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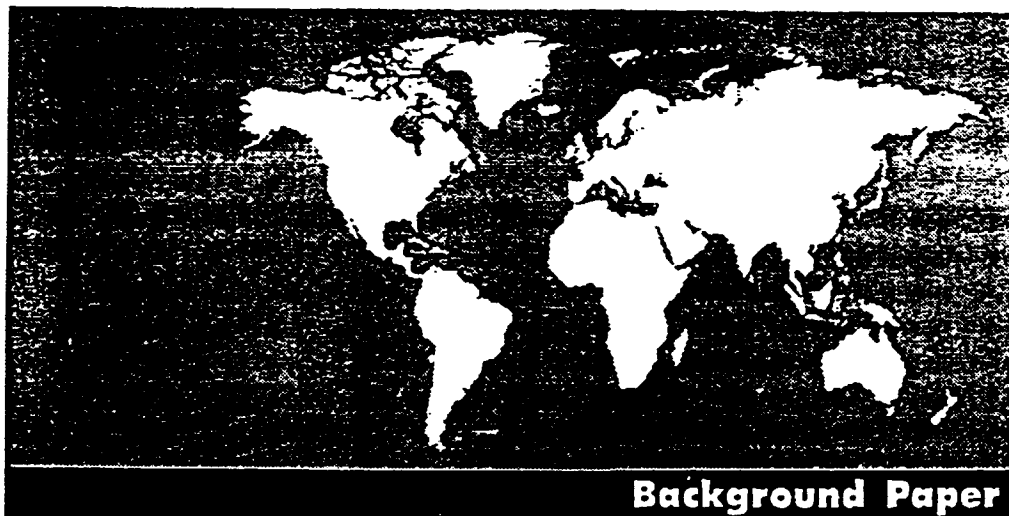
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Panel VIII Industrial development and international cooperation: The future role of UNIDO



Industrial development and international cooperation: The future role of UNIDO

Prepared by
the UNIDO Secretariat



UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

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I. DEVELOPING COUNTRIES IN THE GLOBAL INDUSTRIAL DEVELOPMENT PROCESS: CURRENT AND EMERGING CHALLENGES

A. Overview

1. Most developing countries began to industrialize in the late 1950s or 1960s after gaining their independence. In fact, industrialization efforts formed part of broader endeavours towards economic independence. Through the build-up of domestic industrial capacities, developing countries strove to generate an overall, indigenous base for socio-economic development based on continuing value-adding processes.

2. The absence of functioning markets and growth stimulants led to the formulation and application by Governments of various development planning models. The lack of domestic private risk capital and entrepreneurship was seen to require a central role by Governments, which assumed an interventionist and entrepreneurial function and initiated industrial development with significant public ownership of large-scale enterprises.

3. Towards the end of the 1970s, industrial development in many developing countries had reached a stage at which structural constraints became evident. Structural imbalances, market distortions prompted by the effects of internal policy, domestic market limitations and lack of international competitiveness, as well as several waves of external shocks, caused a break in past growth trends. Many countries confronted "de-industrialization", external debt crises and sharp falls in income and employment.

4. Yet, over time, to use just one indicator, the share of developing countries in total world manufacturing value-added (MVA) increased from 8.6 per cent in the 1960s to 14.8 per cent in 1980 and - after a temporary decline - to 17.0 per cent in 1990. This in itself represents a major achievement. One might be led to believe, therefore, that developing countries as a group have been able to build up significant industrial capacities, generating employment, overall income growth and export proceeds, thus enabling access to goods and services, know-how and higher standards of living. This is true only to a limited extent.

5. A closer review of the industrial process reveals that the pace of development has been very uneven in the various regions. Africa's share in total world MVA moved only slowly from 0.9 per cent in 1975 to 1.1 per cent in 1992. The share of all least developed countries (LDCs) worldwide remained static over this period at 0.3 per cent. This reflects the continuing lack of resources and opportunities for development, and the prevalence of significant constraints in building up viable industrial structures. In contrast, the South and East Asian region increased its share from 3.3 per cent in 1975 to 7.8 per cent in 1992.

6. Moreover, the population increase has been significant in many countries, resulting in only modest per capita growth. Thus, in developing countries as a whole, MVA per capita grew only by 1.9 per cent and 1.6 per cent annually in the periods 1975-1985 and 1985-1992, respectively. Per capita MVA in African LDCs even fell by an annual rate of 2.4 per cent in 1975-1985 and 0.3 per cent in 1985-1992. Deteriorating social conditions and widespread poverty have been the consequence in many of these countries.

7. An obvious accentuation of growth difference is thus noted, with a very small number of developing countries accounting for the lion's share in manufactured exports, foreign direct investment and technology advancement. In 1992 some 60 per cent of foreign direct investment to developing countries went to Asia alone - as opposed to some 2 per cent to Africa. Similarly, manufactured exports are highly concentrated on a small number of countries in South-East and East Asia as well as in Latin America. Thus, whereas over the past two decades an accelerated growth of manufactured exports from the entire group of developing countries has occurred, with an annual growth rate of close to 20 per cent, only 11 countries accounted for 80 per cent of these exports.

8. Past patterns of industrial development in developing countries thus reveal that for the majority of these countries considerable constraints and adjustment requirements have accumulated over the years. It is opportune at this stage to review these and new, emerging constraints and to assess their impact and identify possible responses for the years to come.

9. The beginning of the 1990s showed a reassessment and emergence of a widespread change in the macroeconomic context, involving the concept, strategies and policies for industrial development in developing countries on the basis of the drastically changing conditions in the global economy. A new orthodoxy gained momentum with greater reliance on market forces, policy deregulation, trade liberalization, rapid technological innovation, privatization and a lead role given to the private sector. The experiences gained became largely irrelevant under this changed context. This implied that most developing countries had to shift policies and launch major adjustment programmes so as to be able to respond to the changing conditions, capture new opportunities and build up resilience and sustainable competitiveness in the globalized industrial production and trade system.

10. These adjustments have proven to be more complex than originally anticipated and tend in some cases to place a heavy burden on the weakest segments of the economy and society. At the same time, social and environmental concerns are gaining increased attention in the global arena and in many developing countries. It is this reconciliation of sustainable competitiveness and equitable development through industry which is a central theme in the formulation of socio-economic policies, geared towards the creation of an overall enabling environment, including proper institutional infrastructure, incentives and regulations. The LDCs, most of which are in Africa, are facing particular problems and resource constraints in their endeavours to meet these emerging challenges.

B. Industrial competition

11. The global economy is currently characterized by a general trend towards trade liberalization particularly following the recent conclusion of the Uruguay Round agreements. This trend has also found concrete expression in the policy deregulation of national economies and the increasing role of the private sector in developing countries and the countries in transition.

12. International trade in manufactures and related services is expected to grow further at a rapid pace. International competition in industry is increasing drastically also in the domestic markets of developing countries. Whereas the full

implications of the global trade liberalization and of the Uