental Cooperation Agreement.

VII. Major Constraints and Obstacles in Enhancing the Contribution of Industry to Sustainable Development

The export-oriented liberalization strategy adopted by Chile has not generated as much development as anticipated in the manufacturing industry. Some of the obstacles identified are listed below:

- Procedures and bureaucracy: this element should be taken into account when making comparisons with developed countries.

- Under-development of the market offering clean technology: this has led to an imbalance of information about available goods and services, thus tending to increase transaction costs and conceal quality assessment.
- Progressive tariff system used by some developed countries: One example is the case of the United States, one of Chile's major export markets. High value-added products are specifically discouraged by the application of tariffs, which increase progressively according to the level of value added over and above that of the raw materials utilized.

VIII. *Priorities and Future Actions*

Sustainable manufacturing development is based on a strong technological component and competence of the labour-force. Both aspects must focus on production efficiency, minimization of pollution and development of skills to produce more with fewer resources.

- Efficiency improvement: involves identifying, selecting and acquiring technologies with enhanced performance in the use of resources, raw materials and other input materials, and minimum potential for environmental damage. Likewise, it requires flexible skills from the labour-force operating in the process of acquiring raw and input materials, in the production process itself and in the sales and after-sales services.
- Enhanced environmental performance: in this respect the market is exerting strong pressure regarding both product quality and the full life cycle of the production process.
- Producing more with less: the economic reform implemented by the government has forced companies to increase their productivity levels. However, the current strategy is not the best because it has increased unemployment levels and has resulted in a drop in the quality of living of workers. New strategies need to be found and implemented that take into consideration these social concerns as well as improving resource and energy use.
- Minimizing pollution: the Government needs to support and monitor the diffusion of cleaner production and efficient natural resource utilization.

Table 1: International comparisons of manufacturing value-added

Indicator	Year	Chile	Latin-America	Developing countries Total	Developed countries
MVA per capita	1980	441	694	161	3,712
(US$)	1990	486	586	203	4,430
	1998	648	646	291	4,880
Real average annual MVA growth	1970-1980	-0.8	5.7	6.8	2.9
(percentage, %)	1980-1990	3.6	1.3	5.3	2.8
	1990-1998	5.7	3.2	6.9	2.2
Real average annual per-capita growth rates of per-capita MVA	1970-1980	-2.3	3.2	4.5	2.1
(percentage, %)	1980-1990	1.9	-0.6	3.1	2.1
	1990-1998	4.1	1.4	5.2	1.5
Share of MVA in GDP	1980	21.3	24.4	19.5	22.9
(percentage, %)	1990	20.9	22.2	21.2	22.0
	1998	17.4	21.3	24.0	21.4

Source: UNIDO, 2001

Table 2: Evolution of total manufacturing output by pollution potential category

CIIU	Branches	Share in total MVA (%) 1985	1999
More polluting industries			
341	Paper and products	5.9	6.4
351	Industrial chemicals	2.0	6.0
353	Petroleum refineries	5.9	3.7
369	Other non-metallic mineral prod	2.4	3.8
371	Iron and steel	4.8	2.1
372	Non-ferrous metals	24.9	14.0
	Sub total	**45.9**	**36.0**
Moderately polluting industries			
311	Food products	17.1	20.9
313	Beverages	3.8	7.4
321	Textiles	3.4	1.6
223	Leather products	0.4	0.2
342	Printing and publishing	2.2	3.1
352	Other chemicals	6.1	7.2
381	Fabricated metal products	2.8	3.6
382	Machinery, except electrical	1.1	1.8
384	Transport equipment	1.1	1.6
	Sub total	**38.0**	**47.4**
Less polluting industries			
314	Tobacco	4.3	3.8
322	Wearing apparel, except footwear	1.8	1.4
324	Footwear, except rubber or plastic	1.1	0.9
331	Wood products, except furniture	3.0	3.4
332	Furniture, except metal	0.3	0.7
354	Misc. Petroleum and coal products	1.0	0.2
355	Rubber products	1.0	0.8
356	Plastic products	1.3	3.0
361	Pottery, china, earthenware	0.2	0.1
362	Glass and products	0.6	0.7
383	Machinery electric	1.3	1.0
385	Professional & scientific equipment	0.1	0.2
390	Other manufactured products	0.1	0.2
	Sub total	**16.1**	**16.4**
	Total manufacturing industry	**100.0**	**100.0**

Source: author's elaboration based on UNIDO and National Institute of Statistics information.

4. CHINA

Sustainable Industrial Development Overview of China - Current and Future Perspectives

Based on the report prepared by Dr. Wang Huijiong

Executive Summary

I. Broad Trends in Sustainable Development in China

China has achieved great economic and social progress in the past five decades. Prior to 1949, the Chinese economy mainly relied on the agricultural activity and the industrial sector was very weak. Poverty prevailed in both rural and urban areas, and the life expectancy of Chinese citizens was around 40 years. Since the establishment of the People's Republic of China in 1949, great efforts have been made to industrialize and to eradicate poverty based on the former Soviet model of central planning system. China entered into a new stage of its socio-economic development in late 70's, reforming its economic institutions and opening to the outside world. There has been rapid economic development and social progress since 80's. The average annual growth rate of GDP from 1952 to 1978 was 6.2 per cent; it was 9.5 per cent from 1978 to 2000.

Table 1 shows the dramatic shift in economic structure over the period 1950 to 2000. While the primary sector still dominated the economy in 1950, its share had been reduced to 15.9 per cent in the year 2000. The fastest growth was recorded in the industrial sector, led by manufacturing: it expanded its GDP share from 20.9 per cent to 50.9 per cent.

Poverty eradication has made great strides. The number of poor in East Asia region has declined to 280 million, and by the end of the decade it is projected to fall to about 70 million. Most of this progress will be in China. China launched a major national project in 1994 to reduce the number of people living in poverty by 8 million within seven years. It had largely achieved that target by the end of the year 2000. There are still, however, around 30 million of people living in poverty, mainly in areas with very poor natural geographical and climatic conditions. The Government intends to solve this issue in the 10th Five Year Plan, launched in 2001.

However, the rapid development process has had high environmental costs. Coal has been China's dominant energy resource, accounting for some 75 percent of the primary energy consumption, for several decades. The consumption of bulk coal, especially direct combustion of coal has become the primary source of air pollution in China, limiting sound urban development and threatening human health. According to the results of air quality monitoring in 338 Chinese cities in 2000, the air quality in 215 cities (63 per cent of all the cities being monitored) did not meet Grade 2 of the National Standards for Ambient Air Quality in terms of total suspended particulates, sulphur dioxide and nitrogen oxides, and 112 cities (33 cent of all the cities being monitored) could not meet Grade 3 (the minimum level) of the National Standards for Ambient Air Quality.

II. *The Manufacturing Industry and Sustainable Development*

Prior to the 1980's, development of industry was focused on the establishment of a heavy industrial base as well as the formation of a comprehensive range of modern industries. Economic reforms in the 1980s emphasized the role of private domestic and foreign

enterprise. Industry (including mining) is now the dominant sector of the economy. MVA/capita in 1989 and 1999 was around 444.45 yuan/capita and 1747.5 yuan/capita, respectively. The average annual growth rate of MVA from 1989-1999 was 13.2 per cent. During the period 1990 to 1999, there were some noticeable changes in the composition of the manufacturing sector, as can be seen in Table 2. The heavy industries (industrial chemicals, iron and steel, non-ferrous metals, metal products and non-electric machinery) have decreased considerably in importance, along with textiles. Several high value-added industries, including electric machinery, transport equipment and professional equipment, have increased their shares. The sector's exports have boomed: in 1999, manufactured exports were over US$ 1.7 billion, an almost twenty-fold increase over 1980, and the sector's share in exports rose from about 50 per cent to almost 90 per cent. There has been a dramatic shift towards the more sophisticated products: while, for example, machinery and transport equipment accounted for only 10 per cent of manufactured exports in 1980, their share was about 30 per cent in 1999 (see Table 3).

SMEs make an important contribution to the economic growth, export performance as well as employment generation. They account for approximately 30 per cent of national GDP, 50 per cent of MVA, 48 per cent of national exports, and 17 per cent of tax revenue. While the number of people employed is 1.5 times of the total employment of state-owned enterprises (SOEs), the per capita wage rate of employees in SME's is 5,200 yuan, which is only 62 per cent of national average wage rate, contributing to the wage competitiveness of China's industries.

One aspect of Chinas national development strategy since the establishment of PRC was the nationwide distribution of industry. In 1999, the share of industrial sector in GDP of Eastern, Central and Western region was 51 per cent, 45 per cent and 41 per cent, respectively. One major feature of the Western region is the high share of primary sector compared to Eastern region: 23 per cent and 12 per cent respectively in 1999. The other feature is that the Western region has a higher share of raw material production and heavy industry, while the Eastern region has a higher share of high value-added manufacturing goods.

Due to the insufficient monitoring and supervision capacity of the national and provincial environmental protection agencies, environmental data are only generally available for SOEs. Industrial wastewater treatment in SOEs increased from 50 per cent in 1989 to 67 per cent in 1999, treatment of industrial combustion gases increased from 74 per cent in 1989 to 88 per cent in 1999, and treatment of gases from production processes increased from 62 per cent in 1989 to 80 per cent in 1999.

Whilst SO_2 in waste gas is a major issue, because of its high cost in treatment and removal, the growth rate of SO_2 discharged from 1989 to1999 was only about 2 per cent, which is much lower than the growth rate of economy. The share of environmental protection investment to GDP has increased annually from 1996-1999, with and annual average growth around 0.86 per cent, while it exceeded 1 per cent in 1999.

III. Policies Directed at the Development of Industry

China has had industrial policies since its launch of national five year plan in early 50's Development of heavy industry was targeted early in China's 1st Five Year plan (1953-1957), and this policy lasted several decades. There are three essential documents related to present industrial policies:

- The "Decision on Key Aspects of Current Industrial Policy", promulgated by the State Council of China on 15th March 1989. The document covers, among others, capital investment and technological issues, and policy implementation issues.

- The "Outline of State Industrial Policies in the 1990s", promulgated by the State Council in 25th March 1994 and subsequently supplemented with other official documents. This document emphasized, "it is necessary to realize fully the basic role of the market in the allocation of resources within the context of macro-economic control of the State".

- The "Major Works of Industrial Policy", promulgated by the State Economic and Trade Commission (SETC) in 1999. The policy addressed issues related to the winding down of backward industries, the restructuring of the sector and the improvement of technological level and scale economies.

These policies, covering industrial restructuring, industrial technology and the strategic management of the sector, have partly achieved their objectives and have contributed to the high economic growth of China. Market structure and market performance are still influenced partly by the government (central planning), through lists of prohibitions and preferences in the first policy. Environmental considerations are taken into consideration in the drawing up of the list of prohibited sectors, products and processes. As all regions are not evenly sharing the benefits of the growth of economy, poverty alleviation considerations are included in the policies.

IV. Policies Directed at Industrial Environmental Management

China's current industrial environmental management regime applies in varying degrees all four basic categories of environmental regulation utilized by industrialized countries. These are command and control, economic incentives, voluntary arrangements and information disclosure.

First, the regime applies a command and control approach (licensing) directly to enterprises through authorization procedures to regulate their behaviour affecting the environment. The State Environmental Protection Administration (SEPA) has formulated concentration-based national guidelines, 29 for the most common water pollutants and 13 for the most common air pollutants. It mandates with the licenses that pollution-control treatment takes place within specified time limits to comply with the guidelines. It has required preparation of Environmental Impact Assessments (EIAs) since the early 1980s and through the three Synchronization Programmes, it reviews the design of pollution-control equipment, supervises the construction of treatment plants and monitors operation of the newly constructed plants. The primary limitation to this approach is that these laws and regulation have not been adequately enforced for a variety of reasons.

Secondly, it applies economic instruments to modify behaviour, using financial incentives and disincentives, such as charges, taxes and fines, to improve environmental performance. EPBs apply a pollution levy system (PLS) that imposes a fee on pollutant concentrations exceeding the standards. This fee depends on the difference between actual concentrations and the standards. The EPBs also levy tariffs on wastewater treatment and solid waste disposal and in some cases apply environmental taxes, which apply to all emissions/effluents even those inside the pollutant concentration limits. The primary limitations to this approach are that the levy is applied to only one pollutant (the one on which the assessed penalty is the highest; in

other words, the one that exceeds the standard most, if weighted by the charge rate) and the charge rate of the levy system is too low, resulting in only a small effect on enterprise performance.

Thirdly, SEPA has promoted three voluntary instruments that aim to co-opt participation of firms into improving environmental performance. These instruments are environmental labeling (started in 1991), cleaner production (first large-scale demonstration project in 1993 and formulation of the Cleaner Production Law in 2000) and environmental certification procedures (introduced in 1997). The primary limitation with these voluntary instruments is their limited application within the country. The total number of enterprises that have conducted cleaner production audits since 1993 is still less than 500 and, as of February 2001, approximately the same number of enterprises and institutions has obtained ISO 14001 certificates.

Fourthly, there are no information disclosure programmes comparable to those in developed and other developing countries that aim to use public pressure to improve environmental performance. There does exist, however, a formal procedure for citizen complaint within EPBs and there are on-going experiments with the use of information disclosure approaches in Zhenjiang and Hohhot cities.

V. *Policies and Programmes Aimed at Technology Change, particularly EST*

China is clearly awareness that the growing integration of the global economy and the accelerating rate of technological change have created a new competitive environment for all countries, especially with its accession into WTO. The rapid growth of Chinese economy is not only due to large-scale rural industrialization, transferring a surplus labour force of around 130 million from agricultural to industrial activities, but also to technological change.

China has implemented large-scale import programmes to upgrade the technological level of existing enterprises since the1980's. In 1989, the share of manufactured goods and machinery and transport of total import was 80 per cent and 31 per cent respectively, rising to 84 per cent and 42 per cent respectively in 1999. Know-how imports also took place, and one well-known result of this process it the Chinese computer "Legend", which has highest share in the domestic market.

China has also established 53 national high technology development zones (HTDZ) as growth poles for technological innovation and diffusion. These HTDZs are widely distributed. Several HTDZ's in cities of coastal area are very effective, such as Shenzhen, Shanghai, Beijing and cities in the delta area of Yangtze River and Pearl River. The industrial park set up by Singapore in Suzhou has greatly boosted the development of Suzhou and neighbouring cities. The Urumqi HTDV of Xinjiang autonomous region has focused on the development of renewable energy resources and of products based on local raw material resources.

In China's 9th Five Year Plan there is one chapter dealing specially with science and technology. While the text emphasizes education and know-how transfers, it seems that China is more successful in importing hardware than with regard to the transfer of total systems "including know-how, procedures, goods and services, and equipment as well as organizational and managerial procedures", as proposed by the document.

The Chinese environmental protection industry supplies to a significant extent the equipment needed for the prevention and control of pollution. By 1999, there were 9,400 enterprises and institutions in the environmental protection industry, with a total employment of 1.54 million persons; the value of output reached 69.3 billion yuan. The enterprises are usually small, 90 per cent of them having fixed assets less than 15 million yuan. The technological content and quality of the products are low and they undertake little research.

An initial institutional network for cleaner production (CP) technologies has been formed through multilateral and bilateral support programmes. For example, UNIDO and UNEP jointly supported the then National Environmental Projection Agency (now the State Environmental Protection Agency) to establish a National Production Centre in 1993. The Asian Development Bank (ADB) provided technical assistance for the Ministry of Science and Technology (MOST) to set up a Centre for Environmentally Sound Technology Transfer (CESTT). More than two-thirds of the provinces have launched or plan to launch CP initiatives, enterprises in over 10 industrial sectors have conducted pilot CP projects, and around 10,000 people have attended training courses on CP. Awareness about CP has therefore increased.

However, in spite of these efforts, to which those of several transnational corporations should be added, progress with regard to CP implementation is still limited. This can for the most part be attributed to the existing regulatory and policy framework, which is conducive to end of pipe measures rather than preventive action using CP, and a lack of institutional capacity to provide information, technical advice and other support for implementation of CP by industry. Access to finance and the mindsets of top management of Chinese enterprises are additional problems.

VI. *Experience with Integrated Policies and Programmes*

China depends heavily for its path of development on the guidelines in its "Five Year Plan". These plans generally provide integrated development policies and programmes on economic, social and environmental matters. Although it seems that there is consistency of concepts in the coordinated development of economy, society and environment, implementation does not adequately address the environmental issues. China, for example, has an acute shortage of water, especially in the North, but there is no integrated water policy. Indeed, responsibilities are fragmented among ministries that govern water for, respectively, irrigation, transportation and urban use. Nor has "sustainable industrial development" become an essential ingredient in the industrial policy.

VII. *Major Constraints and Obstacles in Enhancing the Contribution of Industry to Sustainable Development*

The major constraints to environmentally sustainable industrial development in China are at the institutional and policy level:

- The traditional Chinese planning process does not involve the participation of industrial enterprises;
- Generally, China is strong in national planning, but business planning at enterprise level is weak, especially long term strategic planning. There is a need to incorporate environmental planning and control into the overall business planning of enterprises;
- Many existing economic policies and measures, such as low water prices and low effluent/waste discharge fees, provide disincentives to CP;

- Government funded R&D programmes have been predominantly geared toward end of pipe technologies in the past and are only recently recognizing the importance of research for cleaner process technologies; and
- For CP to be widely adopted, better cooperation and coordination between leading governmental institutions is essential.

VIII. Priorities and Future Actions

1. A new paradigm of industrial development

The negative effects of industrialization should be fully recognized, and EST and cleaner production should be adopted wherever possible. The positive economic and social effects of industrialization should be fully realized without negative environmental effects. A balance should be struck between the scale economies of large enterprises and the employment effects of SMEs.

2. More attention to services

Traditional industrial policy focuses only on the manufacturing sector. But industry in a broader sense includes transport, telecommunication and e-commerce. The growth of the manufacturing sector cannot be separated from the growth of the service sector. Research, design, accounting, consultancy, information collection and dissemination and goods distribution are inseparable from an efficient and effective manufacturing system, especially in a global knowledge based society

3. Technological innovations and upgrading

In the new millennium, ICT, biotechnology, brain technology, new (renewable) energy technology, nano-technology, environmental technology etc., have become the engines of growth of society. Purchasing, licenses, and FDI are useful means to promote the transfer of technology. International organizations can help to promote this technology transfer on a fair basis. And the developing countries should try all means to improve education and training to upgrade their own research capacity and capability, to contribute to the common goal of the mankind - sustainable development of human society.

Table 1 Share of GDP of Economic Sectors (%)

	1950	1957	1970	1980	1985	1990	1995	2000
Primary sector	50.5	40.6	35.8	31.3	30.6	27.0	20.5	15.9
Secondary sector	20.8	29.2	39.8	48.2	44.5	41.6	48.8	50.9
Tertiary sector	28.7	30.2	24.4	20.5	24.9	31.4	30.7	33.2

Source: Chinese Statistics and reference 9.

Table 2 Composition and Growth of Manufacturing Industry of China 1990-1999

ISIC class	Item	1990 (A)		1999 (B)	
		Million U.S.D.	Share of total %	Billion yuan (mill. US$)	Share of Total(%)
311/2	Food Products	4489	3.3	179.45(21620)	5.8
313	Beverages	2414	2.9	95.1(11457)	3.1
314	Tobacco products	6220	7.4	144.68(17431)	4.7
321	Textiles	10299	12.2	181.19(21830)	5.9
322	Wearing apparel	2109	2.5	82.07(9888)	2.7
323	Leather and fur products	944	1.1	46.0(5542)	1.5

324	Footwear				
331	Wood and wood products	502	0.5	21.56(2597)	0.7
332	Furniture and fixtures	455	0.5	12.65(1527)	0.4
341	Paper and paper products	1949	2.3	57.67(6948)	1.9
342	Printing and publishing	1036	1.2	54.84(6607)	1.8
351	Industrial chemicals	8459	10.1	197.37(23779)	6.4
352	Other chemical products	3372	4.0	124.47(14996)	4.1
353	Petroleum refineries	2714	3.2	95.73(11533)	3.1
354	Misc petroleum & coal products	208	0.2		
355	Rubber products	1603	1.9	32.86(3969)	1.1
356	Plastic products	1736	2.1	62.90(7578)	2.0
36	Non-metallic mineral products			162.94(19631)	5.3
361	Pottery	504	0.6		
362	Glass and glass products	705	0.8		
371	Iron and steel	6571	7.8	175.35(21177)	5.7
372	Non-ferrous metals	2050	2.4	65.7(7915)	2.1
381	Metal products	2946	3.5	87.7(1059)	2.9
382	Non electric machinery	10116	12.0	149.8(18048)	4.9
383	Electric machinery	7445	8.8	381.22(45930)	12.4
384	Transport Equipment	3918	4.6	193.51(23313)	6.3
385	Professional and scientific equipment	843	1.0	83.64(10077)	2.7
390	Other industries	2125	2.5		
Total		84145.3	100	3069.12(360381)	100

Technical Notes:
Column A is quoted from A-26 of "Industry and Development Global Report 1993/94" of UNIDO.
Column B is derived from the China Statistical Year Book with corrections by the author .

Table 3 Export performance of manufactured goods of China (US$ 100 million)

	1980	1985	1990	1995	1999
Total export (A)	181.19	273.50	620.91	1487.8	1949.3
Manufactured goods (B)	90.05	135.22	462.05	1272.95	1749.9
Share B/A %	49.7	49.4	74.4	85.6	89.8
Chemicals and related products	11.20	13.58	37.30	90.94	103.73
Light & textile rubber products etc.	39.99	44.93	125.76	322.40	332.62
Machinery & transport equipment(C)	8.43	7.72	55.88	314.07	588.36
Share C/B %	9.4	5.7	12.0	24.6	33.6
Miscellaneous products	28.36	34.86	126.86	545.48	725.10
Not classified	2.07	34.12	116.25	0.06	0.09

Derived from: China Statistical Yearbook 2000

5. COLOMBIA

Industry and Sustainable Development in Colombia – Achievements and Prospects

Based on the report prepared by Mr. Carlos Arango Escobar

Executive Summary

I. Broad trends in Sustainable Development in Colombia

Colombia is the third most populated country in Latin America, with a population of about 43 million people. The economy has deteriorated seriously over the past four years, a particularly sharp recession affecting the country in 1999 when GDP fell by about 4.5 per cent. The economic decline has been accompanied by a rapid increase in unemployment, which in urban areas stood at 19.5 per cent in March 2000. The poorest quintile of the population has an unemployment level of 25 per cent, more than three times that of the top quintile (7 per cent). As a consequence, the incidence of poverty, which declined from an estimated 50 percent in 1964 to 20 percent in the mid-1990s, is rising again. Today, some 10 million Colombians have incomes below a nutritionally-defined subsistence level. Salary gaps between high and low income employees also increased.

Poor natural resource management over many years and over dependence on exploitation of natural resources, illicit crops for drugs (which replaced crops with low market values, especially coffee), and high urban population growth have a negative impact on Colombia's soil, water and agricultural resource base. The government and civil society alike recognize that violence is a key constraint on development, and that the fight against corruption is a major priority.

Colombia main development priorities are poverty reduction, social development, and sustainable growth. These objectives are to be achieved by interventions in six strategic areas: (i) peace and development; (ii) rural development; (iii) human capital; (iv) public sector responsiveness and efficiency; (v) infrastructure services; and, (vi) sustainable development.

II. The Manufacturing Sector and Sustainable Development

In 1999, the manufacturing sector in Colombia contributed 13 per cent to GNP (see Table 1), accounted for 12 per cent of the total labour force and almost 34 per cent of the total exports. Chemicals, textiles, leather, food, machinery and equipment, metal products, paper and wood products are the most important export items (see Table 2). In 1995, the average annual growth was 5 per cent. Between 1995 and 1999 the rates were negative, and there has been a trend towards investment in other countries; but positive growth rates were recorded during the last two years.

Large-scale industries dominate the sector and the globalization process is favouring a further trend to large firms. Industries are heavily concentrated in five regions, Antioquia, Cundinamarca, Valle del Cauca, Barranquilla, and the coffee-growing area. Food, beverages, textiles, clothing, chemicals, petroleum and plastics are the most significant industries.

Between 1990 and 1999, per capita MVA has decreased while the reverse happened elsewhere in Latin America – and in the developing world an as whole. Although during the past decade technological developments have focused on productive processes,

systematization and improvements through capital investments, staff training and a shift to qualified labour, and although labour productivity has increased, technological levels are poor when compared to the more dynamic developing countries. In the process, unskilled workers have often lost jobs. Women, who constitute a minority of the industrial labour force but who are more often breadwinners than men, have suffered particularly.

Of the Colombian manufacturing sub-sectors, UNIDO considers the following industries to be the most polluting: paper, industrial chemicals, non-ferrous products, iron and steel, and cement. Manufacturing is also the greatest user/transformer of natural resources. The manufacturing sector gets 65 per cent of its total intermediate consumption from the agricultural and livestock sector, and accounts for half of the total final consumption of energy. Oil and coal are the main energy sources. Oil refining, an industrial activity, represents a great potential for air contamination: refineries emit a great amount of sulfur dioxide (SO_2) and nitrogen oxides (NO_2). Agrochemical products have caused widespread contamination of streams.

III. Policies Directed at the Development of Industry

In order to boost industrial development and to face globalization and open markets, Colombia has formulated a number of policy priorities:

- Strengthening technology information.
- Promoting science and technology policies.
- Commercial policies and industrial competitiveness agreements.
- Domestic agreements, outsourcing and competitiveness agreements.
- Export promotion, especially in Latin America, and stronger participation in regional trade agreements.
- Support to micro enterprises, small and medium-size enterprises (SMEs), enterprise networking and outsourcing.

The intention is to decentralize the implementation of these policies to the provincial and sector level; the Ministry of Economic Development would mainly play a coordinating role in the various activities. The detailed preparation and execution of the policies, however, is held up by the security situation in the country, which makes it very difficult to make the necessary surveys of local development problems and potential, to create and fund local capacities for the implementation and monitoring of the activities, and to attract investment.

IV. Policies Directed at Industrial Environmental Management

During the last decade, the main advances made by Colombia in the area of environmental protection were:

- A new environmental legislation (the National Environmental Act) along with the creation of the Ministry of the Environment and the National Environmental Information System (SINA). SINA is to re-organize the previous regional land planning and economic management corporations.
- The preparation of the first sustainable development plan.
- New institutions to help implement sustainable development policies.

The main outcomes have been:

- Industrial Activity Agreements for Cleaner Production *(Convenios de Concertación para una Producción Más Limpia),* which encompass sectors such as coal, hydrocarbons and electricity, sugar, oil palm, pita fiber, agrochemical products, coffee, flowers, small and medium-sized mines, brick and clay-derived products. A UNIDO evaluation of the environmental situation and environmental management in a number of industrial sectors provided part of the information on which the agreements were based.
- Rural Industrial Clusters *(Corredores Industiales),* for the management of the largest geographical concentrations of industry: Antioquia, Mamonal, Barranquilla and Sogamoso.
- The creation of the public-private National Centre for Cleaner Production and Environmental Technologies *(CNPMLTA),* and the Colombian Network for Clean Technologies *(CIRE).*

V. Policies and Programmes aimed at Technology Change, particularly EST

At the beginning of the 1990s, regulations for the achievement of sustainable development were adopted. These regulations defined the Government's obligation to incorporate science and technology into the economic and social development plans and programmes, and a national science and technology network was created.

The CNPMLTA, established in 1998, covers the whole country, with decentralized activities in seven regions, working with the local chambers of commerce. It provides a wide range of services:

- Clean technology demonstrations;
- Seminars on relevant topics, emphasizing the importance of pollution prevention and the contribution to (international) competitiveness of cleaner technologies;
- Training, especially for SMEs;
- A market for residues (BORSI);
- An information network and publications on cleaner production and related issues;

The Swiss Government's Secretariat for Economic Development SECO is providing support to the transfer of cleaner production technologies.

VI. Experience with Integrated Policies and Programmes

There is no experience with such programmes yet. In the specific case of the industrial sector, such policies are to integrate and link:

- Economic, social and environmental dimensions.
- The Ministries of Development and of Environment, with their social policies.
- A programme to create greater awareness and train entrepreneurs in environmental matters.

International support networks should be created for pilot projects and the widespread dissemination of clean technologies, and for the consolidation and strengthening of the CNPMLTA.

The following environmental issues should be also be addressed:

- Promotion of green products and green markets in Colombia.
- Creation of green funds.
- Expansion of markets for waste.

VII. Major Obstacles to Enhancing the Contribution of Industry to Sustainable Development

These include:

- Inadequate regulations and non-compliance by most enterprises due to a lack of monitoring and enforcement capacities.
- Political short-termism;
- An industrial culture focused on narrow economic cost-benefit thinking.
- Lack of environmental awareness and little understanding of the need for preventive action.
- Existence of old, very polluting technologies in some industries.
- A large SME sector where know-how and resources for sustainable development are in short supply and which is not served by the environmental institutions.
- The weakness of consumer movements and the limited demand for green products.

VIII. Priorities and Future Actions

Economic Dimension

Recovery of Colombia's economy will depend on the following aspects:

- Transformation of the coffee sector.
- Decisive Government action against illicit crops, and a new approach to rural development.
- Higher oil, coal, and iron-nickel prices.
- Clearing the deficit and public debt.
- Strengthening the SME sector.
- Partnerships between industry and the Government to promote value chains and competitive industrial exports.

Social Dimension

Efforts must be focused on fighting corruption, increasing the efficiency of public institutions, separating public powers, increasing accountability, modernizing the judiciary system, and seeking decentralization to guarantee institutional development at the local level.

Unemployment rates in urban areas could be reduced significantly if the Government, in partnership with the private sector, stimulated SME creation, reviewed current worker training programmes (emphasizing, among others, environmentally friendly technologies), revitalized export industries by improving commercial strategies, and promoted economic

decentralization by encouraging rural industrial clusters *(corredores industriales)* meeting strict environmental guidelines.

Environmental Dimension

The major factors to be taken into account in this field are:

- Control of illicit crops. In this context, the strategy proposed by Plan Colombia to use glyphosphate to fumigate illicit crops must be questioned, as this an environmentally controversial chemical.
- Reducing the overdependency of Colombian exports on natural resources and promote domestic markets for green products.
- Intensifying the various existing efforts to promote cleaner production.

Table 1. Sector shares in GDP (per cent)

	1989	1998	1999
1. Agriculture	17	13	12
2. Industry	**38**	**26**	**25**
(Manufacturing)	**(22)**	**(14)**	**(13)**
3. Services	45	61	63

Source: National Administrative Department of Statistics (DANE).

Table 2. Exports of the manufacturing industry (per cent of total exports)

	1990	1994	1997
Chemical products	5	7	10
Textiles and leather products	14	12	8
Food products	4	8	8
Machinery and equipment	1	3	4
Manufactured metal products	-	1	1
Paper	2	3	2
Non-metallic mineral products	2	1	1
Wood products and furniture	-	-	-
Other products	5	3	2

Source: COINVERTIR. 2000

6. CÔTE D'IVOIRE

Manufacturing Industry and Sustainable Development In Côte d'Ivoire

Based on the report prepared by Kadio Ahossane, Ph. D.

Executive Summary

I. Broad Trends in Sustainable Development in Côte d'Ivoire

The Republic of Côte d'Ivoire is located in West Africa by the Atlantic Ocean. More than 15 million inhabitants live in a territory of about 322 000 km2. GDP was around $US 700 per capita in 1988. The average annual inflation rate of Côte d'Ivoire in 1998 was 4.5 per cent.

The economy of Côte d'Ivoire is heavily reliant on agriculture (primarily cocoa and coffee), which accounts for nearly a third of the country's gross domestic product (GDP) and 70 per cent of its exports. Consequently, the economy is highly sensitive to fluctuations in international prices for these products and to weather conditions.

Côte d'Ivoire's economic evolution from 1960 to 1998 has been marked by three distinct periods:
a long period of prosperity and development from 1960 to 1979 during which the economic system was built up, followed by a period of economic recession during which the economic system first underwent a depression (1980-1984) before picking up (1985-1993), and later on a third one of economic recovery and development (1994-1998).

Due to a drop in oil and cocoa production, exports rose by only 7.1 per cent in 1998 compared with 12.5 per cent in 1997. Imports increased by 13.0 per cent in 1998 compared to 6.6 per cent in 1997 because of the import of capital equipment following important investment efforts and the importation of foodstuffs whose local production is insufficient. An essential contribution was made by the industrial sector progressing mainly in the sub-sectors of textiles (+39.5 per cent), wood (+22.0 per cent) and mechanical engineering (+14.0 per cent).

II. Manufacturing Industry and Sustainable Development

The industrial sector, considered as the main source of economic growth, accounts for 24 per cent of GDP. About 3/4 of the added value is generated by some 400 major companies. The period of strong economic growth (1960-1979) was also one of rapid expansion of manufacturing industries due to the expansion of exports: Exports of manufactured goods grew 11.1 per cent annually from 1970, almost keeping pace with the growth in global manufactured exports. Since 1980, the manufacturing sector suffered a decline from the negative repercussions of the economic downturn of the country, with an average annual growth of –1.2 per cent in the period 1981-1986 and –2.2 per cent between 1987 and 1991.

Agro-industries constitute the main component of industrial activity, accounting for almost half of the manufacturing industry's added value and jobs. In 1997 they accounted for about half of the added value (49.6 per cent) and jobs (50.0 per cent) in the manufacturing industry. They also account for 7 per cent of GDP and contribute about 4 per cent to manufactured exports.

According to the Inspectorate of Listed Facilities there are 175 priority-listed units according to hazard, risk or pollution and nuisance generated. The most recurrent sub-sectors are farm-produce, chemicals, wood processing, textiles, leather and shoes including rubber. The use of water in industrial processes produces important volumes of industrial liquid waste every day. The composition varies according to the type of industry, some being quite toxic and containing varieties of synthesized organic compounds. The uncontrolled pouring of industrial liquids, especially those containing toxic compounds, in the municipal sewers or in the streams, rivers and waterways (case of the Lagoon Ebrié in Abidjan) constitutes a permanent hazard. Solid waste is most often disposed of hap hazardously rather than at controlled disposal sites.

III. Policies Directed at the Development of Industry

The State has made important efforts, in collaboration with development partners (donors, civil society, and economic operators) by creating many private sectors related to development such as: private sector support agencies; adjustment programme for the competitiveness of the private sector; a financial sector support program (PSFI); sector based adjustment credits for the development of the private sector (ASDSP), including an Ivorian private sector support project (ASPI).

IV. Policies Directed at Industrial Environmental Management

In the framework of environmental management in Côte d'Ivoire, the definition and implementation of the country's sustainable development strategy have required extended dialogue at national, regional, and local levels between the various actors (public sector-private sector-citizens).

The preparatory process of this plan consists of two successive phases:

- A first phase culminating in the elaboration of "an Official Report on Environment" presented during a national workshop held from November 28 to 30, 1994;
- A second phase devoted to the elaboration of a National Environmental Action Plan of Côte d'Ivoire (PNAE-CI) for the period 1996 to 2010.

The PNAE-CI is the first tool of overall environmental management and is composed of 10 major framework – programmes. Programme Five addresses the three main sources of industrial pollution: effluents, emissions, and special wastes. The programme identifies the following major objectives:

- Reduction/control of pollution and other nuisance related to industrial and small scale production by artisanal activities;
- Elimination or processing of industrial wastes from small scale artisanal production;
- Assurance of the operational control of listed facilities;
- Harmonization of space distribution between industrial activities and housing.

In the National Environmental Action Plan, the industrial environmental management part entitled "Industrial Pollution and Nuisance Program" or a strategy of the PNAE for industrial pollution and nuisance are not developed and thus remains to be completed. This situation is favourable to the setting up of a program of ecologically sustainable industrial development

(ESID). The other programs of the PNAE permit the integration of some actions of ESID such as sector–based information systems or the integrated management of water.

As far as the legislative aspects are concerned, many initiatives complying with the requirements of Agenda-21 have been materialized through the implementation of actions among which the following are noteworthy:

1. The Environment Act n° 96-766 of October 3, 1996 setting the general framework for the legal and institutional texts relating to the environment;

2. Decree n° 96-894 of November 1996 determining the procedures applicable to Environmental Impact Assessments (EIA) of development projects.

The SIIC (Bureau of Inspection of Classified Industrial Establishments for Environmental Protection), which is the official agency in charge of the control of corporate hygiene, security and environment, does not have sufficient technical and human means to correctly fulfil its tasks. The regulatory texts at its disposal are not sufficient. As regards legislation, the texts of enforcement of the framework law on the environment are not yet published. The SIIC appeals to external laboratories to take samples and conduct analyses at costs chargeable to the companies. Those laboratories are the Laboratoire National d'Essais de Météorologie et d'Analyse (LANEMA) and the Centre Ivoirien Anti Pollution (CIAPOL).

The Government has actually put a very special emphasis on the involvement of various partners in environment protection action and technology transfer, either by involving the private sector and civil society in the mobilization of local populations or by integrating them as relay investors, to ensure the transformation and change required to achieve sustainable development in Côte d'Ivoire.

V. Policies and Programmes Amed at Technology Change, particularly EST

In order to promote and facilitate the use of new technology and innovative programme to prevent pollution, Côte d'Ivoire has set up a new mechanism such as:

- system quality/standardization/metrology to deal both with quality regulation and control, competition and fraud;
- intellectual property rights since 1997 to reinforce the effectiveness of the technology development process in the country;
- waste reduction programme to a better exploitation of waste reduction including the integration of ISO 14000 considerations in all the enterprises activities;
- Production quality as well including a cleaner production system, control of industrial emissions, and control of consumer goods.

VI. Experience with Integrated Policies and Programmes

UNIDO has assisted the government in the execution of a series of initiatives undertaken as basis for the elaboration of an Integrated Programme of Sustainable Development for the private sector.

The setting up and the implementation of ESID in Côte d'Ivoire correspond to a favourable period witnessing the progressive establishment of the regulation. National strategy of

sustainable development has been adopted by the State. Moreover, the updating of the Industrial Development Master Plan (SDI) is underway. The implementation of the ESID will therefore deal not only with existing activities but also with investment projects identified by the SDI. The new industrialization projects will be advised from their conception to include the notion of clean technologies in their manufacturing process and opt for more economical facilities consuming less resources and polluting less. International competitiveness is an increasing imperative and the ESID can contribute to sensitise and monitor enterprises with respect to quality, environment, and safety.

VII. Major Obstacles in Enhancing the Contribution of Industry to Sustainable Development

Among some major constraints the following can be mentioned:

- The non-existence of an industrial development Master Plan adapted to the current economic situation and of monitoring instruments for industrial policy
- poor competitiveness of enterprises (high factor cost, high tax pressure, lengthy administrative procedures, deficient internal organization and management, etc.)
- the limited contribution of SMEs to national added value;
- low private investment in Côte d'Ivoire;
- the extent of fraud, smuggling, forgery and, because of the lack of explicit policy on sustainable development, the degradation to some extent of the resource base.

VIII. Priorities and Future Actions

The most innovative future actions are based on: quality/standardization/metrology; protection of intellectual property rights; waste reduction; and quality of production including: cleaner production, control of industrial emissions, control of consumer goods. Indeed, the Ivorian industry strategy should necessarily take into account the changes relative to globalization of the economy and the new role of international trade. On this account, the sustainable industrial strategy will continue to be based on achieving two strategic objectives, namely the implementation of the industrial upgrading program in order to improve the competitiveness of production units and mainstreaming environmental considerations in production and consumption systems.

7. CZECH REPUBLIC

Industrial development in the Czech Republic in the light of sustainable development

Based on the report prepared by Mr. Bedrich Moldan.

Executive Summary

I. Broad Trends in Sustainable Development in the Czech Republic

In November 1989, the "Velvet Revolution" in Czechoslovakia overthrew the Communist system. The former Czechoslovakia started a deep transition process towards democracy and free market economy.

The transition process proved to be a difficult and painful one, accompanied by a sharp drop in economic output that created hardships for large segments of the population. The gross domestic product decreased by about 12 per cent in 1991 followed by a further 0.5 per cent decline in 1992. The division of Czechoslovakia into the Czech Republic and the Slovak Republic marked the year 1993. This brought an additional negative economic impact. In contrast, the GDP remained at the same level. The decrease of industrial production was greater. The 1993 volume was only 63 per cent of the 1990 level. The year 1994 was the first one with modest economic growth. In 1995, the GDP increased by 5.3 per cent. This growth continued in 1996, but it was replaced by decrease in 1997-1999. In 2000, the GDP grew again but it didn't still reached the level of 1990.

II. The Manufacturing Industry and Sustainable Development

MVA decreased significantly after 1990 and again after the division of the former Czechoslovakia in 1993. Later it started growing and it reached higher levels in 1996 and 1997 compared with 1990. This growth was interrupted in 1998 and 1999 and in spite of the growth in 2000 the gross MVA did not reach the 1990 level in 2000 (Table 1 & 2).

Gross MVA *per capita* and MVA as a percentage of GDP declined slightly over the ten year period (Tables 3 & 4).

Work productivity lagged behind the productivity in the developed countries: in 1998, in metallurgy it was 28 per cent of the EU member countries average only, in pulp industry 16 per cent of Austrian productivity, and the industry value added per employee was 20.5 per cent of the EU member countries average in 1997.

The branch structure of the manufacturing industry in the Czech Republic is gradually approaching the average structure in the EU. The largest changes were especially in metallurgy, electro technical industry, transport, engineering and textile industry. At present nearly 800 companies with foreign equity participation operate in the Czech Republic and employ approximately 255,000 employees. Labour productivity increased in all mentioned industrial branches as consequence of the restructuring process especially in the cases of the transport and electro technical industries. During the 90's the employment in the manufacturing industry decreased from 33.7 per cent in 1991 to 28.5 per cent in 1996. After that it increased to 30 per cent in 1999.

The number of industrial enterprises has decreased during the last decade. While 238,109 industrial enterprises were registered in 1993, in 1999 this number had dropped to 151,195 industrial enterprises.

The structure of the manufacturing production base according to the size of enterprises in 1999 shows that the best performers are those with more than 1000 employees. In 1999 these organisations participated in total revenues for products and services, in value added and in number of employees with 38.9 per cent, with 35.5 per cent and with at 27.5 per cent, respectively. Their added value generated per employee equal to CZK 394,000, the best result of all the product groups. Since 1994, the ratio of the value added per employee has grown in all product groups. Workforce reduction has been apparent mainly in organisations over 1000 employees, whose share in the total number of employees decreased from 30.9 per cent in 1994 to 24.5 per cent in 2000 as a result of restructuring and cost cutting. In contrast, the share of organisations with 50 –249 workers increased from 21.2 per cent in 1994 to almost 25 per cent in 2000.

In 1999 the shares of small and medium enterprises (up to 250 employees) in revenues for products and manufacturing services, in value added and in number of employees were 36.9 per cent, 37.3 per cent and 47.2 per cent, respectively. These companies recorded lower work productivity than large enterprises employing more than 250 workers. As compared with the EU countries, the number of small and medium enterprises (SME) is relatively low in the Czech Republic. However, they play a key role in the EU in ensuring economic growth, competitiveness and employment. In the EU small and medium enterprises employ 66 per cent of workforce in the private sector and generate 56.2 per cent of the total revenue.

As a consequence of the industrial production decrease after 1990 and thanks to the wide implementation of end of pipe cleaning technologies the amount of pollution released by industry decreased significantly, and this decrease reached up to 90 per cent in some cases. During the same period there was also a sharp decrease in the volume of waste water discharged by industry into surface water (Figure 1).

Regarding waste generation, according to OECD in 1999, the Czech Republic was the largest producer among the OECD countries with 345 kg of industrial waste per 1000 USD of GDP, followed by Luxembourg with 149 kg/1000 USD. The average of OECD countries is 81 kg/1000 USD. Recycling and utilization of waste as a secondary raw material has improved during the last years, but still remains low. In 1999 only 3 per cent of the total wastes were recycled (without the "sorting" category) and 26 per cent were utilised as a secondary raw material. Metal waste was used above all, metal-containing waste to a lesser degree and waste plastics, glass and used paper even less.

Domestic consumption of primary energy sources decreased over this period by about 26 per cent and the share of solid fuels also decreased in favour of cleaner fuels, e.g. natural gas. Over the same period the energy intensity of the national economy decreased by about 30 per cent and the electrical energy intensity decreased by about 11 per cent. However, in 1999 energy efficiency was still rather low: by 22 per cent and by 3.8 per cent lower than in the EU and OECD countries in 1997, respectively. Simultaneously, there has been also a decrease in energy intensity of the manufacturing industry.

The ratio of the environmental expenditures to the overall output of the economy, i.e. to the GDP is a very important indicator. It follows from this figure that there was a rapid increase

in environmental investments after 1990 (from 1.1 per cent in 1990 to 2.5 per cent in 1994); between 1994 and 1997 the share remained practically constant (2.4 per cent in 1995 and 1996 and 2.5 per cent in 1997). In 1998 there was a decrease in environmental expenditures in the GDP to 2.0 per cent that continued in 1999. In the 1990 - 1992 period, the share of expenditures within the public budgets increased (from 0.9 per cent in 1990 to 1.5 per cent in 1992) and in the subsequent years this figure decreased to 0.5 per cent in 1998.

III. Policies Directed at the Development of Industry

The aim of the Czech industrial policy after 1989 was to carry out restructuring of the old "planned economy" and to start up its growth subsequently.

After 1989, various policy documents concerning industry were developed. In 2000, *The Concept of Industrial Policy* was adopted. Based on the Government's non-interventionist and market-oriented concept of the development of the country's industrial base, the main goal of this Policy is to preserve and to promote the existing competitiveness and effectively produced industrial potential. For 2000 and 2001, the policy contemplates as primary short-term objectives help to recover GDP growth, stabilise the business environment and to trigger longer-term growth tendencies in the processing industry.

The Action Programme for Enhancing Competitiveness of the Czech Industry, which objective is to create the institutional and financial base for implementation of the Industrial Policy's initiatives, followed *The Concept of Industrial Policy*, its impact should be medium term, in the horizon of 3-6 years.

Besides, these general industry policies there are also some sectorial ones that have been developed. In 1992, the *Energy Policy of the Czech Republic* was adopted and then replaced by a new one in 2000. In 1999, *The Raw Material Policy of the Czech Republic in the Field of Mineral Raw Materials and Their Resources* was prepared by the Ministry of Industry and Trade and the Ministry of the Environment as the basic conceptual document. In 1993, the sector strategic document *Transport Policy of the Czech Republic* for 1990's was adopted. It stipulated basic principles, the necessary framework and rules for all transport process participants in the Czech Republic. In 1998, following the assessment of the Czech Republic entry preparations into the EU, the transport sector presented the updated *Transport Policy of the Czech Republic* for the future period, namely as a part of the pre-access strategy of the entry of the Czech Republic into the EU and one of the program document required for the Czech Republic entry into the EU.

Finally, several voluntary agreements in the field of environment and sustainable evelopment have been signed with various governmental and non-governmental bodies, such as the "Responsible Care in Chemical Industry" program that provided the logo "Responsible Care in Chemical Industry" to 18 enterprises of that sector.

IV. Policies Directed at Industrial Environmental Management

The current Czech Republic legislation on protection of the environment is composed of a considerable number of legal instruments that were adopted during the 90's. Those that concern to industry refer amongst other issues to air pollution control, levies and fees for wastewater discharge into surface waters, right to information on the environment and protection of the ozone layer. The importance of these legal instruments has increased as a result of the objective of the Czech Republic to join the EU. For this purpose, a series of

amendments will be develop and promoted in order to bring into line the national legislation with that of the Union.

At the general level, there is a *State Environmental Policy* from 1995 that considers sustainable development as the basic starting point and sets some requirements for the industrial policy that generally refer to incorporation of environmental considerations into strategic industrial and business plans; movement towards products with higher value added; preparation of programmes to support extensive application of low- e mission, low- waste and energy saving technologies with reasonable costs and promote the creation of programmes directed towards development of environmentally sound manufacturing industry.

Amongst the industry specific policies and programmes, the implementation of the Eco-management System and Audit Scheme (EMAS) or ISO 14 000 is gradually becoming a necessary condition for maintaining the competitiveness on the markets of the developed countries. As of August, 2001, 135 enterprises had introduced the environmental management system. As of December, 1999, it was only 48 enterprises. The system ISO 14001/EMAS is being implemented in a great array of the industrial sectors including the food industry, especially in the car industry, metallurgy, the machine industry, the chemical industry and the electro-technical industry.

There is also a National Program of Labelling Products with "Environmentally Friendly Product" ecolabel. This program has been implemented since 1994 when the first ecolabel was awarded. Over the six years of its implementation, the ecolabel has been awarded to more than 250 products in 26 product categories by 43 producers, of which 26 producers are from the Czech Republic and 17 are foreign companies. The Czech Republic was officially accepted into the international community of countries implementing ecolabelling (Global Ecolabelling Network) in December 1999. This was an important achievement and it will lead to the improvement of the export opportunities for companies that have products labelled with the "Ecolabel".

Finally, in 1999, the Czech Confederation of Industry and Transport that deals with the integration of the main environmental aspects into the industry sector elaborated *The Environmental Policy of the Czech Confederation of Industry and Transport.* The policy directly endorses the concept of sustainable development and recognizes the need to build partnership for development between the private sector, the Ministry of Environment, local authorities and NGO's.

V. Policies and Programmes Aimed at Technology Change, particularly EST

A decrease of the negative impact of the industry on the environment has been achieved primarily by the massive introduction of expensive end of pipe technologies. Despite the fact that in the Czech Republic there is no major effort to systematically support the development and implementation of EST on the part of the Government, it could be generally stated that the pace of its proliferation is rather high.

The European Council Directive 96/61 EC – Integrated Prevention and Pollution Control (IPPC), has introduced the notion of the best available techniques. An important part of the IPPC Directive (and the respective Czech Act) is the application of the best available technique (BAT). According to this concept, the emission and other limits shall not be achieved through the end-of-pipe abatement measures even though these might be sufficiently

effective. The full application of the IPPC Act will be from 2007 (according to the date stated in the Directive) for existing plants and 2003 for new plants. In the Czech Republic the Act will be applicable to about 1000 industrial enterprises of all sectors that represent about 20 per cent of GDP.

In terms of research and development, there are research programmes of individual ministries that have been supporting the development of EST by providing grants. For instance the Ministry of Industry and Trade in its Sectorial Operational Industry Programme 2001, which is part of the National Development Plan of the Czech Republic approved 32 projects for the year 2001. A National Research and Development Policy of the Czech republic was adopted in 2000 and the National programme is currently under preparation.

Cleaner production has played an important role during the implementation of the EST in the 90's. The Czech Cleaner Production Centre, established jointly by UNIDO and UNEP has been very active in promoting the cleaner production and it provides services mainly to industrial companies and to the central and local governments as well as neighbouring countries. In 1998 the Centre participated in the project *Implication of the IPCC Directive and the BAT concept for the Czech Republic*, financed by PHARE that proposed an approximation programme for BAT in the country. The centre also participated in the preparation of the IPCC ACT in 1999 and is currently taking part in the "*The Indicators of BAT and their Statistical Monitoring*".

VI. Experience with Integrated Programmes and Policies.

The National Development Plan of the Czech Republic (NDP), 2001 drawn up in connection with the Czech accession into the EU tries to overcome the narrow branch approach of the present policies. This document is an in-depth justification for the support from the EU structural funds needs. Its main objective is the analysis of the problems in individual sectors relevant to the Structural Funds and problems of regions, including comparison with the EU countries.

At the institutional level, *The Government Council for Social and Economic Strategy*, an advisory, initiative and coordinating body of the Government, has focused on improving coordination of particular strategic materials by initiating a long-term vision of Czech social development (GCSES). The Council could involve the environmental aspects in future and then it would be renamed *the Governmental Council for Sustainable Development.* Adding the environmental dimension to the already covered economic and social pillars would create a body dealing with sustainable development in its entirety at a sufficiently high Government level.

VII. Major Obstacles in Enhancing the Contribution of Industry to Sustainable Development

In general, there are still several major obstacles for broad acceptance and implementation of the idea of sustainable development in the Czech Republic. As regards industry, an essential requirement is the integration of environmental concerns within the overall development strategies, integration that can provide support for the progressive uptake of environmentally sound technologies and the internalisation of environmental costs produced by industrial production.

There is also a need to establish an economic climate conducive to the successful implementation of the approaches guided by eco-effectiveness through the systematic introduction of economic instruments. Up to now, economic instruments are being used insufficiently and fiscal instruments like taxes and many others have not been fully developed and utilized yet. On the contrary, environmentally harmful subsidies are still used. For this to happen a better evaluation of goods and services provided by ecosystems is required as well as a clear definition of property rights over these good and services.

Small and medium enterprises lack both resources and knowledge. They need institutional support to fully embrace and contribute to sustainable development of the country.

VIII. Priorities and Future Actions

One of the features of industrial development during the last ten years has been that the social and environmental dimensions of sustainable development have been neglected. The National Strategy for Sustainable Development intends to change this situation by focusing in some of the issues mentioned below.

An important prerequisite for the long-term sustainability in the country is the stabilization and gradual decrease in consumption of natural resources and particularly of non-renewable resources. The decreasing trend showed in the last decade should be maintained and improved.

Regarding industrial pollution there is a need to move towards increasing material and energy efficiency, implementation of cleaner technologies, increased recycling, reuse, recovery of wastes and other principles of eco-effectiveness that could at the same time increase the country's competitiveness. Reduction of wastes production is esteemed as crucial.

In the framework of the UNDP project "Towards Sustainable Development of the Czech Republic: Building National Capacities" the proposal was elaborated with these specific goals: long-term prosperity of all groups of citizens; high level of employment; minimum, reasonably grounded negative impacts on human health and the environment, with consideration of the social and economic aspects; strengthening the competitiveness of the Czech industry at the united internal market of the EU and at the global market, to gradually achieve the competitiveness level of the EU.

The priority is to use eco-effective solutions by decreasing material intensity; energy inputs; recycling rates limiting toxic substances emissions; promoting maximum sustainable utilization of renewable energy sources; extension of product durability; and increasing use value of products and services.

The most relevant task for the forthcoming years is the transition to eco-effective, preventive and partnership approaches, which would lead to waste minimization, saving in energy and materials with concurrent increase in employment and competitiveness.

Technical Annex

Table 1 – Gross MVA (1995 constant prices)

Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
mil. CZK	379 092	289 346	325 223	267 968	299 763	335 616	381 767	405 517	371 533	358 525	378 476

Source: CZSO

Table 2 – Gross MVA Index, 1990=100 (1995 constant prices)

Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Index	100.0	76.3	85.8	70.7	79.1	88.5	100.7	107.0	98.0	94.6	99.8

Source: CZSO

Table 3 – Gross MVA per capita (1995 constant prices)

Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	
CZK	36 581	28 067	31 520	25 938	29 002	32 486	37 011	39 355	36 089	34 866	

Source: CZSO

Table 4 – Gross MVA per GDP (1995 constant prices)

Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	
%	26.2	22.6	25.5	21.0	23.0	24.3	26.4	28.3	26.5	25.6	

Source: CZSO

Table 5 – Main production indicators according to size groups of enterprises in 1999

(mil. CZK, persons)	0-9	10-49	50-249	250-999	Over 1000
Revenues for sale of products & services	68 918.1	160 601.4	326 574.9	365 551.4	586 273.1
Value added	19 810.4	41 961.3	89 048.4	110 147.9	143 599.8
Number of employees	96 190	199 022	331 240	336 158	364 534

Source: CZSO, MIT

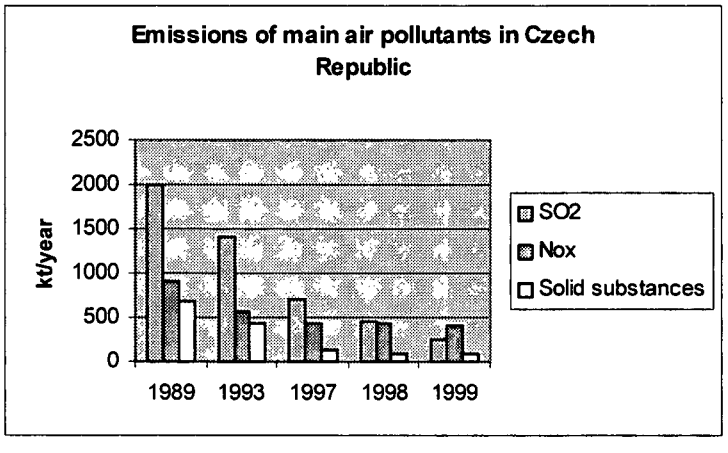


Figure 1 – Emissions of main air pollutants, 1989, 1993, 1997-1999

8. EGYPT

The Challenges of Sustainable Industrial Development in Egypt

Based on the report prepared by Prof. Dr. Amin Mobarak

Executive Summary

I. Broad Trends in Sustainable Development in Egypt

With an area of 1 million sq. km. and a population of about 70 million, Egypt does not appear to be a densely populated country, but virtually all of the population of the country is concentrated in the fertile Nile valley, over 90 per cent of the country consisting of desert. Egypt's major natural resources are minerals (petroleum and natural gas, various metallic ores, non-metallic minerals). In addition, cotton is an important cash crop.

The Egyptian economy has expanded considerably in recent years (see Table 1). Real GDP grew at a rate of about 3.5 per cent annually during the second half of the 1990s. Sound fiscal and monetary policies helped to tame inflation, slash budget deficits and build up foreign reserves, while structural reforms such as privatization and new business legislation prompted increased foreign investment. The private sector now accounts for almost three-fourths of GDP and unemployment is declining slowly but steadily. The unemployment rate is 21.3 per cent among males and 15.6 per cent amongst females; the latter figure, however, ignores the fact that most women are not job seekers.

In 1997, Egypt ranked 70th in the world in terms of per capita income (US$ 1,180). About 20 per cent of households live in poverty while 7 per cent live in absolute poverty. The Human Development Report of UNDP (1999) places Egypt in the group of medium human development countries with a ranking of 107 out of 162 countries.

The narrow strip of fertile land along the Nile is under threat from population pressure and the attendant soil and water pollution; injudicious use of pesticides and fertilizers; desertificantion; and soil salinization below the Aswan High Dam. Apart from water quality, the availability of water is becoming an increasing problem, the Nile virtually being the only source of water. Oil exploitation is polluting coral reefs, beaches, and marine habitats. In the large urbanized areas in the Nile delta, where most of the manufacturing sector is concentrated as well, air and water pollution and uncontrolled waste disposal are a particularly serious problem (Cairo has one of the world's highest lead contents in its air).

II. The Manufacturing Industry and Sustainable Development

Realizing the importance of manufacturing, Egypt looks at industrial development as vital for economic and social development. In 2001, manufacturing output represented more than 20 per cent of the Gross Domestic Product (GDP) employing about 20 per cent of the active labor power (Table 2). Manufacturing Value Added (MVA) in 2001 was 61.65 billion LE represented about 12 per cent of the Gross National Product (GNP). MVA per capita for the same year was 934 LE. Private sector share of MVA was 87.9 per cent whilst the public sector share of MVA was 12.1 per cent.

According to recent information, registered industrial establishments, totaling approximately 24,900, are categorized as follows: 21,500 micro units, 1260 small units, 770 medium units, and 1290 large units. The informal industrial sector accounts for between 25 to 30 per cent of the industrial production.

Most of the industrial sector is located in or near the Nile delta. Greater Cairo has 41 per cent of industrial production, the Delta region 17 per cent, Alexandria 16.8 per cent and finally the Canal Zone 14.2 per cent. Altogether, 89 per cent of the industrial production is located in the Cairo and Northern regions, whilst 11 per cent is in Upper Egypt. For social reasons, the Egyptian government is giving more attention to Upper Egypt, resukting in 29 per cent industrial growth in Upper Egypt in the last ten years.

The industrial production value has reached 168 billion LE in 2001, which was a 300 per cent increase from 1991. Exports reached 8.8 billion LE during 2001, which was an increase of 130 per cent over 1991 levels. The investments allocated to the industrial sector valued 144 billion LE, which was an increase of 90 per cent over 1991 levels. Total wages increased by 63 per cent and the industrial labour force increased by 45 per compared to 1991 levels. The 1980s and 1990s have witnessed s shift in industrial structure away from the traditional agro-processing and textile industries, the strongest growing sectors being petroleum refining and non-metallic minerals. The manufacturing sector makes an important contribution to exports in the form of (petro)chemicals, metals and cotton products.

The development of industry is having negative impacts on environment, as many industrial establishments do not comply with environmental laws and regulations, and as production is often very inefficient. This has resulted in uncontrolled emissions and effluents, and the dumping of solid waste. It is estimated that the sector dumps at least 10 tonnes of solid waste every minute. The large micro and SME sector, where environmental know-how and financial resources are very limited, and the rapid growth of the petroleum refining and non-metallic minerals industries – both heavy potential polluters - constitute a special problem.

III. Policies Directed at the Development of Industry

The development of industry in Egypt has passed through many different phases from the 1960s onwards, depending on the political atmosphere in the different decades. The current phase can be best characterized as one of privatization and reduction of the Government's role.

At the beginning of the 1980s, about 80 per cent of the industrial production was in public hands, whereas in 2001 about 85 per cent of the industrial production was in private hands. Since 1996, the Government has sold 142 out of the 314 enterprises destined for privatization. In addition, 38 factories were sold or leased to employees.

Industrial development in Egypt is characterized by two main trends. The first is the establishment of new competitive industries, and the second is the expansion and renovation of existing industries to increase their productivity. The strategy of the Government regarding industrial development is to direct investments to new regions and grant incentives and tax concessions for location in remote areas. The Ministry of Industry and Technological Development has introduced a ten-year strategy for upgrading, renovation, and modernization of the Egyptian industry. Almost all of the projects target export-oriented industries.

The Government gives considerable support to young investors and entrepreneurs through several programmes financed primarily by the Social Fund for Development. This fund was established in 1991, and is supported by the EU and the United Nations system. It has two aims: provision of basic infrastructure in poor regions and the creation of employment. There are currently 170 thousand entrepreneurs working on micro and small projects backed by financing of 685 million LE in revolving funds managed by the govenorates of Egypt.

IV. Policies Directed to Environmental Industrial Management

The Government has initiated several important policies in order to develop and implement environmental management programmes and projects. Examples include the environmental assessment and management (SEAM) project funded by Britain's Department for International Development (DFID) and the Egyptian Pollution Abatement Project (EPAP) project funded by the World Bank, FINNIDA, European Investment Bank (EIB) and the Egyptian Environmental Affairs Agency (EEAA). The Government has also set up three programmes to promote investments in pollution abatement and to implement cleaner technology initiatives in the industrial sector. The two most important ones are the Environmental Protection Fund (EPF) and the Egypt Environmental Initiatives Fund (EEIF).

The Ministry of State for Environmental Affairs (MSEA), with its executive arm EEAA, is responsible for carrying out the environmental policy of the Egyptian government. Their main foci are reduction of all sources of pollution and protection of Egypt's natural resources. The EEAA has branch offices in several regions to monitor environmental problems, especially in the industrial sector.

The major components of MSEA's strategy for industrial environmental management consists of the following: submission of an Environmental Impact Assessment before final approval of a project; reallocation of polluting activities from residential areas; establishment of Industrial Zones; improvement of production technologies to minimize the use of raw materials, water and energy; implementation of cleaner technologies and cleaner production as pollution prevention procedures; adoption of production quality technologies by applying ISO 9000 series and environmental system 14000 series, whenever possible; and cooperation between industry and scientific research centers, universities, and international programmes and organizations in the areas of environment and sustainable development.

The period 1999-2000 witnessed the most important environmental initiative in Egypt since the ratification of the Law 4/1994 for the Protection of the Environment. The initiative is to eliminate polluted industrial wastewater discharge to the Nile. In addition, MSEA launched the environmentally-friendly new industrial cities programme in five cities. The goal of the programme is to introduce cleaner technologies and practices to all enterprises in these cities.

V. Policies and Programmes Aimed at Technology Change, particularly EST

While there are no activities specifically aiming at EST, the Ministry of Industry had taken several important initiatives regarding technological development: analyzing industrial sectors and the impacts of international agreements on them; establishing technological centers for the weaving, food, and leather industries; establishing an engineering company for the purpose of designing products and production lines;□preparing a presidential decree that sets up an authority for industrial technology development;□□establishing an industry development board; signing a cooperative agreement with the center for agriculture research

to development the food industries; and improving the operations of two technology upgrading initiatives, the European Partnership and the Industry Development Programme.

The Industrial Modernization Programme (IMP), an initiative funded jointly by the Government of Egypt and the European Union, is helping to prepare the industrial sector for the challenge that will follow the introduction of free trade conditions and exposure to global markets. IMP targets the technological upgrading and modernization of SMEs, and improving their access to new markets.

VI. Experience with Integrated Policies and Programmes

In 1999, with support of the United States Agency for International Development (USAID), MSEA initiated an environmental policy programme to formulate and implement policy measures for ensuring effective and sustainable environmental protection and natural resources management. The focus is on institutional development, integration of an environmental dimension into national policy planning and development, and removing the economic and financial constraints for investments in pollution prevention and control.

As environmental issues cut across the activities of all ministries and institutions, public and private, the MSEA has signed six cooperation protocols with other partners such as the ministries of Interior, Education, Manpower and Immigration, as well as the Social Fund for Development, the Federation of Egyptian Industries, and the 10th of Ramadan City (one of the locations in the new industrial cities programme mentioned above).

VII. Major Constraints and Obstacles in Enhancing the Contribution of Industry to Sustainable Development.

The major constraints, many of them common to countries in the Arab region, fall into four categories:

- Human resource development is inadequate: the number of students is growing rapidly, but the current capacity of the educational system is too small to ensure good technological training.
- Limited technical knowledge, the high cost of conducting research and of imported pollution prevention technologies, the lack of trained technical staff, and a lack of interest in cleaner production technologies in manufacturing enterprises.
- Legislative and regulatory obstacles: there is, for example no law regarding intellectual property rights, which is a disincentive to technology development, coordination between authorities with common objectives is lacking, and the taxation regime discourages exports, which again means that there is little incentive to adopt modern limiting the environmental impact of manufacturing.
- Economic constraints such as hard currency limitations, fluctuations in raw materials market prices, inadequate exchange rate policies, lack of globally competitive companies, and a reluctance to apply existing environmental regulations because this may lead to closures and therefore to job losses.

VIII. Priorities and Future Actions

Egypt has made some progress in its pursuit of sustainable development in the industrial sector. However, there is a pressing need for more technological upgrading and more investments in applied research and development. There are two areas for action:

- In general, Egypt needs to expand its funding for applied research and development to industry, especially for ESTs. This can be done by increasing the share of funding for R & D and technology transfer from the present low 0.6 per cent of GDP to 2.5 per cent of GDP.

The Government and industry should study the East Asian model (in particular South Korea) for technology transfer, and adopt relevant aspects of this model, with some modifications to suit local conditions and explicitly taking into account environmental considerations. Korea, which was an LDC in the 1950s and is now one of the strongest Asian economies, has followed a consistent policy of gradual absorption of and improving on foreign technology through a step-by-step approach that could adapted to Egypt's needs.

Table (1): Economic and Financial Indicators – Annual Series

Real Economy	**94/95**	**95/96**	**96/97**	**97/98**	**98/99**	**99/2000**	**2000/2001 Projections**
Nominal GDP, Market Price (LE Billions)	204	229	256	280	302	337	365
Real GDP, Market Price (LE Billions) *	156	164	173	271	287	302	316
Real GDP Growth Rate	4.7	5.0	5.3	5.7	6.1	5.1	4.9
Real GDP Growth Rate (Per Capita)	2.5	2.9	3.4	3.7	3.7	--	--
Share of Private Sector in GDP	64.3	65.5	68.8	70.7	74.9	73.1	--
Unemployment Rate	9.6	9.2	8.8	8.5	8.2	7.9	7.6
Average Annual Inflation	9.4	7.3	6.2	3.8	3.8	2.8	2.4
End of Period yr./yr. Inflation Rate	9.9	8.3	4.8	4.1	2.9	2.5	2.2
Savings – Investments							
Gross Domestic Savings (LE Billions)	30.6	29.1	37.0	44.0	47.0	--	--
Gross Domestic Investments (LE Billions)	33.1	36.8	45.2	54.6	60.0	--	--
Gross Domestic Savings	15.0	12.7	14.5	15.7	15.6	--	--
Gross Domestic Investments	16.2	16.1	17.7	19.5	19.9	--	--

Figures Revised.

1 / Excludes Petroleum and Tourism sectors.

* Starting 1997/98 GDP uses 1996/97 as base period. Previous years are based on 1991/92 as the base period.

Table 2: Manufacturing Indicators (All values in Billion LE)

Item	1996-1997	1999-2000	2000-2001
GDP	234.5	282.2	296
Industrial Production	103	163	168
MVA	43.4	56.18	61.65
Share of MVA/GNP	10.7%	11.9%	12%
MVA per capita LE	723	864	934
Private Sector share as a percentage of MVA	73.7%	86.7%	87.9%
Public Sector share as a percentage of MVA	26.3%	13.3%	12.1%
Share of industry in GDP	18.5%	19.6%	21.1%

9. ETHIOPIA

Development of the Manufacturing sector in Ethiopia

Based on the report prepared by Mr. Emmanuel Malifu

Executive Summary

I. Broad Trends in Sustainable Development in Ethiopia

Ethiopia is an agricultural economy, clinching a place as one of the least-developed countries in the world. Per capita income in Ethiopia is, therefore, among the lowest of the least-developed countries and the country's immense reliance on agriculture among the highest in the group.

Agriculture accounts for 45 per cent of the GDP, over 75 per cent of total exports and over 85 per cent of employment. Coffee alone accounts for over 87 per cent of the total agricultural exports. Agriculture is supplemented by manufacturing, mining, trade, tourism, construction and social services, which had their beginning at the turn of the last century. The turn of the century saw the 'belated' birth of wage employment in Ethiopia. This change has since been growing steadily, now accounting for some 45 – 50 per cent of the GDP, 15 per cent of the workforce and 20 per cent of the country's export.

The high incidence of poverty has resulted in one of the lowest saving ratios in the world, only 13 per cent. This situation has fostered a number of inter-related social, economic and political problems, such as low investment and equally depressed industrial development, high unemployment (and underemployment), natural resource degradation (such as deforestation, soil erosion, and in general, desertification), urban congestion and pollution (both municipal and industrial).

II. The Manufacturing Industry and Sustainable Development

In the same way as Ethiopian agriculture, which is substantially dominated by small holders, industry is also by and large constituted of cottage and artisanal producers.

The manufacturing sector is to a large extent dominated by light manufacturing and agro-industries, most notably food processing, textiles and leather processing although cement, metal work and chemical production are also important. Partly, due to infrastructure and logistical constraints, there is a large concentration of manufacturing activity in Addis Ababa and along the 100 km stretch extending to Nazareth. In recent years, however, other important manufacturing locations like Bahir Dar and Kombolcha in Amhara Region, Mekele in Tigray Region and Awassa in SPNNR have started to emerge as industrial centres (Table 1).

The number of manufacturing establishments with ten and more employees in 1975/76 was 430. According to the 1997 CSA survey this number surged to 892,700 cottage/handicrafts and 2,730 small-scale industries (partly due to a significant change in definition, where unlike the first, the second survey included cottage and artisanal (handicraft) industries). Even considering the change in definition, there has been a significant increase, primarily towards the more liberal economic policies than those that prevailed under the previous regime.

The total value of production of the manufacturing sector in 1995/96 was Birr 8.6 billion. The bulk of this value came from a small number of medium and large-scale manufacturing establishments employing ten or more workers, accounting for Birr 5.8 billion or 67 per cent of the gross value of production. Cottage manufacturing activities, on their part, constituting some 76 per cent of the number of establishments, contributed only 24 per cent of the total gross value of production. The balance is accounted for by enterprises in the informal sector and small scale manufacturing activities, 7 and 2 per cent, respectively. Manufacturing value added (MVA) at the market price in 1995/96 was Birr 3.55 billion. According to some studies, the contribution of manufacturing to GDP fell by 100 per cent from 6 per cent in 1980 to 3 per cent in 1995.

Four consumer goods producing industrial groups, viz., food, beverages, textiles and leather and shoes dominate the large and medium scale-manufacturing sub-sector in Ethiopia. The size of employment in the industrial sector as a whole was of the order of 1.8 million, accounting for 7.3 per cent of the total economically active population in 1998 (Table 2)

This work force found employment in some 1.2 million establishments offering on the average a labour-establishment ratio of about 1.5 to 1. The average large and medium sized establishments employed about 142 workers, the small ones had 3.3 workers, cottage/handicrafts employed 1.5 workers and the informal sector employed 1.3 workers. In private sector manufacturing, employment grew by about 40 per cent per annum in the period 1991/92 to 1996/97. Labour productivity, as measured by value-added per person, grew at an average rate of 35 per cent per annum during the period 1991/92 to 1996/97. It appears that productivity grew faster in the public than private manufacturing establishments during this period.

Raw materials consumed by the manufacturing sector grew over time in the wake of the expansion of manufacturing establishments in the country. The total value of raw materials consumed in 1975/76 was Birr 486.1 million, which rose nearly to 2.3 billion by 1994/95. Major sources of energy for the sector are electricity and oil, although there are a number of enterprises burning wood and charcoal, at least, for some aspect of their manufacturing process.

Environmental pollution problems resulting from manufacturing activities are intense in areas of industrial concentration. These are tanneries' discharges in the Amhara and Oromia regions, textiles' effluent in Tigray and Southern Ethiopia and a combination of industrial discharges in the case of Addis. Although there is some level of localized air and land pollution, the major pollution problem is caused by industrial wastewater discharged from manufacturing establishments.

Considering the fact that the number of women residing in most cities and towns is slightly higher (for example, in Addis last year women numbered 1,330 thousand while it was 1,240 thousand for men), their achievement in the sphere of industrial employment leaves much to be desired. The only sub-sector demanding and employing more women (52.6 per cent and 53.8 per cent, respectively) was wholesale and retail trade. Employment of women in the manufacturing sector was scarcely a fifth of that of men (22 per cent).

III. Policies Directed at the Development of Industry

Three broad categories of such policies can be identified, those that are basically directed at the: (i) development of industry, (ii) industrial environmental management, and (iii) technology transfer.

The economic policy introduced in November 1991 by the Transitional Government of Ethiopia called for liberalization of prices and markets, removal of subsidies, reduction of tariffs and attaining current account stability. When it comes to industrialization, the policy focuses on coordination and synergy between agriculture and industry in order to achieve effective development for the majority of the Ethiopian population. This focus, called Agricultural Development Led Industrialization (ADLI), underscores the importance of simultaneous improvements in the backward and forward linkages between agriculture and industry.

The Ethiopian Privatization Strategy is one of the core elements of the economic liberalization process. The Ethiopian Privatization Agency, established in 1994, aims to generate more governmental revenue for financing development, limiting government participation in the economy to only key issues and expanding the private sector.

The Export Promotion Strategy, formulated in 1996, is the basis for the Ethiopian Export Promotion Agency whose sole objective is promotion of the country's export. The development of industrial development zones is identified as one of the long-term development strategies to be promoted by the Agency.

The National Science and Technology Policy, adopted in December 1993, aims to build the country's science and technology capability, coordinate related activities and enhance their contribution to national economic development. The industrial section of the policy proposes development of essential inputs for the benefit of agriculture, of implements and equipment for agriculture and for the modernization of traditional handicrafts. It also calls for the development of technologies that prevent pollution from industrial activities.

IV. Policies Directed at Industrial Environmental Management

The environmental policy of Ethiopia, adopted in April 1997, has five major sections; the first is devoted to the resource base and justifies the need for the policy; the second deals with policy goals, objectives and guiding principles; the third is directed to sectoral environmental policies, the fourth deals with cross-sectoral environmental policies and the fifth addresses policy implementation. These sections, between them, provide the policy elements that define industrial sustainability for the country.

This policy stemmed from the Conservation Strategy of Ethiopia (CSE), which was initiated in 1989. It addresses eleven sectoral and another eleven cross-sectoral issues. The principles, guidelines and strategies set out in the CSE documents provide the country with an adequate umbrella strategic framework for effective management of the environment.

The Ethiopian Water Resources Management Policy addresses both water quality management and water supply. In addition to pollution control and water quality standards, the policy stipulates the creation of appropriate mechanisms to protect water resources from

pollution. The policy also envisages the issuance of water pollution prevention and control strategies.

The Health Policy, enunciated in September 1993, places a premium on environmental health. "Development of safe disposal of industrial waste, as well as the prevention of environmental pollution from hazardous chemical wastes" occupies an important place in the general strategy.

Finally, the National Science and Technology Policy, in its natural resources development and environmental protection sections, contains seven articles on promoting the conservation of resources and protecting the environment. These articles, among others, call for the development of a system that helps map out the country's eco-system and registers, collects, stores, protects and utilizes biological resource; provide for the support of studies on sustainable soil conservation and the facilitation of research and development on vegetation for the rehabilitation and development of degraded environments; and studies and research on air, water and soil pollution caused by industrial and agricultural chemicals.

V. Policies and Programmes Aimed at Technology Change, particularly EST

The policies falling under this category exist only as working drafts:

The National Biotechnology Policy recognizes the need for development of biotechnology in Ethiopia as one of the mechanisms for adverting food deficits. It underscores the fact that developing the capability is by facilitating the transfer of biotechnology. Hopefully, the policy will be ratified in the near future, paving the ways and means for the transfer of biotechnologies. Its completion, however, requires the elaboration of a biosafety policy.

For various reasons, the transfer of technologies which Multilateral Environmental Agreements make available, has not adequately been exploited so far in spite of the fact that the technologies used by the industrial sector are often obsolete.

The Ethiopian Cleaner Production Centre, administered by UNIDO and UNEP, funded by the Government of Italy and housed in the Ethiopian Science and Technology Commission, aims to disseminate the concepts and practices of cleaner production by holding training seminars and conducting environmental audits in factories around the country. The Cleaner Production Centre, working in close collaboration with the Indian National Cleaner Production Centre, has conducted cleaner production seminars for industry and regulatory agencies. The Centre also facilitated in-the-plant assessments for ten companies in an array of subsectors, i.e. textile, leather, chemicals, beverages, pulp and paper. The Centre, moreover, has created synergies between relevant entities, such as the Ethiopian Private Industries Association, the Ethiopian Chemical Engineers Association and regional industry bureaux.

The Tannery Pollution and Cleaner Technologies Project, administered by UNIDO and funded by the Government of Switzerland, is a multi-faceted effort, involving the supply of equipment and technology aimed at expaing production and improving product design. The project will promote environmental awareness and enhance the technical capacity in tanneries to mitigate environmental deterioration caused by indiscriminate discharge of (toxic) tannery wastes.

VI. Experience with Integrated Policies and Programmes

As noted earlier, one cardinal policy element advanced by the Environmental Policy of Ethiopia that integrates development with environment is environmental impact assessment (EIA). Although there is no full-fledged law as yet which is devoted to and makes EIAs mandatory, an article in the Investment Proclamation (Article 14/1 of Proclamation 37 of 1996) requires the Ethiopian Investment Authority to forward applicants wishing to invest to present themselves to the Environmental Protection Authority (EPA) with environmental impact statements (EIS) for approval before receiving approval for investment. This experience, besides providing the opportunity to eliminate or mitigate adverse environmental impacts of would-be establishments in an early planning stage, has enabled the EPA to build capacity for formulating legislation and enforcing regulations.

Another important experience of similar significance was a two-year project (1990-1991) on cleaner production, the national cleaner industrial production project of Ethiopia. The project was conducted by the Chemical Society of Ethiopia in collaboration with the Ethiopian Private Industries Association and financed by the Heinrich Böll Foundation. The project enabled the 38 participating firms, in addition to gaining an appreciation of the environmental and economic potential of cleaner production, to conduct comprehensive environmental audits to determine sources of pollution and wastage and draw up implementation plans. This was an eye-opener, particularly so as the experience was fruitful in demonstrating to all involved that pollution and waste are losses of valuable resources, environmental gains are easy to come by along with such returns as better public image and improved relations with regulatory authorities.

VII. Major Obstacles in Enhancing the Contribution of Industry to Sustainable Development

Numerous constraints and obstacles limit the contribution of industry to sustainable development in this country such as:

- lack of finance (firms find it difficult to invest in cleaner production or in end-of-pipe facilities as well as provide workers with safety equipment, education and motivation, etc.);
- low demand (firms stop using end-of-pipe facilities to cut cost and remain competitive, as has been done by textile firms);
- contraband (as unfair competition, it is hampering the performance of such large employers as textiles with wide reaching negative ramifications, inducing retrenchment and other cost cutting contingencies);
- lack of adequate legislation (laws and regulations prohibiting pollution, instituting EIAs, environmental and occupational standards);
- poor regulatory enforcement (for example, no employer had ever been fined or imprisoned for infractions leading to the death or injury of workers clearly caused by the fault of the employer. In fact no occupational accident has ever been investigated duly leading to court action);
- absence of advocacy and pressure groups (in the case of employees, weak or even servile unions);
- outdated technology (a large number of firms produce with vintage machinery that waste resources as well as the fact that EST-technology transfer is hamstrung by patent laws;
- poor training (the absence of environmental courses for technicians and technocrats in the curricula of technical institutes and other places of higher education);

- low awareness on the part of major actors like public officials, employers and workers (for example, industries do not opt for environmental management systems and workers misuse or abuse safety equipment, including selling them);
- lack of facilities (for example, absence of sanitary land fills and incinerators to dispose of hazardous waste in an environmentally sound manner, lack of environmental laboratories or their accredited substitutes).

VIII. Priorities and Future Actions

The industrialization and environmental policies shows that sustainable development in Ethiopia is seen as an integrated approach rather than as an environmental agenda. What is lacking, unfortunately, is the wherewithal, mainly due to low GDP, to implement this integrated strategy. Had it not been for the recent Ethio-Eritrean boarder conflict and the repeated drought stalking the country, hampering both industrial and agricultural advances of the country, amongst others, achievements in the area of sustainable development could have been reached in the past decade.

Environmental challenges in the area of sustainable development of the manufacturing sector are amongst others:

- creating sufficient awareness about the pollution impact caused and the subsequent economic loss involved both to the industries and the national economy;
- developing the required institutional and technical capacity at various levels for the reduction of the total amount of waste generated and the related pollution impact on the environment;
- promoting a comprehensive industrial wastewater management programme based on an integrated pollution prevention and control approach emphasizing more pollution prevention;
- instituting an incentive mechanism for encouraging manufacturing industries to be engaged in a continuous improvement process that may lead to both economic and environmental dividends.

Table 1: Regional Distribution of Manufacturing Value-Added, 1995/96

Region	10+ group	Small-scale	Cottage/handicrafts	Total
Addis Ababa	796,801 (50%)	29,768.8 (49%)	192,065 (30%)	1,018,634.8 (45%)
Amhara	65,266 (4%)	8,528.7 (14%)	99,747 (16%)	173,542.7 (8%)
Dire Dawa	27,918 (2%)	1,063.7 (2%)	2,379 (0.4%)	31,361.7 (0%)
Harari	17,359 (1%)	747.7 (2%)	3,843 (0.6%)	21,949.7 (1%)
Oromia	637,084 (40%)	4,649.5 (21%)	215,441 (34%)	865,212.5 (38%)
SPNNR	29,067 (2%)	4,649.1 (8%)	78,530 (12%)	112,246.1 (5%)
Others	20,343 (1%)	3,159.6 (5%)	46,833 (7%)	70,335.6 (3%)
Total	1,593,839	60,605.1	638,838	2,293,282.1

Source: Degefe & Nega, 1999/2000, Annual Report on the Ethiopian Economy, Vol. I. 1999/2000.

Table 2: Share of Value-Added from the Total for the 10+

Sectors	1975/76	1980/81	1985/86	1990/91	1995/96
Food	21.8	25.7	1.6	32.4	29.0
Beverage	9.9	8.8	11.4	13.3	12.1
Tobacco	6.3	4.8	3.5	10.9	4.8
Textiles	31.3	22.3	13.7	13.3	9.8
Leather	2.5	2.1	1.4	4.7	6.7
Printing	2.8	2.9	3.7	5.6	4.9
Paper	0.5	0.6	2.5	1.6	1.7
Non-Metallic	1.7	0.9	2.1	2.9	8.8

Source: Degefe & Nega, 1999/2000, Annual Report on the Ethiopian Economy, Vol. I. 1999/2000.

10. INDONESIA

Industry and Sustainable Development in Indonesia – Achievements and Prospects

Based on the report prepared by Mr. Syed Asif Hasnain, UNIDO Representative, Indonesia and Mr. El Khobar Muhaeim Nazech, UNIDO National Consultant

Executive summary

I. Broad Trends in Sustainable Development in Indonesia

With a population of about 212 million, Indonesia is the world's fourth most populous nation. It is also the world's largest archipelago state, with over 13,000 islands. Indonesia has a wide range of natural resources - oil, natural gas, coal, gold, timber, silver, copper, tin, spices and several other minerals. In addition to being largely self sufficient in rice, the national staple crop, Indonesia has a large plantation economy (main outputs: crude palm oil and rubber), and is a major supplier of spices, coffee and cocoa. With extensive and variegated coastal zones and the largest tracts of primary tropical forest after Brazil, Indonesia is one of the major repositories of tropical biodiversity.

Population and economic assets are very unequally distributed. Two islands — Java and Sumatra - are home to nearly 80 per cent of the population. Java is home to over 120 million people in an area equivalent to New York State. Three islands - Sumatra, Kalimantan and Irian Jaya - account for over half of the natural resources and plantations. Java is the location of 80 per cent of the manufacturing sector, and its Greater Jakarta region generates an estimated 40 per cent of GDP. Presently, about 29 per cent of the population is urban. This may rise to over 50 per cent by 2050, when the total population may exceed 250 million. Greater Jakarta would then be one of the world's mega-cities.

The economic and political upheavals triggered by the Asian crisis of 1997 and 1998 *inter alia* saw the country embark on a course towards democratisation. The transition has been somewhat turbulent, as a new balance between different political stakeholders as well as a greater accountability of government is sought. Indonesia also faces threats of secession by some resource-rich provinces and communal conflict elsewhere. In 2001, the government responded with a wide-ranging decentralization programme, devolving effective authority on fiscal expenditures and developmental priorities to districts and provinces. Most local administrations, however, are ill equipped for these responsibilities.

While inter-sector comparisons are difficult, the industrial sector is probably not the greatest cause of environmental stress. Urban and rural waste are the main source of sanitation problems, land degradation and contamination of inland and coastal waters. In major cities, urban air pollution caused by transport is well beyond WHO standards. Chemicals-intensive agriculture causes loss of biodiversity and deterioration of soils, rivers and subterranean water. Fossil fuels are projected to constitute 40 per cent of the energy mix by 2021, and energy demand is likely to grow at 5.5 per cent p.a. This will greatly increase emissions of particulate matter and greenhouse gases. The adverse impact of informal sector and illegal mining (such as mercury runoff) has also become a major concern.

Currency devaluation has, in addition, shifted the country's competitive advantage to primary resources and resource based industries, which can have severe environmental consequences.

For example, a recent World Bank study estimates that timber, pulp and oil palm companies cleared a total of 17 million hectares of primary forest over 1986-1998, and the deforestation rate has increased to 2 million hectares p.a. in the last two years. In Sumatra, for example, current deforestation rates may virtually finish off all lowland primary forest resources by 2005.

II. The Manufacturing Industry and Sustainable Development

During 1985-1996, the Indonesian economy grew by 7-8 per cent annually, GDP exceeding US$200 billion in 1996. Successful policies moved the country away from dependence on raw materials and towards manufacturing, and poverty was reduced dramatically. But Indonesia suffered heavily during the Asian crisis. In 1998, GDP contracted by 14 per cent, inflation reached 68 per cent, and an estimated 2.5 million jobs were lost. Absolute poverty, estimated at 16 per cent of the population in 1996, increased to 25 per cent; an additional 25 per cent may now face the threat of poverty. Nominal GNP was estimated at about US$145 billion in 2001. Even if the economy would grow by 4-5 per cent p.a., it would take Indonesia until 2004 to attain the per capita income levels of 1996. Stalled economic growth will have severe social consequences, as about 2.5 million people enter the workforce every year. Development trends are summarized in Table 1.

The share of manufacturing in GDP reached 26 per cent by the year 2000, up from about 16 per cent in 1985. MVA grew by an average of 9 per cent per annum and manufactured exports by 15 per cent. Total exports reached about 33 per cent of GDP and manufactured exports reached more than 50 per cent of total exports. The share of large companies was about 85 per cent of MVA, while medium scale, small and household enterprises accounted for about 5-6 per cent each. About 13 per cent of the 95 million work force were employed in manufacturing, modern manufacturing accounting for 36 per cent of the manufacturing work force.

Table 2 shows that there has been significant structural change in manufacturing since 1985. The main export-oriented industries, textiles and garments and pulp and paper, markedly increased their output shares - and have a major environmental impact. The trends suggest that Indonesia was developing a competitive, diversified industrial sector and was on the way to becoming a mid-income economy. But the economy had several weaknesses, and Indonesia's competitiveness relative to other emerging Asian economies began to decline several years before the 1997 crisis[2]. The growth of manufactured export earnings slowed down from 30 per cent p.a. to 7 per cent p.a., while those of the four major products (plywood, textile, garments and footwear) stagnated. In spite of drastic devaluation after the 1997 crisis and lower labour costs (in US$ terms), Indonesia's competitiveness has not been restored, and recovery will be hard due to the US recession, Japan's stagnation and the emergence of major competitors in the markets for goods and investments.

Indonesia's current external debt is US$ 140 billion, of which roughly US$70 billion is public debt. In addition, the government has incurred domestic debt of about Rp. 650 trillion (about US$ 65 billion at current exchange rates). Public debt, some 90 per cent of annual GDP, is one of the heaviest in the world, and is due largely to attempts to rescue a faltering domestic banking sector. The IMF estimates that debt servicing will absorb one-third of government

[2] These conclusions are based on the findings of the UNIDO project NC/INS/99/004 "Policy Support for Industrial Recovery".

expenditure in 2000, and one quarter in 2001 and 2002. Over the next three or four years public development expenditure will therefore be marginal.

III. Policies Directed at the Development of Industry

A member of ASEAN and APEC, and therefore party to AFTA and APEC trade liberalization accords, Indonesia has pursued a policy of export orientation and liberalization of the investment regime since the 1980s. The 1980s and early 1990s were characterized by investment-driven growth, spurred by large, usually politically well-connected business houses investing on their own or in partnership with foreign actors. The crawling peg of the Rupiah, its free convertibility, open capital markets, and a favourable interest rate differential between US$ borrowing and Rupiah lending and returns on investments, enabled Indonesian and foreign banks to rapidly expand credit to Indonesian companies, creating productive assets at a rarely witnessed rate. The government managed its budgets prudently, balancing domestic deficits with a carefully serviced public sector foreign borrowing of about US$ 5 billion per year.

In addition to sound macroeconomic management, a sustained policy of industrialization was pursued to reduce the country's dependence on agriculture, oil and gas and primary commodity exports. From the early 1980s on, industrial expansion was led by a remarkably successful export drive by private domestic firms and, to an extent, foreign investors. The transformation of the economy was assisted by the strengthening of the Japanese yen and rising manufacturing costs in Japan, Korea and Taiwan: firms from these countries sought lower cost manufacturing platforms in the open economies of Indonesia, Malaysia and Thailand, especially in such labour-intensive export-oriented sectors as textiles, garments, footwear and consumer electronics assembly.

The inflow of direct foreign investment, which reached a peak of US$ 6 billion in 1996, was replaced by a net DFI outflow in 1998. In 2000, these reached US$4.056 billion. In addition to DFI, portfolio investment, which reached a record high of US$5 billion in 1996, was replaced by massive outflows. DFI, in spite of its rapid growth, accounted for only about 6 per cent of gross fixed capital formation during 1987-97. Most investment came out of domestic savings (averaging about 29 per cent of GDP), and this investment has stalled due to political uncertainty, a largely non-performing domestic banking sector and corporate debt. As a result of these adverse trends, Indonesia now faces the threat of industrial stagnation or even substantial de-industrialization.

VI. Policies Directed at Industrial Environmental Management

The environmental impact of the industrial sector has long been the focus of policy measures and action by the government and international agencies. There is considerable production capacity in such environmentally sensitive sectors as textiles, pulp and paper, plywood, cement, ferrous and non-ferrous metals, organic and inorganic chemicals industry. Much of that capacity is to be found in the densely populated island of Java. There is therefore a great need for active environmental management.

Over the past ten years, the Government has adopted legislation for this purpose. Effluent and emission standards have been adopted and propagated by the Environmental Impact Management Agency (BAPEDAL). Environmental impact assessments are mandatory in licensing procedures for large industrial or infrastructure projects. The Government has set up 60 laboratories in the provinces to provide analytical services and to monitor environmental

impacts and compliance with emission standards. The private sector and some universities also provide environmental impact assessments. But there are implementation and enforcement constraints, especially at the provincial and district levels, where capacities are limited. The national Agenda 21, drawn up by the Ministry of Environment in cooperation with UNDP in 1996, clearly articulates environmental priorities but has suffered from a lack of publicity.

V. Policies and Programmes Aimed at Technology Change, particularly EST

Indonesia has, over the last decade, followed *laissez-faire* policies. There are no specific technology transfer policies. However, as mentioned above, environmental impact assessments are used to assess the suitability of technologies, especially in environmentally sensitive investments. Additionally, capital goods and equipment specifically geared to environmental protection can be imported duty free.

Apart from the legislative and control measures already mentioned, the Government has actively supported voluntary measures for the adoption of cleaner production, environmental management and the transfer of environmentally sound management practises. BAPEDAL has undertaken several programmes targeting manufacturing in support of voluntary adoption of environmental management standards and certification (notably ISO/EMS 14000), eco-labelling, demonstration of cleaner production and energy conservation. Other ministries (particularly the Ministries of Industry and Trade and of Mines and Energy) have also undertaken numerous projects and programmes to support the transfer of environmentally sound technologies and demonstrate their effectiveness to the private sector. These programmes have drawn considerable support from donor agencies and have involved stakeholders from the public and private sectors.

In 1995, Indonesia committed itself to minimizing production waste by implementing cleaner production principles. Pilot projects took place in the paint, textile, food, plastic, and pulp & paper industries under the Cleaner Production Programme coordinated by BAPEDAL, with relatively good results. Waste, water consumption and often energy and raw material use were reduced, additional investments being paid back in one to five years. BAPEDAL also published technical guidelines on cleaner production for specific industries such as textile, electroplating, tapioca, leather tanning, pulp & paper, palm oil and gold mining. It also established a standard operating procedure for cleaner production audits and encourages their use by the private sector.

Cleaner production training programmes, seminars and workshops for industry, the public sector and NGOs complement these efforts. BAPEDAL also publishes general information and awareness-raising materials, and intends to develop a cleaner production information system, an incentive programme and an award programme for cleaner production implementation. Other activities related to cleaner production include: the US Asian Environmental Programme's Eco-Productivity and Waste Exchange Initiative; The National Pollution Prevention Roundtable (with a regional Round Table in West Java); BAPEDAL's Toxic and Hazardous Waste Management Programme; the Clean River Programme (PROKASIH), for local governments (coordinated by BAPEDAL); and BAPEDAL's Blue Sky Programme, for the most heavily populated provinces.

VI. Experiences with Integrated Policies and Programmes

The National State Policy Guidelines, approved by parliament, constitute the overall strategic directions of Government. The guidelines for 1999-2004 have a specific section on Natural Resources and the Environment, calling for the "...conservation, rehabilitation and economising on the use [of natural resources and the environment] through the application of environmentally friendly technology". At the policy level at least, environment and sustainable development are integrated into Indonesian development thinking. This is partly due to the public consciousness of the abundance and wealth of natural resources and the need to conserve them for future generations.

VII. Major Obstacles in Enhancing the Contribution of Industry to Sustainable Development

Several interviews, consultations and seminars were organized in Jakarta and at the provincial level for this report. Three clear messages emerged:

- There is relatively widespread understanding of the concept of cleaner production, but much less awareness of the national Agenda 21, and virtually no knowledge of the links between cleaner production, sustainable industrial development and Agenda 21.
- The implementation of cleaner production and environmental management by companies was largely due to customer pressures, especially in the case of export-oriented companies.
- As a consequence, awareness must be systematically increased among both the both public and private sectors on the need for pursuing common sustainable development goals (Agenda 21) and the practical means for realizing those goals (cleaner production, hazardous waste management, energy conservation and pollution prevention). This requires systematic and long-term efforts in the fields of training, awareness building and information.

Training and awareness-raising are crucial for local and regional governments and authorities to fulfil their supervisory and enforcement responsibilities. Further, minimal nationwide environmental norms and standards must be established and enforced.

As regards the private sector, the impetus to improve environmental performance comes (as elsewhere) not only from the enforcement of norms and standards, but also from the prospect of increased profit through resource conservation and voluntary measures that will enhance the image of firms as good corporate citizens. Consumer pressure should play a greater role in this context. Companies facing pressure from foreign customers tend to adopt environmental management measures, but domestic customers tend to be less interested in environmental issues. Long-term awareness building and the creation of green consumer movements may be an effective means in this context.

VII. Priorities and Future Actions

While much has been achieved in Indonesia in establishing an environmental management regime, through legislation, enhancing national capacities, creating public awareness, advocacy and transferring technology and know-how for cleaner production or pollution prevention, the current political and economic conjuncture poses the threat of a reversal, and local capacities are inadequate.

Three priorities for future action can be identified:

- Sustained efforts to boost public awareness and advocate environmentally conscious value-systems at all levels: in the private sector, among local governments and in Indonesia's rapidly growing civil society organizations. This will create a good climate for environmentally sound industrial development.
- More efforts to promote cleaner production and the transfer of environmentally sound technologies.
- Environmentally sound performance must be recognized as a critical component of good corporate governance now that Indonesian industry is under pressure to reform business practice and compete successfully in the global economy.

Table 1 Sectoral Shares in GDP, 1985 and 2000

	1985	2000
1. Agriculture, Forestry and Fisheries	23	17
2. Mining and Quarrying	18	13
3. Manufacturing Industry	16	26
4. Electricity, Gas and Water Supply	-	1
5.Construction	5	7
6.Trade, Hotels and Restaurants	15	15
7. Transport and Communication	5	5
8. Financial Services	4	6
9.Other Services	14	9

Table 2 Structural Change in Manufacturing (% shares)

ISIC Sub-sector	1985	1999
31 Food	31	24
32 Textiles	11	19
33 Wood	9	8
34 Paper	4	6
35 Chemical	18	16
36 Non metallic minerals	5	3
37 Basic metals	8	3
38 Fabricated metals	14	2
39 Other manufacturing	0	1

11. NIGERIA

Industry and Sustainable Development in Nigeria – Achievements and Prospects

Based on the report prepared by Prof. A. M. A. Imevbore

Executive summary

I. Broad Trends in Sustainable Development in Nigeria

Nigeria is the most populous country in Africa, with about 127 million inhabitants, and it has abundant natural resources. Mineral deposits include petroleum, natural gas, uranium, tin, columbite, coal, precious metals and gemstones. Petroleum is the most important of these: over the last three decades, Nigeria has earned over US$300 billion from oil sales.

In spite of its natural wealth, Nigeria is Africa's biggest debtor nation. External debt stood at an estimated US $ 32 billion in 2000, up from US$ 28.5 billion in 1997. More than one third of Nigeria's export income has been used annually to service the debt. Over dependence on oil income – which accounts for 95 per cent of foreign exchange earnings, 20 per cent of GDP and 65 per cent of budget revenue - is the economy's major weakness. Largely as a consequence of changes in oil prices, the country's economic performance has been erratic: average GDP growth was 2.7 percent between 1989 and 1999, but in 1994 the economy contracted by 0.6 per cent while in 1996 it grew by 6.4 per cent. Under the present Government, the economy has become more stable and the economy may grow by 4 per cent in 2001-2002.

Over the years, a combination of decreasing oil earnings and inadequate management of the economy has resulted in low and declining capacity utilization in the goods producing sectors, a neglected transport and power infrastructure, large budget deficits and a high rate of inflation. The country's industrial base remains narrow while its agriculture – by far the largest contributor to GDP - still relies on traditional methods of production.

Per capita GDP (at purchasing power parity) was US$ 950 in 1999; GDP growth has in recent years not kept pace with population growth. Almost half of the population now lives below the poverty line, and in the mid-1990s the unemployment rate was 25-30 per cent. Despite its low per capita income, Nigeria is not included in the list of 41 countries potentially eligible for the Heavily Indebted Poor Countries (HIPC) initiative developed jointly by IMF and the World Bank.

Nigeria's rapid population growth and high urbanization rates have not been matched by the development of environmental protection capacities. As a consequence, sewage, air pollution and solid waste have become a major environmental and health problem, especially in urban areas. In the Niger delta, the oil industry has caused serious air, soil and water pollution through oil spills and flaring of residual gas. The Ministry for Environment intends to revoke the licenses of oil companies that have not phased out flaring by 2004.

II. The Manufacturing Industry and Sustainable Development

According to UNIDO statistics, the share of manufacturing in GDP has remained virtually stable, at just over 5 per cent, from the 1980s from to the late 1990s. Between 1998 and 2000,

industrial capacity utilization averaged about 30 per cent. Per capita MVA, already well below the African average, decreased during the 1990s, as manufacturing employment grew much faster than productivity.

The most important industry in the mid-1990s was food and beverages, accounting for about 22 per cent of MVA, followed by transport equipment, metal products and textiles, in that order (products from the oil industry are not taken into consideration). The metals and transport industries are to a large extent creation of failed import substitution policies in the past, and their capacity utilization rates are among the lowest. Structural change has been very limited, the most rapid growth over 1985-1999 occurring in the clothing industry, while the industrial chemicals and electrical machinery industries contracted quite strongly; none of these, however, was or is a major contributor to MVA.

While the major industries are in themselves not the most polluting ones, and while the sector is relatively small, manufacturing has a clear negative impact on the environment. Most firms have no effluent treatment plants or waste collecting systems. Solid waste is simply dumped, and wastewater and noxious gases are discharged directly into the environment, resulting in air and water pollution and soil contamination. The Nigerian Government has singled out gaseous emissions, especially from fossil fuels, as a particularly problematic issue – but compared to the oil industry, manufacturing is probably not very important in this respect.

III. Policies Directed to the Development of Industry

In its present state, much of the manufacturing sector is a product of the import substitution policies practiced until the 1990s. In 1986 a technology policy was formulated to complement the import-substitution oriented policies. It relied on transfers of foreign technology as well as endogenous technology development.

Both policies resulted in foreign direct investment (FDI) or joint ventures in large and medium-scale light consumer goods industries, and large-scale public-sector projects in steel, cement, pulp and paper, fertilizer, petrochemicals, sugar, machine tools, etc. SMEs owned by local entrepreneurs were mainly established in low-skill intensive industries; the new generation of SME's with relatively high technology intensities remained conspicuously absent from the industrial landscape. But the large enterprises were not successful in adopting new technologies either. Unrealistic public sector projects, bureaucracy and general economic mismanagement compounded shortcomings at the firm level, such as poor preparation of investment projects and poor management.

In 1998, Nigeria adopted a new development strategy, VISION 2010. Projecting an annual GDP growth of 7 per cent in the years up to 2000 (a figure that has already proved to be unrealistic), accelerating to 9 per cent in 2001-2005 and 10 per cent in 2006-2010, the strategy is to be led by manufacturing, special attention being given to small and medium-scale enterprise (SME). Manufacturing is to attain a GDP share of 25 per cent in 2010, but this cannot be considered a realistic figure, on the basis of the sector's performance so far, the fierce competition in domestic and export markets by especially Asian developing countries, and the lack of know-how and finance in the SME sector. Agro-processing of domestic crops is to be the lead sector. But this cannot be considered realistic either, given the lack of dynamism in that industry (its MVA share has been more or less stable since the 1980s), the largely subsistence-oriented agricultural sector and the obstacles to creating close links

between the two (transport and storage problems, product quality and specification issues, etc.).

The Budget for the year 2001 contained a number of support measures for manufacturing, such as a tax exemption on interest for loans for export manufacturing. The Central Bank also issued a directive to all commercial banks to set aside 10 per cent of their annual profits for financial support to SME.

IV. Policies Directed at Industrial Environmental Management

By the early 1990s, Nigeria had put in place a relatively comprehensive environmental management structure:

- In 1988, a National Environmental Policy to provide overall direction for sustainable development was adopted. A number of sectoral policies for, among others, industry, health and agriculture were also adopted;
- A coherent body of environmental laws to provide legislative framework for the implementation of the policy was established;
- A system of institutional training, research and monitoring laboratories had also been established;
- Steps were taken to address policy coordination, execution and monitoring, especially at the state and local government levels.

The Federal Environmental Protection Agency (FEPA) was charged with implementing laws and creating awareness of the need to install waste handling facilities in industries. The compliance level of industries with national industrial waste management requirements now stands at about 20 per cent, two years after the expiration of the moratorium for compliance. The figure indicates that there still is a wide gap between formal environmental management structures and the realization of sustainable environmental development goals. It appears that ways of achieving 80 per cent compliance have now been proposed. The capacities to achieve this level will however be heavily taxed by a series of additional measures are to be realized by 2010:

- Wider introduction of cleaner technologies, efficient energy use and promotion of environmental management systems;
- Installation of basic treatment facilities in all new industries and tackling of gaseous emissions;
- Promotion waste segregation, recycling and re-use;
- Systematic application of the polluter pays principle;
- Systematic adoption of eco-labeling;
- Creation of environmental databases on industries and their compliance status (a national survey on hazardous industrial chemicals has already been undertaken);
- Financial stimuli (soft loans, tax rebates) for cleaner production measures.
- Enforcement of siting laws for new industries;
- Building of secondary central treatment facilities on all major industrial estates by 2005 (effluent studies are being made), and commercialization of waste disposal and incineration;

V. Policies and Programmes Aimed at Technology Change, particularly EST

The Nigerian Government has established centres, institutes and councils to research, develop, and promote clean and environmentally sound technologies. In addition, some policy documents (such as the Nigerian National Policy on Environment, Nigeria's National Agenda 21, Vision 2010, National Policy on Science and Technology, etc.) emphasize the need for adoption and promotion of clean and environmentally sound technologies. Clean and environmentally sound technologies are promoted and applied in production by:

- Ensuring access to scientific and technological information;
- Promoting and financing, as appropriate, the acquisition of environmentally sound technologies and corresponding know-how;
- Supporting local capacity building for assessing, adopting, managing and applying environmentally sound technologies;
- Promoting long-term partnerships between owners of environmentally sound technologies and users.

With UNIDO assistance, recovery and recycling of CFCs in imported equipment was initiated. UNIDO also helped Nigeria to develop a national programme for the implementation of the Montreal Protocol. UNIDO also worked with five industrial establishments to reduce emissions by improved fuel efficiency, conversion from high carbon to low carbon fuels and improved productivity.

VI. Experience with Integrated Policies and Programmes

The Government has developed, with UNIDO, a compact between business and government for the Strategic Industrial Development (SID) of the nation. The compact is being implemented and covers governance issues, standards and metrology, alternatives to oil exports, rural industrial development and environment and energy. The latter issues are addressed via an integrated programme for "clean development" which will cover urban and industrial pollution, cleaner production, waste management, energy management, environment and energy information systems and climate change. The various points of the compact are reflected in the first draft of the Revised National Policy on Industry prepared by the Federal Ministry of Industry.

While a number of bilateral and multilateral organizations are involved in environment-related programmes, UNIDO is the major provider of assistance in the field of sustainable industrial development. Under the National Policy on the Environment, for example, UNIDO supported a study to investigate the effectiveness of both the National Policy on the Environment and the Industrial Policy of Nigeria with regard to the textile and leather industries. The report clearly showed that both policies would need to be revised and brought in line with the ecological sustainable industrial development (ESID) concept. Following this study, a number of factories have improved their waste treatment, introduced cleaner production through waste minimization and environmental management, including materials recovery and monitoring of pollution. Together with FAO, UNIDO carried out the studies on industrial effluents and hazardous industrial chemicals referred to under IV.

VII. Major Obstacles to Enhancing the Contribution of Industry to Sustainable Development

According to the Manufacturers Association of Nigeria (MAN), the principal private sector institution serving the industrial sector, the environmental problems of the sector are closely related to the development obstacles of the sector. These obstacles, which either prevent the sector from minimizing the environmental impact of their operations or cause entrepreneurs to ignore environmental issues as they deal with more pressing matters, include:

- High production costs, and consequent low competitiveness, as a consequence of inadequate infrastructure support services and policy-included cost distortions.
- Inadequate yet expensive local raw material supplies.
- Economic policies, which ignored environmental and health issues, as a consequence of short-term thinking or lack of coordination.
- Bureaucratic hurdles and unauthorized multiple levies and charges.

It should be remarked that the lack of environmental awareness and know-how at the enterprise level is a contributing factor – especially in the SME sector. Not only the senior management needs such knowledge: for a good environmental performance, every employee needs to be environmentally aware and have a basic understanding of environmental issues at his or her work place. This is another reason why it will be difficult to implement the many measures listed under IV: at this moment, the capacity and willingness of enterprises to respond to the measures is very limited.

VIII. Priorities and Future Actions

There is a basic understanding of the need for an integrated approach to sustainable development. Better environmental performance of Nigeria's manufacturing industry will partly depend on removing obstacles to industrial development that have resulted in a neglect of environmental issues. This includes improvements in water and power supply and transport infrastructure, and reductions of business tax rates, interest rates and customs tariffs to facilitate, for example, imports of cleaner production technologies. These improvements may be less a matter of new policies than of better management of the economy and stepping up efforts to implement existing development strategies and initiatives, such as the SID compact with the private sector.

From the point of view of social sustainability, the promotion of employment in competitive industries and the creation of viable SMEs need more attention. International assistance in formulating and implementing manufacturing-related projects under the Nigerian Poverty Reduction Strategy and the existing Poverty Alleviation Programme could play a role here.

Working with the private sector and NGOs, the Government should increase its efforts to heighten the awareness of sustainable development among stakeholders, building on the results of the seminars organized with UNIDO under the project Nigerian Competitive Future: Public - Private Partnership in Promoting Sustainable Industrial Development for Economic Growth and Poverty Alleviation. A widespread understanding of the basics of sustainable industrial development, also in the SME sector, is essential for a successful 'greening' of the manufacturing sector.

Finally, international support should be sought to deal with the following issues:

- Prioritizing the large number of environment-related activities, which are to be realized by 2010 (see IV), on the basis of their long-term impact on industrial competitiveness and the environment, the available implementation capacities and the availability of external support.

- Achieving a better integration of the various measures proposed, for example by incorporating the proposed economic incentives in the National Environmental Policy.

- Strengthening the capacities of the State Environmental Protection Agencies and, in particular, their industrial pollution control units, to ensure proper monitoring and enforcement as well as assistance to local manufacturing units.

- Increasing the use of market-oriented tools to deal with various kinds of pollution.

- Generally improving Nigeria's performance in the context of relevant international agreements to which it is party, such as the Climate Change Convention and the Persistent Organic Pollutants Convention.

12. PAKISTAN

Industry and Sustainable Development in Pakistan – Achievements and Prospects

Based on the UNIDO report for project NC/PAK/97/018 – Industrial Policy and the Environment in Pakistan

Executive summary

I. Broad Trends in Sustainable Development in Pakistan

In 2001, Pakistan had a population of 141 million. GDP growth has fluctuated between 4-6 per cent over the past decade, but growth remains heavily dependent on a largely traditional agricultural sector and foreign investment has been low for many years because of Pakistan's internal political problems and instability in the region. Debt service obligations total nearly 50 per cent of government expenditure. Per capita income was a low US$ 480. No recent figures on absolute poverty are available, but given the fact that the average GDP growth during the 1990s was about 4 per cent, it is unlikely that there has been much improvement in the 1991 share of the population living below the poverty line: 34 per cent.

Poverty and a rapid, largely uncontrolled urbanization have major impacts on the environment, through air, land and water pollution. High rural population densities on fertile land and unsustainable agricultural practices have resulted in deforestation, soil erosion, and contamination and overexploitation of water resources. In addition, industrial pollution is growing at a rapid pace. Environmental degradation is thought to reduce GDP by 3-4 per cent annually.

II. The Manufacturing Industry and Sustainable Development

Pakistan's manufacturing sector accounted for 17 per cent of GDP in 1999. Compared to many other Asian countries, the sector's growth has been fairly slow, having increased its share in GDP by only 30 per cent in as many years. The major industries are textiles, food products, chemicals and electrical machinery. Manufacturing is concentrated in and near the major cities, with the largest concentration at Karachi, which accounts for 60 per cent of the total number of industrial enterprises.

The slow growth of the sector notwithstanding, its output is a multiple of what it was 30 years ago. But the sectoral composition has changed in the meantime: the more polluting industries, led by chemicals and non-metallic mineral processing, have increased their share in output from 18.3 per cent in 1976 to 23.9 per cent in 1997 (see Table 1). In addition, the small and medium-scale (SME) sector has grown strongly.

All this has had environmental implications. While the available data suggest that environmental costs of the industrial sector in Pakistan have so far remain moderate, they are growing steadily. The strong growth of the SME sector, for example, means that this sector now accounts for a major portion of industrial pollution, and most SMEs lack the skills and the resources that would enable them to produce more efficiently and minimize their impact on the environment.

The various policies that were used to stimulate industry during the 1990s did little to limit pollution. Liberalization, privatization and foreign investment promotion were expected to increase the efficiency of industrial operations, and should therefore in principle have had environmental benefits as well, as they help to reduce waste. But foreign investment has been heavily concentrated in industries such as cement, fertilizer and (petro-)chemicals, which have a high pollution potential, and productivity growth has been highest in potentially heavily polluting industries such as industrial chemicals and other non chemicals. Location policy has done little to encourage location away from densely populated areas or to provide environmental facilities for industry concentrations. Effluents are usually untreated and are increasingly polluting streams and coastal areas.

III. Policies Directed at the Development of Industry

The Trade Policy 2000 emphasizes a number of export products with low pollution potential, such as textiles and software. This offers opportunities for the adoption of international environmental standards by export-oriented industries, in the context of the Uruguay Round agreements, notably the Agreement on Technical Barriers to Trade, which provides for the preparation, adaptation and international harmonization of process and production methods, especially under the standards and regulations specified by ISO 9000 and ISO 14000. Though these standards are voluntary, non-compliance may result in lost markets: environmentally discerning customers of Pakistani exports will force Pakistan to adopt cleaner production techniques eco-labelling if it is to maintain its market share. Around two dozen companies had acquired ISO-14000 certificates relating to environmental concerns by early 2002.

Future industrial policy is to emphasize the SME sector, which is seen as having a major potential for employment creation and export expansion, if given proper support to overcome financial, technological, management and marketing problems. The food processing, textiles and building materials industries have been selected for targeted intervention. Where private sector initiative is not forthcoming, the Government will look for public-private sector partnerships to promote non-traditional export industries. The Pakistan Industrial Development Corporation (PIDC) is to be the institutional anchor for such intitiatives.

IV. Policies Directed at Industrial Environmental Management

The Pakistan Environmental Protection Ordinance 1983 (PEPO) was the first attempt to tackle environmental problems systematically. But the monitoring and enforcement capacity foreseen by the Ordinance was inadequate, and the emphasis on penalizing entrepreneurs rather than supporting them in adopting less polluting processes and technologies made the Ordinance unpopular.

The 1997 Pakistan Environmental Protection Act (PEP-Act 1997) takes up the key issues of PEPO, paved the way for issue-specific and provincial legislation and initiated a considerable strengthening of institutions at the national and provincial level for the formulation, execution and enforcement of environmental policies. The previous command-and-control approach to environmental protection was partly replaced by mechanisms that actively involved the business sector in pollution control. Under PEP-Act 1997:

- The existing system of National Environmental Quality Standards (NEQS) was revised and rationalized, in consultation with the private sector;

- A system for self-monitoring and reporting for industry (SMART) has been developed;
- The system of environmental impact assessments was reviewed and new regulations for their implementation were drawn up.
- The Pakistan Environment Protection Council (PEPC) was established, with the President of Pakistan as chairman. In the annual PEPC meeting of 2001, a detailed program for pollution control/environmental management was approved.

In formulating and implementing the environmental policies, the Government is paying particular attention to 21 polluting industries, with special emphasis on the leather, textile, cement, paper, chemicals, sugar and fertilizer industries.

Two major additional environmental policy initiatives were launched in the 1990s: the Pakistan National Conservation Strategy (NCS) and the Environmental Planning and Resource Conservation Project (EPRCP). The major objectives of NCS – improved efficiency in resource use and management, natural resource conservation and sustainable development – were incorporated in the Five Year Plans, and programmes were drawn up for specific issues which provided a basis for provincial environmental action plans.

The EPRCP, which ran from 1993 to 2000, was supported by the World Bank and contributed to the development of new institutions, the implementation of environmental legislation, environmental awareness building and education and participatory approaches to sustainable development. As such, it performed a pioneering role in translating strategies such as NCS into action.

In 2000, a mid-term review of NCS concluded that the Strategy had stimulated a greater awareness of environmental issues, among others through the integration of environmental issues in secondary and tertiary education, had helped to initiate a consultative process for achieving its objectives and had contributed to strengthening the institutional support framework for environmental protection. On the other hand, the Strategy had not yet had an impact on macro-economic and sectoral policies, improved incentives for sustainable growth, or resulted in proper environmental reporting/monitoring.

V. Policies and Programmes Aimed at Technology Change, particularly EST

The 1997 Environmental Act and subsequent National Environment Action Plan (NEAP) have contributed to the promotion of EST including cleaner production processes and pollution control technologies. The Environmental Technology Programme for Industry (ETPI), which ran from 1996 to 2000, promoted the use of ESTs for the production of environmentally safe products. Under this programme, industries in 16 branches were audited, including serious polluters such as leather, sugar, fertilizer, pulp and paper, petrochemicals, paint, cement and pesticides. In the second phase of this project, these industries receive support and advice on good management practices, house keeping and environmental technologies for compliance with NEQS. All in all, about Rs. 13,000 million was spent on environmental abatement technologies in the course of this programme; around Rs. 23,000 million would still be needed for full compliance of the industries involved in the programme by the year 2003.

Import tariffs on new machines and equipment are low, ranging from 5-10%, and are a key incentive for the transfer of technology, including EST. Additionally, there is no restriction

on the licensing agreement and fees for the technology transfer, no Government approval or fees are required, and there is no restriction on repatriation.

The Government is directly subsidizing companies for obtaining ISO certification standards. The flat fee of Rs. 200,000 is particularly attractive to SMEs as their total certification cost may be substantially met in this way. The Ministry of Industry is likely to become more active in promoting the environmentally sound industry and technology as well.

VI. Experience with Integrated Policies and Programmes

Until the 1980s development policies were formulated irrespective of environmental considerations. The 8th Five Year Plan (1993-1998) was the first to clearly incorporate environmental concerns, but the establishment of capacities for this purpose was slow. The EPRCP (see IV), largely executed during this Plan period, did address the issue of integrated development, being part of a much larger programme to support economic and social development, with an emphasis on rural areas. However, with 14 components distributed over four different areas, the project was too complex for the available coordination mechanisms.

The National Prospective 10-Year Plan foresees the integration of economic and industrial development. However, no details on the programme were available at the time of writing.

The Government has adopted the UNIDO Integrated Programme to Support Capacity Building for Sustainable Industrial Development in Pakistan, Environment, the major component of the Programme, is linked to components increasing the competitiveness of the manufacturing sector stimulating wider participation in industrial development. One of the key activities will be the establishment of a National Cleaner Production Center (NCPC) (see under VIII).

VII. Major Obstacles in Enhancing the Contribution of Industry to Sustainable Development

Major constraints to effective environmental protection include:

- Political instability;
- Economic stagnation;
- Lack of progress in institution building;
- A weak environmental information system;
- Lack of awareness in the Government administration, bureaucratic hurdles and lack of political will;
- Weak local government;
- Budgetary constraints;
- Underpaid environmental agency staff; and
- Indifference among the majority of industrialists.

VIII. Priorities and Future Actions

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. The composition of the manufacturing sector must therefore change progressively toward a less polluting mix. NEAP, which is to be the focus of UN support in the coming years, will address issues such as clean air and water, and solid waste and ecosystems management, giving special attention to public awareness and the poorest sections of the population.

But there is also a need to formulate specific national industrial policy which incorporates environmental objectives on a par with the more conventional economic objectives. Activities are needed soon in specific areas to reduce the environmental impact of industrial development. In order to maximize the effectiveness of these and related efforts, they should be coordinated within a national vision and plan for the achievement of cleaner production. The key action points would include:

- Improved collection and access to information – for all sectors of society – on the environmental conditions, ecological and health costs of industrial development;
- A system of standards which is more sensitive to actual ambient conditions and different cost structures;
- Better monitoring capacities, in terms of manpower and equipment;
- A comprehensive programme of economic instruments to complement environmental regulations;
- Integration of environmental concerns in economic and spatial planning;
- Building up local enforcement capacities, with emphasis on citizen involvement and peer pressure;
- A coherent programme for industrial estates, improving the environmental infrastructure in existing ones and creating next ones in appropriate locations with a fully integrated environmental infrastructure.
- Promotion of corporate responsibility
- Establishment of centers for environmental management.

Table 1: Shares of Industry Branches in Total Manufacturing Output by Pollution Potential Category

		Output (1990 US$, in Mill)			Share (In per cent)		
More Polluting Industries		**1976**	**1986**	**1996**	**1976**	**1986**	**1996**
341	Paper and products	36	53	136	1.7	1.1	1.6
351	Industrial chemicals	108	392	721	5.1	8.4	8.6
353	Petroleum refineries	93	334	178	4.4	7.1	2.1
369	Other non-metallic minerals	79	307	605	3.7	6.5	7.2
371	Iron and Steel	73	187	351	3.4	4.0	4.2
372	Non-ferrous metals	1	1	2	0.1	0.0	0.0
	Sub-total	**390**	**1275**	**1993**	**18.3**	**27.2**	**23.9**
Somewhat Polluting Industries							
311	Food products	487	808	1284	22.8	17.2	15.4
313	Beverages	33	104	134	1.6	2.2	1.6
321	Textiles	554	832	1985	26.0	17.7	23.8
323	Leather products	23	80	66	1.1	1.7	0.8
342	Printing and publishing	25	53	170	1.2	1.1	2.0
352	Other chemicals	110	368	654	5.2	7.8	7.8
381	Fabricated metals	35	40	58	1.6	0.9	0.7
383	Machinery, electrical	69	159	648	3.3	3.4	7.8
384	Transport equipment	74	118	189	3.5	2.5	2.3
	Sub-total	**1412**	**2563**	**5190**	**66.2**	**54.6**	**62.2**
Less Polluting Industries							
314	Tobacco products	182	479	522	8.5	10.2	6.3
322	Wearing apparel	6	53	115	0.3	1.1	1.4
324	Footwear	3	10	42	0.1	0.2	0.5
331	Wood products	4	13	20	0.2	0.3	0.2
332	Furniture	3	4	4	0.1	0.1	0.0
354	Misc. Petroleum & coal products	4	19	81	0.2	0.4	1.0
355	Rubber products	27	73	74	1.3	1.6	0.9
356	Plastic products	4	27	34	0.2	0.6	0.4
361	Pottery	4	11	17	0.2	0.2	0.2
362	Glass	5	30	27	0.2	0.6	0.3
382	Machinery, except electrical	64	114	136	3.0	2.4	1.6
385	Professional & scientific equipment	11	7	21	0.5	0.6	0.3
390	Other	12	16	71	0.6	0.3	0.8
	Sub-total	**330**	**858**	**1164**	**15.5**	**18.8**	**13.9**
	Total	**2131**	**4696**	**8348**	**100.0**	**100.0**	**100.0**

13. THE PHILIPPINES

Industry and Sustainable Development in the Philippines – Achievements and Prospects

Based on the UNIDO report for project NC/PHI/97/020 – Industrial Policy and the Environment in the Philippines

Executive summary

I Broad Trends in Sustainable Development in The Philippines

The Philippines, an archipelago of over 7,000 islands, has a population of about 80 million. Per capita GNP was US$ 1,050 in 1998, but over one-fourth of the population had an income of less than 1 US$/day. Employment is not increasing at the pace of the labour force, which grew from 19 million in 1980 to 32 million in 1998. Poverty is particularly marked in rural areas, resulting in high urban migration rates: close to 60 per cent of the population lives in urban areas now.

Apart from mineral deposits (copper, nickel and iron), the country has considerable fisheries and forest resources, but overfishing and indiscriminate logging constitute a serious threat: deforestation takes place at an annual rate of 3.5 per cent, one of the highest in the world.

MVA growth has just kept pace with population growth: MVA per capita stood at US$ 180 in 1998, the same figure as in 1989. Food and beverages remains the most important manufacturing subsector. Structural change in the manufacturing sector has been quite slow. The most conspicuous development is the growth of the electrical machinery and – to a lesser extent - transport equipment industries, the former increasing its MVA share from 4.5 per cent to 10.1 per cent during the 1985-1997 period, making it the third largest industry, after food and beverages and chemicals.

Recent comprehensive data on environmental issues were not available at the time of writing, and it is difficult to determine how past economic policies, which until the 1980s were generally protectionist, have affected the environment. It is clear, however, that in the past a number of industries with a high pollution potential, such as cement, were effectively protected from competition, and were therefore not under pressure to install modern, less polluting technologies. The trade liberalization of the 1980s subjected the economy to increased competition and resulted in increasing the share of less polluting industries. This may explain why during the 1990s organic water pollutant emissions and industrial CO_2 emissions per unit of MVA remained stable or only increased slowly. But the growth of the industrial sector as a whole resulted in increased pollution: between 1989 and 1997, industrial CO_2 emissions increased from 0.71 to 1.14 tonnes per capita.

II The Manufacturing Industry and Sustainable Development

The Philippine manufacturing sector has shown low rates of growth, usually roughly comparable to those of overall economic growth (Table 1). Nevertheless, as suggested above, its growth may have resulted in a disproportionate overall growth of industrial pollution. Also, as a direct result of industrial policy, manufacturing growth was concentrated in a few regions outside the national capital region. While this reduced the environmental pressure from industry in the Metro Manila area, it clearly accelerated the

potential in other areas where less attention was paid to environmental impacts because of their perceived higher absorptive capacity.

The only sub-sector level overview of environmental pollution in the Philippines so far estimated the total pollution loadings for water and air in 1988 and 1992. The results show that the food, beverage and tobacco products industries are the largest contributors to pollutant loadings. Although the different industry groups are not categorized as heavily polluting by the World Bank and UNIDO, they are responsible for a large share of total output by the Philippine manufacturing sector, which helps to explain their high share of total pollution (Table 2). The lack of priority given to environmental issues by the often small enterprises in the industry would be another explanatory factor. After the food industry, the basic metals, paper and textile industries are the largest contributors to pollutant loadings.

The distribution of pollution potential within the manufacturing sector has remained relatively unchanged over time: the very limited shift of proportions among categories of industries in the Philippine manufacturing sector until the mid-1990s reflects the lack of a dynamic industrial policy. A positive recent development is the adoption of ISO 14000 standards by an increasing number of firms: in 1997, only one company was accredited; in 2001, there were 86, mainly in the IT sector.

III Policies Directed at the Development of Industry

Trade and investment policies have been the major tools of Philippine industrial policy. Trade policies have since the 1970s promoted non-traditional exports, but success in penetrating markets for non-traditional products has been limited. The Philippine investment policy is largely embodied in the investment incentive system administered by the Board of Investments. It promotes selected activities in its Investment Priorities Plan (IPP) through fiscal incentives. These incentives are also relevant to the Build-Operate-and-Transfer (BOT) scheme for environmental support facilities and the attainment of regional development objectives through the promotion of industrial estates.

Regional dispersal of industries and promotion of regional investment have been among the development goals of the Philippine government. By the 1980s, investment incentives were no longer available for firms locating within Metro Manila. Starting in 1991/92, regional investments have been actively promoted through special programs. The promotion of industrial estates was accelerated, and a central agency, the Philippine Export Processing Zones Authority (PEZA) was established in 1995 to coordinate efforts in this area. It has also started the promotion of Regional Agro-industrial Growth Centres (RAIGC). The RAIGC program is implemented by the Department of Trade and Industry and has identified at least one RAIGC in each of the 13 regions.

IV Policies Directed at Industrial Environmental Management

The Philippine Environment Code provides a framework for the promulgation of regulation for the protection of the environment, and the Department of Environment and Natural Resources (DENR) is the key Government agency.

In the course of the years, a number of ambient standards for measuring air, water and soil quality have been formulated by DENR, and a national monitoring programme was

established for some rivers and lakes. But budget cuts have restricted the monitoring and enforcement of standards. Plant-specific discharge permits appear to be lacking. A 1999 UNIDO study[3] found that in some major concentrations of manufacturing, Cavite and Metro Cebu, non-compliance with pollution control regulations is the rule rather than the exception. The current system of environmental impact assessments (EIAs) is in theory a step forward as it has introduced area-based EIAs for industrial estates, limiting the need for time-consuming individual assessments. Unfortunately, this scheme does not appear to be used on any significant scale.

All in all, the regulatory program in the Philippines has in the past failed to respond to the continued presence of a number of manufacturing firms with high pollution potential and to the intensification of industrial activity in the geographic regions where industrial policy has fostered growth. Recent positive developments are the adoption of the Clean Air Act and the Solid Waste Management Act, as well as the drafting of a Clean Water Act. Major stakeholders in the public and private sectors worked together to realize these Acts.

V Policies and Programmes Aimed at Technology Change, particularly EST

DENR has carried out several projects aimed at improving the capacity of industries to comply with environmental laws, including training seminars for operators of wastewater treatment plants.

A number of agencies under the Department of Science and Technology (DOST) provide technical support for minimizing environmental impacts of industrial production. The Industrial Technology Development Institute, for example, provides analytical services and research facilities for wastewater treatment and applied research in industrial manufacturing, energy and the environment. A cleaner technology centre is being created by DOST under its industrial technology and development programme with support from the Asian Development Bank.

Outside the Government sector, some academic institutes and non-government organizations are active in the field of environmental technologies, but they do not, as yet, appear to be involved in actual programmes to transfer these technologies.

VI Experience with Integrated Policies and Programmes

There is as yet no comprehensive national plan integrating the relevant parties and resources. A step in the right direction is the 1999-2004 Medium Term Philippine Development Plan. Among the goals for the industrial sector in the Plan during this six-year period is the establishment and development of globally competitive industries consistent with sustainable development. To achieve this goal, industries will be encouraged to adopt practices that support sustainable development and to comply with environmental standards and regulations. However, the Plan's basic policy thrust is to promote industries with large employment and export potential and high value added, and to integrate the country into regional free-trade agreements. These objectives falls short of a comprehensive industrial policy, and in practice environment is not one of the criteria to guide industrial growth.

[3] UNIDO, Industrial Policy and the Environment in the Philippines, NC/PHI/97/020, July 1999.

VII Major Obstacles in Enhancing the Contribution of Industry to Sustainable Development

In the absence of an integrated national vision and plan for sustainable development, it is not surprising that there is a lack of cooperation among different Government agencies (particularly DENR and the Ministry of Trade and Industry), among regional/local government units and between these and the relevant central Government agencies. Agencies and institutions involved in environmental protection, as indicated above, usually have inadequate resources as well.

The ineffectiveness of the institutional framework is exacerbated by the Philippine system of industrial effluent standards. The system is relatively insensitive to actual ambient conditions and to different cost structures for pollution reduction due to the use of concentration-based standards, which allows polluters to meet standards by dilution.

At the industry level, the fact that the small and medium-scale enterprise (SME) sector accounts for the larger part of industrial pollution is a major obstacle: most of the firms in this sector lack the skills and resources that would enable them to produce more efficiently and minimize their environmental impact.

VIII. Priorities and Future Actions

A clear national industrial policy is needed in order to incorporate environmental objectives on a par with the more conventional economic objectives (such as increased employment, value added, import substitution and export promotion). Within the context of an integrated national vision and plan for environmentally sustainable development, backed by the Government, the business community and society at large, an environmentally responsive industrial policy should include:

- Effective integration of environmental objectives with economic and social objectives;
- Market-oriented tariff and trade policies;
- Full cost-pricing of resources to incorporate environmental costs;
- Investment incentives in key industries which are more consistent with the sustainable use of local natural resources;
- New investments: full identification of environmental consequences of new investments and continuous self-reporting, also to the local community;
- Incentives in all sectors for more efficient processes and cleaner production, and for firms to adopt international environmental management standards;
- Promotion of industrial ecology (re-use of wastes, co-location of complimentary industries);
- A focus on small and medium enterprises, encouraging and assisting them them to achieve cleaner production;
- Informing and training financial and insurance institutions on the reduction of lending risk through cleaner production and better environmental management; and
- Fora through which industry can participate in setting industrial policy and objectives and in monitoring the performance and achievements of industry.

Table 1: Production Structure of the Economy: Average Growth Rates in Real Terms

Sector Years:	75 - 80	80 - 85	85 - 90	90 - 95	90 - 96
Agriculture, Fishery and Forestry	4.5	0.4	1.9	1.3	1.5
Agriculture	6.2	1.8	2.6	2.2	2.3
Forestry	-2.6	-11.3	- 6.0	-24.7	-27.0
Industry	7.4	-2.3	1.5	2.3	2.9
Mining and quarrying	8.8	6.9	4.4	- 1.0	-1.1
Manufacturing	5.1	-1.8	2.9	2.2	2.6
Construction	18.2	-6.9	-1.5	2.2	3.4
Electricity, gas and water	7.6	6.1	2.1	5.8	6.0
Services	5.5	1.9	4.4	2.9	3.4
Transport, commerce and storage7.0	2.1	4.3	2.8	3.4	
Trade	6.3	1.8	4.3	3.1	3.5
Offices, dwellings and real estate1.7	1.2	3.6	1.9	2.2	
Private services	4.8	5.8	3.8	2.6	2.9
Government services	3.7	2.6	4.6	3.7	3.6
Gross Domestic Product	6.0	-1.0	2.8	2.3	2.8
Gross National Product	5.9	- 0.6	3.4	3.1	3.6

Source: National Income Accounts, NSCB

Table 2: Shares of Industry Sectors in Total Manufacturing Output

	Absolute value (Mil. US$ 1990)			Share (%)		
	1970-1974	1980-1984	1990-1994	1970-1974	1980-1984	1990-1994
More pollutingindustries						
341 Paper and products	328	462	510	3.3	2.6	2.1
351 Industrial chemicals	487	648	749	4.9	3.7	3.1
353 Petroleum refineries	929	3199	2865	9.4	18.1	11.7
369 Non-metal. mineral	214	237	586	2.2	1.3	2.4
371 Iron and steel	402	663	1174	4.1	3.7	4.8
372 Non-ferrous metals	67	173	471	0.7	1	1.9
Subtotal	**2427**	**5382**	**6355**	**24.6**	**30.4**	**26 . 0**
Somewhat polluting industries						
311 Food products	2747	4006	5243	27.8	22.6	21.5
313 Beverages	431	830	1522	4.4	4.7	6.2
321 Textiles	744	1089	940	7.5	6.2	3.9
323 Leather products	16	22	44	0.2	0.1	0.2
342 Printing and publish.	161	218	358	1.6	1.2	1.5
352 Other chemicals	714	1208	1821	7.2	6.8	7.5
381 Fabricated metals	331	396	444	3.3	2.2	1.8
383 Machinery, electric.	282	790	2446	2.9	4.5	10
384 Transport equipment	400	631	1172	4	3.6	4.8
Subtotal	**5826**	**9190**	**13990**	**58.9**	**51.9**	**57.4**
Less polluting industries						
314 Tobacco products	500	837	710	5	4.7	2.9
322 Wearing apparel	102	484	1119	1	2.7	4.6
324 Footwear	20	55	93	0.2	0.3	0.4
331 Wood products	394	589	373	4	3.3	1.5
332 Furniture	40	133	189	0.4	0.8	0.8
354 Petroleum and coal	22	12	32	0.2	0.1	0.1
355 Rubber products	195	284	371	2	1.6	1.5
356 Plastic products	112	246	424	1.1	1.4	1.7
361 Pottery	11	46	65	0.1	0.3	0.3
362 Glass	110	133	161	1.1	0.8	0.7
382 Machinery, ex electrical.	104	186	258	1.1	1.1	1.1
385 Professional. & scientific equip	6	16	43	0.1	0.1	0.2
390 Other	25	95	201	0.2	0.5	0.8
Subtotal	**1641**	**3116**	**4039**	**16.5**	**17.7**	**16.6**
Total	**9894**	**17688**	**24384**	**100**	**100**	**100**

Source: UNIDO

14. SUDAN

Industry and sustainable development in Sudan – Achievements and prospects

Based on the report prepared by Mr. Nadir Mohammed Awad

Executive summary

I. Broad trends in sustainable development in Sudan

With a population of 36 million and surface of 2.5 million square kms., Sudan is a sparsely populated country. However, much of the country is arid and unsuitable for agriculture. The only important mineral resource is petroleum.

The economy remains heavily dependent on agriculture; the only sector showing conspicuous growth is mining (see Table 1), due to the growth of the oil industry. The long-running civil war in the south of the country is a heavy burden on the economy of the country, which had a GDP of only US$ 10.7 billion in 1998. The sustained growth of the economy during the 1990s (averaging about 6 per cent per year) is largely due to oil exports. In addition, economic policy reforms have in the past five years helped to stabilize the economy and boost private sector activity.

Population pressure on the limited areas of arable and grazing land is contributing to desertification. Sanitation services are inadequate, which is a particularly serious problem in the major towns. The civil war, apart from having paralyzed economic activity over wide areas, has resulted in large-scale destruction of natural habitats and has an incalculable human and social cost.

II. The Manufacturing Sector and Sustainable Development

The contribution of manufacturing to the country's GDP remains small and has been more or less stable over the past decade, standing at 7.4 per cent in 2000 (see Table 1). Food processing, textile and leather are the main branches. Food processing has the largest share in MVA: it has long stood at around 50 per cent and has recently risen to 70 per cent.

Manufacturing is highly concentrated in Khartoum and the surrounding regions. These areas account for about 60 per cent of the manufacturing establishments, 80 per cent of total manufacturing employment and 75 per cent of manufacturing gross output. Because of their location, most factories would not be directly affected by the civil war.

Public enterprise has played a leading role in past strategies, but there has been a major shift towards the private sector, which now accounts for 80 per cent of gross output and 50 per cent of total gross capital formation. The performance of the sector, however, has shown little improvement over the years, as its low and virtually unchanging share of GDP shows. A large part of the industrial enterprises set up in the context of import substitution policies is basically unviable in an open economy. Others need rehabilitation, and the management and technology capacities needed for competitive manufacturing are in short supply. In Khartoum State there are about 700 operational manufacturing establishments and 350 that are not operational.

When industrial development began in the 1960s, the available legislation on occupational health and hygiene seemed adequate for the required safety levels and for keeping industrial hazards under control. Waste management and treatment were unknown. Sugar factories, for example, did not know how to deal with molasses and bagasse, which were simply dumped. Tanneries and textile factories also dumped their waste with little or no treatment.

Even though industrial pollution may not be the most severe environmental problem in Sudan, due to the relatively small size of the sector, the situation may deteriorate rapidly if the industrial sector expands and environmental protection is not integrated into industrial development at all levels. Sudan, for example, has limited water resources, and therefore the proper management of these resources must be part of any longer-term development vision. Finally, industrial pollution is concentrated in the most densely populated areas, which emphasizes the importance of controlling it.

III. Policies Directed at the Development of Industry

Sudan has made considerable efforts to reform its economy since the early 1990s. Following a long economic deterioration, the Government of Sudan launched the ten-year Comprehensive National Strategy (CNS) in 1992. The objectives of the CNS during the period 1992 – 2002 were:

- Attainment of food security through the extension of cultivated areas and intensification of agricultural production;
- Increase of agricultural productivity of staple food grains;
- Expansion of agro-based industries through private investment;
- Promotion of agricultural exports; and
- Maintaining environmentally sound practices.

The industrial development strategy in the Sudan is based on the objectives of the CNS and the Alliance for Africa Industrialization Plan. It includes:

- Enterprise development led by the domestic private sector;
- Linking agriculture and industrial policies;
- Special attention to small and medium-scale industries (SME) and artisanal enterprises.

A new Investment Encouragement Act was issued in 1996, offering a variety of rebates and exemptions.

The Ministry of Industry and Investment and the Chamber of Industries have begun to discuss industrial development issues together, but both the public and private sector still need to develop capacities for an effective dialogue with concrete results. UNIDO's Integrated Programme for Sudan (see also under VI) intends to help strengthen the system through:

- The creation of a policy unit and strengthening of the Investment Promotion Unit in the Ministry of Industry and Investment;
- The formulation of an SME policy that favours companies making intermediate products, thus linking Sudanese firms to Sudanese firms; and
- Setting up a comprehensive reporting system on developments in the sector that serves both the private and the public sectors.

IV. Policies Directed at Industrial Environmental Management

In rehabilitating enterprises and industrial areas, issues such as the construction of proper sewage systems are explicitly included. However, little has been done in the past to include environmental concerns in industrial development strategies or projects. The national Agenda 21 strategy has not addressed the issue of industry-specific environmental objectives, let alone objectives for specific manufacturing branches. Industrial support institutions and private sector organizations were not involved in its formulation. It is too early to say anything about the environmental impact of the industrial development strategy based on CNS.

Sudan has signed a number of UN conventions on sustainable development, including the Montreal Protocol on Ozone Depleting Substances, the Convention on Climate Change and the Convention on Persistent Organic Pollutants. Progress has been made in phasing out ozone depleting substances, a 50 per cent reduction having been achieved.

V. Policies and Programmes Aimed at Technology Change, particularly EST

While there are a number of institutions, especially in the public sector, that could play a role in technology transfer, it is not evident that these have done so successfully, let alone that they have been involved in transferring EST. A technology policy has been adopted recently, but details were not available at the time of writing.

VI. Experience with Integrated Policies and Programmes

In the 1990s, reform programmes focused on a set of related economic issues, but environmental problems were not included. The CNS, as indicated under II, does look at the link between economic and environmental issues. However, implementation details and results were not available at the time of writing.

VII. Major Obstacles to Enhancing the Contribution of Industry to Sustainable Development

While an awareness of the importance of sustainability issues is growing, as CNS, Sudan's adherence to UN conventions and the adoption of UNIDO's Integrated Programme shows, many obstacles to environmentally sustainable industrial development (ESID) remain:

- There is no effective dialogue between the public sector and other stakeholders yet.
- Domestic capacities are still inadequate in several key areas: ESID strategy formulation, institutional support, technology transfer and development, and information systems.
- Environmental awareness in the business sector is low; in a situation where many enterprises are struggling to survive, limiting environmental impacts will receive little attention. This problem is particularly marked in the SME sector.
- Many small enterprises are unregistered and operate without any form of control.
- Low educational levels limit the understanding of environmental issues among the population at large (more than 50 per cent is illiterate).

VIII. Priorities and Future Actions

The Government intends to pursue policies that will enable Sudan to face the challenge of globalization and reduce the number of people living below the poverty line to 50 per cent by 2015. The rational utilization and protection of natural resources is to safeguard the environment. Social development is to be boosted by, among others, a greater involvement of the population in decision-making, etc., and particular attention is to be paid to empowering women.

Realizing these aims, and in particular realizing the objective of environmentally sustainable industrial development, will require further economic and governance reforms. In addition more focused action is needed to address environmental problems effectively. Creating a development framework for a manufacturing sector that is internationally competitive and at the same time minimizes its environmental impact will require:

- Capacity building in the Ministry of Industry and Investment, particularly in the areas of investment promotion, technology transfer negotiations, networking with other stakeholders and information technologies;
- Development, with other stakeholders, of a strategy for ESID as well as an industrial technology policy.

In the context of the latter, specific action points would include:

- Intensification the links between manufacturing and the agricultural and mining sectors;
- Development of a programme for ESID in the SME sector;
- Development of an industrial water management strategy;
- Using the existing technology institutions to build up capacities for cleaner technologies, life cycle analysis, eco labeling etc., and transferring the relevant know how to industry;
- Developing market-based instruments to promote ESID;
- Accelerating the implementation of the UN conventions signed by Sudan.

Table 1: GDP Contribution of Various Sectors (%):

SECTOR	1995	1996	1997	1998	1999	2000
Agriculture	43	45	47.6	48.7	49.8	46.4
Industry	15.8	14.5	15.1	15.0	15.8	21.4
Mining	0.1	0.9	0.9	0.1	1.9	7.6
Manufacturing	8.6	6.5	7.4	8.0	7.2	7.4
Electricity & Water	2.2	1.9	1.9	1.8	1.8	1.7
Construction	4.9	5.2	4.9	5.1	4.9	4.7
Services	41.2	40.5	37.3	36.3	34.4	32.2

15. TUNISIA

Industry and Sustainable Development in Tunisia: Achievements and Prospects

Based on the report prepared by Mr. Rachid Nafti

Executive Summary

I. Broad Trends in Sustainable Development in Tunisia

The Tunisian economy achieved a remarkable performance that is reflected by a sustained growth rate of 5.1 per cent over the period 1992-2000[4], inflation stabilized at around 3 per cent per annum, with an annual average budget rate deficit of 3 per cent of GDP (Figure 1). The pattern of the contribution of different economic sectors to GDP is changing in favor of the services sector followed by manufacturing industries: agriculture and fishing have a combined share of 14 per cent of GDP, the industrial sector accounts for 33 per cent of GDP[5] and the service sector accounts for 53 per cent of GDP (1999).

Tunisia's social indicators are also positive. According to the United Nations Development Programme, the Human Development Index for 1999 is 0.695, which is above the world medium development average (0.670). The poverty rate regressed to less than 4.2 per cent of the total population in 2000 and the presence of women has increased in all sectors of society. Tunisia stands out as a country in which 80 per cent of the population is considered middle class and in which citizens benefit from improvements in income, purchasing power and improved living standards.

The environment has become a basic element of the country's development policy and it has been incorporated into the institutional framework as well through the creation of various institutions and especially by the adoption of the national Agenda 21 in 1995, entitled 'National action programme for the environment and sustainable development for the 21st Century'.

II. The Manufacturing Industry and Sustainable Development

Tunisia's industrial sector is composed of 9,300 enterprises, of which 4,520 have 10 or more employees and 1,860 are totally exporting (1999 figures). The overwhelming majority are small-and medium-sized enterprises (SMEs), and are principally located in the coastal cities of Tunis, Bizerte, Sousse, Mahdia, Sfax and Gabes.

The manufacturing industries provide employment to some 450,000 persons, who constitute around 33.3 per cent of the labor force (1999); manufacturing enterprises with 10 or more employees employ some 84 per cent of the labor force. Women account for 72 per cent of employment in the textile sector, 15 per cent in the mechanical and electrical industries, 11 per cent in the food industry, 6 per cent in the building materials industry and 16 per cent in other industrial activities.

[4] Data source: National Institute of Statistics (INS)

[5] This figure includes the contribution of the manufacturing industry (21.1per cent and the non manufacturing industry (11.9 per cent)

Over the last decade, the industrial sector has been the most dynamic sector of the country's economy. The average annual growth for the 1992-2000 period was 5.9 per cent, which is above the average annual growth of 5.1 per cent of GDP for the same period. The contribution of the industrial sector to GDP in 1999 reached 33 per cent, taking the lead over the agricultural sector whose contribution was reduced to 14 per cent (Figure 2). The manufacturing industry's share in GDP reached 21 per cent in 1999. Investment in manufacturing industries has grown steadily, averaging around 7 per cent annually for the period 1992-1999.

The value of exports from manufacturing industries has more than doubled for the period of 1992-1999 with an annual average growth rate of 11 per cent. The proportion of exports from manufacturing industries in total exports has risen from 41 per cent in 1981 to 89 per cent in 1999 (Figure 3).

Within the manufacturing sector, textiles and clothing, food, beverages and tobacco, are the largest contributors, accounting for respectively 24 per cent and 20 per cent of total manufacturing added value. The textiles and clothing industries sector represent the greatest share in exports (49 per cent), followed by the chemical industries (15 per cent) and the electric and electronics industries (13 per cent).

In general, the rapid industrial growth often did not sufficiently take into consideration the negative impact on the environment, namely in terms of resource depletion, waste production and impact on the health of the population. Industry has become responsible for the pollution of water, air, land, excessive energy consumption and waste generation. The pollution generated by the industrial sector is estimated at some 18,910, 000 m3 of waste water (including 6,000,000 tons of phosphogypsum as slurry) and some 9,320,000 tons of industrial solid waste in Tunisia every year. The industrial sector is also a major consumer of energy that accounts for about 36 per cent of total energy consumption. The sector consumes about 10 per cent of the drinking water distributed by the water authority (SONEDE), in addition to pumping water at plant sites from underground wells.

For the future, the industrial sector faces challenges resulting from changes in the macro-economic context characterized by further liberalization of the economy and gradual elimination of tariff and quota barriers, combined with the need to respond to new environmental requirements.

III. Policies Directed at the Development of Industry

The Tunisian government is determined to pursue economic liberalization and to support industry that has to face international competition, both in the domestic as well as in overseas markets. Key objectives in the Tunisian industrial policy are: improvement of the competitiveness of industries; improvement of the industrial competencies (human resource development); design and implementation of enabling measures; and adaptation of the financial and technical support structure and institutions to better serve the interests and needs of industries.

The most eminent programme for achieving these objectives is the National Programme for Industry Upgrading (Programme de Mise à Niveau-PMN), launched in 1996. Approximately 4,000 key industrial enterprises have been prioritized for support over a ten-year period. The PMN is voluntary and aims to support industries in consolidating their strengths and reducing

their weaknesses in order to prepare for the opening of the market and the abandoning of trade tariffs, with the gradual implementation of the free trade agreements with the European Union signed in July 1995.

With regard to the integration of environmental considerations in industry, several initiatives have been taken, including: a study conducted by the Ministry of Industry and the Ministry of Environment and Land Use with the support of the Japan (JICA) on recycling industrial waste; a pilot initiative on cleaner production undertaken within the framework of the MITAQ project (Projet de Modernisation des Industries Tunisiennes basée sur l'approche qualité); and various clean-up measures in order to reduce air pollution caused principally by the phosphate processing industry and cement industries.

IV. Policies Directed at Industrial Environmental Management

Tunisia's environmental protection strategy has two major components: corrective actions for remediation of environmental damages already caused, especially in the public sector and preventive initiatives requiring an environmental impact assessment for new industrial investments, introducing cleaner production in industry and integrating environmental factors in production costs.

Among the noteworthy actions targeting industrial pollution abatement and prevention are:

- Regarding industrial liquid waste, setting of standards for the discharge of waste effluents into the recipient environment and the public wastewater network (standard NT 106.002); establishing a waste water fee calculated on the basis of water consumption and the degree of pollution; introducing incentives for clean-up efforts through "the depollution fund (FODEP)"; requiring environmental impact assessments for new industrial enterprises or the expansion of existing ones.

- Regarding solid waste management: a national programme of management of solid waste (PRONAGDES) has been established and the collection and regeneration of used oils is being promoted by the public enterprise (SOTULUB) that regenerates about 16,000 tons per year and which represents about 25 per cent of overall oil consumption.

- Regarding promotion of renewable energies: targeting awareness and capacity building in this field, setting up units to produce electricity from windmill power (savings in terms of conventional energy estimated at 60,000 tonnes equivalent petroleum [tep] per year), measures for the promotion of the use of natural gas (an increase in the consumption of natural gas at an average annual growth of 8.8 per cent, rising from 1,186 ktep in 1990 to 2,333 in 1998). This effort is being reinforced within the national framework of the climate change convention aiming at reducing the emission of greenhouse gases.

- Undertaking other voluntary initiatives: the National Cleaner Production Declaration, a joint effort of the Ministry of Environment and the private sector federation (UTICA) was signed in June 1999 at the same time as the signing of the International Cleaner Production Declaration with UNEP. The new investment code promulgated by Law No. 93 120 of 27.12.93, provides fiscal and financial incentives for investment in projects leading to pollution treatment (end of pipe equipment, EOP) or the

application of clean technologies (Articles 37 and 38 of the code) and constitutes the legal framework for the creation of FODEP.

- Encouraging investment in clean technology: up to the year 2000, FODEP had also supported cleaner production investments in four industrial enterprises operating in the electronics, automobile parts (filters), agro-industrial and building materials branches, with investment costs of around 1.2 million Tunisian Dinars. Another group of four enterprises applied recently for cleaner production investments and their application is under review by ANPE.

- Implementation of environmental management systems: to date, some twenty enterprises are in the process of implementing environmental management systems; four others involving production of car batteries, chemical processing, petroleum exploitation and liquid gas have been certified ISO 14001.

- Promoting energy saving efforts: energy saving programmes and introduction of renewable energies led to energy resource preservation estimated at 1.5 million tep and a reduction of 4.5 million tons of CO_2.

V. Policies and Programmes Aimed at Technology Change, particularly EST

The technological level of Tunisian industries could be rated low to medium. They are in majority consumers of technology with limited innovation. The Government has undertaken numerous measures to improve this situation, as listed below:

- institutional support: the Secretariat of State for Scientific Research and Technology (SERST) was established in 1991 to boost research & development and technology in every sector of the economy and the Tunis International Centre for Environmental Technologies (CITET) was created with a clear mandate to promote EST and strengthen skills in this field. Sectoral centers such as the National Technical Centre for Leather and Shoes (CNCC) and the Technical Centre for Mechanical, Electrical and Electronic industries (CETIME) have also initiated specific programmes aimed at improving production processes through waste minimization and pollution control programmes and better environmental management at the enterprise level;

- financial support: FODEP, created in 1992, provides financial incentives for environmental protection projects, clean-up investment and use of cleaner technologies; the Fund for promoting the transfer of technologies (FOPROMAT) [6] supported the transfer of technology in industrial enterprises to increase local added value and improve productivity. Around 659 industries have benefited from it. This fund was cancelled in 1999 and replaced by the Fund for the Industrial Restructuring and Improvement of the Quality and Competitiveness of Tunisian Enterprises (FODEC); and

- programmes: In 1994, the United States Agency for International Development initiated an Environmental Pollution Prevention project (EP3) in Tunisia and funded it for three years. The project demonstrated the applicability of the cleaner production (CP) concept for Tunisian industry and created capacity and momentum for its further

[6] This fund has been incorporated in 1999 in FODEC.

dissemination. The project provided training for 200 participants, predominantly consulting engineers and engineering students, and raised awareness on pollution prevention for some 250 industry representatives. After the creation of CITET in 1996, it became in 1997 the Centre National de Production plus Propre and received support from UNIDO and UNEP. In 1997, the Ministry of Industry, with support from UNIDO, launched a cleaner production project that was integrated into the pilot programme for modernization of the Tunisian industry through the quality approach (Modernisation des Industries Tunisiennes basée sur l'Approche Qualité - MITAQ). A series of studies have been carried out and various programmes implemented aimed at capacity building in cleaner production and at promotion of eco-technologies for resource conservation and protection, waste treatment, recycling and soil decontamination; amongst others.

VI. Experience with Integrated Policies and Programmes

The aspirations of the country to achieve sustainable development have become an irreversible policy choice that is reflected very clearly in the 8th plan (1992-1996) and the 9th plan (1997-2001). As regards industry, the integrated approach is reflected in the Industrial Upgrading Programme (PMN), which is based on the notion of "integrality" and covers all aspects related to the internal and external environment of the enterprise. As of April 2001, 1753 industrial enterprises joined voluntarily this programme and 956 among them already have had their investment programmes approved for a total investment estimated at 11.6 million Dinars.

At the macroeconomic and sectoral levels, the government supports actions to eliminate administrative obstacles for business leading to improvement of the business environment. Also, efforts have been initiated to strengthen the capacity of existing sectoral technical centres in order to provide enterprises with efficient and demand driven services. New centres have been created in support of fields such as agribusiness, chemical industry, wood and furniture and packaging. Industrial parks were renovated and new modern ones were created. Two free zones were created in Bizerte and Zarzis to promote the establishment of totally exporting enterprises.

Experience with the integrated approach shows that more effort is still required with regard to integration of the environmental dimension into the PMN. More synergy and improved channels of coordination between the Ministry of Industry and the Ministry of Environment will increase the PMN efficiency in achieving the integral upgrading of enterprises.

VII. Major Obstacles in Enhancing the Contribution of Industry to Sustainable Development

Although the Tunisian industrial sector has achieved positive results over the last decade, it still faces challenges in maintaining its performance and in preparing the country for the free zone agreement with the European Union that comes into effect in 2007. This will result in the direct and unprotected interaction of Tunisian industry with the requirements of international markets.

The expected impact of the creation of the free trade zone shows that about 30 per cent of industrial enterprises (majority are SMEs) are threatened to disappear if they do not adjust in time to the opening of the local economy. Even though SMEs have the advantage of being flexible, and able to adjust quickly to changing markets, yet they are characterized by some

structural weaknesses, among them, under-capitalization, low productivity, weak organization and lack of qualified specialized staff. Besides, their production equipment is typically rather old and the technology used rather traditional. Product quality is typically neglected; progress in addressing air and noise pollution is still hindered by the lack of emission standards, which limits monitoring efficiency. This is coupled with the difficulty resulting from the location of some industrial enterprises in urban areas outside of industrial parks. Additionally, some industrial parks are deteriorating for lack of maintenance. Although these constraints are being addressed through the industrial upgrading programme (PMN), less than one third of enterprises have participated in this programme.

VIII. Priorities and Future Actions

The Tunisian sustainable industrial development strategy will continue to be based on achieving two strategic objectives, namely implementation of the industrial upgrading programme in order to improve the competitiveness of production units and mainstreaming environmental considerations in production and consumption systems.

To sustain the achievements, themes such as strengthening the competitiveness of the economy, private sector development, human resource development, quality, technology transfer, appropriate infrastructure and funds mobilization will continue to occupy a prominent place in Tunisia's development strategy for the years to come. For industry to prosper, it must take into account international requirements and concerns for competitiveness including those for environment. It is in the interest of industry to anticipate the growing environmental awareness of consumers and respond to it.

Priorities that should orient future interventions to support industrial development and its contribution to sustainable development are:

In order to support industrial development and enhance its contribution to sustainable development, it is necessary to orient future interventions according to a development plan based on:

- Strengthening the institutional framework supporting the implementation of the *Programme de Mise à Niveau* (PMN) as an effective tool for deepening industrial restructuring and modernization of enterprises. It is necessary to speed up the pace of its implementation at the level of SMEs as they constitute the bulk of the country's industrial base, with focus on product quality improvement, production cost reduction and use of modern and environmentally sound technologies;

- The industrial policy should continue to integrate environmental considerations through the promotion of cleaner production and sustainable consumption modes, including environmentally sustainable technologies (ESTs), as recommended by the National Agenda 21. This policy should include the provision of incentives and the creation of new tools for promoting the adoption of ESTs at the industrial production level and also for stimulating the market for environmentally friendly products and services. The implementation of such policy will require improvement of the coordination mechanism between the actors involved in industrial development and environmental protection;

- At the enterprise level, it is recommended to increase awareness of SMEs regarding the themes related to raw material conservation, water and energy savings and eco-efficient practices, with a view to improve their economic and environmental performance, and to develop their internal capacity for adopting and managing ESTs;

- Finally, the application of sustainable development approaches in industry will require improvements at the level of research and development in support of innovation and adaptation to meet markets requirements. In this respect, access to information technologies and the establishment of technology parks (*technopoles*) to promote higher value added industries, will be given priority in the country's ecologically sustainable industrial strategy.

Figuree 1: GDP growth rate (1992-2000)

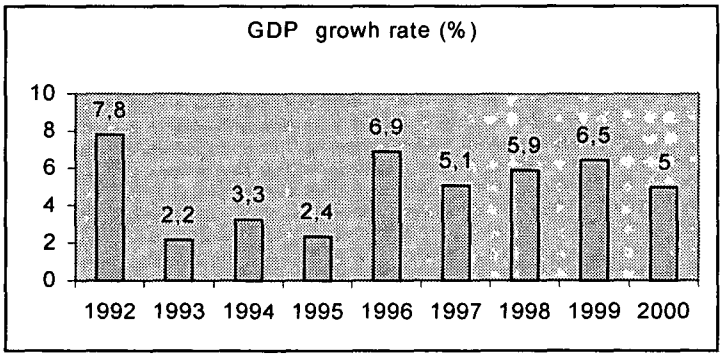


Figure 2: Contribution of Industry to GDP

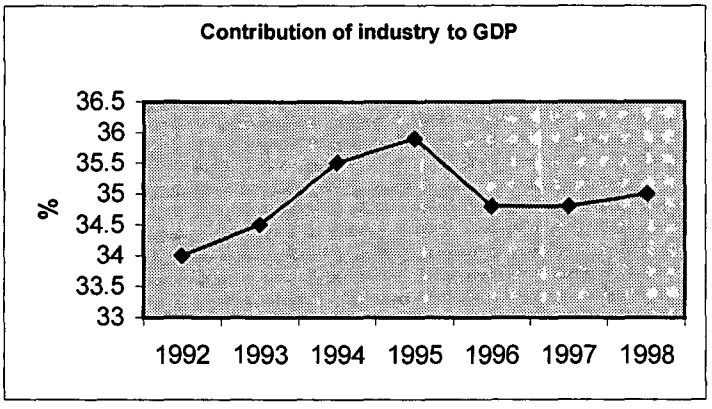
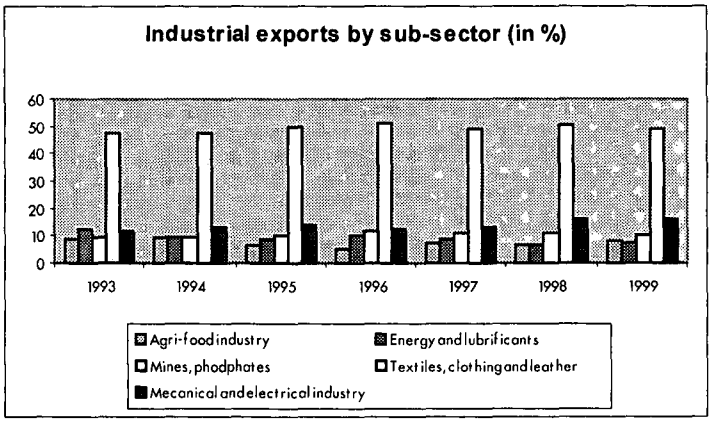


Figure 3: Industrial Exports by subsector



16. TURKEY

Industry and Sustainable Development in Turkey: Achievements and Prospects

Based on the report prepared by Mr. R. Sinan Erer

Executive Summary

I. Broad Trends in Sustainable Development in Turkey

Introduction of the concept of sustainable development has been highly influenced by international debate. The evolution of the sustainable development concept in Turkey can be observed through various indicators: strengthening institutional capacity, changes in the five-yearly development plans, changes in the policies of government institutions to adopt the concept, ratification of international conventions on environment, number of non-governmental organisations with sustainable development goals, private sector practices toward environmental protection measures, environmental standards introduced in various sectors of the economy.

Despite positive signs of adoption of the sustainable development concept, the economy has posed difficulties in its implementation. Being adversely affected by global crises and earthquakes, the Turkish economy has been facing a constant threat of instability, discouraging foreign and domestic investment. Although instant measures toward reversing this situation may neglect environmental concerns, thus posing serious risks on implementing sustainability, the well-established institutional capacity copes with and eliminates such risks in time. Increasing compulsoriness of Environmental Impact Assessment for investments is an important indication of this, as a measure of inhibiting diversions from the sustainable development goal while severe macro-economic instability prevails.

II. The Manufacturing Industry and Sustainable Development

Turkish industry mainly depends on the private sector. In the manufacturing industry, more than 80 per cent of production and about 95 per cent of gross fixed investment is realised by the private sector. The sectoral structure of the manufacturing industry is quite diversified. The food sector has the largest share in manufacturing industry production with 18.8 per cent, followed by textiles and clothing with 16.3 per cent, petroleum products with 8.8 per cent, iron-steel with 6.2 per cent, automotive with 5.8 per cent and chemical industry with 5.0 per cent. In manufacturing exports, food, textiles, ready-made garments and iron-steel products are the major sectors.

Privatization has been one of the major concerns in industry. The privatization of public enterprises in food, cement, electronics, automotive, textile and wood products sectors has been carried out. The public enterprises in iron and steel, oil refining, petrochemicals and paper sectors are in the scope of the privatization programme. There is also a considerable share of public enterprises in tobacco and beverages, chemicals, railway vehicles and defense industry sectors.

A general nation wide evaluation shows that small and medium enterprises occupy an important place in the economic and social fabric of the country, in terms of three important indicators including the number of enterprises, the number of employees and value added.

Small and Medium Size Enterprises (SMEs) account for 99.5 per cent of all industrial manufacturing enterprises. SMEs have a 61.1 per cent share of total employment in the manufacturing industry, with a share of 27.3 cent in value added created.

III. Policies Directed at the Development of Industry

Industrialization has been Turkey's main development strategy since the early days of the Republic. Starting with 1980, main features of the inward looking and interventionist development policies were abandoned and a new understanding of industrialisation was adopted.

One of the milestones in the new industrial policy starting in the 1980s was the entry into the Customs Union. Although it was expected that the competitive environment brought about by Customs Union would stimulate the market economy and lead to the rationalisation in production processes, the Asian crises, which shifted to the Russian market, affected Turkish exports severely, causing economic growth as well as imports to decrease. Besides this, an unfair competition atmosphere appeared against Turkey due to the establishment of Customs Union between EU and Turkey, as well as harmonisation problems. Turkish products could not benefit from funds allocated by EU for elimination of regional imbalances, improvement of infrastructure, solution of environmental problems, building up of research-development capacities, creation of employment or solution of some sectoral problems.

In view of experience in the Customs Union and the existing economic situation, current policies are geared toward integrating with the world market mainly via the private sector, having improved competitiveness and being export oriented, capable of utilisation of raw material and human resources in the most rational way. Product diversity will be continued while efforts will be increased to ensure qualified work power for industry, and develop research-development activities, products and technology. The "Industrial Strategy" Report prepared within the context of the "European Strategy for Turkey" as part of the Turkish National Programme toward the adoption of the EU "Acquis Communautaire" (the entire body of European laws that must be adopted by the accession countries to become full members of the European Union), outlines the sectoral targets as provision of support to enterprises to the competition environment, facilitation of access to the internal market, and facilitation of adoption of the Community's environmental legislation.

Pertinent measures of the Industrial Strategy are adoption of technical legislation, stimulation of investments for restructuring and modernisation of enterprises, development of infrastructures of support for companies, improvement of the financial environment, diversification and reinforcement of the industrial base, increasing the quality of human resources, and facilitation of adaptation to the EU Regulations.

The Turkish National Programme toward adoption of the EU "Acquis Communautaire" also puts targets for SMEs. Turkish Small and Medium Sized Enterprises will be encouraged to adapt to the Internal Market conditions of the EU, in accordance with the conditions existing in Turkey. Turkey will try to participate in the EU's "Fourth Multi-annual Programme for Enterprises and Entrepreneurship (2001-2005)". Through participation in the Programme the necessary alignment and implementation of legislation will be completed. The Multi-annual Programme will enable the SMEs of candidate countries and the SMEs of Turkey to participate in EU activities and this will be beneficial for SMEs in increasing their competitiveness within the EU market. Legislation will be introduced to establish mutual

benefits and greater reliability between the main and subsidiary industry, to provide mutual long-term cooperation between them, and to render the main and subsidiary industries more competitive.

IV. Policies Directed at Industrial Environmental Management

Environmental Impact Assessment reports can be considered as the major preventive measure particularly for the manufacturing industry. Ongoing efforts in increasing their efficiency have recently focused on harmonising with the EU "Acquis Communautaire", and developing the necessary infrastructure.

A positive effort of the Ministry is the voluntary agreements with the sub-sectors of the manufacturing industry, with a view to supporting and encouraging industrial enterprises to comply with environmental legislation.

Increasing public pressure and, more importantly, growing acceptance of the ISO 9000 and the upcoming ISO 14000 standards and international buyer-requested environmental protection specifications are becoming the most effective means of enforcement in Turkey. Additionally, the increasing presence of major international companies with sound environmental management policies in Turkey also plays an important role in improvement of environmental conditions.

With rising awareness and due to enforcement by various means, the majority of Turkish manufacturing companies have recently recognized that effective waste management is an integral part of their operations. Many Turkish companies have started to include the cost of environmental protection measures into their budgets. Management of waste generated by industrial facilities of all kinds has become a major issue in the day-to-day management of a majority of companies in Turkey.

Organized industrial zones, where several medium- and large-scale enterprises are located, are supported by the State in the cities. This enables industries to take common measures for waste disposal and wastewater treatment, which are compulsory to construction in each industrial zone.

Another environmental implication for the manufacturing industry is energy consumption. Energy consumption increased in the industrial sector from 8 million tonnes of oil equivalent (toe) in 1980 to 20 million toe in 1997. With the rising costs of energy and improvement in technologies, industrial enterprises are tending toward energy efficiency measures and programmes. The share of manufacturing in the total industrial sector remained almost the same between 1992 and 1997. Although their consequence on reduced natural resource use and decreased pollution impact are not yet expressed in monetary terms, energy efficiency programmes are certainly bringing economies at enterprise level. In this respect, the industrial sector is showing a significant concern for energy efficiency and saving.

V. Policies and Programmes Aimed at Technology Change, particularly EST

Technology Development Centres have been established on university campuses for the purpose of helping people trained in scientific and technological fields to become entrepreneurs, establishing new technology-based enterprises, supporting similar steps taken by existing SMEs, commercialisation of R&D efforts, development and diversification of

regional economic activities and strengthening university-industry cooperation. They operate as "Business Incubators" aiming to support technology-oriented development. However, these centres focused more on industrial development than on environmental soundness.

Within the context of a loan approved in 1999, the World Bank is supporting industrial technology development in Turkey. The project is aimed to assist Turkish firms in upgrading their technological capabilities and will help the country to harmonize its technology infrastructure with European Customs Union (ECU) standards. The loan is expected to contribute to the increased competitiveness of Turkish industry both in domestic as well as foreign markets.

Transfer of environmentally sound technologies can be said to be limited to the energy efficiency efforts of the industrial sector in Turkey. As noted earlier, this brings about an indirect but significant contribution to environmental pollution control and sustainable resource use. However, economics is usually the driving factor in having an industrial enterprise adopt such a practice.

VI. Experience With Integrated Policies and Programmes

Integrated policies are developed as a result of rising consciousness of government authorities as well as NGOs. Regional development projects are established on the basis of integrating various sectors of economic development, taking into account protection and conservation of natural and cultural resources, thereby the environment.

Integrated policies on industrial development and its sustainability implications are predominantly observed in the policies of the South-eastern Anatolian Region, commonly known as the GAP region, where a number of dams are built for hydropower generation and irrigation. Industrialisation is one of the priority policies for the GAP cities, based on sustainable development goals. Integration is aimed at the cross-sectoral level and among government authorities under the coordination of the GAP Regional Development Administration. GAP Administration is conducting sectoral analyses in cooperation and collaboration with Chambers of Trade and Industry and Associations.

The export oriented private industrial sector is well aware of the importance of environmental concerns in international trade, which has led to environmental awareness and improved environmental performance in industry. This cannot be said of publicly owned enterprises, many of whose facilities are obsolete while others are in the process of being privatised, nor of SMEs, which are primarily oriented to the internal market. The environmental awareness at the level of the private sector manifests itself in clear satisfaction with the regulatory framework, and clear dissatisfaction with the lack of enforcement, largely out of concern that this situation might have adverse effects on overall Turkish industrial export performance, allowing unfair competition between firms in compliance and those that are not.

VII. Major Obstacles in Enhancing the Contribution of Industry to Sustainable Development

As depicted above under Section IV, the environmental dimension of sustainable development is rather weak in terms of the contribution of the industrial sector. The major reason for this is the financial burden of waste treatment, recycling and environmentally sound technologies in the short term, furthered by decreased competitiveness due to increased

market prices. The state subsidies geared to encourage such environmental initiatives at industrial levels are not sufficient.

Another basic constraint to enhancing the role of industry in sustainable development is the lack of an information network whereby industry can have access to knowledge and services for tackling environmental issues. This requires the joint efforts of pertinent institutions encompassing governmental and non-governmental organisations to encourage and support the industrial enterprises.

Although R&D activities have been speeded up recent years, insufficient financial resources to support the manufacturing industry inhibited the acquisition of a structure capable of producing technology.

VIII. Priorities and Future Actions

As a component of sustainable development, the future for environmental investments which are cost-increasing but essential factors, lies with the requisite of harmonisation with EU regulations, as well as world wide competitiveness. The same holds for investments enhancing industrial production quality (renovation, modernisation, research-development). Another substantial need is the development of various information networks for eliminating lack of commercial information and making the administrative systems of firms more effective (international trade, modern administration information, trade mark, patent records, etc.). Therefore, social and environmental aspects of sustainable development enter into the agenda as consequences of competitiveness and international obligations.

Awareness arising on environmentally sound production, recycling and treatment technologies should be given with an approach of enabling and encouraging. The role of NGOs is particularly important in this process, especially to establish partnerships between the state and private sector enterprises. Existing information networks geared to provide support toward increasing competitiveness of industrial enterprises should also be linked to information centres and consultancy groups that can accomplish easy and cost-effective solutions to production, management and environmental problems. It is important to involve all pertinent stakeholders of a problem area.

17. VIETNAM

Vietnamese national industrial overview

Based on the report prepared by Dinh Van Sam (Team leader), Dr. Tran Hong Ha, Dr. Do Huu Hao, Dr. Tran Van Nhan, MSc. Hoang Thanh Nhan, Dr. Pham Khanh Toan, Mr. Le Minh Duc

Executive Summary

I. Broad Trends in Sustainable Development in Vietnam

During the 1980s, Vietnam experienced a serious economic recession as a consequence of multiple year wars, embargo and ineffective management. Since 1986, The Government of Vietnam has introduced the "Doi Moi" policy of renovation, the implementation of which has brought the country to a new era with fundamental and significant economic achievements.

From 1991 to 2000, the country's GDP grew by 7.5 per cent per year or 2.07 times, which brought Vietnam to the rank of regional economies with rapid growth rate during the 1990s. The country was also successful in reducing the rate of inflation. Whereas the consumer-price index increased by 67.5 per cent in 1990, this increase was only 0.1 per cent in 1999 and 0.6 per cent in 2000.

Total social investment compared to GDP rapidly increased from 15 per cent in 1991 to approximately 27 per cent in 1999. Per capita income increased from US$ 222 in 1991 to US$ 400 in 2000. Vietnam's Human Development Index went up from 0.472 in 1990 to 0.671 in 1999, bringing the country from the 121st to the 110th place in UNDP's Human Development Index amongst 174 countries.

Regarding poverty and income inequity, the GINI coefficient in the 1997 UNDP Report on Human Development, Vietnam ranked 33rd with the HPI of 16.2 per cent (as a sub-indicator to per capita income) amongst 78 developing countries. Recent surveys on income inequity among segments of the population revealed that Vietnam's GINI coefficient was 0.35 in 1994; 0.63 in 1996; and 0.39 in 1999. These show that income distribution among segments of the population has changed but still is inequitable.

Since 1993, donors have committed a total ODA of US$ 17.5 billion and US$ 1.2 billion to support Vietnam's economic reforms. From 1991 to 2000, FDI flows to Vietnam increased with permits granted to 2940 foreign investment projects with a total registered capital of US$ 37.3 billion, making up 20 to 30 per cent of its overall capital investment.

Having learnt environmental and ecological lessons from wars and from other countries in the region, Vietnam has also become aware of the effects on the environment caused by industrialization. However, as the country is still poor and facing immediate demanding challenges, the Government of Vietnam has decided to gradually tackle these increasingly important environmental issues.

II. The Manufacturing Industry and Sustainable Development

Vietnam's industrial production increased from VND 103.4 billion (1994 price) in 1995 to VND 200 billion in 2000, which means that the average annual increase was 14.5 per cent between 1991 and 2000. In comparison with the 1990 output, coal and crude oil outputs reached 10.8 million tonnes (or 2.3 fold) and 16.3 million tonnes (or six-fold) respectively; electricity was 26.6 billion kWh (or threefold); cement was 13.3 million tonnes (or 5.3 fold); steel was 1.7 million tonnes, or 16.5 times; chemical fertilizer was 1.3 million tonnes or 3.8 times higher. New products have entered the domestic market replacing imported ones, namely automobiles, motorcycles, refrigerators, washing machines, office equipment, printed circuits, telecommunication and informatics equipment. Export markets have been expanded not only to South East Asia, but also to fiercely competitive markets such as Japan, Europe and North America. Major industrial exports include crude oil, fisheries, shoes and garments.

The industrial share of the country's GDP increased from 19.8 per cent in 1991 to 36.6 per cent in 2000. Internally, positive structural changes in the industrial sector have initially created a rather solid industrial structure. The processing industry became a fast growing sector, representing 80.5 per cent of the overall industrial production value and 18.7 per cent of the country's GDP.

Within the industrial sector itself, several new key sub-sectors have emerged such as the oil and gas industry with its share of 11.2 per cent; food processing and brewing - 20.1 per cent; textiles, tannery and shoes and garments - 12.4 per cent; chemicals, rubber and plastics - 9.6 per cent. In addition, high-tech industrial sub-sectors have been established and developed such as automobile, precision engineering and electronic and telecommunication industries. Contributions to the country's GDP by the construction industry and service sectors were 23.5 per cent and 36 per cent in 1999 and increased to 36.6 per cent and 39.1 per cent respectively, while the combined contribution of the forestry and fishery sectors was 24.3 per cent.

The share of the ndustrial sector from FDI flows grew from 10 per cent in 1990 to 32 per cent in 1998 and to about 35 per cent in 2000. This resulted in the share of industrial production in the domestic sector decreasing from 90 per cent in 1990 to 68 per cent in 1998 and an estimated 64 per cent in 2000.

From 1991 to 1999, the number of employees working in industries increased by more than 660,000. The number of labourers working in household owned industries increased by 433,000; in private and shared industries - 303,000; in foreign capital owned industrial sector - 284,000 employees; while in the collective sector the number was reduced by 375,000.

The value of fixed assets in industrial sectors was at VND 181,500 billion in 1999, or 2.59 times higher than that of 1995. On an average, this value increased by 27 per cent per year, and accounted for 59 per cent of gross property value of the overall national economy.

The State-Owned Enterprises (SOEs) Sector produces a large proportion of major products. These include electricity (100 per cent), coal (97 per cent), fertilizer (95 per cent), pesticides (90 per cent); cement (71 per cent), cane sugar (75 per cent); beverages (71 per cent); tobacco (99 per cent), fibres (92 per cent), textiles (47 per cent); paper (65 per cent), and steel (43 per cent).

The Foreign Capital-Owned Industry Sector is a fast growing sector in terms of the number of enterprises and the volume of capital investment flows. Its output grew by 22.5 per cent per year (while annual growth rates of SOEs and private enterprises were 11.4 per cent and 11.0 per cent respectively). New and high value products including oil and gas, automobiles, motor cycles, luxury home appliances, electronic and telecommunication products are primarily produced by this sector, which plays an important role in the production of export goods.

The Small and Medium Sized Enterprise (SMEs) Sector is mostly run by the collective economy sector with a small share of overall industrial production. The sector has experienced an unstable and inefficient development in the past and the rate of rehabilitation is slow. While privately owned enterprises only contribute a share of 21.7 per cent to the value of industrial production, they employ 61 per cent of the labour force and own 11.4 per cent of the total capital investment. This sectoral development has been encouraged through the establishment of limited liabilities and/or joint stock companies.

Industrial Parks (IPs) and Export Promotion Zones have been established. The first EPZ was established in Vietnam in 1991. By June 1999, there were 66 IPs established, including three EPZs, and one Hi-tech Park in 27 cities and provinces across the country. Out of 66 zones, there are 15 parks established based on the already existing operational industrial areas; 30 small sized parks and 20 new ones that meet international standards (including 13 joint ventures and/or 100 per cent foreign capital owned estates).

III. Policies Directed at the Development of Industry

Vietnam's macro-economic and sectoral policies are shaped by broad-based consensus during the Congress of the Communist Party, which convenes every five years. The Sixth Communist Party Congress in 1986 is recognized as a landmark in policy reform in an effort to reduce poverty. The Seventh Party Congress of 1991 launched the Socio-Economic Stabilization and Development (1991-2000) initiative. Sustainable development has been emphasized in these policies and economic, social and environmental issues have been given equal priority. In 1999, the Ministry of Planning and Investment was requested to formulate a "Socio-Economic Development Strategy to the Horizon 2010", in preparation of the Ninth Party Congress of 2001. Industrial development viewpoints, objectives and policies are highlighted in the Strategy.

The Strategy pegs future economic progress to perfecting *a socialist-oriented market economy.* It defines socialist-oriented market economy "a multi-sector commodity economy operating under the market mechanism, with State management and along the socialist line. It contains many forms of ownership and economic sectors in which the State economic sector assumes the leading role. The State manages the economy by means of laws, strategies, schemes, plans and policies, while the State utilizes the market mechanism and applies economic forms and managerial methods of the market economy to activate production and release productive forces."

The overriding goal of the Strategy is to develop Vietnam into an industrial nation by 2020, based on two main objectives. The first is a continuation of the decisive drive towards export-oriented manufacturing, while recognizing however the potential contribution of economic activities aimed at the domestic market as long as they are made to operate in an open trading environment. The second is to gradually develop selective basic industrial sectors with essential and key products.

The Strategy builds upon an honest assessment of the failures of the past, and the challenges of the future. Among future priorities are the promotion of agricultural product processing industry combined with the expansion of agricultural, forestry and fishery raw material utilization; labour intensive industries of consumer and export goods, and handicrafts; profitable and competitive industries; and modern and high-tech industrial infrastructure for various sectors such as energy, petro-chemistry, chemistry, electronics, software, metallurgy, mechanics and machinery building.

Regarding solutions, emphasis has been placed on fostering further liberalization of SOEs, improvement of investment policies and reaffirming the positive role of the private sector. Most recently on 23 November 2001, the Government promulgated a landmark "Decree on Supporting for Development of SMEs" (90/2001/CP-ND). Future policy reforms are expected to provide SMEs with access to financial sources and/or credits, market information, transfer of technology and training. Finally, the policy on industrial raw materials should focus on planning a stable raw material supply to be integrated with industrial location and providing technical support to improve raw material quality and performance.

IV. Policies Directed at Industrial Environmental Management

The viewpoint on environmental protection and sustainable development was first reflected in the "National Conservation Strategy" in 1988. The Government adopted the "National Plan for Environment and Sustainable Development" in 1999. This Plan advanced various action programmes on 1) natural resource conservation and rehabilitation; 2) urban and industrial pollution control; and 3) enhancement of the institutional framework of environmental planning, management and protection. Following the strategy, a large number of industrial environment related policies have been promulgated.

In institutional terms, there are the National Environment Agency (NEA) at the central level and Departments of Science, Technology and Environment (DOSTEs) at the provincial level, industrial environmental management units in the Ministry of Industry and industry corporations. However, industrial environmental institutional capacity should be strengthened by creating more specialized units in charge of industrial environmental management at relevant line ministries and agencies, IPs and EPZs.

Since the introduction of the Law on Environmental Protection in 1994, the Prime Minister has enacted 14 decrees, decisions and directives that are related to industrial environmental management. In this regard, the preparation of environmental impact assessments (EIA) for new development projects and existing industries at the micro level has been strongly strengthened and this has positively contributed to environmental protection at both central and provincial levels of government. Although the requirement for EIAs at macro level industrial development programmes and projects has been introduced, it is not widely applied.

Environmental control and inspection including solid, liquid and gaseous waste control, certification of pollution control among industries, inspections and handling of violations against environmental laws and regulations have been strengthened and have successfully prevented and put many environmental problems under control. Economic instruments are under consideration for inclusion into environmental quality management, and environmental crime is included in the Criminal Code, a situation that has improved environmental awareness and compliance amongst industrialists.

In 1994, the Ministry of Science Technology and Environment established a national network of environmental monitoring and analysis. The network expanded from five monitoring stations in 1994 to eight stations in 1995; 14 stations in 1997; 17 stations in 1998; and 19 stations in 1999. The quality of environmental monitoring has improved with the formulation of standardized procedures.

The Government has funded a master plan for industrial environmental protection, an industrial pollution prevention policy, a cleaner production programme, amongst others. Also, it funds environmental management, investigation and research activities. However, these investments are still limited if compared to the total needs for environmental protection, particularly at local level.

V. Policies and Programmes Aimed at Technology Change, particularly EST

During the 1980s, Vietnam's technology was 30 to 50 years behind that of the rest of the world. Low technology deployment was a major obstacle to effective development. Since the introduction of the "open-door" policy, a wider range of new policies have been developed and given priority to attract both investment and transfer of advanced technologies to support national industrial reforms.

From 1990 to 2000, the total investment capital was VND 700,000 billion, or 27per cent of the country's GDP. This amount was primarily invested in infrastructure development such as transportation, energy and telecommunication to create the infrastructure for industrial development. However, this capital met only 40 to 50 per cent of all development requirements. The Government of Vietnam has tried its best to maintain Vietnam as a "destination" for foreign investors by improving its investment policy, simplifying administrative and banking procedures, and providing foreign investors with more preferential conditions. At the same time, incentives have been developed to encourage import of new and environmentally sound technologies (EST) and discourage transfer of polluting technologies.

The Government of Vietnam has included technical assistance and transfer of technology as priority issues into various bilateral cooperative agreements, such as the energy cooperation programme with Russia and a software cooperation programme with India. Special mention should be made of the Hoa Lac Hi-tech Park construction programme with Japan and the Republic of Korea. The Government established this Hi-tech park in 1998. The park is considered an "incubator" to develop technological breakthroughs with the goal of developing national technological capabilities in the future, and as a "gate" for the transfer of new technologies. In addition, the Government since 2000 has funded a programme on research and development capacity building. The programme focuses on constructing national key laboratories, and Vietnamese experts have been sent to developed countries to pursue further studies and technical training.

In 1998, a project for a "Vietnam Cleaner Production Centre", 1998-2003, started with financial assistance of US$ 2.5 million provided by the Swiss Government through UNIDO/UNEP. The project aims at national cleaner production capacity building and initial progress has been made in improving production technology and formulating a national cleaner production promotion policy and strategy.

Prior to 1993, Official Development Assistance (ODA) mainly came from the Commission of Mutual Economic Assistance (CMEA) and the former Soviet Union. At that time Vietnam received around Russian Ruble 12.6 billion. Many CMEA and USSR funded projects produced positive effects on the country's economic and industrial developmens. However, at that time, sustainable development was not a concern.

VI. Experience with Integrated Policies and Programmes

Being aware that sustainable development of the country is an objective, Vietnam has, in the past 15 years, developed and completed five national environmental strategies. Sustainable development has been explicitly integrated into national economic and policy reforms and environmental institutional development, thus providing a vision how the country could pursue sustainable industrial development.

Indeed, environmental strategies have positively impacted on policy makers in making decisions on national economic development and technological innovation programmes and projects. The integration of social and environmental considerations with economic and industrial development decisions is not easy, but is essential where public awareness is still low and resources are limited.

VII. Major Constraints and Obstacles in Enhancing the Contribution of Industry to Sustainable Development

Two major obstacles can be identified in this regard. First, a less developed economy is a major obstacle that deters a country from pursuing sustainable development. Environmental protection and sustainable development are neglected when a country confronts many vital and essential needs to be immediately tackled. Second, an obsolete technology based industry is another major obstacle that limits industry's contribution to the economy, society and environmental protection of the country.

VIII. Priorities and Future Actions

Social equity is a traditional objective that Vietnamese society pursues. Many practical lessons drawn from the country and the world have shown that growth itself is not enough to ensure equitable sharing of its products and improvement in social services. The 1998-1999 Asian financial crisis has made Vietnamese leaders acutely aware that the concepts of rapid development and sustainable development must be clarified. In response to these requirements, a wide range of policy initiatives has been developed and supplemented.

The major challenges ahead are to promote Vietnam's economic and industrial developments in terms of scale and rate in incoming years, otherwise it may lag behind in the process of global integration. Meanwhile, there are many constraints including poorly developed infrastructure, high incidence of poverty, high population pressure, incomplete operational mechanisms, lack of investment capital and low technological level.

Vietnam must also compete for FDI while struggling against inflows of obsolete technologies, wastes and ecological invasion, and even social crimes and consumption patterns from outside. In principle, while a socio-economic and environmental linkage is the unifying factor, serious conflicts between these issues are likely to be caused in a poor country where there are so many urgent needs to be tackled daily.

Table 1: Index industrial gross output at constant 1994 prices by ownership (Previous year = 100)

	Total	Of which		
		State economic sector	Non state economic sector	Foreign invested sector
1991	110.4	106.2	107.4	145.6
1992	117.1	116.1	109.4	140.3
1993	112.7	114.8	108.1	113.6
1994	113.7	115.2	111.3	112.8
1995	114.5	114.9	116.9	108.8
1996	114.1	111.6	111.5	121.7
1997	113.8	110.8	109.5	123.2
1998	112.5	107.7	107.5	124.4
1999	111.6	105.4	110.9	121.0
2000	115.7	112.1	118.3	118.6
Average index industrial gross output per year				
1991-1995	113.7	113.4	110.6	123.3
1996-2000	113.5	109.5	111.5	121.8
1991-2000	113.6	111.4	111.0	122.5

Source: Statistical Yearbook 2000 of Vietnam

Table 2: Index industrial Gross output at constant 1994 prices by industrial activity (Previous year = 100)

(%)

	1991	1992	1993	1994	1995
Total	***110.4***	***117.1***	***112.7***	***113.7***	***114.5***
Electricity	105.2	105.5	110.4	115.3	119.1
Fuel	138.0	138.4	112.9	113.6	110.3
Manufacture of ferrous metal	156.7	115.0	133.3	104.1	135.3
Manufacture of non-ferrous metal	133.1	144.6	106.3	80.0	112.0
Manufacture of machinery and equipment	97.9	112.6	115.8	114.0	111.2
Electrical Technology	102.1	108.3	136.0	120.4	107.6
Manufacture of non metallic	97.6	105.1	109.5	133.6	120.6
Chemical	121.2	121.4	119.6	122.8	115.3
Constructive material	116.4	118.7	115.5	122.4	115.8
Manufacture of wood & wood products	104.5	101.9	100.2	131.3	129.5
Manufacture of cellulose & paper products	93.7	115.7	110.5	118.2	128.6
Porcelain and glass	122.2	114.7	116.2	117.7	108.8
Manufacture of rations	107.4	112.3	99.7	139.6	112.6
Manufacture of Food	106.5	114.3	112.4	100.8	112.7
Textiles	101.1	111.5	101.0	113.3	100.4
Manufacture of wearing apparel	112.3	121.9	139.8	143.8	131.3
Leather ,& manufacture of leather products	64.0	136.5	160.8	161.2	190.6
Printing	111.5	117.9	118.9	158.9	133.5
Other	95.4	107.8	108.6	108.6	95.2

Source: Statistical Yearbook 2000 of Vietnam

18. ZIMBABWE

Industry and Sustainable Development in Zimbabwe – Achievements and Prospects

Based on the report prepared by Mr. Romeo Guarjena, SIRDC

Executive Summary

I. Broad Trends in Sustainable Development in Zimbabwe

Zimbabwe, one of the Southern African Development Community (SADC) countries, covers an area of 390,757 sq.km. and has a population of 12.4 million, growing at a rate of 3 per cent at the time of the 1992 census; the very high rates of AIDS infection may however halt or even reverse population growth. Zimbabwe is rich in mineral resources (coal, gold, copper, nickel, tin, clay, etc.), and the mining sector makes a major contribution to the economy.

Zimbabwe's GDP (at purchasing power parity) was US$ 28 billion in 2000, a decrease by 6 per cent over the previous year. Inflation rose from an annual rate of 32 per cent in 1998 to 60 percent in 2000. Inadequate management of the economy and inefficient public sector firms are major problems, but economic performance is also negatively influenced by worsening terms of trade for mining and basic metal exports, involvement in the war in Congo and the AIDS epidemic. Services are the dominant economic sector, accounting for 40 per cent of GDP, followed by industry and mining (32 per cent) and agriculture (28 per cent – the figures may underestimate the importance of traditional farming on which statistics are not complete).

Although post-independence growth-with-equity policies resulted in major advances in some social and environmental fields - sanitation facilities, for example, were improved in 51 per cent of the rural areas and 98 per cent of the urban areas, and literacy levels are high – progress has stagnated as a consequence of economic and political problems. Per capita income in 1999 was US$ 530, unemployment is estimated at 50 per cent and 60 per cent of the population lives below poverty line (75 per cent in rural areas).

The Government has identified the following key environmental issues:

- Poverty and its attendant impact on ecosystems (the unsolved land issue contributes to overcrowding of subsistence farmers on poor soils and hence to deforestation, soil erosion and the destruction of natural habitats);
- Atmospheric pollution due to industrialization, urbanization and other factors;
- Water scarcity due to droughts and irregular rainfalls, and ineffective water management measures.

II. The Manufacturing Industry and Sustainable Development

Manufacturing contributes about 15 per cent to GDP, a high share by African standards. But the performance of the manufacturing sector has slumped: in 1980, its share was 21 per cent and per capita MVA, while still much higher than the African average, has decreased by an annual average of 3.4 per cent during the past decade. Structural change has been very limited since the 1980s. In 1998, the agro-processing industries accounted for 34 per cent of MVA, followed by textile and clothing (12 per cent), chemicals (10 per cent) and iron and steel (8 per cent) (Table 1).

During the year 2000, manufactured exports accounted for 20 per cent of total export revenue whilst minerals and agricultural products accounted for 24 per cent. There is an urgent need to increase the share of high value-added industrial goods in exports to improve the country's economic performance.

The formal manufacturing sector employs 17 per cent of the formal labour force (over 200,000 people) in approximately 40,000 enterprises. Most of these are SMEs with 5-100 employees. Women constitute 7 per cent of those employed in the manufacturing sector. About 45 per cent of Zimbabwe's industry is located in or near the capital city of Harare; the remainder is widely distributed.

Safety, health and environment (SHE) policies are mainly found in transnational corporations. Firms that target export markets are increasingly adopting ISO 14000 standards. The very high proportion of SMEs in the manufacturing sector, however, is a cause for concern, as these firms usually pay little attention to pollution and input waste, and do not have the know-how and financial resources for cleaner production measures. Coal continues to be the major energy source and of air pollution.

III. Policies Directed at the Development of Industry

Since independence, Zimbabwe has promoted indigenous entrepreneurship, and after 1991 a number of public enterprises were privatized. Organizations such as Indigenous Business Development Centre (IBDC) and the Indigenous Business Women's Organisation (IBWO) promote entrepreneurship for women and other disadvantaged groups, helping them to secure loans, etc. But indigenous manufacturing activities remain limited due to skill and technological constraints. By the mid-1990s indigenous Zimbabwean entrepreneurs controlled only 5 per cent of total investment – in spite of restrictions on foreign investment in, among others, agro-processing. Non-indigenous local entrepreneurs controlled another 20 per cent.

Zimbabwe executed an Economic Structural Adjustment Programme (ESAP) from 1990-1995. The measures that were to be implemented were:

- Privatization of loss-making parastatals and reduction of recurrent expenditure;
- Reduction of the Government's fiscal deficit;
- Price adjustments in the energy sector (oil and electricity);
- Deregulation.

While ESAP did not directly address manufacturing, the sector declined as domestic demand stagnated while competition from imports increased. Because of serious flaws in the government's management of ESAP and the sequencing of policy instruments, and the absence of coherent policies for production growth, ESAP failed to make the economy more efficient and competitive.

In 1999, an industrialization policy was presented. A task force of the National Economic Consultative Forum, on which both the public and private sectors are represented, had prepared it. The main feature was a cluster initiative aimed at sub-sectors that would have a critical development impact on the economy. The Confederation of Zimbabwe Industries (CZI), the umbrella body of manufacturers, was given the task to lead the industrialization

drive. Work on the implementation was suspended in May 2000 after the World Bank, which had agreed to fund the programme, cancelled all economic aid to Zimbabwe.

The institutional framework to promote manufacturing includes:

- ZimTrade, a non-profit government organization that has initiated programmes for SMEs in the export-oriented industries. These start-ups are considered a vital component of its export development and promotion agenda, and should help to pave the way to regional and sub-regional economic integration.

- The Export Processing Zones (EPZ) Authority. Investment approvals include a 90 per cent local resource utilization requirement. The Authority also encourages the establishment of industry clusters.

- The Zimbabwe Investment Centre (ZIC), whose main mandate is to promote domestic and foreign investment and international trade. But ZIC is also making an effort to bring the informal sector into the mainstream of the economy.

To remove financial constraints, the Government has approved the establishment of micro-finance schemes for SME. The majority of micro-finance institutions are international NGO's, local NGO's and private companies. Financial resources will however remain limited as a consequence of macro-economic instability, low foreign direct investment and limited foreign assistance.

IV. Policies Directed at Industrial Environmental Management

Environmental policy began with the establishment of the Ministry of Environment and Tourism (MET) and the publication of the National Conservation Strategy (NCS) in 1987. The NCS, however, is hardly referred to in development plans and is not seen as a strategy that has a link to development issues.

The 1996 Southern African Development Community (SADC) Policy and Strategy for Environment and Sustainable Development may be of greater political importance. It provides the basis of implementing Agenda 21 in the Southern Africa context. The goals of the policy include: supporting regional economic development on an equitable and sustainable basis for the benefit of present and future generations; and protecting and improving the health, environment and livelihoods of the people in southern Africa, with priority to the poor majority.

Examples of concrete activities include the Protocol on Shared Water Course Systems, which is to reduce the pollution loads from energy and industrial activities from states in the Zambesi River basin. The Zambezi River Authority is implementing a strategy to this purpose in Zimbabwe and Zambia.

SADC has also initiated environmental impact assessment (EIA) training to build up relevant capacity. The EIA process as set out in Zimbabwe's recently drafted Environmental Management Bill, which has been submitted for government consideration, seeks to integrate the three dimensions of sustainable development. No project, programme or policy is to be implemented unless an environmental impact assessment has been undertaken.

Command-and-control regulations have dominated environmental legislation since the early days, but they are poorly enforced, fines are too low to be deterrent, and they do not reflect the environmental damage. Nor do these regulations encourage the assimilation of clean technologies. The CZI and the Scientific and Industrial Research and Development Centre (SIRDC – see below) have suggested a mixed system to the Government: less command and control and more economic incentives. Although the adoption of standards is still voluntary and customer driven, an increasing number of companies have registered with CZI as meeting ISO standards.

Zimbabwe is signatory to a number of international environmental related conventions, such as those on climate change and the ozone layer, of and SADC protocols such as the Environment Land Management System (ELMS), which contain provisions relevant to economic development. The country therefore acknowledges that some environmental problems are global and regional in nature, requiring concerted efforts. But capacities for the implementation of activities under these conventions or in the context of the national Agenda 21 are very limited, and there is a lack of knowledge and awareness among government agencies, private sector and the general public

V. Policies and Programmes Aimed at Technology Change, particularly EST

Zimbabwe established a National Cleaner Production Centre (NCPC) with UNIDO and UNEP assistance in 1995. About 20 cleaner production assessments have been executed, awareness raising and training workshops were organized and a start has been made in building local capacity for conducting cleaner production assessments. In 1997, UNIDO also initiated a project for tannery pollution control.

The Germany Agency for Technical Co-operation (GTZ) and CZI are implementing an Environmental Conscious Manufacturing (ECOM) project in nine selected industries. It is estimated that environment-related production losses in companies amount to 1-2 per cent of GDP. Branches represented in the project include food, chemicals and pulp and paper.

A UNEP demonstration project on strategies and mechanisms for cleaner production investments was implemented in 1999. The project particularly focused on more effective interaction between the financial and manufacturing sectors.

The issues addressed by the NCPC were also taken up the Cleaner Production Technology (CPT) project, a bi-lateral project with Denmark, with SIRDC, the NCPC and the Danish Technological Institute as partners. The project ran from April 1999 to January 2002 and carried out over 40 environmental audits in enterprises representing a wide range of industries with environmental problems.

Another major objective of this project was to assist the Ministry of Environment and Technology (MET) in developing a national strategy on CPT, and train national staff in undertaking environmental audits and proposals for CPT implementation. This national strategy will be part of a science and technology policy which the Government has begun drafting in consultation with CZI. The policy is to promote national scientific and technological self-reliance and ensure:

- Environmentally sound development programmes.
- Adequate food production and shelter.

- Faster, sustainable industrialization.
- Higher employment rates.

SIRDC will provide institutional support to the development of the policy. Its objectives include:

- The transfer and demonstration of new technologies.
- Assisting enterprises in adopting cleaner technologies;
- R & D to adapt technologies to local conditions and to avoid (environmentally) inappropriate or expensive technology transfers;
- Research into the industrial utilization of local raw materials.

VI. Experience with Integrated Policies and Programmes

There is no experience with integrated policies and programmes yet. It has already been pointed out that the new Environmental Management Bill seeks to integrate economic, social and environmental development issues. But the Bill has not come into force yet. It will be the role of MET to facilitate co-ordination and integration of environmental issues across sectors, departments and agencies and to balance interests.

Recent measures show signs of an increasing understanding of the need to integrate environmental and economic aspects of development. The Central Statistics Office, for example, intends to integrate sustainable development indicators into the national statistics; this could stimulate a greater awareness of the links between economic, social and environmental factors in development. In the water sector, a penalty is levied for water use in excess of $300m^3$, encouraging recycling. Tariffs based on the cost of energy and water supply contribute to the conservation and sustainable development. Carbon taxes were introduced recently on the transport sector.

VII. Major Constraints and Obstacles in Enhancing the Contribution of Industry to Sustainable Development

The current economic situation has a serious impact on the manufacturing sector. Cash flow difficulties and the chronic shortage of foreign exchange are compounding shortages of imported inputs, fuel and spare parts for the ageing machinery with which many factories are equipped.

Under such circumstances, environmental issues – which were not a major concern of most enterprises in the first place – tend to be ignored. The very large share of small firms in manufacturing, which are usually those worst hit in these circumstances and which have little know-how or resources to deal with environmental issues, compounds the problem.

At a more general level, there is little pressure on the manufacturing sector to reduce pollution levels because of the lack of knowledge and awareness among government agencies and the general public.

VIII. Priorities and Future Actions

Sustainability implies a long-term perspective and returns on investment in a distant future. This may clash with short-term economic imperatives: a country like Zimbabwe may feel it

cannot afford the opportunity costs involved. For a developing country, the two dimensions of sustainable development that have obvious priority are the social and economic aspects. This is the basic reason why the new Environmental Management Bill has not yet become effective.

But without immediate attention to the environmental aspects of development, gains made in the other fields may be lost through increased public health costs, loss of exports markets which are becoming increasingly "greener" and destruction of key natural resources, such as clean water. The Government should therefore take steps to achieve the following:

- Implement the Environmental Management Bill;
- Strengthen the institutional capacity for sustainable development planning and economic management;
- Promote awareness of ESID in the industrial sector and the wide diffusion of the results of the EST transfer projects, building on the experience and using the institutional infrastructure of the earlier cleaner production projects;
- Follow up the suggestions made by CZI/SIRDC for a better mix of controls and incentives to encourage environmental management at the enterprise level.
- Develop an ESID strategy specifically focusing on small formal and informal sector enterprises;
- Promote "green labeling" in a new manufactured exports drive.

Table 1. Average Annual Growth Rates- Value Added Per Capita

SECTOR (ISIC)	Currency = USD				Average annual growth rate (%) of:		
	Value added per employee at current prices		Wages and Salaries per employee at current prices		Value added at 1990 prices	Employment	Value added per employee
	1985	1998	1985	1998	1985-1999	1985 - 1999	1985 - 1999
TOTAL MANUFACTURING	12602	139733	5224	40018			
311 Food products	7639	136598	4993	40524	0.74	-1.74	2.35
313 Beverages							
314 Tobacco	20786	25761	5071	47401	1.93	-2.10	4.61
321 Textiles	8761	119052	3694	27321	-7.43	-2.19	-5.23
323 Leather Product	7375	55550	3750	30212	-1.23	0.34	-1.55
332 Furniture	6026	72288	3051	24316	3.49	3.80	0.64
341 Paper and products	13378	110145	6933	44782	2.4	-0.41	3.72
342 Printing & publishing	18125	130554	8675	60896	2.4	1.72	1.10
351 Industrial chemicals	38162	32093	8970	8083	1.21	6.31	-5.93
353 Petroleum refineries	37174	...a/	8739	...a/	1.21	4.35	-4.71
352 Other chemicals	26660	224453	8340	84817	1.21	0.660	0.93
354 Misc. petroleum products	38177	..a/	8975	../a	23.24	5.92c/	-18.01/c
362 Glass & products	14800	72309	8400	49603	2.54	4.68	-1.66
369 Other non-metallic mineral products	9347	176745	5347	42058	2.54	2.18	0.74
371 Iron & steel	12397	157204	7199	45142	-1.76	-1.66	0.33
372 Non-ferrous metals	14200	146805	4400	35813	-1.76	1.23	-2.53
381 Fabricated metal products	9580	104264	5214	44036	-1.76	-0.21	-1.13
382 Machinery except electrical	11767	105150	5200	39918	-1.76	-1.19	-0.14
384 Transport equipment	13241	128309	6552	51840	3.10	-1.41	6.12
385 Professional & scientific equipment	18000	144861	8000	29506	-3.26	6.32	-8.59
390 Other manufactured goods	8278	44178	4222	17859	-3.26	4.16	-7.09

IV. REGIONAL INDUSTRIAL INFORMATION

1. THE CHALLENGES OF SUSTAINABLE INDUSTRIAL DEVELOPMENT IN AFRICA

Based on the report prepared by Desta Mebratu (PhD)

Executive Summary

I. Introduction

The positive contribution of industry to the social and economic dimension of sustainability often does not receive sufficient attention, nor is credit given to industry for the progress made in addressing the negative environmental consequences of industrialization. In order to ensure that the essential contributions of industry is recognized at the WSSD, UNIDO has supported countries, United Nations regional commissions and NGOs in preparing their reports for the Summit. Africa is one of the regions where UNIDO has been actively engaged in promoting industrial development.

UNIDO has supported the African preparatory process by providing support at two levels. At the national level, UNIDO has supported eight African countries (Cameroon, Cote d'Ivoire, Egypt, Ethiopia, Nigeria, Sudan, Tunisia and Zimbabwe) in preparing country reports that reviewed the contribution of industry to sustainable development.

At the regional level, UNIDO has commissioned the preparation of a regional report based on an assessment of the major policy and operational aspects of sustainable industrial development in the region. This is a summary of that report.

II. Industrial development in Africa

Despite the numerous international and regional initiatives and interventions that have been made, Africa as a region has continued to show negative economic growth over the past two decades It is true that the recent economic recovery in Africa that began in 1994 has given grounds for renewed optimism both within and outside the region. The recovery, however, is fragile and its sustainability is in question because not only has it not been underpinned by a strong investment performance, but also it has been highly vulnerable to external shocks, including weather and the terms of trade. One of the major reasons for the failure of African economic growth is the poor performance of the manufacturing sector.

There has been no significant industrial growth and structural change in Africa over the past two decades (Tables 1&2). Average regional annual growth was only 0.6 per cent since 1990 (while the population growth rate for the same period averaged 3 per cent) and the share of manufacturing in GDP averaged only about 11 per cent in the 1990s. The industrial sector is characterized also by a low level of capacity utilization (30-50 per cent on average), and by extreme dependence on foreign inputs, expertise and exchange. The sector's contribution to employment growth is also very low.

The African manufacturing sector contributes only about 1 per cent to the world industrial output (Table 3). Even that small contribution comes mainly from 12 out of 53 African countries, which more or less possess a relatively diversified industrial base. The remaining 41 countries contributed only 28 per cent of the region's manufacturing value-added.

In general, it can be concluded that – in contrast to many countries in Asia and Latin America - the contribution of the manufacturing sector for sustainable development in Africa has so far been minimal (Table 4). There is even a danger that the slowdown in industrial growth in Africa, associated with slightly declining rates of growth in GDP, may turn into a de-industrialization process. In view of the central role that the manufacturing industry can play in achieving sustainable development objectives, African governments and their international partners should make more efforts to stimulate sustainable manufacturing growth.

III. Policies directed at the development of industry

Three major groups of strategies have influenced national industrial development policies in Africa over the last decades. The first group consists of strategies adopted and promoted by the UN agencies using the development decade concept. In parallel with these UN initiatives, there have been a number of regional initiatives promoted by the Economic Commission for Africa (ECA) and the Organization of African Unity (OAU). The regional development initiatives were guided by the principles of the Lagos Plan of Action (LPA), adopted by the Summit of African Heads of States in 1980. The third major group of initiatives were the interventions by the World Bank and the International Monetary Fund (IMF) in economic policy making in African countries.

Although these initiatives had limited success in terms of promoting industrial development, they provide a basis for understanding what kind of policy interventions do *not* work in the region. The following are some of the major lessons that can be drawn from them:

- Limited effects of supply-driven initiatives: the development and promotion of 'supply-driven' and 'top-heavy' regional initiatives in the absence of appropriate mechanisms, infrastructure foundations and a sense of ownership at the national level has limited the possibility of success.
- Transforming is more effective than transplanting: attempts to bring about industrial development through the promotion of economic reform packages using a 'one-fits-all' model have limited success.
- Complementary role of markets and governments: successful industrialization in other regions over the last few decades shows that government intervention should support market trends and competitive forces and should facilitate change.
- Industrial competitiveness as the key factor: Success in economic development depends on a country's ability to break into the virtuous circle of investment-economic growth-competitiveness-investment.
- Infrastructure prerequisites for regional integration: in the context of regional integration efforts, member states should focus on creating the necessary infrastructure to widen industrial cooperation and inter-African trade.
- Strengthening the entrepreneurial base: the key to any kind of industrial transformation is entrepreneurial capacity, and human capital in general. In this context, major efforts are urgently needed to mobilize the great entrepreneurial potential of the informal and small-scale sectors through know-how transfers and other support measures.

In the past, most of the regional initiatives developed by African governments paid limited attention to local and global dynamics. The recent development initiatives that are promoted by multilateral organizations seem to accommodate some of the lessons discussed above.

IV. Policies directed at industrial environmental management

Most African countries have taken measures to create a legal and institutional framework for environmental protection. This includes the establishment of national environmental ministries or authorities for environmental protection, issuing environmental standards and regulations, and the establishment of national secretariats for the major global conventions and treaties. Most countries are developing national institutional capacities for effective monitoring and implementation of environmental programmes.

A number of African countries have introduced mechanisms that would require a more or less stringent environmental impact assessment of new industrial projects. Some are in the process of developing national environmental policies and strategies specifically focusing on the industry sector. The most notable effort is Ethiopia's 'Ecologically sustainable industrial development (ESID)' project, implemented by UNIDO in collaboration with the Environmental Protection Authority of Ethiopia. Similar initiatives are under consideration in other African countries.

V. Policies and Programmes Aimed at Technology Change, particularly ESTs

Chapter 34 of Agenda 21 identified the following two levels of global cooperation for the transfer of environmentally sound technologies to developing countries:

- Promoting, facilitating and financing the access to and the transfer of environmentally sound technologies and corresponding know-how;
- Supporting endogenous capacity building, so that these countries can access, adopt, manage and apply environmentally sound technologies.

Efforts have been made over the past decade to develop national capacities for the transfer of environmentally sound technologies. The most notable ones are the establishment of cleaner production centres and the development of projects on improving energy efficiency in African industries. Although the achievements were important, the programmes are still very much limited to implementation of good house keeping and production practices. Due to lack of financing for the transfer of the required technologies, the wider development opportunities that cleaner production and efficient energy use provide have so far not been exploited.

VI. Experience with integrated policies and programmes supported by UNIDO

The basis for UNIDO's focus on Africa is integrated programmes for technical cooperation incorporating a wide range of activities. The programmes are based on the premise that a development issue must be addressed in its various dimensions. Currently, UNIDO has integrated programmes for 19 African countries: Algeria, Burkina Faso, Cote d'Ivoire, Egypt, Eritrea, Ethiopia, Ghana, Guinea, Madagascar, Mali, Morocco, Mozambique, Nigeria, Rwanda, Senegal, Sudan, Tunisia, the United Republic of Tanzania and Uganda.

The following are some of the major activities under integrated programmes, conducted by UNIDO in collaboration with its partners:

- Technical assistance and capacity building activities for the development of agro-industries
- Technical assistance and capacity building activities for the promotion and support of SMEs;
- Capacity building for industrial energy efficiency and renewable energy development;
- Establishment of national cleaner production centres and environmental management programmes;
- Phasing-out ozone-depleting substances covered under the Montreal Protocol;
- Development of national capacities for launching 'Clean development mechanisms' programmes under the Kyoto Protocol.

VII. Major constraints and challenges

The following are the principal challenges for the promotion of sustainable development in Africa.

Carrying capacity and population mismatch: Africa, perhaps more than other continents, has real physical constraints on the productivity of its land. Climatically, Africa is one of the driest continents. Together with the predominantly rain-fed agricultural practices and rapid population growth, the result is an increasing mismatch between population and the carrying capacity of the resource base, adversely affecting the effectiveness of environmental rehabilitation and protection efforts in the last few decades, as well as the development of the agro-industries, which are of key importance to industrial development in Africa.

Poverty and environmental degradation: Poverty and environmental degradation are linked in a vicious circle in which people cannot afford to take proper care of the environment. Almost 40 per cent of people in sub-Saharan Africa live below the poverty line, and according to recent projections, Africa is the only continent in which poverty is expected to rise during the coming decades, if development trends are not reversed.

Lack of financial and human resources: Financial and human resources are in short supply. The issue of capital flight is a serious problem in Africa: 39 per cent of wealth is held overseas by residents than, more than in any other continent (for East Asia, the figure was 6 per cent before the crisis). Similarly, most African countries suffer from a low level of investment in human capital. This has been aggravated by a massive outflow of skilled workers.

Mainstreaming sustainability: Environmental issues tend to be considered as an 'add-on' element in development policies and strategies. Most of the intervention measures so far have not seriously considered altering economy-wide policies to achieve broad environmental objectives on a sustainable basis, but instead have relied on specific complementary measures to mitigate environmental harm. Examining the environmental implications of macroeconomic and sectoral policies and mainstreaming of environmental issues in national policy regimes is of vital importance.

Policy coordination: Over the past two decades, many countries have put in place a wide range of new environmental laws and regulations. One unfortunate result of the commitment to strengthen environmental protection has been a significant fragmentation and duplication of authority and responsibilities. Government institutions are usually structured to meet narrow

mandates such as providing food, water, or electricity. In many cases responsibility for safeguarding the environment is separated from that of meeting basic needs. Often there is little recognition of how sectoral policies interact, contribute to local environmental problems or accelerate global changes. This lack of coordination is not limited at the national level. Co-ordination and co-operation are often lacking at the international level as well, in part because the existing international organizations and mechanisms have a single-issue focus analogous to the sectoral organization of national governments.

Globalization and marginalization: Globalization has been less favorable to Africa than to other developing regions and has created a divergence in living standards in relation to those of developed countries and the fast growing industrializing countries of East and South East Asia. Africa has not only failed to penetrate international markets for manufactured goods; existing manufacturing industries are increasingly marginalized even in liberalized national markets, due to their inability to compete with imports.

The knowledge economy and the digital divide: While the evolving knowledge economy is expected to open new opportunities for developing countries, the existing level of human resource development, information and communication infrastructure in most African countries is a major constraint to exploiting these opportunities. African countries could remain on the wrong side of the digital divide unless the necessary measures are taken soon. Africa also risks losing whatever competitive advantage its traditional industries have if they fail to upgrade technologies and skills – low labour costs alone are insufficient.

VIII. Multilateral Support Programmes for Environmental Protection

Multilateral and bilateral cooperation programmes and projects cover different aspects of industrial environmental management including the phasing-out of ozone depleting substances (ODS), industrial energy efficiency, cleaner production, industrial wastewater treatment and sectoral support services. Apart from programmes and projects at the national level there are projects which have more of a regional nature, including:

- Gulf of Guinea Large Marine Ecosystem Project (GOGLME): the Gulf of Guinea is a large marine ecosystem stretching from Guinea Bissau to Gabon. The west-east current of Guinea carries large quantities of waste, partly toxic, from towns and industries. This creates an international water pollution problem. The Global Environmental Facility has financed a regional project aimed at containing water pollution and the preservation of the biological diversity in the Gulf of Guinea. The project involved five countries (Benin, Cameroon, Cote d'Ivoire, Ghana and Nigeria) and it was implemented by UNIDO in collaboration with the United Nations Environment Program (UNEP) and other regional partners.

- Strengthening of Environmental Pollution Control in IGAD States: the Inter-Governmental Authority on Development (IGAD) is a regional organization composed of Djibouti, Eritrea, Ethiopia, Kenya, Sudan and Uganda. While the sub-region is preoccupied with the scourge of desertification, IGAD recognizes that it also faces threats from the production, storage and transportation of toxic chemicals and hazardous wastes, including solid and radioactive wastes. To improve the ability of its member states to deal with this issue, IGAD is implementing a project to control environmental pollution control by strengthening existing institutional and legal frameworks, developing databases, promoting information exchange and networking.

- The Swedish initiative for water resources in the SADC region: This initiative for support to sustainable management of water resources in Southern Africa has been developed in response to the fact that within 10-20 years several countries in the region will reach a situation of permanent water scarcity. The overall goal is integrated water resources management in Southern Africa. This will be achieved by supporting regional initiatives in this field both financially and technically. The support has a preventive character, focusing primarily on capacity building for water resources management, prevention of domestic and international conflicts related to water, environmental surveying and more efficient water use methods.

IX. Actions that Require Global Cooperation

Poverty reduction through sustainable industrialization: the reduction of poverty is of primary importance for Africa's progress towards sustainable development. Development of the industrial sector will help to reduce poverty. In this context, global cooperation is required to:

- Assist African countries to develop coherent system-wide sustainable industrial development policies and strategies;
- Improve the industrial governance process by promoting a dynamic public-private sector partnership;
- Promote micro, small and medium sized enterprises, with special focus on agro-industries as a provider of sustainable livelihoods.

Transfer of environmentally sound technologies: the development of industrial skills and technological capabilities is a basic prerequisite for sustainable industrial development and effective participation in the global economy. In this context, global cooperation is required to:

- Enhance the industrial technological capacity of African industries through the transfer of environmentally sound technologies;
- Support industries to move beyond good housekeeping by establishing national financing mechanisms for the transfer of cleaner and more energy efficient technologies;
- Promote rural electrification through the development of sustainable energy systems.

Mainstreaming sustainability and policy coordination: the fundamental challenge of making and implementing sustainable development policies is the current focus on 'add-on' environmental policy regimes. Besides its limited effectiveness in terms of promoting sustainable development, this approach has given rise to the problem of policy co-ordination at both national and international levels. In this context, global cooperation is required to:

- Enhance the capacities of African policy-making institutions to mainstream environmental issues;
- Develop an international coordination system that streamlines national reporting requirements for the different conventions so that it promotes the careful examination of dynamic linkages;
- Promote synergies between projects and programmes encouraging sustainable industrial development by supporting integrated approaches at the national level.

Enhancing regional cooperation and integration: The African experience shows that globalization - in the form of trade and investment liberalization - without the enhancement

of domestic manufacturing capacity leads to marginalization. The region's "speed of integration index" was negative between 1961 and 1990. In the 1990's, it has averaged 0.9 annually compared with 6.0 for low and middle-income regions as a whole. Marginalization effect is expected to increase with the increasing role of knowledge and ICT in the global economy. In this context, global cooperation is required to:

- Develop Africa's ICT infrastructure and institutions promoting effective regional cooperation and integration;
- Enhance the productivity and competitiveness of African manufacturing industries through the combination of appropriate economic instruments and technological support services;
- Identify the unique contribution that African countries could make to the evolving knowledge economy, and enhance their capacity to define their own market niche.

Redefining trade, environment and development linkages: Progress towards sustainable production and consumption involves the redefinition of the linkages between trade, environment and development. Consumer preferences in the industrialized countries play a large role in this context. The shift towards sustainable production and consumption will have multiple socio-economic and socio-ecological benefits. But there is the danger of "environmental protectionism", which will particularly affect countries lacking the capacity to identify and exploit the opportunities of "green markets". In this context, global cooperation is required to:

- Develop national export promotion strategies based on eco-efficient production and help to implement them through targeted technical and financial support to export industries;
- Enable African countries to develop and implement trade liberalization measures that reconcile national economic interests and capacities with the challenges of globalization and environmental requirements;
- Eliminate subsidies that encourage practices that are economically unsound, ecologically destructive and socially inequitable, especially in the industrialized countries.

X. Conclusion

Despite the overwhelming challenges that Africa is facing, it has a considerable potential for sustainable development that benefits its people and the whole world. To realize this potential in a globalizing economy, African governments face the challenge of creating an enabling environment, and their international partners will need to provide the necessary technical and financial support. UNIDO should take the lead in facilitating the global cooperation that is required for the promotion of sustainable industrial development in Africa.

Table 2.1: Total MVA growth rate and per capita MVA growth rate

Economic groupings/regions	Total MVA growth rate (percentage)		Per-capita MVA growth rate (percentage)	
	1980-1990	1990-1998	1980-1990	1990-1998
Low income	6.7	6.5	4.2	4.4
Middle income	6.8	5.7	4.3	3.4
High income	2.6	3.1	0.4	1.5
Africa	4.3	2.0	1.3	-0.6

(Source: Extracted from *UNIDO. 2001a. International Yearbook of Industrial Statistics. Vienna: UNIDO)*

Table 2.2: Distribution of value added (percentage) of selected branches, 1990 and 1997[a]

Industrial classifications	1990	1997
Food products	9.8	8.7
Beverages	12.9	12.4
Tobacco	8.6	6.5
Textiles	8.5	7.1
Wearing apparel	6.1	7.1
Leather and fur products	6.0	6.8
Footwear	8.0	8.0
Wood and cork products	12.2	9.6
Paper	4.8	3.6
Industrial chemicals	4.1	3.1
Other chemicals	5.0	4.8
Petroleum refineries	8.7	7.2
Products of petroleum and coal	2.4	2.2
Rubber products	4.2	3.7[b]
Pottery, china, earthenware	9.4	7.7
Glass	3.8	3.6
Other non-metallic mineral products	10.9	9.2
Iron and steel	4.1	3.2
Non-ferrous metals	4.4	3.6
Metal products	7.1	5.3
Non-electrical machinery	2.4	1.8
Electrical machinery	2.7	1.4
Transport equipment	3.1	1.6

(Source: Extracted from *UNIDO. 2001a. International Yearbook of Industrial Statistics. Vienna: UNIDO)*

Table 2.3: Africa's share of MVA and population from the World and developing countries*

	1990	1995	1996	1997	1998[a]	1999[b]
Percentage share in world total MVA	1.0	0.9	0.9	0.9	1.0	1.0
Percentage share from developing countries MVA	5.8	4.4	4.3	4.2	4.3	
Population share from developing countries	14.7	15.3			15.7	

* at constant 1990 prices, a/ provisional, b/ estimate

(Source: Extracted from *UNIDO. 2001a. International Yearbook of Industrial Statistics. Vienna: UNIDO)*

Table 2.4: Average share of MVA in GDP of economic groupings/regions

Developing Countries/region	1985	1990	1995	1996	1997	1998[a]
Low income	16.4	18.6	20.4	20.7	20.7	20.3
Middle income	20.2	22.1	22.8	23.0	23.5	22.9
High income	22.5	21.8	21.0	21.1	21.2	21.2
Africa	13.4	13.4	12.7	12.5	12.8	12.9

a/ Provisional

(Source: Extracted from *UNIDO. 2001a. International Yearbook of Industrial Statistics. Vienna: UNIDO)*

2. UNEP INDUSTRY STATEMENTS

United Nations Environment Programme

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ПРОГРАММА ОРГАНИЗАЦИИ ОБЪЕДИНЕННЫХ НАЦИЙ ПО ОКРУЖАЮЩЕЙ СРЕДЕ

Contribution made by UN/ECE industry stakeholders in the context of the World Summit on Sustainable Development

Geneva – September 3, 2001

"A NEW BUSINESS MODEL"

1. Business has an important role to play in improving people's lives today and for generations to come and at the same time in preserving our natural resource base and the environment. This brings significant responsibilities for business to ensure it is understanding and meeting those diverse needs both in the products and services it provides and the way in which it operates.

2. Business finds it effective to work towards clear targets and thus requests these be set in key areas related to sustainable development. It is important that targets be maintained consistent once set. To facilitate this, existing public targets should be inventoried prior to filling gaps and agreeing key over-arching global targets. Once set, a process will be needed to cascade these to companies and geographies in an equitable manner.

3. Business wishes to strengthen the Global Compact with a view to setting the basis for a new business model. This should build on the framework provided by the Compact and bring together related efforts, such as the Global Reporting Initiative. Business values the potential of the Compact for articulating the goals of the World Summit on Sustainable Development.

4. Business has on-going opportunities for improving its resource productivity and decrease its waste intensity (life cycle management is a tool to be used in this context). Encouragement to do this is required from leading business partners and governments. Effective and fair application of the polluter-pays principle, reliance on precautionary approaches and the implementation of existing international framework agreements are central to this.

5. New business models are needed in all parts of the world for promoting sustainable development, in particular by introducing cleaner technologies, product and practices; for implementing new work and employment systems; and for effective partnership structures.

6. Key elements of the new business model are transparency, increasing accountability through reporting, implementation of codes of conduct, understanding stakeholder needs and being appropriately responsive to them. Business wishes to see government and civil society be similarly transparent and accountable.

7. Business governance needs strengthening to ensure that its economic power is balanced by increased democratic input through stakeholder involvement. The power of the market, whereby consumers "vote with their purchases", and the power of shareholder questioning should not be under-estimated.

8. Companies must eliminate discrimination and set clear targets for women and minorities to achieve levels of high responsibility.

9. Business requests that public authorities take a leading role in setting out sound market conditions for business to act towards sustainable development. Corruption must be stamped out and the role of law strictly enforced in order to ensure the fair operation of the market. Effective conflict resolution mechanisms are required inside business and, when needed, at a national and international level.

10. Business needs to engage with stakeholders on issues and concerns related to globalisation. Business and government need to create mechanisms for dealing with issues that are outside the competence of nation states in a more globalised world.

11. Business needs to develop effective means for meeting the needs of stakeholders and government for appropriate, transparent information. To this end, the potential of new partnerships (building on the experience accumulated from the development of existing voluntary initiatives) shall be fully exploited.

12. To reach the goal of sustainable development more commercial capital must be directed towards investments that meet sustainability requirements. Capital flows have to be-redirected towards sustainable development.

13. Business generally prefers voluntary action, but recognizes the importance of a number of other possibilities:

    - *price incentives and economic instruments are important tools to address specific sustainability concerns;*

    - governments/regulators should reduce or eliminate subsidies and "perversive incentives" on water, energy and other resources, which would have the effect of higher prices, which in turn would raise the competitiveness of investments into eco-efficiency.

14. The administrative capacity to collect "polluter pays" fees and fines must be improved, also in Central and Eastern Europe and in the Newly Independent States. Awareness and information campaigns must be designed to help the general public and business better understand the cause/effect of market prices.

15. The finance sector (especially commercial banks) should be involved in incentive programmes to redirect gradually larger parts of their credit to sustainable investment. The banks will want to consider setting ambitious targets for how much they should invest. Efficient monitoring will be required.

16. The extra government revenue from "polluter-pays" fees could be used to create or replenish eco-funds which could act as guarantee funds for eco-efficiency investments as well as to compensate for social disparity in the ability to pay market prices in periods of transition. Gradually consumers must learn to save precious resources through pricing.

CAMRE UNEP ESCWA

RECOMMENDATIONS

ABOUT SUSTAINABLE DEVELOPMENT IN INDUSTRIAL SECTOR IN THE ARAB REGION

For Consideration By The Industry Forum Manama, 22/9/2001

We, the industrialists in the Arab Region, meeting in Bahrain on 22 September 2001, having assessed the endeavours of industrial developments in our Region during the last decade, i.e. since the Rio Earth Summit in 1992

Recognise the increasing contribution of the industrial sector to the overall Gross National Product (GNP) in the Region and the need to expend the region industrial base;

Value the continuous effort to create more employment opportunities in the industrial sector, which requires focussed attention on continuing education and training;

Appreciate the role of industry in improving the living standards of the Arab Citizen, and its contribution to the alleviation of poverty, ignorance and regression;

Commend all the diligent attempts to increase the ratio of national employment in the various industrial establishments;

Point out the concerted efforts by different countries in the Region to restrict the negative impacts of industrial activities and refer to the achievements reflected in their clear vision concerning the social and environmental effects of industrial processes and the positive results of such achievements as manifested in the implementation of natural resource conservation and pollution prevention or minimization;

Emphasise the positive impacts of industrial ethics that include discipline, commitment and perfection. These principles, deeply rooted in our Arabic and Islamic culture, have been resurrected and illustrated in such values as the admiration of productive work, encouragement of cooperation and teamwork, stressing the concept of life-long learning and training and striving for greater skills and proficiency.

As we look forward to a prosperous tomorrow, we can at the same time diagnose some of the problems facing industry in the Arab Region and predict general undesirable consequences in the near future. Our national responsibility and duty obligate us to consider the following areas:

In The International Arena

- The frontiers of globalisation have had, thus far, negative effects on industrial activities. However globalisation may provide promising opportunities should the countries of the Region arrange their activities in such a way as to benefit from it. This can be achieved by determining the unique contributions to be made by the Region in certain fields that can place the Region in an effective position in the international arena.

- The liberalisation of international trade has not helped the industrial development of the region. Also, the stringent wording of the World Trade Organisation (WTO) concerning intellectual property rights (TRIPs) may cause harm to the interests of the Region, especially in the area of availability and transfer of new technology, for example, in the pharmaceutical industry.
- Forcing environmental and labour matters to be included in the WTO's treaties may veer it away from its original path and may interfere with the scope of other treaties that are the responsibility of different international organisations.
- The impressive developments in information and communication technologies have increased the economic advantages of the Northern Countries at the expense of the Developing Countries. At the same time such technologies may have facilitated the transfer of Developed World problems, such as crime, self-centred individuality, consumerism and materialism.
- Although the increased focus on the role of the private sector, which has resulted in shrinking the size of the governmental bureaucracy, has its benefits, the higher proficiency of the private sector should not cause monopolies or shortages in the essential needs of people.
- Countries in the region that have advanced capacity for transformative manufacturing industry and skilled labour are indeed qualified to benefit from globalisation. Regional economic cooperation can increase our Region's competitive edge within the international market.
- More emphasis should be given in the negotiations of UNFCCC and Kyoto Protocol to address the implementation impacts related to the response and mitigation measures on developing countries, including oil-producing countries, and to call upon developed countries to honour their commitments in this regard.

In the National and Regional Arenas

- Fortification of cooperation between governments and the industrial sector to limit and restrain the negative impacts of industrial activity on the environment resulting from the exploitation of non-renewable natural resources. Moreover, to open a constructive dialogue on the matter of interactive economic and environmental dimensions, taking into consideration the environmental implications in accounting the overall cost of a product and the impact of this full-cost accounting system on the competitive potential of industry.
- Embracing the Cleaner Production Strategy and the transfer of environmentally friendly technologies to combat industrial pollution and its consequences. Also adopting Integrated Waste Management systems, such as Responsible Care Programmes, Integrated Wastes Management, taking into consideration Life Cycle Assessment and full-accounting methodology approaches.
- The concentration of regional industrial activities on large-scale industries, especially in the oil and petrochemicals sectors may result in undesirable long-term conditions. it might be prudent to address the development of smaller scale, new industries, for example in environmental services.
- The Small and Medium-sized Enterprises (SMEs) need more attention and support in order to facilitate better opportunities for job creation. Furthermore, providing capacity building in the area of advanced technologies and the development of indigenous sustainable technologies, such that SMEs can over come any problems and become more competitive, therefore in enabling them to increase their contributions to the overall national production and create more job opportunities as well as initiate strong and useful relationships with larger industries.
- The division in the Arab market has reflected negatively on the industrial sector. On the other hand, regional cooperation and integration will provide a larger market for industrial products and will fortify the negotiating stance of our countries with other regional cartels, with multi-national corporations and within the WTO. Such cooperation and integration are indeed essential requirements in light of the current international economic alliances.
- Regional cooperation and integration require facilitating and securing the movement of capitals, information and personnel. This will necessitate tangible improvements in the communication and

transportation fields, in addition to founding real partnership between the industrial sector on the one hand and the governmental and societal sectors on the other.

- The transportation networks in the Region are still inefficient in terms of achieving effective connections (socially and economically) between residential areas and industrial production zones in order to facilitate the needs of production and manufacturing which reflects positively on development in general and industrial development in particular.
- Even though the Region has witnessed several campaigns for improvement and modernisation during the last few years, the legal and regulatory frameworks are still inadequate, in most countries, to achieve an investment and industrial development climate that is capable of withstanding international competition and to keep up with economic and technological advancements in the world.
- Emphasis should be placed on the positive impacts of privatisation policies in the area of industrial and technological progress and economic development in the Arab Region. Nonetheless, there should be regulatory constraints and legal enforcement to avoid the negative effects on society and the environment.

We pledge to our people and our governments to continue the march in order to accomplish further achievements that anchor and strengthen the foundations of Sustainable Development in the industrial sector, and we look forward to:

- Seeing that regional impediments and barriers receive proper attention and focus on action to overcome them as soon as possible.
- Seeing that governments in the Region take clear positions during the upcoming meeting of the WTO in Doha, by cooperation among Arab States and coordination with friendly Developing Countries, to serve our interests in the Region, while the countries of the North are attempting to include issues which may oppose our interests. We ought to reject discussion of such issues, and postpone addressing them until future rounds, and concurrently request re-evaluation of our commitments in light of the fact that we have opened our markets to products from Developed Countries in contrast to their attitude of placing more restrictions and constraints on our products entering their markets, as well as their procrastination in implementing certain agreements (e.g. the 1998 agreement to donate technical assistance manifested in electronic devices and instruments to propagate electronic trade in Developing Countries).
- Making every reasonable effort, to the greatest extent practicable, to reduce risk by introducing appropriate procedures to minimise adverse health and environmental effects, developing safer packaging and labelling standards, and taking into account the entire life cycle of a product through the use of Environmental Management Systems, Cleaner Production Techniques and Integrated Waste Management, and developing voluntary procedures for self-evaluation, monitoring and reporting to assess performance and take self-corrective measures
- Sharing our knowledge and experiences, both in terms of potential risks to human health and the environment of activities and/or products and the economic, social and environmental benefits of the use of such strategies to governments and other industries throughout the Arab Region.
- Maintaining quality assurance and quality control systems to ensure that manufacturing and products comply with relevant human health and environmentally acceptable standards and specifications, and guarantee that advertisements are consistent with such standards.
- Achieving fair and safe marketing and trade practices locally, nationally, regionally and globally.

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INDUSTRY STATEMENT TO THE MINISTERIAL SEGMENT
African Preparatory Conference
Nairobi, 15-18 October 2001

Presented to the Ministerial Segment of the African Preparatory Conference Held in Nairobi, 15-18 October 2001 by Laurraine Lotter, Chemical and Allied Industries Association, South Africa, Chair of the Industry Workshop.

Representatives of business and industry with other civil society and international organizations including UNIDO, UNDP and ECA, considered a report, that will be refined and expanded to become part of the record on the African industry contribution to sustainable development since 1992. They concluded that although some progress had been made towards the achievement of the goals of Agenda 21, much remains to be done.

In deliberating on the actions that should be taken to reverse the current trend of increasing marginalization of Africa, participants identified the achievement of peace and security and partnerships amongst stakeholders as two of the major priorities. Participants recognised that dealing with both the opportunities and threats posed by globalisation presented one of the greatest challenges to Africa.

Participants identified a range of gaps in the current approach to sustainable development and recommend that the following issues be incorporated into the agenda of the World Summit on Sustainable Development:

- Increased sustainable use and beneficiation of African resources
- Extension of basic services to all people
- Increased debt relief linked to sustainable development, good governance and poverty reduction
- Creation of enabling environments for increased investment
- Formation of partnerships amongst all stakeholders
- Technology transfer

The participants emphasised that the promotion of industrial development on a sustainable basis would make a significant contribution to reduction of poverty and improved natural resource management and that the Summit presents an opportunity for the special needs of Africa in this regard to be addressed. The participants recognised that sound corporate governance in the public and private sector and the achievement of political and social stability were prerequisites for the successful implementation of any Summit decisions.

A number of issues were identified for governments to consider as input to the Summit agenda so that the outcome of the Summit includes a clear action plan and commitment from all stakeholders to its implementation. These are listed in the document that will be circulated.

During the deliberations many more practical suggestions than time allows me to present here, for improving the industrial contribution to sustainable development, particular poverty reduction and natural resource management.

Although time did not allow the workshop to deliberate on practical ways of building on what we achieved, the spirit of the workshop was one of eagerness to work together to improve industry's contribution to sustainable development.

I therefore take the liberty as the Chair to suggest that in addition to the recommendations already mentioned, governments consider ways in which African industry efforts to build on what was achieved at the workshop can be supported. One way could be to engage with industry stakeholders with a view to preparing an African industry action plan for presentation to the Summit in Johannesburg.

In closing I would like to thank the various UN agencies that collaborated in arranging this workshop and the funders for the opportunity afforded industry at this event and to confirm industry support for the Summit, which we trust will deliver a "new deal", which will include all stakeholders working in partnership for our common future.

LIST OF ISSUES IDENTIFIED IN THE WORKSHOP

Social

- Provision of cost effective energy services in rural areas including renewable
- Bridging the digital divide
- Reversal of the current brain drain from Africa (retain the skills by creating viable local education and training, economic activity base)
- Food security
- Alleviating the effect and avoidance of natural disasters
- Communicable diseases (for example HIV/AIDS, malaria, TB)
- Education levels
- Technological skills to sustain industrial development
- Occupational health and safety of workers

Economic

- Creation of an enabling environment, including a platform for partnerships by for example, forming National councils that comprise multi-stakeholders for collaborative discussions to promote the right incentives for sustainable development.
- Development of research and development facilities in Africa
- Promotion of intra-African co-operation, use of local knowledge;
- Strengthening industrial and trade associations and linkages amongst them at national, regional and international level
- Improve the efficiency of the agricultural sector
- Improve infrastructure and communication
- Establish appropriate institutional framework for sustainable industrial development
- Technological skills to sustain industrial development
- Corporate governance in public and private sector
- A range of financial and economic instruments to promote sustainable industrial development; examples are:
    - Local budgetary provision for cleaner production initiatives
    - Establishment of revolving fund to promote cleaner production
    - Use a portion of central bank reserves to fund environmental initiatives
    - Establish sustainable development treasury bond
    - Link poverty reduction and debt relief to cleaner production
    - Financial liability for environmental degradation

  - Preferential exchange allocations for environmental equipment

- Promotion of SME's and small-scale mining
- Support for the informal sector

Environmental

- Need to address emerging environmental issues (e.g. GHG including carbon sinks, water, marine pollution – need to reduce pollution…)
- Working in partnerships with other stakeholders
- Establishment of appropriate institutions and policies to improve environmental performance; examples are:
  - Resources for meeting environmental standards
  - Environmental policies (national/regional/by governments+)
  - Regional/national environmental agencies
  - Create awards (environmental and consumer) which become incentives for promoting environmental improvements
  - Promote the use of renewable energy sources
  - Raising the environmental awareness of financial institutions
  - Create specialist advisory services
- Promote recycling and reuse of waste
- Promotion of indigenous technologies

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RECOMMENDATIONS

FOR SUSTAINABLE INDUSTRIAL DEVELOPMENT IN THE LATIN AMERICA AND CARIBBEAN REGION

Rio de Janeiro, 18-19 October 2001

The participants of the Regional Industry Consultation of the Latin American and Caribbean (LAC) region, meeting in Rio de Janeiro on 18-19 October 2001, having assessed the endeavours of industrial developments in the Region since the Rio Earth Summit in 1992 recognise the following:

1. The Industry sector has an important role to play in improving people's lives today and for generations to come and at the same time in preserving our natural resource base and the environment. This brings significant responsibilities for the industry sector to ensure it understands and meets the diverse needs both in the products and services it provides and the way in which it operates;

2. The increasing contribution of the Industrial sector to the overall Gross National Product (GNP) in the Region and the need to expand the region industrial capacities based on the sustainability concept, separate economic growth from pollution and the exhaustive use of natural resources.

3. The continuous effort to create more employment opportunities in the industrial sector, which requires focused attention on education, applied research and training;

4. The sector has on-going opportunities for improving its resource productivity and decrease its waste intensity (life cycle management and cleaner production are tools to be used in this context). Encouragement to do this is required from leading business partners and governments. Effective and fair application of the polluter-pays principle, reliance on precautionary approaches and the implementation of existing international framework agreements are central to this;

5. The finance sector (especially commercial banks) should be involved in incentive programs to redirect gradually larger parts of their credit to sustainable investment;

6. The Micro, Small and Medium Enterprises (MSEs) need more attention and support in order to continue providing opportunities for job creation. The development needs of MSEs, in terms of technology, finances and access to environmental services should be addressed. For instance, providing capacity building in the area of advanced technologies and the development of indigenous appropriate technologies, to increase competitiveness;

7. The globalization process may provide promising opportunities for the industries in the region but it needs to be adapted to the sustainable needs of LAC. A reduction in the percentage of highly pollutant industries and an increment of high added value products in the export sector should be promoted;

Furthermore, the industrialists of Latin America and the Caribbean acknowledge the need to:

8. Address the impact of climate change in the region by giving high priority to the Kyoto Protocol, in particular to the concept of Clean Development Mechanism, and to call upon developed countries to honor their commitments by complying with the "common but differentiated responsibilities" principle;

9. Embrace a Cleaner Production Strategy and the transfer or environmentally sound technologies to prevent industrial pollution and its consequences, supporting Cleaner Production and Renewable Energy Centers;

10. Promote the adoption of sustainable production and consumption practices that comply with the principles of eco-efficiency. In addition to this, promote the implementation of corporate programs based on the business philosophy of optimizing and generating wealth, while providing better social and environmental performance;

11. Introduce appropriate procedures to minimise adverse health and environmental effects by: a) developing safer packaging and labeling standards, b) considering the concept of life cycle of products through the use of Environmental Management Systems, Cleaner Production Techniques and Integrated Waste Management, and c) developing voluntary procedures for self-evaluation, monitoring and reporting to assess performance and take self-corrective measures;

12. Promote Energy Saving, Energy Efficiency and the use of Renewable Energy;

13. Prioritize the use of clean fuels in transport;

14. Develop mechanisms that assure quality and sustainable availability of water resources, including waste water treatment, in order to contribute to the industry competitiveness in a socially responsible manner;

15. Stimulate the management and reduction of toxic waste and materials;

16. Promote a broader discussion about the criteria for the sustainable use of bio-diversity and the access to bio-technology, including the industry sector as an important stakeholder;

17. Ensure the proactive participation of the industrial sector with the governments and with non-governmental organizations to develop and perfect regulations and environmental standards in both national regulations and international agreements;

18. Promote an appropriate economic and political environment for savings and investment. Sustained periods of stability and growth should be generated to avoid recurring crises;

19. Expedite de-regulation; consolidate the financial system; guarantee public and legal safety to the people, and the safety of their patrimony and property rights;

20. Articulate World Trade Organization's (WTO) agreements with multilateral environmental provisions contained in multilateral agreements to harmonize trade measures with environmental objectives;

21. Avoid the use of environmental regulations as trade barriers in international commerce;

22. Develop and/or review policies for promoting technological change and stimulating the environmental market and the utilization of fiscal incentives for environmentally sound investments;

23. Promote openness to competition in those areas where monopolies still exist, in order to overcome underdevelopment and to expand, modernize and make the operations of these areas more efficient;

24. Develop the internal market of each country, promote the manufacturing of high value-added products and increase regional economic cooperation to improve LAC's competitive edge within the international market;

25. Foster tourism that is in harmony with nature so as to reduce the environmental impact that has been on the rise, as well as the most serious threats that are related to the modification and destruction of habitat;

26. Increase the participation of LAC enterprises in the implementation of joint-venture projects and actions, in collaboration with UN agencies, that will lead to sustainable development;

27. Promote the dissemination of voluntary initiatives that include social, environmental and economic aspects of sustainable development and that aim at improving quality of life;

28. Adopt transparency as a standard attitude optimizing the access to information to decision making processes and to justice;

29. Foster the implementation of high-quality education and capacity building programs for the development of leadership and human resources in accordance with the economic and social requirements of a sustainable global market.

Note:
For the preparation of these Recommendation the following documents were considered:

1. Environmental Performance of the Industrial Sector in Latin America and the Caribbean, 10 Years after the Rio Agreement, UNEP, UNIDO, CONIECO, 2001.
2. Proposition for Corporate Compromise, The Latin American Standpoint for the World Summit, Brazilian Business Council for Sustainable Development (CEBDS), 2001
3. Recommendations of the Industrial Sector to the XIII Forum of Environmental Ministers of LAC, Brazilian National Confederation of Industry (CNI), 2001

This report was prepared with the support of:

- United Nations Environmental Program (UNEP) Regional Office for LAC (ROLAC)
- United Nations Industrial Development Organization (UNIDO)

United Nations Environment Programme

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UNEP

Industry Statement
to
The High-level Regional Meeting for the World Summit on Sustainable Development
- Asia-Pacific Roundtable on Sustainable Development –

Phnom Penh 27 November 2001

As part of the preparations for the World Summit on Sustainable Development the United Nations Environment Programme and the United Nations Industrial Development Programme undertook a review of the context, achievements and current position of industry in Asia and the Pacific in relation to sustainable development. The review was carried out in consultation with more than 300 industry organizations in the region and the findings were finally reviewed at the Regional Industry WSSD Seminar, organized in Bangkok, Thailand on 22 November 2001. This Industry Statement is the consolidated message from the above review process.

Industry is an integrated part of society and provides means for progress in all tiers of the sustainable development process, including economic, environmental and social factors. At the same time industry also has a large potential for counteracting sustainable development through depletion of natural resources, inadequate management practices and lack of coordination of industrial development with other sectors in society. Industry recognizes its role and responsibility as a key stakeholder in achieving sustainable development in society at large.

The conditions for industrial operations varies considerably between different parts of the region, between different industry sectors, and even within sectors and countries. Keeping this in mind, the following general recommendations are hereby provided as means to support and enhance industry's ability to support and move towards sustainable development:

I. Industry operates primarily according to economic parameters. The ability for industry to respond to sustainable development issues is closely linked to whether such responses can be justified in economic terms. It is therefore important that governments' policies and strategies vis-a-vis industry are in accordance with the economic conditions in the market. Market conditions supporting sustainable development investments can be established by governments through economic instruments such as pricing of natural resources, removal of counteracting subsidies, provision of subsidized funding for sustainable development investments. In a world where globalization is a main force affecting industry, it is important that the economic instruments aimed at supporting sustainable development do not create an unfair competitive situation for industry in the international context. Industry calls upon governments to ensure that sustainable development strategies and policies are supported by the economic conditions in the market and that these conditions are set to provide a level playing field, nationally as well as internationally.

II. Considering the large numbers of small and medium sized enterprises in the region, and their impact on all aspects of development, it is essential that efforts to integrate them into the programmes and activities aimed at sustainable development are enhanced. Industry, through supply chains, governments through legislation and support programmes, and non-governmental organizations through participatory efforts should all increase their activities to this aim.

III. Access to financing for investments in sustainable development need to be enhanced through institutional capacity building in industry as well as in the financing community. Official Development Assistance (ODA) and Foreign Direct Investments (FDI) constitute major funding sources for any kind of investments in several developing countries in the region. This kind of financing furthermore provides good opportunities for developed-developing country partnerships, including transfer of best management practices and environmentally sound technologies. Industry and financing institutions are recommended to develop their capacities to facilitate access to funding for sustainable development. This may include removal of protective interest rates and simplified screening procedures for loans. Governments in developed as well as developing countries should seek to increase the level of ODA and FDI by reviewing and streamlining the conditions and procedures for ODA/FDI.

IV. Climate change is recognized by some of the key industry sectors as an issue that has a large potential impact on its business. The potential impact and concerns are almost opposite in different industry sectors (e.g. the tourism and insurance sectors stand to be negatively affected by the climate change effects, while, e.g. the energy-, chemical-, steel- and transportation- sectors are more concerned with the impact of remedial measures). Industry impact is furthermore affected by the kind of response the governments are adopting. Even with these disparate views, industry commonly agrees that responses to climate change needs to be worked out in partnership between industry, governments and civil society. For some of the above mentioned industry sectors the need to improve their energy efficiency (and to receive assistance to this end) is emphasized by the climate change discussions.

V. Waste generation, air- and water pollution, as well as the depletion of natural resources are basic aspects of the same problem: Wasteful production and consumption. Cleaner production, application of the reduce/reuse/recycle waste management strategy, and improved consumer awareness are important means of addressing these problems. These ends can be met by institutional capacity building, revision of governmental policies and legislation, transfer of technologies and outreach programmes to consumers. All sectors of society have roles to play in this regard and should be initiated by public-private sector partnerships as exemplified by the Global Compact.

VI. Public awareness, life styles and consumer's behavior are basic factors influencing the demand for the products and services provided by industry. Improved education and information to the public on sustainable development issues are basic requirements to create sustainable development markets. Governments, non-governmental organizations and industry share a responsibility for providing such education and information. Supporting tools, such ISO standards and Occupational Health and Safety Management Systems, as well as eco-labeling, greening of supply chains, and social responsibility, should be further integrated in standard business management systems of the industry, supporting Agenda 21 in Asia-Pacific.

VII. Human resources constitute a key asset for sustainable development. Unequal opportunities e.g. for men and women, violation of basic labor rights, e.g. child labor, neglecting health and safety, and disregard of the local cultural values, are all counteracting sustainable development. Stringent enforcement of relevant legislation, including labor rights, in combination with codes of conduct, transparency of operating conditions within the industry, and enlightened leadership by local community leaders and CEO's of the industry, are needed to address these issues. Educational programmes regarding skills development for workers by

enterprises, as well as poverty alleviation, are other responsibilities of governments and industries.

VIII. The framework provided by governments for developing industrial activities needs to be well defined, reflected in realistic legislation and division of responsibilities among authorities and ministries, and integrated with the planning of other sectors in society (e.g .environment, agriculture, infrastructure). To minimize graft and corruption, transparent decision-making and accountability of decision-makers at all levels should be supported.

Industry in Asia and the Pacific does not speak with one voice. The commitment to sustainable development expressed in the above recommendations, is not endorsed by all companies. However, as the review process leading up to this statement has demonstrated, there is a significant part of industry that is committed. The first priority for this segment of industry is to show leadership towards other parts of industry, so as to achieve a wider industry participation in society's move towards sustainable development.

3. UNIDO INTERVENTIONS

UNIDO Intervention For Regional (ECA) Ministerial Meeting For WSSD

Distinguished delegates, ladies and gentlemen, it is my privilege as the UNIDO Field Representative for Kenya to present UNIDO's perspective on the draft WSSD Africa Common Position, which is being reviewed at this Ministerial meeting.

Let me start by putting the Common Position in the context of two major global initiatives underway that are directly affecting the extent to which industry can contribute to sustainable development. The first consists of efforts to liberalize the world economy through the GATT-negotiations and creation of the World Trade Organization (WTO) in 1994. The second consists of efforts to protect the local and global environment as expressed in Agenda 21 signed at the Earth Summit in 1992. Properly and simultaneously pursued these two global initiatives have the potential for maximizing the contribution of industry to sustainable development.

Most developing countries are increasingly marginalized in these two global initiatives. First, the majority of developing countries are not benefiting from trade liberalization. Quite the opposite, very few regions, particularly Sub-Saharan Africa, show competitive dynamism in manufactured trade. On the one hand, East Asia benefited the most by increasing its share of manufactured goods exported from developing countries from 56 per cent in 1985 to 70 per cent in 1998. In 1998, the region accounted for 47.5 of resource-based products exported, 70.2 per cent of low-tech products exported, 63.8 per cent of medium-tech products exported and 85.5 per cent of high-tech products exported. On the other hand, the share of manufactured goods exported from Sub-Saharan African in 1998 was only 1.8 per cent. It accounted for only 4.8 per cent of resource-based products exported, 1.5 per cent of low-tech products exported, 1.9 per cent of medium-tech products exported and 0.4 per cent for high-tech products exported.

Only 13 countries accounted for 88 per cent of total manufactured exports from the developing world in 1998, and their share had risen from 76 per cent in 1985. These were the four mature Asian Tigers (Hong Kong, Singapore, South Korea and Taiwan), the four new Asian Tigers (Indonesia, Malaysia, the Philippines and Thailand) as well as China, India, Turkey and, in Latin America, Brazil and Mexico.

The distribution of manufacturing is also highly uneven among low- and middle-income countries or areas. East Asia and the Pacific accounted for 40 per cent of the total manufacturing value added in the developing world, Latin America and the Caribbean for 23 per cent, South Asia for 5 per cent and Sub-Saharan Africa 3 per cent. While the developing world raised its share of global manufacturing output over time, the increase came largely from the rapid growth of the Newly Industrializing Economies. The share of the least developed countries stagnated at 0.3 per cent from 1980 onwards.

Similarly, the developing countries are not participating in the global trend to reduce the pollution intensity of their manufacturing activities. The pollution intensity of the manufacturing sector in terms of organic water pollutants and CO2 emissions per unit of industrial output is twice as high in developing countries as it is in industrialized countries. Just as is the case for manufacturing production, the total pollutant loading is unevenly distributed with the African region contributing only a small amount. This level of pollution

intensity is, nevertheless, resulting in noticeable local air and water pollution problems, and supports the claim that there is considerable scope for eco-efficient measures for pollutant reduction. Not surprisingly, many of the small group of developing countries that are benefiting from trade liberalization are also the ones where the manufacturing sector is reducing its pollution intensity. In some cases, the reduction in pollutant intensity is due to a shift from heavy to light industry and in others due to the multiple drivers, ranging from regulatory to supply chain pressures, that are forcing the uptake of environmentally sound technologies. Unfortunately, these benefits are often offset by an increase in total pollutant loadings due to increased production.

How does one account for the success of the 13 developing countries that are benefiting from these two global initiatives? Although there are many country-specific factors that need to be considered, the one factor that appears to be common to all these countries is the ability of their manufacturing sector to improve its competitive position through the successful application of new technologies and techniques, which tends to be less polluting as well. As documented in numerous investigations, "international competitiveness depends less on resource costs and price than on the quality of human resources and capacity for adopting and using new technologies." (UNIDO, *Industrial Development. Global Report 1996).* These developing countries are doing so successfully because they have sufficient human and social capital to take advantage of advanced technologies that would improve the economic and environmental performance of their industrial sector.

The advanced technologies fall into three broad groupings-- advanced production technologies and techniques (APTs); information and communication technologies (ICTs) and cleaner technologies (CTs), all of which refer to both hardware and software. These three broad groupings are often complementary. APTs are often CTs and vice versa. ICTs are not only essential for improved competitive performance, but also for improved environmental performance.

Let me give two specific examples of how these technologies are being combined in ways that contribute to both market access and environmental protection.

Turning first to market access, let us look briefly at a recently completed UNIDO project for Food Safety in seven Sub-Saharan African countries. Fortunately, for Kenya, United Republic of Tanzania and Uganda, this project started just before a EU ban in 1999 on fish export from Lake Victoria as a result of shipments of contaminated fish fillets. The EU ban resulted in a 50 per cent reduction in exports from Lake Victoria. Eighteen fish processing enterprises along Lake Victoria shores worked closely with bureaux of standards and other institutions supported by UNIDO to institute food safety [Hazard Analysis Critical Control Point (HACCP)] and quality management systems. The fact that the EU lifted the ban is solid evidence of the effectiveness of the enterprises' food safety and quality management systems. The project also contributed to the environmental performance of the enterprises, some of which have implemented environmental management systems.

Turning now to environmental protection, let us briefly look at UNIDO's work with the refrigerator-manufacturing sector in Egypt to eliminate the use of ozone depleting substances (ODS) as required by the Montreal Protocol. The Montreal Protocol Fund provided financing for conversions and the nine enterprises themselves contributed additional financing for additional renovations in their factories. As a result, the use of ODS was completely phased-out of the production process. In addition, the plants improved the quality and energy

efficiency of their refrigerators allowing them to remain competitive in a market that is increasingly difficult as a result of reduced import tariffs.

In the light of the strong evidence of the benefits of technology synergies, the African Common Position should contain specific proposals for how to make both the new round of trade liberalization and global environmental agreements mutually supportive of the quest for sustainable development.

African countries as well as developing countries in other regions need to be more assertive in their demands for greater symmetry in the rules of the multilateral trading system as embodied in the WTO. If developing countries provide greater access to their markets, it should be matched by some corresponding access to technology, increased ODA for building sufficient human and social capital to take advantage of advanced technologies, and reconsideration of the unequal treatment on Trade-related Aspects of Intellectual Property Rights (Trips). There is also a need for creative thinking about and financial support for corrections and interventions in national development strategies that have the potential for fairer and more socially responsible development.

African countries as well as developing countries in other regions also need to be more insistent that global environmental conventions are supportive of not only the environmental but also developmental goals. The market access benefits that are flowing from the phase-out of ODS are an unexpected result of the Montreal Protocol. The clean development mechanism (CDM) of the Kyoto Protocol calls for projects that contribute to sustainable development and not just to reduction in greenhouse gases (GHG). Here, developing countries need to be more explicit in their demands that industrial CDM projects should contribute explicitly to the competitive position of their manufacturing sector. Lastly, they need to start now, in the inventory phase for the Stockholm Convention, lobbying for mechanisms that would simultaneously achieve environmental and development goals.

Technical cooperation programmes and projects are needed to help ensure that all parts of the world, including least developed countries, are integrated into global economic and environmental networks in a mutually beneficial way. UNIDO is working to ensure such integration with its on-going 18 national integrated programmes and its regional programmes for West Africa (UEMOA) and SADC. All of these efforts are contributing to improved market access for resource-based manufactured goods in ways that are compatible with environmental norms.

The Organization is also working to ensure that as many countries as possible secure the capacity to find funding for innovative industrial energy efficiency technologies supportive of the Kyoto Protocol and for advanced industrial process technologies supportive of the Stockholm Convention, in both cases in ways that would also contribute to market access. Achieving integration of these two global initiatives has the potential to maximize the contribution of African industrial expansion to fairer and more socially responsible sustainable development.

UNIDO stands ready to expand its efforts in the region along the lines stated above and has already put forward this proposal in many of the national industry reports and the regional industry report that it has sponsored as background information for the preparatory process. In order to do so, however, the Organization needs to be strengthened financially. A statement in the African Common Position, acknowledging the useful work that UNIDO has done so far, would be helpful in securing donor support and funds for expansion of such work.

UNIDO Intervention For Regional (ECLAC) Ministerial Meeting For WSSD

Distinguished delegates, ladies and gentlemen, it is my privilege as the UNIDO Field Representative for Brazil to present UNIDO's perspective on the draft WSSD Latin American Common Position, which is being reviewed at this Ministerial meeting.

Let me start by putting the Common Position in the context of two major global initiatives underway that are directly affecting the extent to which industry can contribute to sustainable development. The first consists of efforts to liberalize the world economy through the GATT-negotiations and creation of the World Trade Organization (WTO) in 1994. The second consists of efforts to protect the local and global environment as expressed in Agenda 21 signed at the Earth Summit in 1992. Properly and simultaneously pursued these two global initiatives have the potential for maximizing the contribution of industry to sustainable development.

Most developing countries are increasingly marginalized in these two global initiatives. First, the majority of developing countries are not benefiting from trade liberalization. Quite the opposite, very few regions show competitive dynamism in manufactured trade. In 1998, East Asia increased its share of manufactured goods exported from developing countries from 56 per cent in 1985 to 70 per cent in 1998. In 1998, the region accounted for 87 per cent of high-tech products exported from developing countries, 64 per cent of medium-tech products and 70 per cent of low-tech products. The Latin American and Caribbean Region including Mexico accounted for 23.1 per cent of total manufactured exports in 1985, but only 19.3 per cent in 1998; without Mexico the share was 16.9 per cent in 1985 and 8.9 per cent in 1998. Comparing the distribution of exports for LAC without Mexico shows an equal decline -- 30.7 per cent for resource-based in 1985 and 24 per cent in 1998; 10.2 per cent for low-tech in 1985 and 5.4 per cent in 1998; 17.5 per cent for medium-tech in 1985 and 10.2 per cent in 1998; and 6.6 per cent for high-tech in 1985 and 2.2 per cent in 1998.

Only 13 countries accounted for 88 per cent of total manufactured exports from the developing world in 1997, and their share has risen from 77 per cent in 1985. Those were the four mature Asian Tigers (Hong Kong, Singapore, South Korea and Taiwan), the four new Asian Tigers (Indonesia, Malaysia, the Philippines and Thailand) as well as China, India, Turkey, and, in Latin America, Brazil and Mexico.

The distribution of manufacturing is also highly uneven among low- and middle-income countries or areas. East Asia and the Pacific accounted for 40 per cent of the total manufacturing value added in the developing world, Latin America and the Caribbean for 23 per cent, South Asia for 5 per cent and Sub-Saharan Africa 3 per cent. While the developing world raised its share of global MVA over time, the increase came largely from the rapid growth of the Newly Industrializing Economies. The share of the least developed countries stagnated at 0.3 per cent from 1980 onwards.

Similarly, the developing countries are not participating in the global trend to reduce the pollution intensity of their manufacturing activities. The pollution intensity of the manufacturing sector in terms of organic water pollutants and CO2 emissions per unit of industrial output is twice as high in developing countries as it is in industrialized countries. This level of pollution intensity is resulting in noticeable local air and water pollution problems, and supports the claim that there is considerable scope for eco-efficient measures for pollutant reduction. Not surprisingly, many of the small group of developing countries that

are benefiting from trade liberalization are also the ones where the manufacturing sector is reducing its pollution intensity. In some cases, the reduction in pollutant intensity is due to a shift from heavy to light industry and in others due to the multiple drivers, ranging from regulatory to supply chain pressures, that are forcing the uptake of environmentally sound technologies. Unfortunately, these benefits are often offset by an increase in total pollutant loadings due to increased production.

How does one account for the success of the 13 developing countries that are benefiting from these two global initiatives? Although there are many country-specific factors that need to be considered, the one factor that appears to be common to all those countries is the ability of their manufacturing sector to improve its competitive position through the successful application of new technologies and techniques, which tend to be less polluting as well. As documented in numerous investigations, "international competitiveness depends less on resource costs and price than on the quality of human resources and capacity for adopting and using new technologies." (UNIDO, *Industrial Development. Global Report 1996).* These developing countries are doing so successfully because they have sufficient human and social capital to take advantage of advanced technologies that would improve the economic and environmental performance of their industrial sector.

The advanced technologies fall into three broad groupings-- advanced production technologies and techniques (APTs); information and communication technologies (ICTs) and cleaner technologies (CTs), all of which refer to both hardware and software. These three broad groupings are often complementary. APTs are often CTs and vice versa. ICTs are not only essential for improved competitive performance, but also for improved environmental performance.

Let me give two specific examples of how these technologies are being combined in ways that contribute to both market access and environmental protection.

Turning first to market access, let us look briefly at an on-going joint regional UNIDO/ECLAC project, which started in the year 2000, to provide footwear manufacturers of Argentina, Chile and Uruguay, through their respective chambers, with technical advice on production for specific market niches in other than the traditional –Latin American—markets, with emphasis on the European Union. The project is providing technical advice to 30 companies in the shoemaking, shoe component and tanning subsectors on necessary structural changes at the production level to improve export potential. Already some of the companies, particularly in Chile, have started to streamline their production mix and to implement commercialisation advice that has definite potential for increasing exports to European niche markets. Implementation of some of the technical measures also promises to improve the environmental performance of these companies.

Turning now to environmental protection, let us briefly look at UNIDO's work with the refrigerant using sector in Venezuela to eliminate the use of ozone depleting substances (ODS) as required by the Montreal Protocol. The Montreal Protocol Fund provided financing for 16 plant conversions and the enterprises themselves contributed additional financing for additional renovations in their factories. As a result, the use of ODS was completely phased-out of the production process. In addition, the plants improved the quality and energy efficiency of their refrigerators allowing them to remain competitive in a market that is increasing difficult as a result of reduced import tariffs.

In the light of the strong evidence of the benefits of technology synergies, the Latin American Common Position should contain specific proposals for how to make both the new round of trade liberalization and global environmental agreements mutually supportive of the quest for sustainable development.

Latin American countries as well as developing countries in other regions need to be more assertive in their demands for greater symmetry in the rules of the multilateral trading system as embodied in the WTO. If developing countries provide greater access to their markets, it should be matched by some corresponding access to technology, increased ODA for building sufficient human and social capital to take advantage of advanced technologies and reconsideration of the unequal treatment on Trade-related Aspects of Intellectual Property Rights (Trips). There is also a need for creative thinking about and financial support for corrections and interventions in national development strategies that have the potential for fairer and more socially responsible development.

Latin American countries as well as developing countries in other regions also need to be more insistent that global environmental conventions are supportive of not only of the environmental but also developmental goals. The market access benefits that are flowing from the phase-out of ODS are an unexpected result of the Montreal Protocol. The clean development mechanism (CDM) of the Kyoto Protocol calls for projects that contribute to sustainable development and not just to reduction in greenhouse gases (GHG). Here, developing countries need to be more explicit in their demands that industrial CDM projects should contribute explicitly to the competitive position of their manufacturing sector. Lastly, they need to start now, in the inventory phase for the Stockholm Convention, lobbying for mechanisms that would simultaneously achieve environmental and development goals.

Technical cooperation programmes and projects are needed to help ensure that all parts of the world, including the least developed countries, are integrated into global economic and environmental networks in a mutually beneficial way. UNIDO is working to ensure such integration with its on-going six national integrated programmes and its regional programmes for Central America, all of which are contributing to improved market access that is taking into account environmental norms. It is also working to ensure that as many countries as possible secure the capacity to find funding for innovative industrial energy efficiency technologies supportive of the Kyoto Protocol and for advanced industrial process technologies supportive of the Stockholm Convention, in both cases in ways that would also contribute to market access. Achieving integration of these two global initiatives has the potential to maximize the contribution of Latin American industrial expansion to fairer and more socially responsible sustainable development.

UNIDO stands ready to expand its efforts in the region along the lines stated above and has already put forward this proposal in many of the national industry reports and the regional industry report that it has sponsored as background information for the preparatory process. In order to do so, however, the Organization needs to be strengthened financially. A statement in the Latin American Common Position, acknowledging the useful work that UNIDO has done so far, would be helpful in securing donor support and funds for expansion of such work.

UNIDO Intervention For Regional (ESCWA) Ministerial Meeting For WSSD

Distinguished delegates, ladies and gentlemen, it is my privilege as the UNIDO Field Representative for Egypt to present UNIDO's perspective on the draft WSSD League of Arab States Common Position, which is being reviewed at this Ministerial meeting.

Let me start by putting the Common Position in the context of two major global initiatives underway that are directly affecting the extent to which industry can contribute to sustainable development. The first consists of efforts to liberalize the world economy through the GATT-negotiations and creation of the World Trade Organization (WTO) in 1994. The second consists of efforts to protect the local and global environment as expressed in Agenda 21 signed at the Earth Summit in 1992. Properly and simultaneously pursued these two global initiatives have the potential for maximizing the contribution of industry to sustainable development.

Most developing countries are increasingly marginalized in these two global initiatives. First, the majority of developing countries are not benefiting from trade liberalization. Quite the opposite, very few regions show competitive dynamism in manufactured trade. On the one hand, East Asia benefited the most by increasing its share of manufactured goods exported from developing countries from 56 per cent in 1985 to 70 per cent in 1998. In 1998, the region accounted for 47.5 of resource-based products exported, 70.2 per cent of low-tech products exported, 63.8 per cent of medium-tech products exported and 85.5 per cent of high-tech products exported. On the other hand, the share of manufactured goods exported from the Middle East/North Africa (MENA) region declined from 12.9 per cent in 1985 to 6.0 in 1998. In 1998, the region accounted for 15.0 per cent of resource-based products exported, 7.2 per cent of low-tech products exported, 4.4 per cent of medium-tech products exported and 0.7 per cent for high-tech products exported.

Only 13 countries accounted for 88 per cent of total manufactured exports from the developing world in 1998, and their share had risen from 77 per cent in 1985. These were the four mature Asian Tigers (Hong Kong, Singapore, South Korea and Taiwan), the four new Asian Tigers (Indonesia, Malaysia, the Philippines and Thailand) as well as China, India, Turkey, and, in Latin America, Brazil and Mexico.

The distribution of manufacturing is also highly uneven among low- and middle-income countries or areas. East Asia and the Pacific accounted for 40 per cent of the total manufacturing value added in the developing world, Latin America and the Caribbean for 23 per cent, South Asia for 5 per cent and Sub-Saharan Africa 3 per cent. While the developing world raised its share of global MVA over time, the increase came largely from the rapid growth of the Newly Industrializing Economies (NIEs). The share of the least developed countries stagnated at 0.3 per cent from 1980 onwards.

Similarly, the developing countries are not participating in the global trend to reduce the pollution intensity of their manufacturing activities. The pollution intensity of the manufacturing sector in terms of organic water pollutants and CO2 emissions per unit of industrial output is twice as high in developing countries as it is in industrialized countries. This level of pollution intensity is resulting in noticeable local air and water pollution problems, and supports the claim that there is considerable scope for eco-efficient measures for pollutant reduction. Not surprisingly, many of the small group of developing countries that are benefiting from trade liberalization are also the ones where the manufacturing sector is

reducing its pollution intensity. In some cases, the reduction in pollutant intensity is due to a shift from heavy to light industry and in others due to the multiple drivers, ranging from regulatory to supply chain pressures, that are forcing the uptake of environmentally sound technologies. Unfortunately, these benefits are often offset by an increase in total pollutant loadings due to increased production.

How does one account for the success of the 13 developing countries that are benefiting from these two global initiatives? Although there are many country-specific factors that need to be considered, the one factor that appears to be common to all these countries is the ability of their manufacturing sector to improve its competitive position through the successful application of new technologies and techniques, which tend to be less polluting as well. As documented in numerous investigations, "international competitiveness depends less on resource costs and price than on the quality of human resources and capacity for adopting and using new technologies." (UNIDO, *Industrial Development. Global Report 1996).* These developing countries are doing so successfully because they have sufficient human and social capital to take advantage of advanced technologies that would improve the economic and environmental performance of their industrial sector.

The advanced technologies fall into three broad groupings-- advanced production technologies and techniques (APTs); information and communication technologies (ICTs) and cleaner technologies (CTs), all of which refer to both hardware and software. These three broad groupings are often complementary. APTs are often CTs and vice versa. ICTs are not only essential for improved competitive performance, but also for improved environmental performance.

Let me give two specific examples of how these technologies are being combined in ways that contribute to both export potential and environmental protection.

Turning first to facilitating export potential, let us look briefly at the completed project for industrial modernization in Tunisia [Modernisaion des Industries Tuniesiennes basee sur l'Approach Qualite (MITAQ)]. The Ministry of Industry with the support of UNIDO launched this initiative in 1996. It was decided to test a dynamic lean quality management model with 30 enterprises, six of which also volunteered to conduct cleaner production assessments. The assistance resulted in many of the enterprises streamlining their product mix and implementing commercialisation advice. For example, a plastic container manufacturer reduced its product mix from over 1,000 items to less than 200. The cleaner production component resulted in annual financial savings of US$ 1.3 as a result of reduced gas use, water consumption and solid waste disposal for an investment of US$0.7 million by the six firms. This effort is now being expanded in the UNIDO Integrated Programme for Tunisia.

Turning now to environmental protection, let us briefly look at UNIDO's work with the refrigerator-manufacturing sector in Egypt to eliminate the use of ozone depleting substances (ODS) as required by the Montreal Protocol. The Montreal Protocol Fund provided financing for conversions and the nine enterprises themselves contributed additional financing for additional renovations in their factories. As a result, the use of ODS was completely phased-out of the production process. In addition, the plants improved the quality and energy efficiency of their refrigerators allowing them to remain competitive in a market that is increasingly difficult as a result of reduced import tariffs.

In the light of the strong evidence of the benefits of technology synergies, the Arab States Common Position should contain specific proposals for how to make both the new round of trade liberalization and global environmental agreements mutually supportive of the quest for sustainable development.

Arab States as well as developing countries in other regions need to be more assertive in their demands for greater symmetry in the rules of the multilateral trading system as embodied in the WTO. If developing countries provide greater access to their markets, it should be matched by some corresponding access to technology, increased ODA for building sufficient human and social capital to take advantage of advanced technologies, and reconsideration of the unequal treatment on Trade-related Aspects of Intellectual Property Rights (Trips). There is also a need for creative thinking about and financial support for corrections and interventions in national development strategies that have the potential for fairer and more socially responsible development.

Arab States as well as developing countries in other regions also need to be more insistent that global environmental conventions are supportive of not only the environmental but also developmental goals. The market access benefits that are flowing from the phase-out of ODS are an unexpected result of the Montreal Protocol. The clean development mechanism (CDM) of the Kyoto Protocol calls for projects that contribute to sustainable development and not just to reduction in greenhouse gases (GHG). Here, developing countries need to be more explicit in their demands that industrial CDM projects should contribute explicitly to the competitive position of their manufacturing sector. Lastly, they need to start now, in the inventory phase for the Stockholm Convention, lobbying for mechanisms that would simultaneously achieve environmental and development goals.

Technical cooperation programmes and projects are needed to help ensure that all parts of the world, including least developed countries, are integrated into global economic and environmental networks in a mutually beneficial way. UNIDO is working to ensure such integration with its on-going 10 national integrated programmes. All of these efforts are contributing to improved export potential for manufactured goods in ways that are compatible with environmental norms. The Organization is also working to ensure that as many countries as possible secure the capacity to find funding for innovative industrial energy efficiency technologies supportive of the Kyoto Protocol and for advanced industrial process technologies supportive of the Stockholm Convention, in both cases in ways that would also contribute to market access. Achieving integration of these two global initiatives has the potential to maximize the contribution of Arab States industrial expansion to fairer and more socially responsible sustainable development.

UNIDO stands ready to expand its efforts in the region along the lines stated above and has already put forward this proposal in many of the national industry reports and the regional industry report that it has sponsored as background information for the preparatory process. In order to do so, however, the Organization needs to be strengthened financially. A statement in the Arab States Common Position, acknowledging the useful work that UNIDO has done so far, would be helpful in securing donor support and funds for expansion of such work.

UNIDO INTERVENTION FOR REGIONAL (ESCAP) MINISTERIAL MEETING FOR WSSD

Distinguished delegates, ladies and gentlemen, it is my privilege as the UNIDO Representative to present the Organization's perspective on the draft Regional Platform on Sustainable Development for Asia and the Pacific, which is being reviewed at this Ministerial meeting.

Let me start by putting the Platform in the context of two major global initiatives underway that are directly affecting the extent to which industry can contribute to sustainable development. The first consists of efforts to liberalize the world economy through the GATT-negotiations and creation of the World Trade Organization (WTO) in 1994. The second consists of efforts to protect the local and global environment as expressed in Agenda 21 signed at the Earth Summit in 1992. Properly and simultaneously pursued these two global initiatives have the potential for maximizing the contribution of industry to sustainable development.

Most developing countries are increasingly marginalized in these two global initiatives. First, the majority of developing countries are not benefiting from trade liberalization. Quite the opposite, only East Asia shows competitive dynamism in manufactured trade; all others show a lack of competitive dynamism. On the one hand, East Asia increased its share of manufactured goods exported from developing countries from 56 to 70 per cent between 1985 and 1998. The distribution of these exports among different technology categories showed a bi-polar change between 1985 and 1998. Their share of resource-based exports increased greatly from 34.6 per cent to 47.5 percent, of low-technology based exports declined slightly from 71.7 to 70.2 percent, of medium-technology based exports increased slightly from 63.4 to 63.8 per cent, and of high-technology based exports increased significantly from 81.0 to 85.5 per cent. On the other hand, South Asia experienced a decline in the share of total manufactured exports from 4.5 to 3.8 per cent between 1985 and 1998. While the share of exports for South Asia improved for the more basic sectors (from 3.8 to 4.7 per cent for resource-based and from 8.3 to 8.5 per cent for low-tech), it declined for the higher-tech sectors (from 2.0 to 1.8 per cent for medium-tech and from 1.1 to 0.6 per cent for high-tech). Other regions (Latin America and Caribbean, West Asia and North Africa and Sub-Sahara) experienced similar declines over this time period.

Only 13 countries accounted for 88 per cent of total manufactured exports from the developing world in 1998, and their share had risen from 77 per cent in 1985. These were the four mature Asian Tigers (Hong Kong, Singapore, South Korea and Taiwan), the four new Asian Tigers (Indonesia, Malaysia, the Philippines and Thailand) as well as China, India, and Turkey and, in Latin America, Brazil and Mexico.

The distribution of manufacturing is also highly uneven among low- and middle-income countries or areas. East Asia and the Pacific accounted for 40 per cent of the total manufacturing value added in the developing world, Latin America and the Caribbean for 23 per cent, South Asia for 5 per cent and Sub-Saharan Africa 3 per cent. While the developing world raised its share of global manufacturing output over time, the increase came largely from the rapid growth of the Newly Industrializing Economies. The share of the least developed countries stagnated at 0.3 per cent from 1980 onwards.

Similarly, the developing countries are not participating in the global trend to reduce the pollution intensity of their manufacturing activities. The pollution intensity of the manufacturing sector in terms of organic water pollutants and CO_2 emissions per unit of industrial output is more than double that of industrialized countries. Just as is the case for manufacturing production, total pollutant loadings are unevenly distributed within the region. This level of pollution intensity results in noticeable local air and water pollution problems and supports the claim that there is considerable scope for eco-efficient measures for pollutant reduction. Not surprisingly, some countries among the 13 developing countries that are benefiting from trade liberalization are also the ones where the manufacturing sector is achieving the greatest reduction in pollution intensity. In some cases, the reduction in pollutant intensity is due to a shift from heavy to light industry and in others due to the multiple drivers, ranging from regulatory to supply chain pressures, that are forcing the uptake of environmentally sound technologies. Unfortunately, these benefits are often offset by an increase in total pollutant loadings due to increased production as has been showed by several country case studies for the region.

How does one account for the success of the 13 developing countries that are benefiting from these two global initiatives? Although there are many country-specific factors that need to be considered, one factor that appears to be common to all these countries is the ability of their manufacturing sector to improve its competitive position through the successful application of new techniques (including organizational arrangements) and technologies, which tend to be less polluting as well. As documented in numerous investigations, "international competitiveness depends less on resource costs and price than on the quality of human resources and capacity for adopting and using new technologies." (UNIDO, *Industrial Development. Global Report 1996).* These developing countries are doing so successfully because they have sufficient human and social capital to take advantage of advanced technologies that would improve the economic and environmental performance of their industrial sector.

Let me give two specific examples from UNIDO projects in the region of how enhancing the quality of human resources and capacity for adopting and using new techniques and technologies can simultaneously contribute to both improved export potential and increased environmental protection.

Turning first to market access, let us look briefly at an on-going UNIDO project in Sri Lanka that is enhancing institutional infrastructure to improve product quality and enhance export capabilities through standards, metrology and testing. Without these capacities, technical barriers to trade (TBT) have the potential to replace traditional trade barriers in a globalized market. The project is upgrading testing laboratories, technical skills and management capabilities at the Sri Lanka Standards Institute, the Industrial Technology Institute and the Textile Training & Service Centre with the aim of facilitating the accreditation of chemical and microbiology testing laboratories. This will be a major boost to Sri Lanka's exports, in addition to heightening consumer safety through compliance to standards and conformity assessment. The upgrading programme includes developing national capacities for setting up Environmental Management Systems (EMS) according to the ISO 14000 international standards. It is providing training support to auditors and consultants, and lends direct assistance to 10 enterprises to launch EMS schemes.

Turning now to environmental protection, let us briefly look at UNIDO's work with the packaging sector in China to eliminate the use of ozone depleting substances (ODS) as

required by the Montreal Protocol. The Multilateral Fund for the Implementation of the Montreal Protocol is funding UNIDO to assist the small and medium-sized enterprises sector in the manufacture of foam extruded packaging material for the export of agricultural products. Following the national strategy for "industrial rationalization of SME sub-sectors", the new or retro-fitted production facilities have been relocated and concentrated at 20 selected and modernized factories, which are responsible for the co-financing of 10 to 20 per cent of the overall conversion costs. The use of ODS has been replaced by butane. Their new production technology is compatible with the ISO 14000 standard and therefore removes obstacles for export of the agricultural products. The enlarged factories will have much better technical and financial capabilities as well as market stability than their predecessors.

In the light of the strong evidence of the benefits of technology change and learning, participants at this meeting might consider including in the Regional Platform specific proposals on how to make both the new round of trade liberalization and global environmental agreements mutually supportive of the quest for sustainable development.

Asian countries as well as developing countries in other regions might put forward proposals for changes in the specific rules in the multilateral trading system that will change as a follow-up to the Doha WTO Ministerial Declaration. If developing countries are to achieve the maximum benefits from greater market access, they need improved access to advanced production technologies, increased official development assistance for enhancing human and social capital for trade facilitation and reconsideration of some trade-related aspects of intellectual property rights (TRIPS). There is also a need for proposals that would ensure that the benefits of export promotion contribute to fairer and more environmentally responsible development.

Asian countries as well as developing countries in other regions might consider putting forward proposals that make global environmental agreements supportive of not only environmental but also socio-economic goals. The market access benefits that are flowing from the phase-out of ODS are an unexpected result of the Montreal Protocol. The clean development mechanism (CDM) of the Kyoto Protocol calls for projects that contribute to sustainable development and not just to reduction in greenhouse gases (GHG). To ensure this, developing countries need to be attentive to their formulation of CDM projects in order that they contribute explicitly to the competitive position of their manufacturing sector as well as to reduction in greenhouse gases. Lastly, they need to start now, in the inventory phase for the Stockholm Convention, lobbying for mechanisms that would simultaneously achieve environmental and development goals.

Technical cooperation programmes and projects are needed to help ensure that all parts of the world, including least developed countries, are integrated into global economic and environmental networks in a mutually beneficial ways. UNIDO is working to ensure such integration with its ongoing 44 integrated programmes covering 39 countries and Palestine (including five in this region), all of which are building export potential and generating employment in ways that do not harm the environment. In addition, it has put forward a proposal for improved market access and trade facilitation support for Mekong Delta Countries through strengthening institutional and national capacities related to standards, metrology, testing and quality. The Organization is also assisting many countries implement industry-related projects supportive of the Montreal Protocol, Kyoto Protocol and the Stockholm Convention in ways that also contribute to export potential. Leveraging the complementarities of developmental and environmental efforts has the potential to maximize

the contribution of industrial expansion to fairer and more environmentally responsible sustainable development.

UNIDO stands ready to expand its efforts in developing countries along the lines stated above and as suggested in some of the national and regional reports that it has sponsored as background information for the preparatory process for WSSD. In order to do so, however, the Organization needs to be strengthened financially. A statement in the Regional Position, acknowledging the useful work that UNIDO has done so far, would be helpful in securing donor support and funds for expansion of such work.

V. NATIONAL ASSESSMENT REPORTS FOR THE WORLD SUMMIT

UNIDO reviewed the National Assessment Reports available (as of 10 January 2002) on the Internet site for the Johannesburg Summit. Out of the 42 developing countries and economies in transition listed, only 20 completed national assessment reports were available[1]. The other entries were comments or outlines. UNIDO reviewed 15 reports to evaluate the extent to which issues central to the role of industry (manufacturing in particular) in sustainable development were addressed in these reports. The issues are: (a) quantitative assessments of the positive contributions of industry to economy and employment and the potentially negative impacts on the environment (3Es); (b) policies and programmes that are supporting the growth of a competitive industrial sector within the larger context of achieving sustainable development; (c) policies and programmes that prevent and mitigate industrial pollution in ways that minimize the adverse impacts on a competitive economy; (d) policies and programmes that are supporting technology upgrading and transfer for industry and in particular those that encourage the utilization of environmentally sound technologies to achieve sustainable development; (e) innovative policies and programmes for industry that integrate economic, social and environmental concerns; and (f) the role of industry in future efforts to pursue sustainable development.

The results of the review are summarized for all countries in the table below and pertinent abstracts from each national assessment report are presented in the following pages. The results based on this review of available reports suggest that most countries still perceive the sustainable development agenda as only an environmental agenda rather than one that as a development agenda that takes into social and environmental concerns. Few countries acknowledge the role of technological modernization as central for enhancing the contribution of industry to sustainable development. Many are experimenting with policies and programmes that recognize the complementarities and trade-offs involved in integrating economic, social and environmental concerns. Most national reports recognize that the major forces of development and in particular industry have a role to play in their future efforts to pursue sustainable development.

	Achievements in the 3 Es	Industrial development policies	Environment management policies	Technology transfer policies	integrated policies & programmes	– Future directions for industry
Argentina	X		X	X	X	X
Bolivia		X	X			X
Burundi		X				X
Costa Rica			X			X
East Timor			X		X	
Honduras	X		X	X	X	
Jordan	X			X		X
Nicaragua	X	X	X	X		
Niger	X		X		X	
Paraguay		X	X	X	X	
Peru			X		X	
Saint Lucia	X		X		X	X
Senegal	X		X			
Syria			X	X	X	X
Tunisia	X		X		X	X

[1] Argentina, Bolivia, Burundi, Costa Rica, Dominican Republic, East Timor, El Salvador, Honduras, Jordan, Kazakstan, Nicaragua, Niger, Panama, Paraguay, Peru, Senegal, St Lucia, Syrian Arab Republic, Tunisia, Ukraine.

1. ARGENTINA

- ***Achievements in the 3 Es (Economy/ Employment/ Environment)***
  - Creation of a department responsible for the implementation of sustainable development in the Ministry for Environment and Social Development;
  - Development of a National strategy for the promotion of sustainable production;
  - Improvement of national regulation.

- ***Industrial Development policies:***

- ***Industrial Environment management policies***
  - Ratification of the Multilateral Environmental Agreements; development and implementation of the respective national strategies and policies;
  - National programmes and policies for Agenda 21.

- ***Technology transfer (in particular EST) policies:***
  - Institutional capacity building in cleaner technologies;
  - National Programme for the Promotion of Sustainable Production: promotion of environmental technology innovations through information dissemination, training, projects, applied research projects and cooperation between government, industry, scientific and technologies organizations, at the national and the international level.

- ***Experiences with integrated policies and programs:***
  - Cleaner Production Roundtable, which enhances cooperation between government, private sector and scientific and technology institutions.

- ***Reflections – Future directions for the Country:***
  - Design and promote legal and economic tools to foster sustainable environmental management in the private sector (among large enterprise but also SMEs); eliminate policies of subsidy to polluting industrial activities; promote the adoption of clean technologies;
  - Create a regional network integrating the national clean production centers and all the other organizations or institutions involved in environmental sound technologies to share experiences; create an inter-regional working group for the dissemination of information.
  - Improve the formulation and evaluation methodology of programmes and projects from credit organizations;
  - Promote export of products for which Argentina has a comparative advantage.
  - Increase participation and cooperation with local actors and institutions; increase local capacity; improve education/training/information related to environmental management;

2. BOLIVIA

- ***Achievements in the 3 Es (Economy/ Employment/ Environment)***
  - Creation of institutions in charge of sustainable development;
  - Fight against corruption, consolidation of democracy.

➢ ***Industrial Development policies***
- Policy/Strategy to promote productivity and competitiveness;
- Investment protection policies;
- Application of "sustainable development" tools (e.g. Norms of the National Planning System, National Plan of Economic and Social Development, Departmental Plans of Development...).

➢ ***Industrial Environment management policies***
- *Regulation:* Law on the Environment (general framework, basis for sectoral laws); Law on the National Institute for the Agrarian Reform (to democratize land ownership and improve the juridical security); Law on Forests;
- *Policies*: "Strategies of Climate Change and Biodiversity" (conceptual and operational framework for cooperation between the private and the public sectors).

➢ ***Technology transfer (in particular EST) policies:***

➢ ***Experiences with integrated policies and programs:***

➢ ***Reflections – Future directions for the Country:***
- Develop long term visions and policies as well as a shared strategic vision on "sustainable development" to unify Bolivian people;
- Develop a competitive economy in the framework of sustainability by increasing the value of the natural resources used in a sustainable manner (e.g. fair-trade), building multidimensional sustainable development indicators, promoting technology, building internal and external integration (through better coordination, integration into global supply chains, technology development);
- Promote management tools for sustainable development; develop Municipalities' environmental management capacities, incentives to improve private sector's practices, reach better compliance with existing norms...
- Create a planning office with political and economic responsibilities and develop strategic alliances with social organizations;
- Promote dialogue, local participation and leadership; build the macro- from the micro-; achieve a better coordination among the Departmental councils of sustainable development and with the National Council.

3. BURUNDI

➢ ***Achievements in the 3 Es***
- *Economy:* Few achievements due to the persistent insecurity and the lack of financial resources. Priority is given to the humanitarian aid for war victims;
- *Employment:* Rural development programs, sectoral projects...

➢ ***Industrial Development policies***
- Sectoral policies (from the relevant technical ministries); 5-year Economic and Social Development Plan; Economic and financial tools such as Public Investment Programs, Public Expenditure Programs, Technical Cooperation Programs.

- ***Industrial Environment management policies***

- ***Technology transfer (in particular EST) policies***

- ***Experiences with integrated policies and programmes***

- ***Reflections – Future directions for the Country***
  - Develop a National strategy for sustainable development; foster Agenda 21 implementation; mobilize funds for the implementation of Agenda 21; promote local initiatives;
  - Increase decentralization and build better institutional planning capacities and inter-institutional coordination; improve information system;
  - Need for economic reforms; improve rural sector's performance; restore distribution channels; foster local entrepreneurship (fiscal policy); develop support services for enterprises; enhance export potential; increase and diversify exports; develop transport infrastructure; valorize natural resources; support/promote SME and handicraft;
  - Develop natural resources protection programs and improve legislation on natural resources' exploitation;
  - Restore peace, security and stability; improve national policy for education and employment; foster job creation by promoting investment; improve and valorize national capacities.

4. COSTA RICA

- ***Achievements in the 3 Es***
  - *Creation of Institutions in charge of sustainable development*: National System for Sustainable Development (SINADES), National Council of NGOs for sustainable development, National fund for Forests…

- ***Industrial Development policies***

- ***Industrial Environment management policies***
  - *National action plans*: "Strategy for sustainability", Wind energy development, Private electricity generation initiatives, Pollution intensity reduction in San José;
  - *Ratification of International agreements* (Law No 7414 on Climatic changes, Law No 7416 on Biodiversity) *and regulation* (Laws on environmental services, hydrocarbons, soil conservation and use, gas emissions…). However, there is little concordance between the legislative and the operational level, existing norms are not really implemented.

- ***Technology transfer (in particular EST) policies***

- ***Experiences with integrated policies and programmes***

- ***Reflections – Future directions for the Country***
  - Produce a National Agenda 21; design mechanisms to implement the National Plan and Policy for sustainable development;

- Improve education and information in private/public sector and among civil society; promote people's participation and local initiatives;
- Foster environmental sound technologies and sustainable exploitation of natural resources; design well-defined territorial units in order to solve environmental problems, transport infrastructure problems...

5. EAST TIMOR

➢ ***Achievements in the 3 Es***

- In 1998 it was assumed that 75% of the workforce was employed in agriculture. Most economic or social issues in East Timor are related to the environmental problem;
- Creation of institutions in charge of sustainable development (e.g. Environmental Commission).

➢ ***Industrial development policies***

➢ ***Industrial environment management policies***

- *Watershed management* (deforestation and availability and quality of drinking water)
- *Coastal zone management* (if utilised in a non- destructive and well- planned manner, it will provide great possibilities for economic development, while providing necessary products to sustain the costal population. If not controlled, economic interests relating to the coastal zone, particularly oil exploration and tourism will constitute a significant threats to this unique resource)
- *Raising the general public awareness and education* (information to the general public, development for environmental programs in school)
- *Solid waste and pollution management* (the lack of solid waste management strikes the visitor as an aesthetic problem in towns and village)

➢ ***Technology transfer (in particular EST) policies***

➢ ***Experiences with integrated policies & programmes***

- An effort is made to integrate environmental consideration into policies and modern legislation regarding economic sectors such as industry, tourism, agriculture, forestry, and fisheries.

➢ ***Reflections- Future direction for the country***

6. HONDURAS

➢ ***Achievements in the 3 Es***

- Improved participation of the civil society in sustainable development (in the design of policies, elaboration and implementation of projects); increased interest for pollution control, environment protection, ecological tourism, clean technologies development...
- *Institutions*: Secretariat for natural and environmental resources (SERNA), Forest administration (AFE-COHDEFOR), National Council for sustainable development (CONADES), Sustainable Development network of Honduras; Rehabilitation of the Inter-institutional Technical Committee for Environment and Health (COTIAS);

- *Strategies & policies*: Central-American Alliance for sustainable development (ALIDES), National strategy for sustainable development (ENDS).
- Improved natural resources management (especially water), territorial administration and environmental information system;

➢ ***Industrial Development policies***

➢ ***Industrial Environment management policies***
- *Policies*: National strategy for biodiversity, National program for sustainable rural development (PRONADERS), National environmental information system (SINIA), National system of protected areas (SINAPH)...
- *Regulation*: Law on the environment, on the modernization and development of the agricultural sector, on forest protection and restoration, on water, on fishery, on protected areas, on toxic products...
- *Programs*: Sustainable agriculture programs, Natural Resources management programs, Forest development programs...

➢ ***Technology transfer (in particular EST) policies***
- Creation of the Office for Integrated implementation and Clean Development mechanisms (OICH).

➢ ***Experiences with integrated policies and programmes***
- The National program for sustainable rural development (PRONADERS) aims at improving living conditions through sustainable human, social, environmental and productive development. Special attention is given to natural resources management;
- Inter-institutional Technical Committee for Environment and Health.

➢ ***Reflections – Future directions for the Country***
- Improve inter-institutional cooperation and coordination (in particular between ENDS and ERP) and define a national vision towards sustainable development;
- Elaborate a new Law on Water and define the responsibilities of the organizations in charge of water management;
- Improve education on environmental management and improve the national environmental information system in order to develop sustainability indicators;
- Improve waste collecting, solid waste treatment and promote recycling;
- Internalize the environmental costs into the production processes and services;
- Promote technology and infrastructure development;
- Reform market systems and planning.

7. JORDAN

➢ ***Achievements in the 3 Es***
- Economic and political reforms aiming at improving the level of economic performance, increasing the degree of transparency, preparing the appropriate environment for investment, increasing the participation of the private sector in the economic activity, activating the participation of the different political parties and forces in the process of decision-making;
- Industry sector in Jordan contributed to 18.7% of GNP in the year 2000, as well as it is considered a key supporter for hard currencies where industrial exports formed

in 1998 about 66% of the gross national exports. The number of industrial establishments in Jordan reached 23.000 establishments in 1997. The scarcity of natural resources in Jordan had forced local industries to depend on imported production inputs with the worth of 51.3% of the total import cost of these industries.

- Jordan is aware of the importance of achieving sustainable development for its positive impacts on the development of its social life, economic growth and the conservation of its natural and environmental resources. As a result, adequate institutions have been created.

➢ ***Industrial development policies***

➢ ***Industrial environment management policies***

➢ ***Technology transfer (in particular EST) policies***

- Development of the "sciences and technology" sector through socio-economic development plans and policies to promote scientific research. Currently, the government seeks to introduce information technology into its institutions and has made distinguished progress in the application of the Electronic Government Programs.

➢ ***Experiences with integrated policies & programmes***

➢ ***Reflections- Future direction for the country***

- Cooperate with the international and donor organizations to establish integrated strategies to manage debts, and look for financial sources to fund projects that achieve sustainable development in the least cost;
- Combat desertification through international and regional cooperation and the establishments of strategies and action plans;
- Transfer/develop environmentally sound technologies and cleaner production technologies;
- Increase private sector involvement in financing projects supporting sustainable development; improve investment environment to promote investment;
- Increase coordination between the public and the private sector.

8. NICARAGUA

➢ ***Achievements in the 3 Es***

- Improved national regulation (for sound natural resource exploitation, environment protection…), institutional capacity building for sustainable development;
  Promotion of local participation and sustainable practices.
- *Institution*: National Council for Sustainable Development (CONADES).

➢ ***Industrial Development policies***

- Support to agriculture and related agro-industries (agricultural diversification and cattle rearing), organic products production development (for fair-trade), Foster alimentary security, foster sound timber exploitation.

➢ ***Industrial Environment management policies***
- *Institutions*: National Commission for Environment and territorial administration (CONAMAR) (1990), National Commission for Environmental Education (CNEA) (1994); National Forest Institute (INAFOR), Technical Office for Ozone, National Environment Information System (SINIA)...
- *Strategies:* National Strategy of Conservation for sustainable development of Nicaragua (ECODESNIC) with its Territory environmental ordering scheme (EOAT) and its Forest action plan for Nicaragua (PAF-NIC); Environmental action plan (PAA-NIC); National Plan for Hydraulic resources...
- *Regulation*: 1) For the implementation of a system to prevent and control environmental damages and for the protection of natural resources, in particular those whose contribution to the PIB is important (General Law on Environment and Natural Resources; Law to suspend negotiation for concession of natural resources' exploration and exploitation; Other laws: on fishery and agriculture, on pesticides and toxic substances, on emissions control); 2) Ratification of international agreements (e.g. Biological diversity convention, Climatic Change convention)

➢ ***Technology transfer (in particular EST) policies***
- Creation of the "Clean Development Office" to promote and support environmental sustainable industrial development.

➢ ***Experiences with integrated policies and programmes***

➢ ***Reflections – Future directions for the Country***
- Define a vision and a National Plan to promote sustainable environmental management while developing economic and social welfare; develop mechanisms to valorize and benefit from environment protection;
- Develop adequate regulatory tools to foster environment protection (incentives, sanctions...); improve compliance with the existing norms;
- Promote environmental sound production processes; promote environmentally sustainable industries and ecological tourism;
- Promote peoples' participation and inter-institutional cooperation/coordination; improve environmental education and information.

9. NIGER

➢ ***Achievements in the 3 Es***
- Creation of institutions in charge of sustainable development; creation of the Office for Environmental evaluations and Environmental impact studies;
- Job creation through investment and entrepreneurship promotion.

➢ ***Industrial Development policies***

➢ ***Industrial Environment management policies***
- National Plan of Environment for Sustainable Development (PNEDD) with 6 priority programs: 1) Management of the Biological Diversity Program; 2) Climatic changes and variability program (data base on greenhouse gazes emissions and subsequent reports); 3) National action for fighting desertification and natural

resource management program; 4) Urban environment program; 5) Energy and Sustainable Development program; 5) Water and sustainable development program.
- Other Environmental programs: Natural resource management, Forest protection, Pastoral zones, and home energy use…
- Complementary policies and activities: Information and education programs, Institutional capacity building, Regulation (Law: No 98-56 on environment management, No 98-048 on hunting and fauna protection; No 98-042 on fishing).

➢ ***Technology transfer (in particular EST) policies***

➢ ***Experiences with integrated policies and programmes***
- Efforts have been made to integrate the 3 dimensions of sustainable development. For instance, environmental programs (such as Natural Resources' Management, Desertification fighting programs…) have an impact on the country's rural economy.

➢ ***Reflections – Future directions for the Country***
- Foster private initiatives and job creation, improve technical education and traineeship.

10. PARAGUAY

➢ ***Achievements in the 3 Es***

➢ ***Industrial Development policies***
- Regional market system development, micro-enterprises and SME support, rural familial productive unit support.

➢ ***Industrial Environment management policies***
- *Regulation*: waste and emissions;
- *Programs*: Natural capital protection program (natural resources, biodiversity…),

➢ ***Technology transfer (in particular EST) policies***
- Sustainable technology development programs.

➢ ***Experiences with integrated policies and programmes***
- The "Economic and Social Strategic Plan" (PEES) aims at coordinating the country's efforts towards sustainable development. It is composed of 4 integrated action areas: 1) Development of production, competitiveness and investment, 2) Social development and poverty alleviation, 3) modernization of the state and institutional capacity building, 4) macro-economic balance.

➢ ***Reflections – Future directions for the Country***
- Foster implementation of Agenda 21 by defining priorities and action plans;
- Improve natural resource management and environmental regulation;
- Develop a national territorial ordering plan and define responsibilities in order to solve environmental problems;
- Improve information and education/traineeship; promote local participation and foster regional-national coordination.

11. PERU

- ***Achievements in the 3 Es***
  - *Creation of Institutions*: Creation of the National Council on Sustainable Development (CONAM) (elaboration of 3 national environmental agendas); General framework for environmental management (MEGA); Environmental Impact evaluation system (SEIA); National Fund for the Environment (FONAM); System Commission for environment, ecology and the Amazon.

- ***Industrial Development policies***

- ***Industrial Environment management policies***
  - *Institutions*: National System of Environmental management (SNGA); Environmental information system (SINIA);
  - *Regulation*: e.g. Laws on solid waste, forests, sound exploitation of natural resources, biosecurity, biodiversity, air quality standards and regulation on environmental impact evaluation;
  - *Programs:* Atmosphere protection program; Planning and ordering of soil resources program, Deforestation and draught fight program, Biological diversity conservation program, Sound biotechnology management program, Sea and ocean protection program, Water protection program, Environmentally sound management of toxic chemical products, dangerous waste, solid waste and radioactive waste.

- ***Technology transfer (in particular EST) policies***

- ***Experiences with integrated policies and programmes***

  Efforts have been made to integrate the 3 dimensions:
  - The CONAM which foster inter-institutional coordination and private/public sector cooperation for the formulation of the regional environmental agendas.
  - Example of initiative: Development of "Ecologic economic zone" (ZEE) to foster integrated economic, social and environmental development in rural areas.

- ***Reflections – Future directions for the Country***
  - Define a national strategy and action plans that respects cultural, demographic and social diversity; improve the integration of the 3 dimensions of sustainable development;
  - Develop adequate economic instruments, disseminate information, create incentives/ sanctions to foster environment protection, foster local initiatives and people's participation…

12. SAINT LUCIA

- ***Achievements in the 3 Es***
  - St. Lucia has a very open economy, with a value of trade as a percentage of GDP per capita of EC 411,830 (US$4,354).
  - In 1997 the Government has moved swiftly to restructure, stabilize and reposition the economy and reducing unemployment and poverty.
  - The Sustainable Development and Environmental Unit of Ministry of Planning is in charge of coordinating national planning for sustainable development.

➢ ***Industrial development policies***

➢ ***Industrial environment management policies***

- In 1996 the Government of St. Lucia developed the Emergency Shelter Management Policy for St. Lucia. This policy provides a basis for action to be taken to mitigate the effects of natural and other disasters within available resources.
- *New focuses:* Trade and private sector Involvement in Environmental Management; Watershed Management and Coastal Area Management; National Land Policy (which is intended to guide the sustainable use and management of land).

➢ ***Technology transfer (in particular EST) policies***

➢ ***Experiences with integrated policies & programmes***

- The Integrate Development Planning (IDP) seeks to integrate and coordinate the economic, cultural, social, environmental, demographic, financial and spatial dimensions of the planning process to ensure the effective and sustainable use of available human, financial and natural resource for the benefit of all.

➢ ***Reflections- Future direction for the country***

- The way forward for St. Lucia' pursuit of sustainable development can be characterized by the following key recommendations: Establishing the institutional and legal framework for Integrated Development Planning (IDP); Sustainable Development Information; Strengthening of environmental management institutional, policy and legal frameworks; Establishing a Sustainable Development Management and Auditing System for Public and Private Operations.

13. SENEGAL

➢ ***Achievements in the 3 Es***

- National Policy of Sustainable Development and National Strategy for the Implementation of Agenda 21.
- Local action programs; Education/information programs; Recycling/Reusing programs.

➢ ***Industrial Development policies***

➢ ***Industrial Environment management policies***

- *Regulation*: 1) Energy production (Natural resource exploitation, Electricity, Hydrocarbons…); 2) Energy consumption: ("Code on Petrol", Emission regulation, Electricity for Rural areas…); 3) Protection of the Atmosphere (Environmental Code, International Conventions, fiscal policy to promote environment protection…); 4) Soil conservation (desertification); 5) Transport regulation (security, emissions…);
- *Programs*: 1) Improve access to energy; 2) Renewable energy programs (solar and wind energy); 3) Home Energy (butane); 4) Greenhouse gas emission reduction programs (e.g. solar energy for rural electricity, energy efficiency and energy saving programs, forest protection and development…); 5) Sound energy use programs (e.g. energy audits, biogas, improve energy consumption of transports…);

6) Soil conservation programs; 7) Agriculture intensification programs; 8) Transport emission control programs…

- ***Technology transfer (in particular EST) policies***

- ***Experiences with integrated policies and programmes***

- ***Reflections – Future directions for the Country***

14. SYRIAN ARAB REPUBLIC

- ***Achievements in the 3 Es***
  - Creation of institutions in charge of sustainable development.

- ***Industrial development policies***

- ***Industrial environment management policies***
  - The Syrian National Environmental Action Plan comprises a complete list of actions dealing with environmental policies, institutions, investments and information /training.

- ***Technology transfer (in particular EST) policies***
  - Improved availability and access to information and training programs; investment promotion; indigenous technology development; promotion of technology development by regional centers; promotion of Cleaner Production technology; promotion of technology transfer.

- ***Experiences with integrated policies & programmes***
  - Since the early 1990's, Syrian experts in co-operation with MAP/UNEP experts have prepared the Plan of Integrated Management of the Syrian Coastal Region. The plan demonstrates an integrated approach between ecological, economic and social dimensions. There is still however, a necessity to strengthen coordination among the concerned parties and to follow up execution of the relevant measures within definite timetables in a short and long terms.

- ***Reflections- Future direction for the country***
  - Improved regulation, policy changes and institutional adjustments are needed to address key concerns;
  - Foster investment and develop technical and managerial resources;
  - Develop a good and qualified management, predicated on a sound understanding of the issues, having the technical ability to implement management techniques and the necessary financial resources as well as active stakeholder co-operation is need.
  - Foster research and information exchange (develop an adequate information system) to evaluate options to adopt the most cost-effective solutions;
  - Measures should be taken by Mediterranean countries (e.g. combined monitoring programs covering all pollution parameters in coastal waters originated from land-based sources).

15. TUNISIA

➢ ***Achievements in the 3 Es***

- *Economy:* Private sector development and local initiative promotion through decentralization;
- *Environment:* Institutional capacity building (e.g. municipal environmental plans);
- Creation of institutions in charge of sustainable development: National Commission on sustainable development (CNDD), National Agency for Renewable energies (ANER), National agency for environment protection (ANPE), Coast protection and administration agency (APAL)...

➢ ***Industrial Development policies***

➢ ***Industrial Environment management policies***

- Policies: 1) *Natural resources management strategies* to preserve natural resources by using them in a sustainable way; Laws and regulations on land resources, forests, biodiversity, humid areas, sea and marine resources, energy and air to prevent pollution and environmental damages; 2) *Environment protection and waste management strategies*: National Programme for Solid Waste Management (develops a system of waste collection, promotes re-use and recycling, fosters waste minimization by charging polluters, treats dangerous waste adequately, develops a system of urban waste waters treatment); 3) Industrial pollution control;
- Resources: Between 1992/96 and 1997/2001, the budget for natural resources and environment protection rose by 10,5% (compared to 6% increase for other budgets).

➢ ***Technology transfer (in particular EST) policies***

- Energy efficiency and saving programs; water saving programs; cleaner technology development programs (to reduce toxic emissions); waste management programs.

➢ ***Experiences with integrated policies and programmes***

- Efforts are made to integrate the 3 dimensions in the two main environmental strategies: 1) "curative actions" that are undertaken to correct former actions (to protect damaged areas and develop the poorest regions of the country), the integration of the 3 dimensions is straightforward (e.g. pollution control, protection of already damaged natural resources...); 2) "preventive development and environmental programs", efforts are made to integrate the 3 dimensions but it is more difficult.
- The National Commission on sustainable development (CNDD) tries to improve coordination by putting the different actors together with the view to elaborate a systematic approach to address sustainable development.

➢ ***Reflections – Future directions for the Country***

- *Economy:* Develop capacities to be able to anticipate changes and adapt rapidly to new economic opportunities that may rise from globalization; Support to the private sector to be competitive in a globalized economy; Promote policies/tools to use international cooperation's resources more efficiently; Reform the system to increase civil society's and local actors' participation;
- *Environment:* Develop better information systems for decision-making and information dissemination; Develop practical approaches to implement Agenda 21 recommendations; Promote coordination mechanisms between the different national actors; Develop tools to evaluate costs and benefits of environmental protection and sustainable development.

VI. STATISTICAL INFORMATION

The statistical information in this report consists of two types. The global overview, which contains data for as many countries for which UNIDO could find the relevant information and the national overview that presents data for the 18 countries covered by the national reports. Both types of statistical information include indicators from the three dimensions of sustainable development, economic, environmental and social that were considered relevant to industry.

The global overview consists of the following:

1. Industrial statistics for the regions of the world - income per capita, manufacturing value added per capita, manufacturing exports per capita, share of medium and high-level technology activities in total manufacturing value and share of medium and high-level technology products in total manufacturing exports and research and enterprise development.

2. Economic indicators that include a combined index (using the same methodology as in the UNDP *Human Development Report*) for all countries for which data on manufacturing value added and manufacturing exports per capita for two years - 1988 and 1998 was available;

3. Environmental indicators on industrial CO2 emissions and organic water effluent (BOD) for all countries for which data are available for two years - 1989 and 1997; and a combined index for all countries for which there are data on industrial CO2 emissions and organic water effluent for two years – 1989 and 1997.

4. Social indicators on employment in industry for all countries for which data was available for two years 1989 and 1997; female employment in industry for all countries for which data was available for two years 1989 and 1997; and Human Development Index for the countries for which data on employment was available.

The data for the global overview provide essential information for creating an Industrial Performance Scoreboard, one that could be limited to economic variables or one that could combine economic and environmental variables. The World Industrial Development Report, currently under preparation by UNIDO, will describe an Industrial Performance Scoreboard based only on economic variables (MVA per capita, manufactured exports per capita, share of medium and high technology activities in MVA and share of medium and high technology products in manufactured exports) and the changes in country performance between 1985 and 1998.

Only a few comments are given here to illustrate how one might use such statistical analysis in comparing performances among countries as an input into a national report on the contribution of industry to sustainable development. Even limiting the statistical analysis to only two variables (MVA per capita and manufacturing exports per capita) and a shorter period than covered by the World Industrial Development Report, it is possible to show remarkable changes. Within the industrialized countries, Ireland improved its performance considerably. Among developing countries, Singapore was a leader in both periods and some regions and countries showed considerable improvements over the past ten years. East Asia as a region improved with noticeable changes in the performance by China, the Philippines,

Indonesia and Thailand. Among Latin American countries Mexico showed a marked improvement in its performance. For Sub-Saharan Africa, most of the countries congregate at the bottom of the list for both years and some show marked declines (Zimbabwe and Mauritius).

For the 18 countries for which there are national reports on the contribution of industry to sustainable development, there are country specific data for social, economic and environmental indicators. The country performance on these indicators is compared with relevant sub-region and regional performance.

Here again one can see how statistical analysis could be utilized as an input into a national report. Take Bolivia for example. Industry-related economic activity improved, but is still behind other countries in the Andean Community and in Latin America. Industry-related social indicators in the two periods showed improvement in female employment as a percentage of the economically active population. Industry related environmental indicators showed a small deterioration in terms of CO2 per unit of MVA and BOD per day per worker, but still these pollutant releases per unit of economic activity were lower than in the Latin American region for the year 1996.

1. NATIONAL OVERVIEWS

INDICATORS	BOLIVIA				Andean Community*		Latin America**
Industry related SOCIAL Indicators	**1989**	**1992**	**1996**	**1998**	**1992**	**1996**	**1996**
Total employees (%in total labor force)	628220 (24.7%)	864097 (31.4%)	878508 (28.8%)	----	---	---	---
Female Employees, (% of economically active population)	11.8	16.5	15.8	---	17.4	15.7	13.9
Male Employees (% of economically active population)	34.2	42	39.7	---	33.5	30.9	27.6
Industry related ECONOMIC Indicators	**1989**	**1992**	**1996**	**1998**	**1989**	**1998**	**1998**
MVA Per capita (US$)	119	125	140	142	306	328	220
Manufactured exports per capita (constant 1990 US$)[1]	6.1	13.8	22.9	45.1	31.4	68	84.6
No of Worker per 1000 US$ of MVA	8.2	9.9	8.2	---	3.3	5.7[3]	
Industry related ENVIRONMENTAL Indicators	**1989**	**1992**	**1995**	**1998**	**1989**	**1995**	**1995**
Industrial CO2 emissions (mt ton per capita)	0.81	0.99	1.4	---	2.2	2.9	26.3
CO2 emissions ton per 100 US $ of MVA	0.68	0.79	1.05	---	0.71	0.88	64.7
Organic water pollutant emissions (kg per day per worker)	8.2	9.4	10.2	---	0.2	58.6[2]	64.7

Sources: World Development Indicators Report and UNIDO Industrial Statistics.

* The Andean Community comprises Bolivia, Colombia, Ecuador, Peru and Venezuela.

** As defined in the World Development Indicators Report 2001.

[1] Source, Unido Statistics.

[2] The average was calculated using data for 1994 in Peru and 1995 for all the other countries.

[3] Calculated with data from Peru, Ecuador and Colombia. Information of number of total workers was not available for Bolivia and Venezuela on this year.

INDICATORS	CAMEROON				CENTRAL AFRICA*		SUB-SAHARAN AFRICA**	
Industry related SOCIAL Indicators	**1990**	**1992**	**1996**	**1998**	**1990**		**1990**	
Total number of employees (% in total labor force)	410445 (8.9%)	---	---	---	---		---	
Female employees (% of economically active population)	2.9	---	---	---	3.15[1]		4.7	
Male Employees (% of economically active population)	12.3	---	---	---	12.7[1]		13.6	
Industry related ECONOMIC Indicators	**1989-0**	**1992**	**1996**	**1998**	**1989**	**1997**	**1989**	**1997**
MVA Per capita (constant 1995 US$)	95.4	84	63.7	70.6	92[2]	68[2]	91	78.3
Manufactured exports per capita (US$ 1990 per capita)	---	---	---	---	---	---	---	---
No of workers per 1000 constant 1995 US$ of MVA	4.1[3]	---	---	---	4.4[4]	---	---	---
Industry related ENVIRONMENTAL Indicators	**1989**	**1992**	**1996**	**1997**	**1989**	**1997**	**1989**	**1997**
Industrial CO2 emissions (metric tones per capita)	0.69	0.31	0.16	0.19	1.79	0.76	0.97	0.83
Industrial CO2 emissions per 1000 constant 1995 US$ of MVA	7.2	3.6	2.5	2.8	11.6[5]	4.5[5]	10.7	10.6
Organic water pollutant emissions (kg per day per worker)	0.25	0.26	0.24	0.23	0.20[6]	0.23[6]	---	---

Sources: World Development Indicators Report and UNIDO Industrial Statistics.

* The Central African Region comprises Cameroon, Chad, Congo, Gabon, Equatorial Guinea, Central African Republic, Sao Tome and Principe.

**According to the definition contained in the World Development Indicators Report 2001.

[1] The average calculated does not include data for Sao Tomas and Principe.

[2] The average calculated does not include data for Chad and Equatorial Guinea.

[3] Data from 1990.

[4] [1]Index calculated with information from Cameroon, Congo and Gabon only.

[5] The average calculated does not include data for Chad and Equatorial Guinea.

[6] Averages were calculated with data for 3 countries only, namely Gabon, Cameroon and Central African Republic.

INDICATORS	CHILE				MERCOSUR*		Latin America
Industry related SOCIAL Indicators	**1989**	**1992**	**1996**	**1998**	**1989**	**1996**	**1996**
Total number of employees (% in total labor force)	1286274 (26.5%)	1389097 (26.5%	1526400 (26.6%	1823152 (25.5%)			
Employees, industry female (% of economically active population)	15.7	15.1	14.9	13.8	17.1***	11.5**	13.9
Employees, industry, male (% of economically active population)	31.2	31.7	32.1	31.4	34.4***	30.4**	27.6
Gini Index %							
Industry related ECONOMIC Indicators	**1989**	**1992**	**1996**	**1998**	**1989**	**1998**	**1998**
MVA Per capita (US$)	224	232	220	142	444.9	328	220
Manufactured exports per capita (US$ 1990 per capita)	41.4	60.4	79.8	45.1	318.6	144.2	84.6
No of workers per 100US$ of MVA	2	1.8	1.6	1.8			
Industry related ENVIRONMENTAL Indicators	**1989**	**1992**	**1996**	**1997**	**1989**	**1997**	**1995**
Industrial CO2 emissions (metric tones per capita)	2.6	3.6	1.5	4.1	2	2.4	26.3
Industrial CO2 emissions per 1000US$ of MVA	1.1	1.55	0.68	2.88			
Organic water pollutant emissions (kg per day)	65	73.9	78.5	78.1	---	---	64.7

Sources: World Development Indicators Report and UNIDO Industrial Statistics.

* The MERCOSUR Community comprises Argentina, Brazil, Chile, Uruguay and Paraguay.

** The average was calculated excluding Uruguay because of lack of data for that year.

*** The average was calculated excluding Argentina because of lack of data for that year.

INDICATORS	CHINA				NORTHEAST ASIA*
Industry related SOCIAL Indicators	**1989**	**1992**	**1996**	**1997**	**1996**
Total employees (% in total labor force)	140105010 (21.3%)	135630040 (19.6%)	151442720 (20.8%)	150058320 (20.4%)	
Female employees (% of economically active population)	---	---	---	---	
Male Employees (% of economically active population)	---	---	---	---	
Industry related ECONOMIC Indicators	**1989**	**1992**	**1996**	**1998**	**1998**
MVA Per capita (US$)	106	143	240	283	
Manufactured exports per capita (US$ 1990 per capita)	---	---	---	---	
No of worker per 1000 US$ of MVA	1.1	0.8	0.5	0.4	
Industry related ENVIRONMENTAL Indicators	**1989**	**1992**	**1996**	**1997**	**1997**
Industrial CO2 emissions (metric tones per capita)	2.2	2.4	2.9	2.9	
Industrial emissions per 1000 US$ of MVA	2	16.7	12	11	
Organic water pollutant emissions (kg per day)	0.15	0.14	0.13	0.14	

Sources: World Development Indicators Report and UNIDO Industrial Statistics.

* North East Asia comprises the Democratic Republic of Korea, Japan, Mongolia, China, South Korea and the Russian Federation.

INDICATORS	COLOMBIA				Andean Community*		Latin America**
SOCIAL	**1989**	**1992**	**1996**	**1998**	**1992**	**1996**	**1996**
Total number of employees (% in total labor force)	4039390 (29.3%)	4573173 (30.9%)	4928618 (29.8%)	4638803 (26.5%)	---	---	---
Female employees (% of economically active population)	23.7	25	24.1	20.9	17.4	15.7	13.9
Male Employees (% of economically active population)	34	35.1	33.8	30.8	33.5	30.9	27.6
Industry related ECONOMIC Indicators	**1989**	**1992**	**1996**	**1998**	**1989**	**1998**	**1998**
MVA Per capita (US$)	224	232	220	142	306	328	220
Manufactured exports per capita (US$ 1990 per capita)	41.4	60.4	79.8	45.1	31.4	68	84.6
No of workers per 1000 US$ of MVA	5.2	5.4	5.6	5.1	3.3	5.7[1]	
Industry related ENVIRONMENTAL Indicators	**1989**	**1992**	**1996**	**1997**	**1995**	**1995**	**1995**
Industrial CO2 emissions (metric tones per capita)	1.6	1.7	1.7	1.7	2.2	2.9	26.3
Industrial CO2 emissions per 1000US$ of MVA	0.71	0.73	0.77	1.19	0.71	0.88	64.7
Organic water pollutant emissions (kg per day)	91.9	113.1	109.5	110.6	0.2	58.6[2]	---

Sources: World Development Indicators Report and UNIDO Industrial Statistics.

* The Andean Community comprises Bolivia, Colombia, Ecuador, Peru and Venezuela.

** As defined in the World Development Report 2001.

***The average was calculated using data for 1994 in Peru and 1995 for all the other countries.

[1] Source, Unido Statistics. Calculated with data from Peru, Ecuador and Colombia. Information of number of total workers was not available for Bolivia and Venezuela on this year.

[2] The average was calculated using data for 1994 in Peru and 1995 for all the other countries.

INDICATORS	CZECH REPUBLIC				EASTERN EUROPE*		EUROPE & CENTRAL ASIA	
SOCIAL	**1992**	**1994**	**1996**	**1997**	**1994**	**1997**	**1992**	**1997**
Total number of employees (% of total labor force)	248925 (45.%)	2364091 (42.2%)	2355781 (41.6%)	2343400 (41.2%)				
Employees, industry female (% of economically active population)	32.8	31.7	30.5	29.1	26.8**	25.26**		
Employees, industry, male (% of economically active population)	55.2	51.3	50.2	50.4	43.5**	43.14**		
Gini Index %								
ECONOMIC	**1989**	**1992**	**1996**	**1998**	**1998**			
MVA Per capita (US$)								
Manufactured exports per capita (US$ 1990 per capita)								
INDUSTRY RELATED ENVIRONMENTAL INDICATORS	**1989**	**1992**	**1993**	**1997**	**1993**	**1997**	**1992**	**1997**
Industrial CO2 emissions (metric tones per capita)	--	13.1	12.3	12.1	8.18	7.09	8.87	6.94
Organic water pollutant emissions (kg per day per worker)	0.13	0.13	0.14	0.14	0.15	0.15		

Sources: World Development Indicators Report and UNIDO Industrial Statistics.

* The Easter Europe Sub-region Belarus, Bulgaria, Czech Republic, Hungary, Poland, Republic of Moldova, Romania, Russian Federation, Slovakia and Ukraine.

** The average were calculated including information from Czech Republic, Hungary, Poland, Romania and Slovak Republic. Data for the other countries was not available.

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INDICATORS	EGYPT				NORTH AFRICA*		MIDDLE EAST & NORTH AFRICA**	
Industry related SOCIAL Indicators	**1990**	**1992**	**1995**	**1998**	**1990**		**1990**	
Total number of employees (% of total labor force)	3788567 (20.7%)	4181090 (21.5%)	4625135 (21.9%)	---	---			
Female employees (% of economically active population)	9.1	10.4	9.2	---	8.3[1]		11.7	
Male Employees (% of economically active population)	25.1	24.6	24.9	---	23.6[1]		26	
Industry related ECONOMIC Indicators	**1989**	**1992**	**1996**	**1998**	**1998**		**1998**	
MVA Per capita (US$)	190	203	230	260				
Manufactured exports per capita (US$ 1990 per capita)	20	19	18	22				
No of worker per 1000US$ of MVA	3.6[2]	3.4	3.1[3]	---				
Industry related ENVIRONMENTAL Indicators	**1989**	**1992**	**1996**	**1997**	**1989**	**1997**	**1989**	**1997**
Industrial CO2 emissions (metric tones per capita)	1.5	1.6	1.9	---	2.5	2.6	3.4	4
Industrial CO2 emissions per 1000 US$ of MVA	0.78	0.78	0.82	---			--	----
Organic water pollutant emissions (kg per day)	0.19	0.19	0.18	---	0.19[4]			

Sources: World Development Indicators Report and UNIDO Industrial Statistics.

* The North African sub-region comprises Algeria, Egypt, Libyan Arab Jamahiriya, Mauritania, Morocco, Sudan and Tunisia.

**According to the definition contained in the World Development Indicators Report 2001.

[1] Average calculated does not include data from Tunisia for the given year.

[2] Data for 1990.

[3] Data for 1995.

[4] Average does not include data from Libya, Mauritania and Sudan. Data for 1996.

INDICATORS	ETHIOPIA				EASTERN AFRICA*		SUB SAHARAN AFRICA**	
Industry related SOCIAL Indicators	**1990**	**1994**	**1995**	**1998**	**1990**		**1990**	
Total number of employees (% of total labor force)	479352 (2.1%)	626515 (2.6%)	494072 (2%)	---				
Female employees (% of economically active population)	1.8	2.5	1.7	---	5.61		4.7	
Male Employees (% of economically active population)	2.3	2.6	2.2	---	13.8		13.6	
Industry related ECONOMIC Indicators	**1989**	**1992**	**1996**	**1998**	**1998**		**1998**	
MVA Per capita (constant 1995 US$)	7.3	4.2	6.9	6.7				
Manufactured exports per capita (US$ 1990 per capita)	---	---	---	----				
No of workers per 1000 constant 1995 US$ of MVA	1.3	1.8	1.2	---				
Industry related ENVIRONMENTAL Indicators	**1989**	**1992**	**1996**	**1997**	**1989**	**1997**	**1989**	**1997**
Industrial CO2 emissions (metric tones per capita)	0.06	0.05	0.06	0.06	0.2	0.2	0.97	0.83
Industrial CO2 emissions per 1000 constant 1995 US$ of MVA	8.1	11.7	8.6	8.3				
Organic water pollutant emissions (kg per day)	0.22	0.22	0.22	0.21	0.24[1]	---	----	---

Sources: World Development Indicators Report and UNIDO Industrial Statistics.

* The Eastern African region comprises Burundi, Comoros, Democratic Republic of Congo, Djibouti, Eritrea, Ethiopia, Kenya, Madagascar, Rwanda, Seychelles, Somalia, Tanzania and Uganda.

**According to the definition contained in the World Development Indicators Report 2001.

[1]Average calculated only with information from Cape Verde, Nigeria and Senegal for 1992.

INDICATORS	INDONESIA				SOUTH EAST ASIA*		EAST ASIA AND PACIFIC**	
SOCIAL	**1990**	**1992**	**1996**	**1997**	**1990**	**1996**	**1996**	
Total number of employees (%of total labor force)	10719407 (13.7%)	11658046 (14.1%)	16665046 (18.1%)	15769798 (16.3%) 1998				
Female employees (% of economically active population)	12.4	12.8	15.9	16.3	12.4[1]	18.3[2]	--	
Male Employees (% of economically active population)	14.1	14.9	19.5	20.7	19.5[1]	23.5[2]	--	
Industry Related ECONOMIC Indicators	**1989**	**1992**	**1996**	**1998**				
MVA Per capita (US$)	117.4	152.6	222.5	200.4				
Manufactured exports per capita (US$ 1990 per capita)	39.6	87	129.6	105.8				
No of workers per 1000 US$ of MVA	5	4	3.7	3.3[3]				
Industry related ENVIRONMENTAL Indicators	**1989**	**1992**	**1996**	**1997**	**1989**	**1997**	**1989**	**1997**
Industrial CO2 emissions (metric tones per capita)	0.75	0.98	1.30	1.25	4.2	5.3	2	2.8
Industrial Co2 emissions per 1000 US$ of MVA	0.63	0.64	0.58	0.62				
Organic water pollutant emissions (kg per day)	0.2	0.18	0.17	0.16	0.16[4]	0.13[5]	---	---

Sources: World Development Indicators Report and UNIDO Industrial Statistics.

* The South East Asian sub-region comprises Brunei, Cambodia, Indonesia, Laos, Myanmar, Philippines, Singapore, Thailand and Vietnam.

** As defined in the Word Development Indicators Report 2001.

[1] The average was calculated with information from only eight countries and does not include information for Myanmar and Singapore.

[2] The average was calculated with information from only six countries and does not include information for Brunei, Cambodia, Laos and Myanmar.

[3] Data for 1997.

[4] The average was calculated with information from only seven countries and does not include information for Brunei, Laos and Vietnam.

[5]The average was calculated with information from only six countries, and does not include information from Brunei, Cambodia, Laos and Vietnam.

INDICATORS	NIGERIA				WEST AFRICA*		SUB-SAHARAN AFRICA**	
Industry related SOCIAL Indicators	**1990**	**1992**	**1995**	**1998**	**1990**		**1990**	
Total number of employees (% of total labor force)	2655203 (6.9%)	---	---	---			---	
Female employees (% of economically active population)	3.3	---	---	---	5.61		4.7	
Male Employees (% of economically active population)	8.9	---	---	---	13.8		13.6	
Industry related ECONOMIC Indicators	**1989**	**1992**	**1996**	**1998**	**1998**		**1989**	**1997**
MVA Per capita (constant 1995 US$)	13.2	13.6	13.3	13.1			91	78.3
Manufactured exports per capita (US$ 1990 per capita)	---	---	---	---			---	---
No of workers per 1000 constant 1995 US$ of MVA	1.9[1]						---	---
Industry related ENVIRONMENTAL Indicators	**1989**	**1992**	**1996**	**1997**	**1989**	**1997**	**1989**	**1997**
Industrial CO2 emissions (metric tones per capita)	0.86	1.1	0.7	0.7	0.28	0.26	0.97	0.83
Industrial CO2 emissions per 1000 constant 1995 US$ of MVA	64.7	80.6	52.3	53.1			10.7	10.6
Organic water pollutant emissions (kg per day)	---	0.23	0.18[2]	---	0.24[3]	---	---	---

Sources: World Development Indicators Report and UNIDO Industrial Statistics.

* The West African region comprises Burkina Faso, Benin, Cape-Verde, Cote d'Ivoire, The Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone and Togo.

**According to the definition contained in the World Development Indicators Report 2001.

***Average calculated only with information from Cape Verde, Nigeria and Senegal for that year.

[1] Data for 1990.

[2] Data for 1994

[3] Data for 1992

INDICATORS	PAKISTAN				SOUTH ASIA*	
Industry related SOCIAL Indicators	**1989**	**1992**	**1994**	**1997**		
Total number of employees (% of total labor force)	7420248 (19.8%)	8031493 (10.7%)	7564025 (17.5%)	8934408 (18.9%)		
Female employees (% of economically active population)	14.2	15.3	11	10.5		
Male Employees (% of economically active population)	20.6	20.4	18.6	20.2		
Industry related ECONOMIC Indicators	**1989**	**1992**	**1996**	**1998**	**1989**	**1998**
MVA Per capita (constant 1995 US$)	63.8	71.8	73.2	74.5	51.8	61
Manufactured exports per capita (US$ per capita)	31	50.3	61.9	53.8	---	---
No of workers per 1000 constant 1995 US$ of MVA	1.1	0.98	0.83	0.97	---	---
Industry related ENVIRONMENTAL Indicators	**1989**	**1992**	**1996**	**1997**	**1989**	**1997**
Industrial CO2 emissions (metric tones per capita)	0.6	0.67	0.78	0.76	0.69	0.93
Industrial CO2 emissions per 1000 constant 1995 US$ of MVA	9.5	9.3	10.6	10.6	13.3	14.7
Organic water pollutant emissions (kg per day)	0.18	0.18	---	---	---	---

Sources: World Development Indicators Report and UNIDO Industrial Statistics.

* According to the definition contained in the World Development Indicators Report 2001.

INDICATORS	PHILIPPINES				SOUTH EAST ASIA*		EAST ASIA AND PACIFIC**	
SOCIAL	**1990**	**1992**	**1996**	**1997**	**1990**	**1996**	**1996**	
Total number of employees (%of total labor force)	3659426 (15%)	4134366 (16%)	4793146 (16.6%)	4949835 (16.7%)				
Female employees (% of economically active population)	12.8	13.7	12.5	12.7	12.4[1]	18.3[2]	--	
Male Employees (% of economically active population)	15	16	16.6	16.7	19.5[1]	23.5[2]	--	
Industry Related ECONOMIC Indicators	**1989**	**1992**	**1996**	**1998**				
MVA Per capita (US$)	180	169	183	180				
Manufactured exports per capita (US$ 1990 per capita)	47.5	63.5	243.2	363				
No of workers per 1000 US$ of MVA	0.3	0.3	0.3	0.37				
Industry related ENVIRONMENTAL Indicators	**1989**	**1992**	**1996**	**1997**	**1989**	**1997**	**1989**	**1997**
Industrial CO2 emissions (metric tones per capita)	0.71	0.84	1	1.14	4.3	5.3	2	2.8
Industrial Co2 emissions per 1000 US$ of MVA	0.34	0.37	0.4	0.38				
Organic water pollutant emissions (kg per day)	0.19	0.21	0.18	0.18	0.16[3]	0.13[4]	---	---

Sources: World Development Indicators Report and UNIDO Industrial Statistics.

* The South East Asian sub-region comprises Brunei, Cambodia, Indonesia, Laos, Myanmar, Philippines, Singapore, Thailand and Vietnam.

** As defined in the Word Development Indicators Report 2001.

[1] The average was calculated with information from only eight countries and does not include information for Myanmar and Singapore.

[2] The average was calculated with information from only six countries and does not include information for Brunei, Cambodia, Laos and Myanmar.

[3] The average was calculated with information from only seven countries and does not include information for Brunei, Laos and Vietnam.

[4] The average was calculated with information from only six countries, and does not include information from Brunei, Cambodia, Laos and Vietnam.

INDICATORS	SUDAN				NORTH AFRICA*		MIDDLE EAST & NORTH AFRICA**	
SOCIAL	**1990**	**1992**	**1994**	**1998**	**1990**		**1996**	
Total number of employees (% of total labor force)	758795 (8.5%)	---	---	---	---		---	
Female employees (% of economically active population)	5.3	---	---	--	8.3[1]		11.7	
Male Employees (% of economically active population)	9.6	---	---	---	23.6[1]		26	
ECONOMIC	**1989**	**1992**	**1996**	**1998**	**1989**	**1998**	**1998**	
MVA Per capita (current US$)	77.4	---	24.7	30.6	179[2]	169[2]	272	
Manufactured exports per capita (US$ 1990 per capita)	---	---	---	---	---	---		
No of workers per 1000 US $ of MVA	---	---	---	---				
INDUSTRY RELATED ENVIRONMENTAL INDICATORS	**1989**	**1992**	**1996**	**1997**	**1989**	**1997**	**1989**	**1997**
Industrial CO2 emissions (metric tones per capita)	0.14	0.4	0.14	0.13	2.5[5]	2.6[3]	3.42[4]	4.02
Industrial CO2 emissions per 1000 current US$	1.89	---	5.6	4	4.8[4]	12.5[4]	---	15.2
Organic water pollutant emissions (kg per day)	---	---	---					

Sources: World Development Indicators Report and UNIDO Industrial Statistics.

* The North African sub-region comprises Algeria, Egypt, Libyan Arab Jamahiriya, Mauritania, Morocco, Sudan and Tunisia.

**According to the definition contained in the World Development Indicators Report 2001.

[1]Average calculated does not include data from Tunisia for the given year.

[2] The Average does not include data from Libya, Mauritania and Sudan.

[3] The index was calculated with data on MVA in constant 1995 US$. However, it does not include data for Libya and Sudan. For Sudan only data on current US$ is available and for Libya there is no data.

[4] The index was calculated with data on MVA in constant 1995 US$. However, it does not include Sudan and Libya in the given year. For Sudan only data on current US$ is available and for Libya there is no data.

INDICATORS	TUNISIA				NORTH AFRICA*		MIDDLE EAST& NORTH AFRICA**	
Industry related SOCIAL Indicators	**1989**	**1992**	**1994**	**1998**	**1990**		**1996**	
Total number of employees (% of total labor force)	936127 (33.6%)	---	1090740 33.5%)	---				
Female employees (% of economically active population)	31.1	---	---	--	8.3[1]		11.7	
Male Employees (% of economically active population)	44.1	---	---	---	23.6[1]		26	
Industry related ECONOMIC Indicators	**1989**	**1992**	**1996**	**1998**	**1998**		**1998**	
MVA Per capita (US$)	333	271	309	334				
Manufactured exports per capita (US$ 1990 per capita)	243	345	484	505				
No of workers per 1000 US$ of MVA	3.5	---	4.3[2]	---				
Industry related ENVIRONMENTAL Indicators	**1989**	**1992**	**1996**	**1997**	**1989**	**1997**	**1989**	**1997**
Industrial CO2 emissions (metric tones per capita)	1.86	1.99	2.05	2.04	2.5	2.7	3.42	4.02
Industrial CO2 emissions per 1000US$ of MVA	0.55	0.73	0.66	0.61				
Organic water pollutant emissions (kg per day)	---	0.18[3]	0.16	0.16	---	0.19[4]	---	---

Sources: World Development Indicators Report and UNIDO Industrial Statistics.

* The North African sub-region comprises Algeria, Egypt, Libyan Arab Jamahiriya, Mauritania, Morocco, Sudan and Tunisia.

**According to the definition contained in the World Development Indicators Report 2001.

[1] Average calculated does not include data from Tunisia for the given year.

[2] Data for 1994.

[3] Data for 1993.

[4] Average does not include data from Libya, Mauritania and Sudan. Data for 1996.

INDICATORS	TURKEY				CENTRAL ASIA*
Industry related SOCIAL Indicators	**1989**	**1992**	**1996**	**1998**	**1996**
Total number of employees (% in total labor force)	4980780 (21%)	5953816 23.3%)	6199920 (21.8%)	6686176 (22.4%)	
Female employees (% of economically active population)	9.3	14.2	8.9	13.3	
Male Employees (% of economically active population)	26.4	27.3	27.3	29.2	
Industry related ECONOMIC Indicators	**1989**	**1992**	**1996**	**1998**	**1998**
MVA Per capita (US$)	548	615	707	775	
Manufactured exports per capita (US$ 1990 per capita)	138	181	276	326	
No of workers per 1000 US$ of MVA	1.6	1.6	1.4	1.4	
Industry related ENVIRONMENTAL Indicators	**1989**	**1992**	**1996**	**1997**	**1997**
Industrial CO2 emissions (metric tones per capita)	2.67	2.77	3.34	3.46	
Industrial CO2 emissions per 1000US$ of MVA	0.48	0.45	0.47	0.44	
Organic water pollutant emissions (kg per day)	0.19	0.18	0.17	0.16	

Sources: World Development Indicators Report and UNIDO Industrial Statistics.

* Central Asia comprises Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistán, Uzbekistán, Turkey, Georgia, Azerbaijan, Armenia (the last 3 countries form their own separate caucus in the WSSD process).

INDICATORS	VIETNAM				SOUTH EAST ASIA*	
Industry related SOCIAL Indicators	**1990**	**1992**	**1996**	**1994**	**1990**	**1996**
Total number of employees (% of total labor force)	4698876 (14%)	4240660 (12.1%)	3933145 (10.4%)	4697284 (12.9%)	25942781 (13%)**	
Female employees (% of economically active population)	10.8	--	8.6	--	12.4[1]	18.3[2]
Male Employees (% of economically active population)	17.1	---	12.3	---	19.5[1]	23.5[2]
Industry related ECONOMIC Indicators	**1989**	**1992**	**1996**	**1999**	**1989**	**1999**
MVA Per capita (current US$)	18.5	30.9	---	65	162[3]	283.6[4]
Manufactured exports per capita (US$ 1990 per capita)	---	---	---	---	---	---
No of worker per 1000 current US$ of MVA	3.8	1.9	---	---	0.38[5]	---
Industry related ENVIRONMENTAL Indicators	**1989**	**1992**	**1996**	**1997**	**1989**	**1997**
Industrial CO2 emissions (metric tones per capita)	0.28	0.34	0.54	0.60	4.4	5.2
Industrial CO2 emissions per 1000 current US$ of MVA	15	10.9	---	---	11.5[6]	---
Organic water pollutant emissions (kg per day)	---	---	---	---	0.16[7]	0.13[8]

Sources: World Development Indicators Report and UNIDO Industrial Statistics.

* The South East Asian sub-region comprises Brunei, Cambodia, Indonesia, Laos, Myanmar, Philippines, Singapore, Thailand and Vietnam.

** The Average calculated does not include information for Brunei and Myanmar.

[1] The average calculated does not include information for Myanmar and Singapore.

[2] The average calculated does not include information for Brunei, Cambodia, Laos and Myanmar.

[3] The average calculated does include information for Myanmar.

[4] The average calculated does not include information for Brunei, Cambodia, Laos and Myanmar.

[5] The average calculated does not include information for Brunei and Myanmar and corresponds to data for 1990.

[6] The average calculated does not include information for Myanmar.

[7] The average was calculated with information from only seven countries and does not include information for Brunei, Laos and Vietnam.

[8] The average was calculated with information from only six countries, and does not include information from Brunei, Cambodia, Laos and Vietnam.

INDICATORS	ZIMBABWE				SOUTH AFRICA*		SUB-SAHARAN AFRICA**	
Industry related SOCIAL Indicators	**1990**	**1992**	**1994**	**1998**	**1990**		**1990**	
Total number of employees (% of total labor force)	1261808 (27.9%)	1327754 (27.9%)	1378965 (27.7%)	---				
Female employees (% of economically active population)	8.1	7.9	10.3	--	13.9		4.7	
Male Employees (% of economically active population)	32.3	32.3	32	---	25.7[1]		13.6	
Industry related ECONOMIC Indicators	**1989**	**1992**	**1996**	**1998**	**1998**		**1998**	
MVA Per capita (US$)	165	164	144	139				
Manufactured exports per capita (US$ 1990 per capita)	35	43	55	54				
No of workers per 1000US$ of MVA	3.8	3.7	3.8					
Industry related ENVIRONMENTAL Indicators	**1989**	**1992**	**1996**	**1997**	**1989**	**1997**	**1989**	**1997**
Industrial CO2 emissions (metric tones per capita)	1.74	1.79	1.6	1.6	1.6[2]	1.6[2]	0.97	0.83
Industrial CO2 emissions per 1000US$ of MVA	1.05	1.09	1.11	1.15				
Organic water pollutant emissions (kg per day per worker)	0.2	0.2	0.19	0.2	0.2[3]	0.18[4]		

Sources: World Development Indicators Report and UNIDO Industrial Statistics.

* The South African region comprises Angola, Botswana, Lesotho, Malawi, Mauritius, Mozambique, Namibia, South Africa, Swaziland, Zambia and Zimbabwe.

**According to the definition contained in the World Development Indicators Report 2001.

[1] Average calculated without data from Swaziland for the given year.

[2] Average calculated without data from Lesotho and Namibia.

[3] Average calculated without information from Namibia and Zambia for the given year. Data for 1992.

[4] Average calculated with information from Botswana, Lesotho, Mauritius, Mozambique, South Africa and Zimbabwe for the given year. Data for 1996.

2. GLOBAL OVERVIEW

Global Industrial Statistics

Evolution of Income per capita, 1980 and 1999		
	Gross National Product per capita (US$)	
	1980	1999
World	4,327	5,407
Developed countries	20,298	29,518
Transition economies	N.A.	2,097
Developing countries	972	1,269
Least developed countries	N.A.	280
Sub-Saharan Africa	629	538
South Asia	238	446
Middle East & North Africa	1,897	1,952
Latin America	3,561	3,612
East Asia	386	1,155
China	167	755

	Manufacturing Value Added per capita (US$)	
	1985	1998
World	619	1094
Developed countries	2579	5040
Transition economies	N.A.	725
Developing countries	147	300
Sub-Saharan Africa	83	92
South Asia	42	65
Middle East & North Africa	202	392
Latin America	462	771
East Asia	278	668

	Manufacturing exports per capita (US$)	
	1985	1998
World	292.5	821
Developed countries	1345.2	3714.4
Transition economies	N.A.	500.7
Developing countries	60.2	242.2
Sub-Saharan Africa	25	45
South Asia	9	32
Middle East & North Africa	96	220
Latin America	116	404
East Asia	317	1178

	Share of MHT Value Added in total MVA (%)	
	1985	1998
World	56.8	58.7
Developed countries	59.3	61.2
Transition economies	N.A.	42.2
Developing countries	42.5	48.7
Sub-Saharan Africa	38.6	37.6
South Asia	49.8	52.7
Middle East & North Africa	30.7	36.8
Latin America	42.5	39.7
East Asia	44.3	54.4

	Share of MHT exports in total Manufacturing exports (%)	
	1985	1998
World	57.7	63.8
Developed countries	62.9	67.8
Transition economies	N.A.	46.9
Developing countries	33.5	53.8
Sub-Saharan Africa	13.0	12.7
South Asia	12.0	15.8
Middle East & North Africa	15.6	22.5
Latin America	31.8	56.9
East Asia	40.3	66.2

	Enterprise R&D per capita (US$)	
	1985	1998
World	22.9	71.4
Developed countries	122.3	402.4
Transition economies	N.A.	8.8
Developing countries	0.7	4.6
Sub-Saharan Africa	0	0.0
South Asia	0.3	0.3
Middle East & North Africa	0.4	1.4
Latin America	8.1	7.5
East Asia	53.1	31.0

3. COUNTRY COMPARISONS

a) Industry related Economic Indicators

(Sources: World Development Indicators 2000 & UNIDO Industrial Statistics)

I.- Manufacturing value added per capita

MVA in US$ per capita in 1989			
Rank	Country	MVA-pc	Index
1	Germany*	12626.115	1.00000
2	Switzerland	8041.545	0.63670
3	Japan	6368.664	0.50413
4	Luxembourg	6119.973	0.48443
5	Sweden	5347.201	0.42319
6	Italy	4304.674	0.34057
7	United States	4171.702	0.33004
8	Singapore	3689.719	0.29184
9	Puerto Rico	3676.501	0.29079
10	Netherlands	3490.061	0.27602
11	United Kingdom	3467.554	0.27424
12	Iceland	3342.770	0.26435
13	Ireland	3233.990	0.25573
14	Norway	3222.529	0.25482
15	Slovenia	2908.748	0.22995
16	Spain	2785.438	0.22018
17	New Zealand	2415.067	0.19083
18	Israel	2407.406	0.19023
19	Hong Kong, SAR	2273.542	0.17962
20	Qatar	1961.414	0.15488
21	Portugal	1872.080	0.14780
22	Malta	1706.881	0.13471
23	Korea, Rep.	1570.465	0.12390
24	Yugoslavia, SFR	1547.659	0.12210
25	Latvia	1481.955	0.11689
26	United Arab Emirates	1287.227	0.10146
27	Slovak Republic	1164.773	0.09175
28	Russian Federation	1160.660	0.09143
29	Ukraine	1068.097	0.08409
30	Lithuania	1029.810	0.08106
31	Kuwait	996.504	0.07842
32	Poland	987.185	0.07768
33	Greece	963.430	0.07580
34	Hungary	916.671	0.07209
35	French Polynesia	821.458	0.06455
36	Réunion	777.200	0.06104
37	South Africa	751.538	0.05901
38	Romania	732.437	0.05749
39	Uruguay	723.098	0.05675
40	New Caledonia	715.848	0.05618
41	Martinique	697.542	0.05473
42	Netherlands Antilles	621.086	0.04867
43	Mexico	573.387	0.04489
44	Malaysia	563.344	0.04409
45	Turkey	548.485	0.04292
46	Moldova	526.276	0.04116
47	Suriname	516.787	0.04040
48	Georgia	509.666	0.03984
49	Kazakhstan	502.685	0.03929

MVA in US $ per capita in 1997			
Rank	Country	MVA-pc	Index
1	Switzerland	8547.089	0.67694
2	Japan	7658.412	0.60655
3	Finland	6848.105	0.54238
4	Ireland	6521.050	0.51647
5	Sweden	6490.004	0.51401
6	Luxembourg	6003.254	0.47546
7	Singapore	5460.696	0.43249
8	Germany	5407.976	0.42832
9	Austria	4961.784	0.39298
10	United States	4812.667	0.38117
11	France	4747.098	0.37597
12	Italy	4701.027	0.37233
13	Puerto Rico	4577.513	0.36254
14	Belgium	4366.493	0.34583
15	Denmark	4206.930	0.33319
16	Netherlands	3956.682	0.31337
17	Canada	3554.532	0.28152
18	United Kingdom	3510.001	0.27800
19	Norway	3507.000	0.27776
20	Taiwan Prov.	3448.246	0.27310
21	Iceland	3284.672	0.26015
22	Kuwait	3151.270	0.24958
23	Israel	3071.672	0.24328
24	Bermuda	3015.873	0.23886
25	Spain	2905.633	0.23013
26	Korea, Rep.	2715.086	0.21504
27	New Zealand	2513.091	0.19904
28	Australia	2396.789	0.18983
29	Malta	2362.205	0.18709
30	Slovenia	2301.339	0.18227
31	Qatar	2168.541	0.17175
32	Portugal	2062.131	0.16332
33	Bahrain	1910.806	0.15134
34	Hong Kong, SAR	1703.348	0.13491
35	Argentina	1523.909	0.12070
36	United Arab Emirates	1452.189	0.11501
37	Malaysia	1223.019	0.09686
38	Estonia	1103.641	0.08741
39	Poland	1033.779	0.08188
40	Hungary	1018.756	0.08069
41	French Polynesia	1011.211	0.08009
42	Cyprus	982.700	0.07783
43	Czech Republic	962.790	0.07625
44	Seychelles	919.947	0.07286
45	Greece	903.305	0.07154
46	Croatia	903.211	0.07154
47	Réunion	864.785	0.06849
48	Brunei Darussalam	822.403	0.06514
49	Turkey	775.638	0.06143

50	Venezuela	494.203	0.03862
51	Saudi Arabia	489.610	0.03825
52	Peru	489.308	0.03823
53	Iraq	488.549	0.03817
54	Mauritius	464.342	0.03625
55	St. Kitts-Nevis	457.952	0.03574
56	Libya	432.810	0.03375
57	Seychelles	426.898	0.03328
58	Guadeloupe	416.359	0.03245
59	Thailand	366.265	0.02848
60	Gabon	363.086	0.02823
61	Trinidad and Tobago	352.302	0.02737
62	Jamaica	337.605	0.02621
63	Tunisia	333.059	0.02585
64	Montserrat	303.909	0.02354
65	Swaziland	284.755	0.02202
66	Mongolia	239.481	0.01843
67	Uzbekistan	225.490	0.01732
68	Paraguay	216.716	0.01663
69	Côte d'Ivoire	211.798	0.01624
70	Namibia	201.698	0.01544
71	Egypt, Arab Rep.	190.873	0.01458
72	Panama ex. Can.Zone	187.735	0.01433
73	Morocco	181.622	0.01385
74	Philippines	180.484	0.01375
75	Turkmenistan	178.771	0.01362
76	Oman	177.975	0.01356
77	Iran, Isl. Rep	176.416	0.01343
78	St. Lucia	169.894	0.01292
79	Zimbabwe	165.674	0.01258
80	Kyrgyz Republic	163.972	0.01245
81	St. Vincent-Grenad.	162.448	0.01233
82	Lebanon	157.459	0.01193
83	Zambia	156.588	0.01186
84	Syrian Arab Rep.	142.212	0.01072
85	Tajikistan	135.135	0.01016
86	Guatemala	131.966	0.00991
87	Jordan	131.399	0.00987
88	Grenada	121.165	0.00905
89	Indonesia	117.464	0.00876
90	Senegal	100.887	0.00745
91	Papua New Guinea	99.589	0.00734
92	Sudan	97.001	0.00714
93	Honduras	92.989	0.00682
94	Yemen Rep.	88.623	0.00648
95	Rwanda	68.550	0.00488
96	Tonga	61.674	0.00434
97	India	57.561	0.00401
98	Haiti	56.961	0.00397
99	Vanuatu	53.384	0.00368
100	Mauritania	52.074	0.00358
101	Nicaragua	50.995	0.00349
102	Pakistan	49.936	0.00341
103	Guyana	49.377	0.00337
104	Burkina Faso	47.962	0.00325
105	Anguilla	43.429	0.00289
106	Togo	41.684	0.00276

50	Brazil	707.095	0.05600
51	Thailand	705.231	0.05585
52	Brit. Virgin Islands	695.000	0.05504
53	Uruguay	688.768	0.05455
54	New Caledonia	688.119	0.05450
55	Mexico	683.986	0.05417
56	Mauritius	671.026	0.05315
57	Chile	667.205	0.05284
58	Libya	666.219	0.05277
59	St. Kitts-Nevis	665.769	0.05273
60	South Africa	657.448	0.05207
61	Latvia	655.836	0.05194
62	Belarus	652.757	0.05170
63	Slovak Republic	618.857	0.04901
64	Peru	577.450	0.04573
65	Netherlands Antilles	575.355	0.04557
66	Bulgaria	573.776	0.04544
67	Saudi Arabia	545.179	0.04318
68	Venezuela	524.274	0.04152
69	Russian Federation	516.379	0.04090
70	French Guiana	515.000	0.04079
71	Romania	507.561	0.04020
72	Barbados	450.187	0.03566
73	Martinique	424.870	0.03365
74	Guadeloupe	417.849	0.03309
75	Macedonia, FYR	395.269	0.03131
76	Trinidad and Tobago	386.822	0.03064
77	Costa Rica	377.559	0.02990
78	Cuba	374.187	0.02964
79	Suriname	367.718	0.02912
80	Lithuania	367.072	0.02907
81	Gabon	334.979	0.02653
82	Ukraine	334.324	0.02648
83	Swaziland	333.445	0.02641
84	Tunisia	327.107	0.02591
85	Belize	294.009	0.02329
86	El Salvador	282.817	0.02240
87	Jamaica	280.831	0.02224
88	China, P.R.	278.904	0.02209
89	Kazakhstan	273.316	0.02165
90	Armenia	267.660	0.02120
91	Iran, Isl. Rep	264.472	0.02095
92	Moldova	264.191	0.02092
93	Oman	263.947	0.02090
94	Panama ex. Can.Zone	261.056	0.02068
95	Egypt, Arab Rep.	245.019	0.01941
96	Fiji	232.316	0.01840
97	Indonesia	230.799	0.01828
98	Namibia	224.513	0.01778
99	Colombia	221.900	0.01757
100	Ecuador	216.669	0.01716
101	Morocco	212.520	0.01683
102	Dominican Rep.	211.236	0.01673
103	Côte d'Ivoire	202.870	0.01607
104	Mongolia	193.299	0.01531
105	Montserrat	190.909	0.01512
106	Paraguay	188.889	0.01496

107	Lesotho	38.015	0.00247
108	Djibouti	37.140	0.00240
109	Ghana	37.001	0.00238
110	Liberia	36.104	0.00231
111	Kenya	35.897	0.00230
112	Maldives	32.239	0.00201
113	Malawi	31.198	0.00192
114	Madagascar	30.387	0.00186
115	São Tomé-Principe	24.060	0.00136
116	Tuvalu	23.333	0.00130
117	Mali	22.461	0.00123
118	Guinea	21.694	0.00117
119	Niger	20.045	0.00104
120	Samoa	19.597	0.00101
121	Gambia, The	19.482	0.00100
122	Lao PDR	18.342	0.00091
123	Nigeria	17.707	0.00086
124	Guinea-Bissau	17.665	0.00085
125	Tanzania, U.Rep.	11.891	0.00039
126	Nepal	10.094	0.00025
127	Uganda	10.025	0.00025
128	Kiribati	9.451	0.00020
129	Sierra Leone	7.581	0.00005
130	Somalia	6.908	0.00000

Sources: UNIDO Industrial Statistics and WDI 2000

*	MVA-pc in 1989
Germany, East	5607.699
Germany, West	7018.416

107	Philippines	186.791	0.01479
108	Dominica	176.845	0.01401
109	Antigua and Barbuda	174.439	0.01382
110	Uzbekistan	174.246	0.01380
111	Grenada	165.989	0.01315
112	Lebanon	165.383	0.01310
113	Jordan	162.547	0.01287
114	Iraq	160.529	0.01271
115	St. Lucia	156.959	0.01243
116	Botswana	153.620	0.01217
117	St. Vincent-Grenad.	147.973	0.01172
118	Zimbabwe	145.422	0.01152
119	Syrian Arab Rep.	142.494	0.01129
120	Bolivia	140.520	0.01113
121	Cameroon	134.391	0.01064
122	Guatemala	132.400	0.01049
123	Sri Lanka	132.297	0.01048
124	Georgia	128.549	0.01018
125	Albania	115.102	0.00912
126	Cook Islands	112.632	0.00892
127	Papua New Guinea	103.941	0.00823
128	Algeria	100.267	0.00794
129	Honduras	97.752	0.00774
130	Senegal	96.540	0.00765
131	Sudan	89.949	0.00712
132	Cape Verde	82.333	0.00652
133	India	81.129	0.00643
134	Azerbaijan	80.306	0.00636
135	Rwanda	79.520	0.00630
136	Turkmenistan	78.762	0.00624
137	Congo, Rep.	71.209	0.00564
138	Yemen Rep.	63.518	0.00503
139	Myanmar	63.301	0.00501
140	Anguilla	62.500	0.00495
141	Guyana	61.887	0.00490
142	Kyrgyz Republic	60.792	0.00481
143	Pakistan	59.451	0.00471
144	Zambia	57.578	0.00456
145	Lesotho	57.490	0.00455
146	Bangladesh	56.999	0.00451
147	Maldives	54.194	0.00429
148	Vanuatu	50.847	0.00403
149	Tonga	49.827	0.00395
150	Burkina Faso	46.387	0.00367
151	Nicaragua	44.523	0.00353
152	Lao PDR	42.123	0.00334
153	Togo	41.421	0.00328
154	Central African Rep.	38.941	0.00308
155	Ghana	38.444	0.00304
156	Benin	36.446	0.00289
157	Kenya	36.218	0.00287
158	Mauritania	35.552	0.00282
159	Angola	34.638	0.00274
160	Chad	34.335	0.00272
161	Tajikistan	33.080	0.00262
162	Malawi	31.915	0.00253
163	Djibouti	28.039	0.00222

164	Mali	27.037	0.00214
165	Bhutan	24.395	0.00193
166	Madagascar	23.383	0.00185
167	Liberia	22.689	0.00180
168	São Tomé-Principe	21.986	0.00174
169	Uganda	20.876	0.00165
170	Haiti	20.295	0.00161
171	Nepal	20.043	0.00159
172	Guinea	19.006	0.00151
173	Niger	18.261	0.00145
174	Tuvalu	18.182	0.00144
175	Solomon Islands	17.574	0.00139
176	Nigeria	17.432	0.00138
177	Comoros	15.959	0.00126
178	Guinea-Bissau	15.807	0.00125
179	Samoa	15.523	0.00123
180	Gambia, The	15.444	0.00122
181	Burundi	12.717	0.00101
182	Cambodia	12.329	0.00098
183	Tanzania, U.Rep.	10.675	0.00085
184	Congo, Dem. Rep.	10.572	0.00084
185	Kiribati	9.175	0.00073
186	Sierra Leone	6.833	0.00054
187	Equatorial Guinea	6.429	0.00051
188	Somalia	5.215	0.00041

II.- Rank Comparisons for MVA per capita

Rank Comparison		
Rank in 1989	**Rank in 1997**	**Country**
105	140	Anguilla
104	150	Burkina Faso
69	103	Côte d'Ivoire
108	163	Djibouti
71	95	Egypt, Arab Rep.
35	41	French Polynesia
60	81	Gabon
121	180	Gambia, The
48	124	Georgia
1	8	Germany*
109	155	Ghana
33	45	Greece
88	111	Grenada
58	74	Guadeloupe
86	122	Guatemala
118	172	Guinea
124	178	Guinea-Bissau
103	141	Guyana
98	170	Haiti
93	129	Honduras
19	34	Hong Kong, SAR
34	40	Hungary
12	21	Iceland
97	133	India
73	101	Morocco
70	98	Namibia
126	171	Nepal
10	16	Netherlands
42	65	Netherlands Antilles
40	54	New Caledonia
17	27	New Zealand
101	151	Nicaragua
119	173	Niger
123	176	Nigeria
14	19	Norway
76	93	Oman
102	143	Pakistan
72	94	Panama ex. Can.Zone
91	127	Papua New Guinea
68	106	Paraguay
52	64	Peru
74	107	Philippines
32	39	Poland
21	32	Portugal
9	13	Puerto Rico
20	31	Qatar
36	47	Réunion
38	71	Romania

89	97	Indonesia
77	91	Iran, Isl. Rep
53	114	Iraq
13	4	Ireland
18	23	Israel
6	12	Italy
62	87	Jamaica
3	2	Japan
87	113	Jordan
49	89	Kazakhstan
111	157	Kenya
128	185	Kiribati
23	26	Korea, Rep.
31	22	Kuwait
80	142	Kyrgyz Republic
122	152	Lao PDR
25	61	Latvia
82	112	Lebanon
107	145	Lesotho
110	167	Liberia
56	58	Libya
30	80	Lithuania
4	6	Luxembourg
114	166	Madagascar
113	162	Malawi
44	37	Malaysia
112	147	Maldives
117	164	Mali
22	29	Malta
41	73	Martinique
100	158	Mauritania
54	56	Mauritius
43	55	Mexico
46	92	Moldova
66	104	Mongolia
64	105	Montserrat
28	69	Russian Federation
95	135	Rwanda
120	179	Samoa
115	168	São Tomé-Principe
51	67	Saudi Arabia
90	130	Senegal
57	44	Seychelles
129	186	Sierra Leone
8	7	Singapore
27	63	Slovak Republic
15	30	Slovenia
130	188	Somalia
37	60	South Africa
16	25	Spain
55	59	St. Kitts-Nevis
78	115	St. Lucia
81	117	St. Vincent-Grenad.
92	131	Sudan
47	79	Suriname
65	83	Swaziland
5	5	Sweden
2	1	Switzerland
84	119	Syrian Arab Rep.
85	161	Tajikistan
125	183	Tanzania, U.Rep.
59	51	Thailand
106	153	Togo
96	149	Tonga
61	76	Trinidad and Tobago
63	84	Tunisia
45	49	Turkey
75	136	Turkmenistan
116	174	Tuvalu
127	169	Uganda
29	82	Ukraine
26	36	United Arab Emirates
11	18	United Kingdom
7	10	United States
39	53	Uruguay
67	110	Uzbekistan
99	148	Vanuatu
50	68	Venezuela
94	138	Yemen Rep.
83	144	Zambia
79	118	Zimbabwe

Sources: UNIDO Industrial Statistics and WDI 2000

III.- Manufacturing Exports per capita

Manufactured Exports (US$ per capita) in 1989				
Rank	**Country**	**ME in $**	**ME-pc in $**	**Index**
1	Singapore	31826659781	10858.635	1.00000
2	Belgium	76260509655	7673.627	0.70668
3	Switzerland	47850380899	7198.794	0.66295
4	Bahamas	1721948234	6887.793	0.63431
5	Sweden	42122472351	4959.669	0.45675
6	Hong Kong, SAR	27307387575	4802.397	0.44226
7	Macao SAR	1605961095	4494.965	0.41395

8	Netherlands	63181918522	4254.961	0.39185
9	Germany	321089012410	4077.217	0.37548
10	Ireland	13897185014	3959.876	0.36467
11	Finland	18893168311	3807.571	0.35065
12	Austria	28138804961	3687.240	0.33956
13	Denmark	16417148468	3198.353	0.29454
14	New Caledonia	425165000	2589.312	0.23845
15	Canada	69031546046	2521.332	0.23219
16	France	131188080980	2324.546	0.21407
17	Italy	123805459120	2184.597	0.20118
18	Norway	9132003241	2160.398	0.19895
19	Malta	756822439	2157.419	0.19868
20	Japan	264374548000	2147.361	0.19775
21	United Kingdom	121783818570	2123.223	0.19553
22	Israel	9345665635	2068.540	0.19049
23	Korea, Rep.	57828862352	1364.532	0.12566
24	Qatar	472439641	1016.590	0.09362
25	Portugal	9976188065	1003.944	0.09245
26	United States	237888600510	963.818	0.08876
27	Spain	32216649540	831.011	0.07652
28	Malaysia	12223302709	691.770	0.06370
29	Hungary	6386192000	614.175	0.05656
30	Bahrain	286259157	585.397	0.05391
31	New Zealand	1933018103	569.256	0.05242
32	Iceland	142241958	562.889	0.05183
33	Mauritius	512749597	488.836	0.04501
34	Kuwait	906400261	442.578	0.04075
35	Cyprus	293976147	438.116	0.04034
36	Trinidad and Tobago	497289332	410.566	0.03780
37	Barbados	103149201	402.204	0.03703
38	Greece	3926389526	389.137	0.03583
39	Romania	7380454000	318.783	0.02935
40	Netherlands Antilles	56231823	299.679	0.02759
41	Antigua and Barbuda	17422359	273.893	0.02522
42	Australia	4474506713	266.112	0.02450
43	Tunisia	1937546962	243.402	0.02241
44	St. Lucia	30772499	232.772	0.02143
45	Poland	8305547246	218.780	0.02014
46	Uruguay	641558747	208.501	0.01920
47	Thailand	11251127005	205.994	0.01897
48	Dominica	14617911	201.571	0.01856
49	Saudi Arabia	3006061089	198.881	0.01831
50	United Arab Emirates	263115735	154.275	0.01420
51	Oman	237699992	150.798	0.01388
52	Turkey	7623084484	138.849	0.01278
53	Jordan	415316441	135.902	0.01251
54	Gabon	125631772	135.072	0.01243
55	Costa Rica	388812842	132.927	0.01224
56	Brazil	18482298658	127.033	0.01169
57	Mexico	10326168685	126.440	0.01164
58	Fiji	87180145	120.083	0.01105
59	Syrian Arab Rep.	1323358994	112.924	0.01039
60	Argentina	3382150409	105.358	0.00970
61	South Africa	3617138000	104.873	0.00965
62	Libya	388004281	90.299	0.00831
63	Belize	16383366	88.837	0.00818
64	Dominican Rep.	573288130	82.357	0.00758

65	Venezuela	1460172204	77.132	0.00710
66	Jamaica	171381907	72.164	0.00664
67	Maldives	14794743	71.441	0.00657
68	Liberia	162965817	68.187	0.00627
69	Lebanon	238324372	66.865	0.00615
70	Morocco	1551501689	65.861	0.00606
71	Chile	831131040	64.554	0.00594
72	Niger	357955641	47.770	0.00439
73	Philippines	2825439192	47.580	0.00438
74	Sri Lanka	776412549	46.199	0.00425
75	Colombia	1420812041	41.437	0.00381
76	Indonesia	6939627000	39.641	0.00365
77	El Salvador	183310032	36.510	0.00336
78	Zimbabwe	338463126	35.759	0.00329
79	Grenada	3028570	32.611	0.00300
80	China, P.R.	36383502602	32.524	0.00299
81	Pakistan	3273215097	31.094	0.00286
82	Congo, Rep.	66570187	30.867	0.00284
83	Guyana	24453327	30.774	0.00283
84	Tonga	2588277	27.102	0.00249
85	Peru	565692908	26.730	0.00246
86	Panama	58001672	24.677	0.00227
87	Senegal	174854949	24.532	0.00225
88	Guatemala	195039439	22.827	0.00210
89	Brunei Darussalam	5448835	21.849	0.00201
90	Central African Rep.	60012762	20.900	0.00192
91	Paraguay	83012076	20.293	0.00186
92	Egypt, Arab Rep.	1031200693	20.118	0.00185
93	Cameroon	194514955	17.436	0.00160
94	Iraq	296379358	16.931	0.00155
95	Haiti	105436985	16.624	0.00153
96	Papua New Guinea	59053154	15.727	0.00144
97	India	11992321642	14.405	0.00132
98	Sierra Leone	52845206	13.517	0.00124
99	Iran, Isl. Rep	709001740	13.320	0.00122
100	Algeria	299668221	12.287	0.00113
101	Honduras	53815445	11.368	0.00104
102	Cape Verde	3395000	10.147	0.00093
103	Guinea	56263873	10.070	0.00092
104	Nicaragua	36802000	9.837	0.00090
105	Bangladesh	982594919	9.082	0.00083
106	Zambia	67279910	8.915	0.00082
107	Equatorial Guinea	3014712	8.648	0.00079
108	Angola	70533932	7.886	0.00072
109	Nepal	119760814	6.544	0.00060
110	Ghana	93293754	6.468	0.00059
111	Bolivia	39665813	6.176	0.00056
112	Kenya	138898562	6.091	0.00056
113	Ecuador	58392819	5.820	0.00053
114	Djibouti	2784366	5.654	0.00052
115	Comoros	2359018	5.606	0.00051
116	Congo, Dem. Rep.	185804894	5.139	0.00047
117	Togo	17373385	5.097	0.00046
118	Afghanistan	84120907	4.866	0.00044
119	Suriname	1359561	3.403	0.00031
120	Mozambique	46995849	3.347	0.00030
121	Madagascar	29564403	2.614	0.00024

122	Malawi	14746719	1.795	0.00016
123	Mauritania	2982447	1.514	0.00013
124	Bhutan	863198	1.469	0.00013
125	Tanzania, U.Rep.	32661058	1.323	0.00012
126	Nigeria	112539797	1.204	0.00011
127	Sudan	27459298	1.166	0.00010
128	Burkina Faso	9185513	1.059	0.00009
129	Viet Nam	68483525	1.057	0.00009
130	Myanmar	39204956	0.978	0.00008
131	Chad	5205827	0.926	0.00008
132	Yemen Rep.	8581297	0.750	0.00006
133	Burundi	2434928	0.459	0.00004
134	Guinea-Bissau	420319	0.440	0.00003
135	Benin	1770536	0.386	0.00003
136	Seychelles	11557	0.167	0.00001
137	Rwanda	915246	0.135	0.00001
138	Uganda	1777620	0.113	0.00000
139	Mali	493018	0.060	0.00000

Manufactured Exports (US$ per capita) in 1997				
Rank	**Country**	**ME in $**	**ME-pc (in US$)**	**Index**
1	Singapore	104730530080	27604.251	1.0000
2	Belgium	132111025370	12976.233	0.4701
3	Ireland	43063901076	11734.033	0.4251
4	Switzerland	70641010812	9966.283	0.3610
5	Netherlands	130580956980	8366.820	0.3031
6	Sweden	65099375475	7356.327	0.2665
7	Denmark	30809538091	5830.480	0.2112
8	Austria	46498713874	5760.366	0.2086
9	Germany	445626420690	5429.767	0.1967
10	Canada	134805576740	4495.437	0.1628
11	United Kingdom	231895128680	3929.826	0.1423
12	Hong Kong, SAR	25478820511	3918.613	0.1419
13	France	221463957360	3804.510	0.1378
14	Slovenia	7471738860	3762.281	0.1363
15	Malta	1410847456	3762.260	0.1363
16	Israel	20732367000	3552.496	0.1287
17	Japan	397814942300	3154.983	0.1143
18	Malaysia	60215526741	2779.135	0.1006
19	Norway	11768704718	2672.216	0.0968
20	Korea, Rep.	118254972030	2571.263	0.0931
21	Spain	80513364387	2047.488	0.0741
22	Portugal	20102908141	2021.409	0.0732
23	Czech Republic	19510096501	1893.430	0.0686
24	United States	513931045450	1892.636	0.0685
25	Hungary	14606910972	1438.410	0.0521
26	New Caledonia	277696000	1377.187	0.0499
27	Estonia	1903945615	1305.870	0.0473
28	Slovak Republic	6972858540	1295.276	0.0469
29	New Zealand	3993560236	1061.806	0.0384
30	Mexico	88823731070	945.666	0.0342
31	Bahrain	516090685	832.404	0.0301
32	Iceland	224752994	826.298	0.0299
33	Australia	14479640734	781.323	0.0283
34	Thailand	41113293158	692.487	0.0250
35	Croatia	3006445449	657.578	0.0238
36	Lithuania	2330857801	629.011	0.0227

37	Greece	5739059058	546.733	0.0198
38	Poland	18715084887	484.220	0.0175
39	Costa Rica	1667754227	481.453	0.0174
40	Tunisia	4335557466	470.489	0.0170
41	Barbados	113048731	426.808	0.0154
42	Latvia	970927917	393.056	0.0142
43	Uruguay	1223159294	374.628	0.0135
44	Bulgaria	3026422606	364.100	0.0132
45	Dominica	24469068	335.193	0.0121
46	Kuwait	594800323	328.801	0.0119
47	Cyprus	240748826	322.400	0.0116
48	South Africa	12962313309	318.717	0.0115
49	Turkey	19653771690	314.909	0.0114
50	Philippines	21602525565	302.467	0.0109
51	Romania	6599516000	292.610	0.0106
52	Argentina	9136545847	256.127	0.0092
53	Brazil	28033389225	171.290	0.0062
54	Chile	2403639126	164.381	0.0059
55	Russian Federation	20332494687	138.031	0.0050
56	Yugoslavia, FR	1447526000	136.508	0.0049
57	Venezuela	3041706154	133.543	0.0048
58	China, P.R.	155953207900	126.783	0.0046
59	Jordan	547281338	122.733	0.0044
60	Jamaica	291071954	113.967	0.0041
61	Indonesia	22490708286	112.235	0.0040
62	Mongolia	250634878	107.503	0.0039
63	Kazakhstan	1367632962	89.187	0.0032
64	El Salvador	524623464	88.754	0.0032
65	Colombia	3515930314	87.806	0.0031
66	Belize	20124202	87.687	0.0031
67	Libya	439677805	84.759	0.0030
68	Guatemala	708146684	67.334	0.0024
69	Zimbabwe	676069765	58.951	0.0021
70	Pakistan	7422497353	57.782	0.0021
71	Maldives	14583570	56.980	0.0020
72	Gabon	64687644	56.126	0.0020
73	Grenada	5088531	53.283	0.0019
74	Kyrgyz Republic	234207167	49.569	0.0018
75	Honduras	284066204	47.485	0.0017
76	Dominican Rep.	377856106	46.607	0.0016
77	Peru	1009906212	41.439	0.0015
78	Panama	112382802	41.332	0.0015
79	Ecuador	426837281	35.758	0.0013
80	Nicaragua	161352727	34.545	0.0012
81	Paraguay	173071122	34.036	0.0012
82	Senegal	253529747	28.828	0.0010
83	Bangladesh	3550602777	28.719	0.0010
84	Suriname	11630435	28.292	0.0010
85	India	25703183806	26.708	0.0009
86	Albania	87790311	26.571	0.0009
87	Syrian Arab Rep.	376159858	25.226	0.0009
88	Bolivia	184672917	23.777	0.0008
89	Kenya	494206367	17.549	0.0006
90	Congo, Rep.	41767085	15.426	0.0005
91	Central African Rep.	48374417	14.152	0.0005
92	Nepal	310577360	13.914	0.0005
93	Cameroon	147971085	10.628	0.0003
94	Algeria	271261288	9.339	0.0003

95	Haiti	50952121	6.801	0.0002
96	Zambia	63535740	6.728	0.0002
97	Madagascar	77367826	5.468	0.0002
98	Bahamas	1233000	4.266	0.0001
99	Nigeria	374781446	3.185	0.0001
100	Malawi	32003885	3.114	0.0001
101	Mozambique	38128031	2.293	0.0000
102	Tanzania, U.Rep.	61867287	1.976	0.0000
103	Seychelles	116622	1.508	0.0000
104	Ethiopia	65561574	1.097	0.0000
105	Yemen Rep.	12506877	0.775	0.0000
106	Sudan	6079589	0.219	0.0000

IV. MVA and ME per capita

Combined MVA & ME in US$ in per capita values for 1989					
Rank	**Country**	**MVA-pc**	**ME-pc**	**Comb.**	**Index**
1	Germany*	12626.115	4077.217	8351.666	1.00000
2	Switzerland	8041.545	7198.794	7620.169	0.91236
3	Singapore	3689.719	10858.635	7274.177	0.87091
4	Sweden	5347.201	4959.669	5153.435	0.61682
5	Japan	6368.664	2147.361	4258.013	0.50954
6	Netherlands	3490.061	4254.961	3872.511	0.46336
7	Ireland	3233.990	3959.876	3596.933	0.43034
8	Hong Kong, SAR	2273.542	4802.397	3537.969	0.42327
9	Italy	4304.674	2184.597	3244.635	0.38813
10	United Kingdom	3467.554	2123.223	2795.388	0.33431
11	Norway	3222.529	2160.398	2691.463	0.32186
12	United States	4171.702	963.818	2567.760	0.30703
13	Israel	2407.406	2068.540	2237.973	0.26752
14	Iceland	3342.770	562.889	1952.829	0.23336
15	Malta	1706.881	2157.419	1932.150	0.23088
16	Spain	2785.438	831.011	1808.225	0.21603
17	New Caledonia	715.848	2589.312	1652.580	0.19739
18	New Zealand	2415.067	569.256	1492.162	0.17817
19	Qatar	1961.414	1016.590	1489.002	0.17779
20	Korea, Rep.	1570.465	1364.532	1467.498	0.17521
21	Portugal	1872.080	1003.944	1438.012	0.17168
22	Hungary	916.671	614.175	765.423	0.09110
23	United Arab Emirates	1287.227	154.275	720.751	0.08575
24	Kuwait	996.504	442.578	719.541	0.08560
25	Greece	963.430	389.137	676.283	0.08042
26	Malaysia	563.344	691.770	627.557	0.07458
27	Poland	987.185	218.780	602.983	0.07164
28	Romania	732.437	318.783	525.610	0.06237
29	Mauritius	464.342	488.836	476.589	0.05649
30	Uruguay	723.098	208.501	465.800	0.05520
31	Netherlands Antilles	621.086	299.679	460.383	0.05455
32	South Africa	751.538	104.873	428.205	0.05070
33	Trinidad and Tobago	352.302	410.566	381.434	0.04509
34	Mexico	573.387	126.440	349.913	0.04132
35	Saudi Arabia	489.610	198.881	344.245	0.04064
36	Turkey	548.485	138.849	343.667	0.04057
37	Tunisia	333.059	243.402	288.231	0.03393
38	Thailand	366.265	205.994	286.129	0.03367
39	Venezuela	494.203	77.132	285.668	0.03362
40	Libya	432.810	90.299	261.555	0.03073
41	Suriname	516.787	3.403	260.095	0.03055

42	Peru	489.308	26.730	258.019	0.03031
43	Iraq	488.549	16.931	252.740	0.02967
44	Gabon	363.086	135.072	249.079	0.02923
45	Seychelles	426.898	0.167	213.533	0.02498
46	Jamaica	337.605	72.164	204.884	0.02394
47	St. Lucia	169.894	232.772	201.333	0.02351
48	Oman	177.975	150.798	164.386	0.01909
49	Jordan	131.399	135.902	133.651	0.01541
50	Syrian Arab Rep.	142.212	112.924	127.568	0.01468
51	Morocco	181.622	65.861	123.742	0.01422
52	Paraguay	216.716	20.293	118.505	0.01359
53	Philippines	180.484	47.580	114.032	0.01305
54	Lebanon	157.459	66.865	112.162	0.01283
55	Panama ex. Can.Zone	187.735	24.677	106.206	0.01212
56	Egypt, Arab Rep.	190.873	20.118	105.496	0.01203
57	Zimbabwe	165.674	35.759	100.717	0.01146
58	Iran, Isl. Rep	176.416	13.320	94.868	0.01076
59	Zambia	156.588	8.915	82.752	0.00931
60	Indonesia	117.464	39.641	78.552	0.00880
61	Guatemala	131.966	22.827	77.397	0.00867
62	Grenada	121.165	32.611	76.888	0.00860
63	Senegal	100.887	24.532	62.710	0.00691
64	Papua New Guinea	99.589	15.727	57.658	0.00630
65	Honduras	92.989	11.368	52.178	0.00564
66	Liberia	36.104	68.187	52.145	0.00564
67	Maldives	32.239	71.441	51.840	0.00560
68	Sudan	97.001	1.166	49.083	0.00527
69	Yemen Rep.	88.623	0.750	44.687	0.00475
70	Tonga	61.674	27.102	44.388	0.00471
71	Pakistan	49.936	31.094	40.515	0.00425
72	Guyana	49.377	30.774	40.076	0.00419
73	Haiti	56.961	16.624	36.792	0.00380
74	India	57.561	14.405	35.983	0.00370
75	Rwanda	68.550	0.135	34.342	0.00351
76	Niger	20.045	47.770	33.907	0.00346
77	Nicaragua	50.995	9.837	30.416	0.00304
78	Mauritania	52.074	1.514	26.794	0.00260
79	Burkina Faso	47.962	1.059	24.510	0.00233
80	Togo	41.684	5.097	23.390	0.00220
81	Ghana	37.001	6.468	21.734	0.00200
82	Djibouti	37.140	5.654	21.397	0.00196
83	Kenya	35.897	6.091	20.994	0.00191
84	Madagascar	30.387	2.614	16.500	0.00137
85	Malawi	31.198	1.795	16.496	0.00137
86	Guinea	21.694	10.070	15.882	0.00130
87	Mali	22.461	0.060	11.261	0.00074
88	Sierra Leone	7.581	13.517	10.549	0.00066
89	Nigeria	17.707	1.204	9.455	0.00053
90	Guinea-Bissau	17.665	0.440	9.052	0.00048
91	Nepal	10.094	6.544	8.319	0.00039
92	Tanzania, U.Rep.	11.891	1.323	6.607	0.00018
93	Uganda	10.025	0.113	5.069	0.00000

	* MVA-pc in 1989
Germany, East	5607.698975
Germany, West	7018.41563

Combined MVA & ME in US$ in per capita values for 1997					
Rank	Country	MVA-pc	ME-pc	Comb.	Index
1	Singapore	5460.696	27604.251	16532.474	1.00000
2	Switzerland	8547.089	9966.283	9256.686	0.55974
3	Ireland	6521.050	11734.033	9127.541	0.55193
4	Belgium	4366.493	12976.233	8671.363	0.52432
5	Sweden	6490.004	7356.327	6923.166	0.41854
6	Netherlands	3956.682	8366.820	6161.751	0.37247
7	Germany	5407.976	5429.767	5418.872	0.32751
8	Japan	7658.412	3154.983	5406.697	0.32678
9	Austria	4961.784	5760.366	5361.075	0.32402
10	Denmark	4206.930	5830.480	5018.705	0.30330
11	France	4747.098	3804.510	4275.804	0.25835
12	Canada	3554.532	4495.437	4024.984	0.24317
13	United Kingdom	3510.001	3929.826	3719.914	0.22471
14	United States	4812.667	1892.636	3352.652	0.20249
15	Israel	3071.672	3552.496	3312.084	0.20003
16	Norway	3507.000	2672.216	3089.608	0.18657
17	Malta	2362.205	3762.260	3062.232	0.18491
18	Slovenia	2301.339	3762.281	3031.810	0.18307
19	Hong Kong, SAR	1703.348	3918.613	2810.980	0.16971
20	Korea, Rep.	2715.086	2571.263	2643.175	0.15956
21	Spain	2905.633	2047.488	2476.561	0.14947
22	Iceland	3284.672	826.298	2055.485	0.12399
23	Portugal	2062.131	2021.409	2041.770	0.12317
24	Malaysia	1223.019	2779.135	2001.077	0.12070
25	New Zealand	2513.091	1061.806	1787.449	0.10778
26	Kuwait	3151.270	328.801	1740.035	0.10491
27	Australia	2396.789	781.323	1589.056	0.09577
28	Czech Republic	962.790	1893.430	1428.110	0.08603
29	Bahrain	1910.806	832.404	1371.605	0.08261
30	Hungary	1018.756	1438.410	1228.583	0.07396
31	Estonia	1103.641	1305.870	1204.755	0.07252
32	New Caledonia	688.119	1377.187	1032.653	0.06210
33	Slovak Republic	618.857	1295.276	957.066	0.05753
34	Argentina	1523.909	256.127	890.018	0.05347
35	Mexico	683.986	945.666	814.826	0.04892
36	Croatia	903.211	657.578	780.395	0.04684
37	Poland	1033.779	484.220	758.999	0.04554
38	Greece	903.305	546.733	725.019	0.04349
39	Thailand	705.231	692.487	698.859	0.04191
40	Cyprus	982.700	322.400	652.550	0.03910
41	Turkey	775.638	314.909	545.273	0.03261
42	Uruguay	688.768	374.628	531.698	0.03179
43	Latvia	655.836	393.056	524.446	0.03135
44	Lithuania	367.072	629.011	498.041	0.02975
45	South Africa	657.448	318.717	488.082	0.02915
46	Bulgaria	573.776	364.100	468.938	0.02799
47	Seychelles	919.947	1.508	460.727	0.02750
48	Brazil	707.095	171.290	439.193	0.02619
49	Barbados	450.187	426.808	438.498	0.02615
50	Costa Rica	377.559	481.453	429.506	0.02561
51	Chile	667.205	164.381	415.793	0.02478
52	Romania	507.561	292.610	400.085	0.02383
53	Tunisia	327.107	470.489	398.798	0.02375

54	Libya	666.219	84.759	375.489	0.02234
55	Venezuela	524.274	133.543	328.908	0.01952
56	Russian Federation	516.379	138.031	327.205	0.01942
57	Peru	577.450	41.439	309.444	0.01834
58	Dominica	176.845	335.193	256.019	0.01511
59	Philippines	186.791	302.467	244.629	0.01442
60	China, P.R.	278.904	126.783	202.844	0.01189
61	Suriname	367.718	28.292	198.005	0.01160
62	Jamaica	280.831	113.967	197.399	0.01156
63	Gabon	334.979	56.126	195.552	0.01145
64	Belize	294.009	87.687	190.848	0.01117
65	El Salvador	282.817	88.754	185.785	0.01086
66	Kazakhstan	273.316	89.187	181.252	0.01058
67	Indonesia	230.799	112.235	171.517	0.01000
68	Colombia	221.900	87.806	154.853	0.00899
69	Panama ex. Can.Zone	261.056	41.332	151.194	0.00877
70	Mongolia	193.299	107.503	150.401	0.00872
71	Jordan	162.547	122.733	142.640	0.00825
72	Dominican Rep.	211.236	46.607	128.922	0.00742
73	Ecuador	216.669	35.758	126.213	0.00725
74	Paraguay	188.889	34.036	111.462	0.00636
75	Grenada	165.989	53.283	109.636	0.00625
76	Zimbabwe	145.422	58.951	102.187	0.00580
77	Syrian Arab Rep.	142.494	25.226	83.860	0.00469
78	Bolivia	140.520	23.777	82.148	0.00459
79	Honduras	97.752	47.485	72.619	0.00401
80	Cameroon	134.391	10.628	72.510	0.00400
81	Albania	115.102	26.571	70.837	0.00390
82	Senegal	96.540	28.828	62.684	0.00341
83	Pakistan	59.451	57.782	58.617	0.00316
84	Maldives	54.194	56.980	55.587	0.00298
85	Kyrgyz Republic	60.792	49.569	55.181	0.00296
86	Algeria	100.267	9.339	54.803	0.00293
87	India	81.129	26.708	53.919	0.00288
88	Sudan	89.949	0.219	45.084	0.00235
89	Congo, Rep.	71.209	15.426	43.317	0.00224
90	Bangladesh	56.999	28.719	42.859	0.00221
91	Nicaragua	44.523	34.545	39.534	0.00201
92	Zambia	57.578	6.728	32.153	0.00156
93	Yemen Rep.	63.518	0.775	32.147	0.00156
94	Kenya	36.218	17.549	26.884	0.00124
95	Central African Rep.	38.941	14.152	26.547	0.00122
96	Malawi	31.915	3.114	17.515	0.00068
97	Nepal	20.043	13.914	16.979	0.00064
98	Madagascar	23.383	5.468	14.426	0.00049
99	Haiti	20.295	6.801	13.548	0.00044
100	Nigeria	17.432	3.185	10.308	0.00024
101	Tanzania, U.Rep.	10.675	1.976	6.325	0.00000

Rank Comparison		
Rank in 1989	**Rank in 1997**	**Country***
44	63	Gabon
1	7	Germany**
25	38	Greece
62	75	Grenada
73	99	Haiti
65	79	Honduras
8	19	Hong Kong, SAR

22	30	Hungary
14	22	Iceland
74	87	India
60	67	Indonesia
7	3	Ireland
13	15	Israel
46	62	Jamaica
5	8	Japan
49	71	Jordan
83	94	Kenya
20	20	Korea, Rep.
24	26	Kuwait
40	54	Libya
84	98	Madagascar
85	96	Malawi
26	24	Malaysia
67	84	Maldives
15	17	Malta
34	35	Mexico
91	97	Nepal
6	6	Netherlands
17	32	New Caledonia
18	25	New Zealand
77	91	Nicaragua
89	100	Nigeria
11	16	Norway
71	83	Pakistan
55	69	Panama ex. Can.Zone
64	74	Papua New Guinea
42	57	Peru
53	59	Philippines
27	37	Poland
21	23	Portugal
28	52	Romania
63	82	Senegal
45	47	Seychelles
3	1	Singapore
32	45	South Africa
16	21	Spain
68	88	Sudan
41	61	Suriname
4	5	Sweden
2	2	Switzerland
50	77	Syrian Arab Rep.
92	101	Tanzania, U.Rep.
38	39	Thailand
37	53	Tunisia
36	41	Turkey
10	13	United Kingdom
12	14	United States
30	42	Uruguay
39	55	Venezuela
69	93	Yemen Rep.
59	92	Zambia
57	76	Zimbabwe

* A number of countries are missing form the Rank Comparison due to unavailability of data for both years.

	**MVA-pc in 1989
Germany, East	5607.698975
Germany, West	7018.41563

(b) Industry related Environmental Indicators:

I. BOD Data (Source: World Development Indicators 2000)

BOD (kg) per Unit of MVA for Developing Countries in 1989				
Rank	Country	BOD (kg)	MVA (US$)	BOD/MVA
1	Kenya	15029087.44	818,604,448	0.01836
2	Honduras	6099713.896	440,206,240	0.01386
3	India	512712671.3	47,921,523,636	0.01070
4	Zimbabwe	13709950.35	1,568,102,335	0.00874
5	Jamaica	6446890.205	801,777,414	0.00804
6	Indonesia	160548945.6	20,563,573,191	0.00781
7	Panama	3219099.321	441,253,247	0.00730
8	Jordan	2906948.398	401,555,423	0.00724
9	Pakistan	36039024.96	5,256,779,494	0.00686
10	Uruguay	14349250.7	2,224,973,314	0.00645
11	Philippines	64322067.97	10,717,692,729	0.00600
12	Thailand	94607749.06	20,004,864,001	0.00473
13	Venezuela	35358513.83	9,355,609,841	0.00378
14	Malaysia	34140796.84	9,954,057,764	0.00343
15	Iceland	2655638.77	844,717,869	0.00314
16	Malta	1575801.062	598,773,763	0.00263
17	Turkey	65324124.14	30,112,913,234	0.00217
18	Korea, Rep.	137508605.8	66,556,300,051	0.00207
19	Peru	20735535.94	10,355,235,650	0.00200
20	Israel	17434565.76	10,876,661,282	0.00160
21	Mexico	63467648.59	46,827,532,031	0.00136
22	Singapore	11409987.69	10,814,565,380	0.00106
	TOTAL	1319602618	307,457,272,336	0.00429

BOD (kg) per Unit of MVA for Industrialized Countries in 1989				
Rank	Country	BOD (kg)	MVA (US$)	BOD/MVA
1	Greece	23436590.12	9,721,008,045	0.00241
2	New Zealand	19251688.32	8,200,819,773	0.00235
3	Portugal	34434005.9	18,602,863,829	0.00185
4	Norway	20487458.55	13,621,628,643	0.00150
5	UK	274848285	198,891,968,142	0.00138
6	Ireland	12617893.16	11,349,686,974	0.00111
7	Spain	116118191.4	107,985,873,181	0.00108
8	Switzerland	52368112.66	53,452,149,424	0.00098
9	Netherlands	49492032.42	51,823,921,877	0.00096
10	Sweden	41639137.27	45,413,776,787	0.00092
11	USA	935968952.5	1,029,655,228,617	0.00091
12	Japan	550078177.5	784,084,412,549	0.00070
	TOTAL	2130740525	2,332,803,337,841	0.00091

RATIO	1.0:4.7

BOD (kg) per Unit of MVA for Developing Countries in 1997				
Rank	Country	BOD (kg)	MVA	BOD/MVA
1	Kenya	17930612.17	1019967021.7	0.01758
2	Costa Rica	11920081.6	1307866102.5	0.00911
3	India	639803070.6	78076929896.4	0.00819
4	Jordan	5891822.871	724816591.7	0.00813
5	Zimbabwe	12283293.67	1667751954.0	0.00737
6	Panama	4290262.397	709810822.5	0.00604
7	Tunisia	16648754.98	3014292328.6	0.00552
8	Philippines	65057160.86	13340827657.7	0.00488
9	El Salvador	7969148.369	1671731000.0	0.00477
10	Colombia	40370933.36	8885329121.8	0.00454
11	Ecuador	11670429.44	2586376000.0	0.00451
12	Uruguay	10118351.78	2248825900.0	0.00450

13	Cyprus	2653245.239	733821349.1	0.00362
14	Chile	28509516.95	9756136367.4	0.00292
15	Indonesia	126685374.8	46249960234.1	0.00274
16	Malaysia	63335524.3	26499144285.7	0.00239
17	Turkey	67761308.98	48408321450.3	0.00140
18	Korea, Rep.	116034560.8	124869534294.6	0.00093
19	Mexico	55315042.81	64244936963.8	0.00086
20	Singapore	12286407.58	20717880154.7	0.00059
	TOTAL	1316534904	456734259496.5	0.00288

BOD (kg) per Unit of MVA for Industrialized Countries in 1997				
Rank	**Country**	**BOD (kg)**	**MVA**	**BOD/MVA**
1	Portugal	50119473.13	20507891601.6	0.00244
2	Greece	21293498.32	9481997208.3	0.00225
3	New Zealand	18507520.33	9451985709.0	0.00196
4	Denmark	34047017.5	22230344569.3	0.00153
5	Norway	19204433.65	15445179701.9	0.00124
6	Spain	126317044.2	114258216018.4	0.00111
7	UK	226292198.1	207121629246.9	0.00109
8	Canada	108031319.8	106590452118.6	0.00101
9	Netherlands	45014486.17	61751932228.3	0.00073
10	USA	941081872.5	1306843464036.5	0.00072
11	Sweden	33632993.44	57432902573.0	0.00059
12	Japan	514454770.6	965656782401.9	0.00053
13	Ireland	12474318.42	23932252597.2	0.00052
	TOTAL	2150470946	2920705030010.8	0.00074

RATIO	**1.0:3.9**

BOD (kg) per Unit of MVA in Developing Countries in 1989				
Rank	**Country**	**BOD (kg)**	**MVA (US$)**	**BOD/MVA**
1	Kenya	15029087.44	818,604,448	0.01836
2	Honduras	6099713.896	440,206,240	0.01386
3	Zimbabwe	13709950.35	1,568,102,335	0.00874
4	Jamaica	6446890.205	801,777,414	0.00804
5	Panama	3219099.321	441,253,247	0.00730
6	Jordan	2906948.398	401,555,423	0.00724
7	Pakistan	36039024.96	5,256,779,494	0.00686
8	Uruguay	14349250.7	2,224,973,314	0.00645
9	Venezuela	35358513.83	9,355,609,841	0.00378
10	Iceland	2655638.77	844,717,869	0.00314
11	Malta	1575801.062	598,773,763	0.00263
12	Peru	20735535.94	10,355,235,650	0.00200
13	Israel	17434565.76	10,876,661,282	0.00160
	TOTAL	175560020.6	43,984,250,319	0.00399

BOD (kg) per Unit of MVA for the 13 Tigers in 1989				
Rank	**Country**	**BOD (kg)**	**MVA (US$)**	**BOD/MVA**
1	India	512712671.3	47,921,523,636	0.01070
2	Indonesia	160548945.6	20,563,573,191	0.00781
3	Philippines	64322068.0	10,717,692,729	0.00600
4	Thailand	94607749.1	20,004,864,001	0.00473
5	Malaysia	34140796.8	9,954,057,764	0.00343
6	Turkey	65324124.1	30,112,913,234	0.00217
7	Korea, Rep.	137508605.8	66,556,300,051	0.00207
8	Mexico	63467648.6	46,827,532,031	0.00136
9	Singapore	11409987.7	10,814,565,380	0.00106
10	Hong Kong, China	No data		
11	Brazil	No data		
12	China	No data		
13	Taiwan	No data		
	TOTAL	311851163.0	164,265,368,459	0.00190

BOD (kg) per Unit of MVA in Developing Countries in 1997				
Rank	Country	BOD (kg)	MVA	BOD/MVA
1	Kenya	17930612.2	1019967021.7	0.01758
2	Costa Rica	11920081.6	1307866102.5	0.00911
3	Jordan	5891822.9	724816591.7	0.00813
4	Zimbabwe	12283293.7	1667751954.0	0.00737
5	Panama	4290262.4	709810822.5	0.00604
6	Tunisia	16648755.0	3014292328.6	0.00552
7	El Salvador	7969148.4	1671731000.0	0.00477
8	Colombia	40370933.4	8885329121.8	0.00454
9	Ecuador	11670429.4	2586376000.0	0.00451
10	Uruguay	10118351.8	2248825900.0	0.00450
11	Cyprus	2653245.2	733821349.1	0.00362
12	Chile	28509517.0	9756136367.4	0.00292
	TOTAL	170256452.8	34326724559.2	0.00496

BOD (kg) per Unit of MVA for the 13 Tigers				
Rank	Country	BOD (kg)	MVA	BOD/MVA
1	India	639803070.6	78076929896.4	0.00819
2	Philippines	65057160.9	13340827657.7	0.00488
3	Indonesia	126685374.8	46249960234.1	0.00274
4	Malaysia	63335524.3	26499144285.7	0.00239
5	Turkey	67761309.0	48408321450.3	0.00140
6	Korea, Rep.	116034560.8	124869534294.6	0.00093
7	Mexico	55315042.8	64244936963.8	0.00086
8	Singapore	12286407.6	20717880154.7	0.00059
9	China	No data		
10	Brazil	No data		
11	Taiwan	No data		
12	Thailand	No data		
13	Hong Kong, China	No data		
	TOTAL	183636011.2	209832351413.1	0.00088

BOD (kg) per unit of MVA (US$) in 1989				
Rank	Country	BOD (kg)	BOD/MVA	Index
1	Kenya	15029087.4	0.018	1.000
2	Honduras	6099713.9	0.014	0.745
3	India	512712671.3	0.011	0.566
4	Zimbabwe	13709950.4	0.009	0.455
5	Jamaica	6446890.2	0.008	0.416
6	Indonesia	160548945.6	0.008	0.402
7	Panama	3219099.3	0.007	0.373
8	Jordan	2906948.4	0.007	0.370
9	Pakistan	36039025.0	0.007	0.349
10	Uruguay	14349250.7	0.006	0.325
11	Philippines	64322068.0	0.006	0.300
12	Thailand	94607749.1	0.005	0.228
13	Venezuela, RB	35358513.8	0.004	0.174
14	Malaysia	34140796.8	0.003	0.155
15	Iceland	2655638.8	0.003	0.138
16	Malta	1575801.1	0.003	0.109
17	Greece	23436590.1	0.002	0.097
18	New Zealand	19251688.3	0.002	0.093
19	Turkey	65324124.1	0.002	0.083
20	Korea, Rep.	137508605.8	0.002	0.077
21	Peru	20735535.9	0.002	0.074
22	Portugal	34434005.9	0.002	0.065
23	Israel	17434565.8	0.002	0.051
24	Norway	20487458.6	0.002	0.045
25	United Kingdom	274848285.0	0.001	0.039
26	Mexico	63467648.6	0.001	0.037

BOD (kg) per unit of MVA (US$) in 1997				
Rank	Country	BOD (kg)	BOD/MVA	Index
1	Kenya	17930612.2	0.018	1.000
2	Costa Rica	11920081.6	0.009	0.504
3	India	639803070.6	0.008	0.450
4	Jordan	5891822.9	0.008	0.446
5	Zimbabwe	12283293.7	0.007	0.401
6	Panama	4290262.4	0.006	0.324
7	Tunisia	16648755.0	0.006	0.293
8	Philippines	65057160.9	0.005	0.255
9	El Salvador	7969148.4	0.005	0.249
10	Colombia	40370933.4	0.005	0.236
11	Ecuador	11670429.4	0.005	0.234
12	Uruguay	10118351.8	0.004	0.233
13	Cyprus	2653245.2	0.004	0.181
14	Chile	28509517.0	0.003	0.141
15	Indonesia	126685374.8	0.003	0.130
16	Portugal	50119473.1	0.002	0.113
17	Malaysia	63335524.3	0.002	0.110
18	Greece	21293498.3	0.002	0.101
19	New Zealand	18507520.3	0.002	0.084
20	Denmark	34047017.5	0.002	0.059
21	Turkey	67761309.0	0.001	0.052
22	Norway	19204433.7	0.001	0.042
23	Spain	126317044.2	0.001	0.034
24	United Kingdom	226292198.1	0.001	0.033
25	Canada	108031319.8	0.001	0.029
26	Korea, Rep.	116034560.8	0.001	0.024

27	Ireland	12617893.2	0.001	0.023
28	Spain	116118191.4	0.001	0.021
29	Singapore	11409987.7	0.001	0.020
30	Switzerland	52368112.7	0.001	0.016
31	Netherlands	49492032.4	0.001	0.014
32	Sweden	41639137.3	0.001	0.012
33	United States	935968952.5	0.001	0.012
34	Japan	550078177.5	0.001	0.000

27	Mexico	55315042.8	0.001	0.020
28	Netherlands	45014486.2	0.001	0.012
29	United States	941081872.5	0.001	0.012
30	Singapore	12286407.6	0.001	0.004
31	Sweden	33632993.4	0.001	0.004
32	Japan	514454770.6	0.001	0.001
33	Ireland	12474318.4	0.001	0.000

II. CO2 Data (Sources:CO2 Emissions from Fuel Combustion, edition 2001, IEA)

CO2 tonnes per unit of MVA in 1989				Sectoral division (CO2 in mt)				
Rank	Country	CO2 Total in tonnes	CO2 tonnes per MVA	Public Electricity & Heat	Energy	Manufacturing & Construction	Transport	Other
1	Netherlands Antilles	5,372,523	0.046	0.3	0.7	0.7	1.0	0.2
2	Oman	7,029,589	0.025	3.2	0.3	0.6	1.3	1.2
3	Trinidad and Tobago	10,403,544	0.024	2.4	2.0	4.6	1.3	0.1
4	Nigeria	38,158,251	0.023	6.0	3.1	5.5	14.0	5.7
5	Kuwait	45,771,003	0.022	16.7	10.2	10.9	4.9	8.3
6	Saudi Arabia	165,751,727	0.022	38.5	38.2	22.4	17.7	53.5
7	Jordan	8,731,341	0.022	2.5	0.6	1.2	2.9	0.9
8	United Arab Emirates	42,602,471	0.019	11.7	1.5	23.8	4.9	0.2
9	Iran	166,856,412	0.018	27.9	4.4	37.7	36.5	35.1
10	Syria	28,693,138	0.017	4.3	1.3	3.1	3.4	15.3
11	Libya	28,708,671	0.015	8.0	7.9	4.0	6.1	1.1
12	Qatar	13,239,865	0.015	2.8	4.3	4.5	1.6	0.0
13	India	565,822,000	0.012	189.1	16.4	191.5	74.5	42.8
14	South Africa	298,700,396	0.012	125.8	2.3	71.0	28.6	13.3
15	Lebanon	6,404,890	0.011	2.8	0.0	0.3	1.8	1.5
16	Romania	193,189,174	0.011	69.0	7.2	78.5	10.7	16.3
17	Poland	425,404,726	0.011	165.9	6.8	55.2	24.1	91.6
18	Pakistan	57,670,161	0.011	14.4	0.6	19.3	13.3	8.7
19	Venezuela	97,270,674	0.010	15.8	22.7	27.3	27.4	5.3
20	Nicaragua	1,773,476	0.009	0.5	0.0	0.3	0.7	0.2
21	Zimbabwe	13,833,949	0.009	6.5	0.2	3.4	2.1	1.7
22	Kenya	6,749,591	0.008	0.2	0.3	1.3	3.5	1.2
23	Jamaica	6,581,403	0.008	1.7	0.0	2.9	1.4	0.6
24	Yemen	8,242,943	0.008	0.7	0.3	1.2	3.7	0.9
25	Egypt	79,430,231	0.008	21.1	3.7	24.7	12.6	9.6
26	Hungary	72,427,142	0.008	21.8	2.5	19.0	8.9	20.9
27	Iraq	63,802,215	0.007	10.4	4.4	20.3	23.1	6.0
28	Greece	69,044,650	0.007	33.1	2.4	10.9	14.5	8.4
29	Indonesia	127,301,482	0.006	19.3	17.8	35.2	27.1	23.3
30	Mexico	287,031,403	0.006	63.8	31.6	71.7	80.2	26.8
31	Panama	2,366,611	0.005	0.4	0.2	0.5	1.1	0.2
32	Honduras	2,281,196	0.005	0.0	0.0	0.8	1.0	0.4
33	Ghana	2,623,327	0.005	0.0	-	0.5	1.6	0.6
34	United States	5,005,645,284	0.005	1 783.9	262.7	640.1	1 430.3	665.4
35	Malaysia	47,329,107	0.005	10.1	2.7	13.4	12.6	1.9
36	Gabon	1,560,828	0.005	0.2	0.2	0.3	0.5	0.1
37	Tunisia	11,957,352	0.005	3.2	0.2	3.1	2.3	2.5
38	Morocco	18,386,809	0.004	6.0	0.3	4.6	1.2	6.1
39	Turkey	125,659,975	0.004	26.6	6.3	30.8	26.3	27.3
40	Nepal	739,281	0.004	-	-	0.0	0.4	0.4
41	Malta	2,303,527	0.004	1.8	-	0.0	0.5	0.1
42	Togo	490,566	0.003	0.0	-	0.2	0.2	0.1
43	Philippines	36,812,682	0.003	10.3	3.1	8.4	5.8	6.5
44	Thailand	64,598,274	0.003	20.2	0.3	12.1	23.9	7.5
45	Israel	34,329,790	0.003	16.2	2.2	4.4	6.0	3.1
46	Korea	204,362,349	0.003	31.8	4.9	63.7	34.9	66.6

47	Netherlands	154,296,044	0.003	39.2	13.9	34.5	25.9	38.2
48	Senegal	2,064,490	0.003	0.9	0.0	0.2	0.7	0.3
49	New Zealand	23,434,413	0.003	3.6	0.9	6.5	8.7	2.0
50	Guatemala	3,197,980	0.003	0.2	0.1	0.7	1.6	0.5
51	United Kingdom	561,652,239	0.003	193.7	29.0	85.4	120.2	109.0
52	Ireland	30,101,857	0.003	10.2	0.3	6.0	4.7	8.3
53	Hong Kong (China)	34,248,272	0.003	22.6	-	4.1	4.0	1.4
54	Haiti	948,579	0.003	0.2	-	0.2	0.4	0.1
55	Singapore	24,778,528	0.002	9.7	4.8	1.6	8.2	0.3
56	Iceland	1,882,540	0.002	0.0	-	0.5	0.6	0.7
57	Uruguay	4,938,284	0.002	1.3	0.2	0.7	1.5	1.0
58	Norway	29,832,653	0.002	0.1	5.6	7.9	10.6	3.4
59	Portugal	39,615,875	0.002	14.5	1.7	9.6	9.2	3.4
60	Paraguay	1,886,274	0.002	0.0	0.0	0.1	1.5	0.1
61	Zambia	2,470,733	0.002	0.0	0.1	1.3	0.6	0.3
62	Spain	207,683,871	0.002	62.4	12.2	46.4	61.1	19.5
63	Peru	19,157,012	0.002	0.8	1.2	3.0	6.6	5.7
64	Sudan	4,147,963	0.002	0.4	0.0	0.8	2.8	0.1
65	Italy	394,493,271	0.002	102.4	21.1	84.9	95.3	77.3
66	Japan	1,001,872,785	0.001	273.7	48.5	259.3	192.4	148.1
67	Sweden	51,570,023	0.001	7.1	1.4	11.6	21.7	10.9
68	Germany	983,122,023	0.001	319.0	32.3	206.0	151.9	204.2
69	Switzerland	37,542,418	0.001	0.4	0.4	5.4	13.8	18.7

		CO2 tonnes per unit of MVA in 1997						
				Sectoral division (CO2 in mt)				
Rank	Country	Total CO2 in tonnes	CO2 in t per MVA	Public Electricity & Heat	Energy	Manufacturing & Construction	Transport	Other
1	Azerbaijan	30367035	0.048	13.5	0.7	4.2	1.6	6.3
2	Netherlands Antilles	3867954	0.032	0.4	0.1	0.4	1.4	0.5
3	Kazakhstan	127381959	0.030	56.8	3.7	41.0	5.9	18.2
4	Qatar	32842638	0.029	4.1	11.7	11.8	2.9	0.1
5	Oman	16621135	0.028	5.5	3.6	2.9	2.4	1.6
6	Tajikistan	5238027	0.026	0.7	-	-	3.1	1.5
7	Uzbekistan	103346989	0.025	34.0	4.1	11.2	9.5	41.2
8	Trinidad and Tobago	11766829	0.024	3.3	2.3	5.4	1.5	0.2
9	Iraq	80145130	0.023	16.1	5.0	16.0	25.9	6.4
10	Lebanon	15578090	0.023	5.9	-	3.4	4.1	2.2
11	Ukraine	373636144	0.022	108.5	4.6	103.4	15.3	90.7
12	Algeria	62376175	0.021	13.8	14.8	5.9	7.9	17.0
13	Saudi Arabia	218792823	0.021	58.6	55.7	29.8	29.6	66.5
14	Nigeria	41107496	0.020	5.5	6.3	9.8	17.7	3.3
15	Syrian Arab Rep.	41736899	0.020	9.4	1.5	7.6	3.5	21.4
16	Russian Federation	1483128022	0.019	514.6	40.5	187.7	153.9	209.4
17	Jordan	12982573	0.018	4.7	0.7	1.8	3.2	2.4
18	United Arab Emirates	62190325	0.017	21.3	2.6	30.0	7.1	0.3
19	Iran, Isl. Rep	246738665	0.015	54.0	9.6	54.4	59.3	74.1
20	Jamaica	10246808	0.014	2.2	0.0	0.8	2.5	1.1
21	Nicaragua	2802326	0.013	1.0	0.1	0.4	1.2	0.2
22	Czech Republic	129038201	0.013	55.8	2.8	29.0	10.4	12.7
23	South Africa	345500944	0.013	171.2	4.8	63.1	34.9	16.2
24	Slovak Republic	39139048	0.012	9.9	1.1	16.0	3.5	7.8
25	Libya	40557455	0.012	12.0	8.4	5.0	9.3	2.1
26	Pakistan	88382023	0.012	26.0	1.2	25.0	22.1	10.5
27	India	894094193	0.011	358.9	19.0	259.6	116.0	51.8
28	Angola	4568339	0.011	0.2	0.3	1.9	1.1	0.9
29	Bahrain	12790828	0.011	2.8	3.6	3.8	1.3	0.2
30	Bulgaria	51261357	0.011	26.4	1.0	14.2	4.3	2.9
31	Estonia	16872404	0.010	11.5	0.0	1.7	1.6	0.8
32	Lithuania	14206415	0.010	5.1	1.2	1.8	3.7	1.6
33	Romania	111621839	0.010	48.7	10.1	26.6	11.9	10.1
34	Moldova	11014142	0.010	4.7	-	1.2	0.9	3.9

35	Dominican Rep.	16096943	0.009	3.0	-	1.2	4.8	2.1
36	Venezuela	111168708	0.009	15.9	37.8	37.4	32.2	4.9
37	Haiti	1401485	0.009	0.3	-	0.3	0.6	0.1
38	Belarus	61335346	0.009	24.1	1.7	8.0	7.0	8.3
39	China, P.R.	3131250885	0.009	1 183.8	141.2	1 106.8	176.5	436.8
40	Bolivia	9680247	0.009	1.7	1.1	1.0	3.4	2.4
41	Yemen Rep.	9068477	0.009	1.1	0.4	0.5	4.6	1.6
42	Poland	347819679	0.009	159.3	12.9	64.5	27.1	60.2
43	Zimbabwe	13782256	0.008	5.2	0.1	2.3	2.1	2.9
44	Greece	76857041	0.008	37.3	2.8	10.6	18.0	10.2
45	Cyprus	5444719	0.007	2.3	0.1	1.3	1.6	0.2
46	Colombia	64219874	0.007	7.6	4.8	21.7	21.7	6.1
47	Kenya	7179973	0.007	0.5	0.6	1.5	3.8	1.1
48	Australia	311003724	0.007	144.4	16.5	50.1	71.1	14.1
49	Ecuador	17570657	0.007	2.7	0.4	2.6	7.3	3.9
50	Egypt, Arab Rep.	98035295	0.007	25.2	5.0	28.0	16.0	10.3
51	Cuba	26815768	0.006	11.1	0.1	11.0	2.2	3.2
52	Georgia	4401436	0.006	0.7	0.0	1.0	1.3	1.1
53	Ghana	4340889	0.006	0.0	-	0.6	2.3	0.9
54	Tanzania, U.Rep.	2095880	0.006	0.5	0.0	0.4	0.7	0.2
55	Namibia	2281085	0.006	0.0	-	0.4	1.2	0.7
56	Honduras	3609124	0.006	0.9	0.0	0.8	1.5	0.4
57	Kuwait	34150116	0.006	21.6	8.6	16.1	5.9	6.5
58	Panama ex. Can.Zone	4209939	0.006	1.1	0.1	0.9	1.7	0.3
59	Nepal	2578763	0.006	0.0	-	0.9	0.7	0.9
60	Hungary	58357531	0.006	21.9	2.4	8.7	7.6	15.3
61	Philippines	72603833	0.005	20.4	4.2	11.3	22.7	7.5
62	Benin	1134152	0.005	0.0	-	0.2	0.7	0.3
63	Mexico	338922925	0.005	91.8	43.7	69.5	93.6	33.1
64	Chile	51092938	0.005	11.8	2.6	14.4	14.6	4.6
65	Latvia	8216198	0.005	3.2	0.0	1.5	2.2	1.1
66	Indonesia	234081135	0.005	52.2	33.4	42.9	57.1	40.6
67	Tunisia	15003061	0.005	4.5	0.2	3.4	3.5	3.3
68	Congo, Dem. Rep.	2424369	0.005	0.0	0.0	0.7	0.5	0.9
69	Guatemala	6746061	0.005	0.5	0.1	1.3	3.0	0.8
70	Canada	479927256	0.005	105.8	50.1	93.0	144.3	95.3
71	Morocco	25652355	0.004	8.1	0.4	4.4	1.6	10.2
72	Gabon	1698370	0.004	0.2	0.2	0.4	0.5	0.3
73	Malaysia	114097711	0.004	25.7	10.9	25.3	25.8	4.5
74	Togo	759176	0.004	0.0	-	0.3	0.3	0.1
75	United States	5459550753	0.004	1 987.0	273.7	600.2	1 602.8	644.5
76	Thailand	160311378	0.004	58.2	1.2	34.4	53.7	8.6
77	Albania	1445576	0.004	0.1	0.1	0.4	0.5	0.4
78	Turkey	183688438	0.004	48.7	7.7	47.6	35.0	33.5
79	Paraguay	3603346	0.004	0.0	-	0.3	3.1	0.2
80	Zambia	1954116	0.004	0.0	0.1	0.8	0.6	0.4
81	Senegal	3036709	0.004	1.1	0.0	0.4	0.9	0.4
82	Bangladesh	24865764	0.004	6.9	0.2	8.9	3.3	4.4
83	New Zealand	31198124	0.003	5.1	1.2	7.8	11.6	2.1
84	Sri Lanka	7971449	0.003	1.5	0.3	2.5	4.4	0.9
85	Armenia	3185876	0.003	1.8	-	0.9	0.1	0.4
86	Luxembourg	7869616	0.003	-	-	2.2	3.7	1.6
87	Costa Rica	4048596	0.003	0.2	0.1	0.7	2.7	0.4
88	Israel	54969549	0.003	27.8	1.8	5.7	9.2	6.8
89	El Salvador	5113083	0.003	1.3	0.1	1.0	2.1	0.4
90	Malta	2563332	0.003	1.6	-	-	0.7	0.3
91	Singapore	59851680	0.003	20.7	10.2	2.4	5.8	-
92	Netherlands	174867401	0.003	48.1	15.5	36.6	31.6	41.0
93	Hong Kong, SAR	31217629	0.003	20.2	-	2.6	7.0	1.7
94	Denmark	60575218	0.003	31.4	2.2	5.6	12.4	8.5
95	Belgium	118667856	0.003	21.4	5.9	30.3	24.1	33.0
96	United Kingdom	537082061	0.003	149.8	40.0	77.8	132.5	112.1
97	Brazil	289216363	0.002	11.5	20.1	83.7	118.5	35.5

98	Argentina	133745873	0.002	18.9	13.8	22.4	40.9	25.7
99	Uruguay	5480994	0.002	0.5	0.2	1.0	2.5	1.2
100	Portugal	49766903	0.002	14.4	2.5	10.8	14.6	5.0
101	Iceland	2115629	0.002	0.0	-	0.7	0.6	0.9
102	Sudan	5547763	0.002	1.1	0.0	0.8	3.1	0.3
103	Congo, Rep.	418908	0.002	0.0	-	0.0	0.3	0.0
104	Spain	246869641	0.002	67.3	14.0	50.8	77.7	25.7
105	Norway	32647709	0.002	0.2	11.9	6.9	12.0	3.9
106	Peru	26885558	0.002	2.4	1.6	5.8	8.7	5.7
107	Finland	63067052	0.002	24.2	1.5	12.8	11.8	7.4
108	Korea, Rep.	223372548	0.002	33.6	0.3	165.0	9.5	0.7
109	Austria	61376374	0.002	10.4	3.0	14.3	17.1	13.2
110	Ireland	36430770	0.002	14.0	0.3	4.7	7.4	9.2
111	Italy	410626048	0.002	100.5	20.4	81.4	109.7	74.3
112	Cameroon	2756852	0.001	0.0	-	0.2	1.8	0.6
113	France	344515414	0.001	19.2	19.5	83.0	128.2	97.7
114	Japan	1160599388	0.001	316.0	55.9	256.5	247.8	170.1
115	Sweden	48666286	0.001	7.2	1.7	11.8	21.2	9.9
116	Côte d'Ivoire	2459972	0.001	1.7	0.2	0.6	1.4	0.6
117	Switzerland	40642159	0.001	0.2	0.7	5.2	15.0	17.9

CO2 Emissions (kg) per unit of MVA from the Manufactoring and Construction Sector in 1989

Rank	Country	MVA	M&C in kg	CO2/MVA
1	United Arab Emirates	2195366280.729	23835698000	10.857
2	Trinidad and Tobago	426718743.442	4597554000	10.774
3	Netherlands Antilles	116540581.076	739707000	6.347
4	Kuwait	2040839324.611	10915317000	5.348
5	Qatar	911527781.969	4541333000	4.982
6	Romania	16957371620.749	78478447000	4.628
7	Iran	9390252037.562	37651024000	4.010
8	India	47921523636.412	191470406000	3.995
9	Pakistan	5256779494.135	19267481000	3.665
10	Jamaica	801777413.620	2905631000	3.624
11	Nigeria	1655728108.642	5495502000	3.319
12	Saudi Arabia	7400379621.232	22425704000	3.030
13	Jordan	401555422.845	1200915000	2.991
14	Venezuela	9355609840.682	27314082000	2.920
15	South Africa	25920948706.318	70964574000	2.738
16	Egypt	9783605495.727	24690502000	2.524
17	Iraq	8552073688.841	20291562000	2.373
18	Zimbabwe	1568102335.160	3449255000	2.200
19	Libya	1859722687.241	4034312000	2.169
20	Oman	280538119.588	579639000	2.066
21	Hungary	9531549442.941	19002386000	1.994
22	Honduras	440206240.439	823258000	1.870
23	Syria	1666581509.582	3060073000	1.836
24	Indonesia	20563573191.211	35223194000	1.713
25	Kenya	818604448.093	1349924000	1.649
26	Mexico	46827532031.066	71684304000	1.531
27	Poland	37476521084.220	55242727000	1.474
28	Nicaragua	190773963.568	257151000	1.348
29	Malaysia	9954057764.481	13405654000	1.347
30	Togo	142093673.127	177938000	1.252
31	Tunisia	2651238678.981	3104014000	1.171
32	Panama	441253246.588	505975000	1.147
33	Yemen	1014205980.575	1152769000	1.137
34	Greece	9721008044.655	10873914000	1.119
35	Morocco	4278516955.275	4634746000	1.083
36	Zambia	1181728623.816	1255986000	1.063
37	Turkey	30112913233.522	30805352000	1.023

38	Ghana	533734386.914	542084000	1.016
39	Korea	66556300050.578	63692567000	0.957
40	Gabon	337710009.699	313691000	0.929
41	New Zealand	8200819772.633	6461292000	0.788
42	Philippines	10717692729.170	8397397000	0.784
43	Netherlands	51823921877.090	34452707000	0.665
44	Guatemala	1127551950.062	748165000	0.664
45	Iceland	844717868.696	536942000	0.636
46	United States	1029655228617.120	640099400000	0.622
47	Thailand	20004864000.643	12090310000	0.604
48	Norway	13621628643.284	7935224000	0.583
49	Lebanon	561223493.348	323245000	0.576
50	Haiti	361277136.820	196748000	0.545
51	Ireland	11349686974.281	6037762000	0.532
52	Portugal	18602863829.130	9635139000	0.518
53	Spain	107985873181.317	46406510000	0.430
54	United Kingdom	198891968142.365	85440535000	0.430
55	Israel	10876661282.081	4440834000	0.408
56	Sudan	2284874343.938	806734000	0.353
57	Italy	243954497673.533	84870936000	0.348
58	Japan	784084412548.539	259340658000	0.331
59	Uruguay	2224973313.988	728629000	0.327
60	Hong Kong (China)	12927814556.792	4125616000	0.319
61	Senegal	719080169.984	213840000	0.297
62	Peru	10355235649.547	2988478000	0.289
63	Sweden	45413776786.777	11648959000	0.257
64	Germany	994331808480.000	206030040000	0.207
65	Nepal	184705787.075	34636000	0.188
66	Singapore	10814565379.564	1599024000	0.148
67	Paraguay	886501715.079	130128000	0.147
68	Switzerland	53452149423.566	5391293000	0.101
69	Malta	598773763.101	1474000	0.002

CO2 Emissions (kg) per unit of MVA from the Manufactoring and Construction Sector in 1997				
Rank	Country	MVA	M&C in kg	CO2/MVA
1	Trinidad and Tobago	494258168.414	5380806000	10.887
2	Qatar	1138484090.520	11794889000	10.360
3	Kazakhstan	4191133928.342	40990370000	9.780
4	United Arab Emirates	3746647594.200	29976483000	8.001
5	Azerbaijan	629439964.420	4187266000	6.652
6	Ukraine	16949569321.276	103362224000	6.098
7	Lebanon	685601877.584	3429122000	5.002
8	Oman	595463896.764	2948542000	4.952
9	Slovak Republic	3331493084.537	15990650000	4.800
10	Nigeria	2051380538.298	9752443000	4.754
11	Angola	403927955.037	1907271000	4.722
12	Iraq	3507073869.187	15979250000	4.556
13	Syrian Arab Rep.	2124794694.978	7590753000	3.572
14	Netherlands Antilles	120910937.907	426932000	3.531
15	Iran, Isl. Rep	16113925924.658	54396910000	3.376
16	India	78076929896.387	259579687000	3.325
17	Pakistan	7636950526.734	25044944000	3.279
18	China, P.R.	343073404315.841	1106810197000	3.226
19	Bahrain	1184699828.500	3820482000	3.225
20	Venezuela	11941378669.988	37362987000	3.129
21	Bulgaria	4769263534.999	14173748000	2.972
22	Czech Republic	9920683848.781	28964706000	2.920
23	Saudi Arabia	10457888295.327	29808040000	2.850
24	Kuwait	5700647806.091	16099668000	2.824
25	Uzbekistan	4105759414.129	11167458000	2.720
26	Cuba	4138132318.413	10979531000	2.653
27	Jordan	724816591.750	1832571000	2.528

28	Russian Federation	76064729339.554	187692862000	2.468
29	Colombia	8885329121.778	21680813000	2.440
30	South Africa	26738624551.518	63068060000	2.359
31	Romania	11447539837.252	26644952000	2.328
32	Nepal	447383572.262	920021000	2.056
33	Algeria	2912263120.298	5907411000	2.028
34	Egypt, Arab Rep.	14798298170.356	27956715000	1.889
35	Togo	179991037.484	331473000	1.842
36	Haiti	152046403.582	269619000	1.773
37	Cyprus	733821349.066	1282317000	1.747
38	Nicaragua	207958802.066	350755000	1.687
39	Poland	39955554743.955	64480037000	1.614
40	Chile	9756136367.383	14434205000	1.480
41	Kenya	1019967021.681	1503731000	1.474
42	Georgia	698150277.617	1016652000	1.456
43	Zambia	543720870.384	790623000	1.454
44	Libya	3455950117.078	4987064000	1.443
45	Zimbabwe	1667751954.009	2337898000	1.402
46	Honduras	584768427.038	792588000	1.355
47	Congo, Dem. Rep.	493795235.732	668921000	1.355
48	Korea, Rep.	124869534294.647	165032137000	1.322
49	Lithuania	1360216572.214	1779174000	1.308
50	Bangladesh	7046903680.102	8900059000	1.263
51	Panama ex. Can.Zone	709810822.489	896176000	1.263
52	Belarus	6671176335.600	7986926000	1.197
53	Tunisia	3014292328.550	3442298000	1.142
54	Tanzania, U.Rep.	334289788.625	379482000	1.135
55	Australia	44417766070.977	50070608000	1.127
56	Greece	9481997208.299	10555176000	1.113
57	Mexico	64244936963.772	69502880000	1.082
58	Gabon	386080013.003	415699000	1.077
59	Namibia	364331520.250	389535000	1.069
60	Jamaica	717243616.495	755060000	1.053
61	Estonia	1609097010.590	1683753000	1.046
62	Moldova	1139191871.849	1172593000	1.029
63	Sri Lanka	2454376235.729	2511188000	1.023
64	Ecuador	2586376000.019	2605787000	1.008
65	Turkey	48408321450.291	47553732000	0.982
66	Malaysia	26499144285.704	25275731000	0.954
67	Guatemala	1392449300.276	1322417000	0.950
68	Albania	380297573.447	360848000	0.949
69	Latvia	1620045689.720	1505567000	0.929
70	Indonesia	46249960234.118	42864005000	0.927
71	Bolivia	1091416262.288	992890000	0.910
72	Armenia	1013360013.666	890629000	0.879
73	Canada	106590452118.614	93034417000	0.873
74	Luxembourg	2530371542.791	2168563000	0.857
75	Philippines	13340827657.655	11253296000	0.844
76	Hungary	10345363368.876	8675857000	0.839
77	Benin	210898118.614	175267000	0.831
78	New Zealand	9451985708.963	7838225000	0.829
79	Ghana	689592693.302	567939000	0.824
80	Thailand	41869922808.371	34356201000	0.821
81	Morocco	5803914712.783	4371245000	0.753
82	Dominican Rep.	1712552519.717	1247143000	0.728
83	Iceland	893430656.922	650396000	0.728
84	Brazil	115723258024.555	83746515000	0.724
85	Belgium	44455267634.698	30289486000	0.681
86	El Salvador	1671731000.021	1001535000	0.599
87	Netherlands	61751932228.320	36552965000	0.592
88	Portugal	20507891601.600	10814408000	0.527
89	Costa Rica	1307866102.458	686453000	0.525
90	Yemen Rep.	1025152567.911	504878000	0.492
91	Senegal	849036717.022	399752000	0.471
92	United States	1306843464036.460	600223240000	0.459
93	Uruguay	2248825900.005	1025152000	0.456
94	Spain	114258216018.421	50803319000	0.445

95	Norway	15445179701.933	6862899000	0.444
96	Argentina	54360891290.378	22381734000	0.412
97	Peru	14073022488.319	5751446000	0.409
98	United Kingdom	207121629246.886	77753643000	0.375
99	Finland	35198165197.699	12803328000	0.364
100	Austria	40052416941.677	14318792000	0.358
101	Sudan	2494897153.259	825459000	0.331
102	Israel	17926279863.196	5693379000	0.318
103	Paraguay	960502421.889	293548000	0.306
104	Italy	270417164616.400	81371608000	0.301
105	France	276332842730.447	83018688000	0.300
106	Japan	965656782401.858	256510055000	0.266
107	Denmark	22230344569.339	5592593000	0.252
108	Hong Kong, SAR	11075169866.360	2633374000	0.238
109	Congo, Rep.	192805307.494	41815000	0.217
110	Côte d'Ivoire	2986295082.609	647295000	0.217
111	Sweden	57432902572.960	11779800000	0.205
112	Ireland	23932252597.180	4726510000	0.197
113	Singapore	20717880154.682	2361661000	0.114
114	Cameroon	1871048662.111	178980000	0.096
115	Switzerland	60581769520.478	5173277000	0.085
116	Tajikistan	199043375.525	0	0.000
117	Malta	885826771.650	0	0.000

CO2 Emissions (kg) per unit of MVA from the M&C Sector for Developing Countries in 1989

Rank	Country	CO2/MVA
1	United Arab Emirates	10.857
2	Trinidad and Tobago	10.774
3	Netherlands Antilles	6.347
4	Kuwait	5.348
5	Qatar	4.982
6	Romania	4.628
7	Iran	4.010
8	India	3.995
9	Pakistan	3.665
10	Jamaica	3.624
11	Nigeria	3.319
12	Saudi Arabia	3.030
13	Jordan	2.991
14	Venezuela	2.920
15	South Africa	2.738
16	Egypt	2.524
17	Iraq	2.373
18	Zimbabwe	2.200
19	Libya	2.169
20	Oman	2.066
21	Hungary	1.994
22	Honduras	1.870
23	Syria	1.836
24	Indonesia	1.713
25	Kenya	1.649
26	Mexico	1.531
27	Poland	1.474
28	Nicaragua	1.348
29	Malaysia	1.347
30	Togo	1.252
31	Tunisia	1.171
32	Panama	1.147
33	Yemen	1.137
34	Morocco	1.083
35	Zambia	1.063
36	Turkey	1.023
37	Ghana	1.016

CO2 Emissions (kg) per unit of MVA from the M&C Sector for Industrialized Countries in 1989

Rank	Country	CO2/MVA
1	Greece	1.119
2	New Zealand	0.788
3	Netherlands	0.665
4	Iceland	0.636
5	United States	0.622
6	Norway	0.583
7	Ireland	0.532
8	Portugal	0.518
9	Spain	0.430
10	United Kingdom	0.430
11	Italy	0.348
12	Japan	0.331
13	Sweden	0.257
14	Germany	0.207
15	Switzerland	0.101

38	Korea	0.957
39	Gabon	0.929
40	Philippines	0.784
41	Guatemala	0.664
42	Thailand	0.604
43	Lebanon	0.576
44	Haiti	0.545
45	Israel	0.408
46	Sudan	0.353
47	Uruguay	0.327
48	Hong Kong (China)	0.319
49	Senegal	0.297
50	Peru	0.289
51	Nepal	0.188
52	Singapore	0.148
53	Paraguay	0.147
54	Malta	0.002

CO2 Emissions (kg) per unit of MVA from the M&C Sector for Deevloping Countries in 1997

Rank	Country	CO2/MVA
1	Trinidad and Tobago	10.887
2	Qatar	10.360
3	Kazakhstan	9.780
4	United Arab Emirates	8.001
5	Azerbaijan	6.652
6	Ukraine	6.098
7	Lebanon	5.002
8	Oman	4.952
9	Slovak Republic	4.800
10	Nigeria	4.754
11	Angola	4.722
12	Iraq	4.556
13	Syrian Arab Rep.	3.572
14	Netherlands Antilles	3.531
15	Iran, Isl. Rep	3.376
16	India	3.325
17	Pakistan	3.279
18	China, P.R.	3.226
19	Bahrain	3.225
20	Venezuela	3.129
21	Bulgaria	2.972
22	Czech Republic	2.920
23	Saudi Arabia	2.850
24	Kuwait	2.824
25	Uzbekistan	2.720
26	Cuba	2.653
27	Jordan	2.528
28	Russian Federation	2.468
29	Colombia	2.440
30	South Africa	2.359
31	Romania	2.328
32	Nepal	2.056
33	Algeria	2.028
34	Egypt, Arab Rep.	1.889
35	Togo	1.842
36	Haiti	1.773
37	Cyprus	1.747
38	Nicaragua	1.687
39	Poland	1.614
40	Chile	1.480
41	Kenya	1.474

CO2 Emissions (kg) per unit of MVA from the M&C Sector for Industrialized Countries in 1997

Rank	Country	CO2/MVA
1	Australia	1.127
2	Greece	1.113
3	Luxembourg	0.857
4	New Zealand	0.829
5	Iceland	0.728
6	Belgium	0.681
7	Netherlands	0.592
8	Portugal	0.527
9	United States	0.459
10	Spain	0.445
11	Norway	0.444
12	United Kingdom	0.375
13	Finland	0.364
14	Austria	0.358
15	Italy	0.301
16	France	0.300
17	Japan	0.266
18	Denmark	0.252
19	Sweden	0.205
20	Ireland	0.197
21	Switzerland	0.085

42	Georgia	1.456
43	Zambia	1.454
44	Libya	1.443
45	Zimbabwe	1.402
46	Honduras	1.355
47	Congo, Dem. Rep.	1.355
48	Korea, Rep.	1.322
49	Lithuania	1.308
50	Bangladesh	1.263
51	Panama ex. Can.Zone	1.263
52	Belarus	1.197
53	Tunisia	1.142
54	Tanzania, U.Rep.	1.135
55	Mexico	1.082
56	Gabon	1.077
57	Namibia	1.069
58	Jamaica	1.053
59	Estonia	1.046
60	Moldova	1.029
61	Sri Lanka	1.023
62	Ecuador	1.008
63	Turkey	0.982
64	Malaysia	0.954
65	Guatemala	0.950
66	Albania	0.949
67	Latvia	0.929
68	Indonesia	0.927
69	Bolivia	0.910
70	Armenia	0.879
71	Philippines	0.844
72	Hungary	0.839
73	Benin	0.831
74	New Zealand	0.829
75	Ghana	0.824
76	Thailand	0.821
77	Morocco	0.753
78	Dominican Rep.	0.728
79	Brazil	0.724
80	El Salvador	0.599
81	Portugal	0.527
82	Costa Rica	0.525
83	Yemen Rep.	0.492
84	Senegal	0.471
85	Uruguay	0.456
86	Argentina	0.412
87	Peru	0.409
88	Sudan	0.331
89	Israel	0.318
90	Paraguay	0.306
91	Hong Kong, SAR	0.238
92	Congo, Rep.	0.217
93	Côte d'Ivoire	0.217
94	Singapore	0.114
95	Cameroon	0.096
96	Tajikistan	0.000
97	Malta	0.000

Total CO2/MVA for Developing Countries in 1989		
Rank	Country	CO2 per MVA
1	Netherlands Antilles	46.100
2	Oman	25.058
3	Trinidad and Tobago	24.380
4	Nigeria	23.046
5	Kuwait	22.428
6	Saudi Arabia	22.398
7	Jordan	21.744
8	United Arab Emirates	19.406
9	Iran	17.769
10	Syria	17.217
11	Libya	15.437
12	Qatar	14.525
14	South Africa	11.524
15	Lebanon	11.412
16	Romania	11.393
17	Poland	11.351
18	Pakistan	10.971
19	Venezuela	10.397
20	Nicaragua	9.296
21	Zimbabwe	8.822
22	Kenya	8.245
23	Jamaica	8.209
24	Yemen	8.127
25	Egypt	8.119
26	Hungary	7.599
27	Iraq	7.460
31	Panama	5.363
32	Honduras	5.182
33	Ghana	4.915
36	Gabon	4.622
37	Tunisia	4.510
38	Morocco	4.297
40	Nepal	4.002
41	Malta	3.847
42	Togo	3.452
45	Israel	3.156
48	Senegal	2.871
49	New Zealand	2.858
50	Guatemala	2.836
54	Haiti	2.626
57	Uruguay	2.219
60	Paraguay	2.128
61	Zambia	2.091
63	Peru	1.850
64	Sudan	1.815
	TOTAL	9.963

Total CO2/MVA for the 13 Asian Tigers in 1989		
Rank	Country	CO2 per MVA
1	India	11.807
2	Indonesia	6.191
3	Mexico	6.130
4	Malaysia	4.755
5	Turkey	4.173
6	Philippines	3.435
7	Thailand	3.229
8	Korea	3.071
9	Hong Kong (China)	2.649
10	Singapore	2.291
11	Brazil	No data
12	China	No data
13	Taiwan	No data
	TOTAL *	5.492

* These countries account for 42.8 % of total CO2 produced by the developing countries.

Total CO2/MVA for Developing Countries in 1997		
Rank	Country	CO2 in kg per MVA
1	Azerbaijan	48.245
2	Netherlands Antilles	31.990
3	Kazakhstan	30.393
4	Qatar	28.848
5	Oman	27.913
6	Tajikistan	26.316
7	Uzbekistan	25.171
8	Trinidad and Tobago	23.807
9	Iraq	22.852
10	Lebanon	22.722
11	Ukraine	22.044
12	Algeria	21.418
13	Saudi Arabia	20.921
14	Nigeria	20.039
15	Syrian Arab Rep.	19.643
16	Russian Federation	19.498
17	Jordan	17.912
18	United Arab Emirates	16.599
19	Iran, Isl. Rep	15.312
20	Jamaica	14.286
21	Nicaragua	13.475
22	Czech Republic	13.007
23	South Africa	12.921
24	Slovak Republic	11.748
25	Libya	11.736
26	Pakistan	11.573
28	Angola	11.310
29	Bahrain	10.797
30	Bulgaria	10.748
31	Estonia	10.486
32	Lithuania	10.444
33	Romania	9.751
34	Moldova	9.668
35	Dominican Rep.	9.399
36	Venezuela	9.310
37	Haiti	9.217
38	Belarus	9.194
40	Bolivia	8.869
41	Yemen Rep.	8.846
42	Poland	8.705
43	Zimbabwe	8.264
44	Cyprus	7.420
45	Colombia	7.228
46	Kenya	7.039
47	Ecuador	6.794
48	Egypt, Arab Rep.	6.625
49	Cuba	6.480
50	Georgia	6.304
51	Ghana	6.295
52	Tanzania, U.Rep.	6.270
53	Namibia	6.261
54	Honduras	6.172
55	Kuwait	5.991
56	Panama ex. Can.Zone	5.931
57	Nepal	5.764
58	Hungary	5.641
60	Benin	5.378
62	Chile	5.237

Total CO2/MVA for the 13 Asian Tigers in 1997		
Rank	Country	CO2 in tonnes per MVA
1	India	11.451
2	China, P.R.	9.127
3	Philippines	5.442
4	Mexico	5.275
5	Indonesia	5.061
6	Malaysia	4.306
7	Thailand	3.829
8	Turkey	3.795
9	Singapore	2.889
10	Hong Kong, SAR	2.819
11	Brazil	2.499
12	Korea, Rep.	1.789
13	Taiwan	No data
	TOTAL *	6.137

63	Latvia	5.072
65	Tunisia	4.977
66	Congo, Dem. Rep.	4.910
67	Guatemala	4.845
68	Morocco	4.420
69	Gabon	4.399
71	Togo	4.218
73	Albania	3.801
75	Paraguay	3.752
76	Zambia	3.594
77	Senegal	3.577
78	Bangladesh	3.529
79	Sri Lanka	3.248
80	Armenia	3.144
81	Costa Rica	3.096
82	Israel	3.066
83	El Salvador	3.059
84	Malta	2.894
88	Argentina	2.460
89	Uruguay	2.437
90	Sudan	2.224
91	Congo, Rep.	2.173
92	Peru	1.910
94	Cameroon	1.473
95	Côte d'Ivoire	0.824
	TOTAL	10.899

* These countries account for 52.6 % of total CO2 produced by the developing countries.

III. CO2 & BOD Data

CO2 & BOD (kg) per unit of MVA for 1989			
Rank	**Country**	**CO2/mva**	**BOD/mva**
1	Brazil	No data	No data
2	China	No data	No data
3	Hong Kong	2.336	No data
4	India	14.06	0.01070
5	Indonesia	6.447	0.00781
6	Malaysia	5.087	0.00343
7	Mexico	6.197	0.00136
8	Philippines	3.947	0.00600
9	Singapore	3.474	0.00106
10	South Korea	3.546	0.00207
11	Taiwan	No data	No data
12	Thailand	4.314	0.00473
13	Turkey	4.877	0.00217

CO2 & BOD (kg) per unit of MVA for 1997			
Rank	**Country**	**CO2/mva**	**BOD/mva**
1	Brazil	2.655	No data
2	China	10.474	No data
3	Hong Kong	2.149	No data
4	India	13.646	0.00819
5	Indonesia	5.438	0.00274
6	Malaysia	5.176	0.00239
7	Mexico	5.911	0.00086
8	Philippines	6.122	0.00488
9	Singapore	4.014	0.00059
10	South Korea	3.663	0.00093
11	Taiwan	No data	No data
12	Thailand	5.416	No data
13	Turkey	4.461	0.00140

c) Industry related Social Indicators:

(Sources: World Development Indicators 2000)

I.- employment in industry & female employment in industry

Employment in industry				
	Total %		Female %	
Country	1989	1997	1989	1997
Australia	26	22	13	11
Austria	37	30	20	14
Bahamas, The	..	15		5
Bangladesh	15	..	22	
Barbados	23	..	15	
Belgium	31	..	16	
Bolivia	24	..	12	
Brazil	23	20	14	10
Canada	26	23	14	12
Chile	27	23	16	14
China	21	20		
Colombia	29	28	24	21
Costa Rica	26	24	27	17
Croatia	..	30		21
Cyprus	29	..	25	
Czech Republic	..	41		29
Denmark	27	26	16	15
Dominican Republic	..	25		21
Ecuador	24	22		16
Egypt, Arab Rep.	21	..	9	
El Salvador	27	24	21	21
Estonia	37	33	32	24
Finland	30	27	17	13
France	30	..	17	
Germany	..	34		19
Greece	28	23	17	13
Honduras	..	22		27
Hong Kong, China	39	25	36	15
Hungary	35	33	28	25
Iceland	..	26		15
Indonesia	13	19	12	16
Ireland	28	29	19	17
Israel	27	28	15	14
Italy	32	..	23	
Jamaica	23	19	12	10
Japan	34	33	28	24
Korea, Rep.	35	31	31	21
Kyrgyz Republic	25	10		7
Latvia	..	27		20
Lithuania	..	28		21
Luxembourg	31	..	9	
Macao, China	47	29	55	33
Malaysia	25	34	25	30

Mexico	..	22		19
Netherlands	26	22	11	10
Netherlands Antilles	22	20		6
New Zealand	25	24	15	13
Norway	25	23	12	10
Pakistan	20	19	14	11
Panama	14	18	11	11
Paraguay	28	..	16	
Peru	26	21		12
Philippines	16	17	14	13
Poland	38	32		21
Portugal	35	31	26	21
Puerto Rico	25	22	22	15
Romania	45	31	38	24
San Marino	44	40	34	26
Singapore	36	30	35	25
Slovak Republic	..	39		28
Slovenia	..	41		31
Spain	32	30	17	14
Sweden	30	26	15	12
Switzerland	..	27		15
Syrian Arab Republic	27	..	13	
Thailand	12	20	10	17
Trinidad and Tobago	27	26	13	13
Tunisia	34	..	44	
Turkey	21	25	9	13
United Kingdom	33	27	18	13
United States	27	24	15	13
Uruguay	34	..	23	
Venezuela, RB	26	24	17	13

II.- Human development Index ranking

Human Development Ranking					
HDI		**GINI**	**HDI Index**		**GDP- HDI rank**
Rank 2001	**Country**	**HDI Report 2001***	**1990**	**2001**	**2001**
34	Argentina	..	0.8070	0.842	6
2	Australia	35.2	0.886	0.936	10
16	Austria	23.1	0.889	0.921	-6
42	Bahamas, The	..	..	0.82	-8
132	Bangladesh	33.6	0.414	0.470	-4
31	Barbados	..	.	0.864	5
5	Belgium	25	0.895	0.935	4
104	Bolivia	58.9	0.596	0.648	7
69	Brazil	59.1	0.710	0.75	-12
3	Canada	31.5	0.925	0.936	3
125	Cameroon	..	0.497	0.506	2
39	Chile	57.5	0.779	0.825	9
87	China	40.3	0.624	0.718	7
62	Colombia	57.1		0.765	6
144	Cote d'Ivoire	36.7	0.414	0.426	-20
41	Costa Rica	45.9	0.807	0.821	6

46	Croatia	29	0.794	0.803	10
25	Cyprus	..	0.843	0.877	-2
33	Czech Republic	25.4	0.833	0.844	6
15	Denmark	24.7	0.889	0.921	-7
86	Dominican Republic	47.4	0.675	0.722	-16
84	Ecuador	43.7	0.7	0.726	19
105	Egypt, Arab Rep.	28.9	0.573	0.635	-8
95	El Salvador	50.8	0.642	0.701	-9
44	Estonia	37.6	..	0.812	6
158	Ethiopia	40	0.294	0.321	0
10	Finland	25.6	0.894	0.925	5
13	France	32.7	0.896	0.924	3
17	Germany	30	..	0.921	-3
23	Greece	32.7	0.857	0.881	10
107	Honduras	59	0.614	0.634	5
24	Hong Kong, China	..	0.857	0.88	-4
36	Hungary	24.4	0.803	0.829	5
7	Iceland	..	0.91	0.932	-3
115	India	37.8	0.51	0.571	0
102	Indonesia	31.7	0.622	0.677	3
18	Ireland	35.9	0.868	0.916	-11
22	Israel	35.5	0.859	0.893	3
20	Italy	27.3	0.878	0.909	-2
78	Jamaica	36.4	0.722	0.738	17
9	Japan	24.9	0.907	0.928	2
27	Korea, Rep.	31.6	0.814	0.875	5
92	Kyrgyz Republic	40.5	..	0.707	15
50	Latvia	32.4	0.803	0.791	12
47	Lithuania	32.4	0.794	0.803	13
12	Luxembourg	26.9	0.879	0.924	-11
56	Malaysia	49.2	0.720	0.774	-4
51	Mexico	51.9	0.759	0.79	0
8	Netherlands	32.6	0.9	0.931	5
19	New Zealand	..	0.873	0.913	3
136	Nigeria	50.6	0.423	0.455	11
1	Norway	25.8	0.899	0.939	2
127	Pakistan	31.2	0.441	0.498	-5
52	Panama	48.5	0.746	0.784	15
80	Paraguay	57.7	0.716	0.738	5
73	Peru	46.2	0.702	0.743	8
70	Philippines	46.2	0.716	0.749	21
38	Poland	31.6	0.790	0.828	11
28	Portugal	35.6	0.818	0.874	2
58	Romania	..	0.775	0.772	6
55	Russian Federation	48.7	0.823	0.775	0
26	Singapore	..	0.816	0.876	-5
35	Slovak Republic	19.5	0.818	0.831	6
29	Slovenia	28.4	0.843	0.874	2
21	Spain	32.5	0.875	0.908	6
138	Sudan	..	..	0.439	19
4	Sweden	25	0.892	0.936	13
11	Switzerland	33.1	0.904	0.924	-6
97	Syrian Arab Republic	..	0.647	0.700	-14

66	Thailand	41.4	0.713	0.757	-3
49	Trinidad and Tobago	40.3	0.778	0.798	4
89	Tunisia	41.7	0.644	0.714	-23
82	Turkey	41.5	0.684	0.735	-21
14	United Kingdom	36.1	0.876	0.923	5
6	United States	20.8	0.912	0.934	-4
37	Uruguay	42.3	0.8	0.828	9
101	Vietnam	36.1	0.604	0.682	19
61	Venezuela	48.8	0.756	0.765	10
117	Zimbabwe	56.8	0.598	0.554	-13

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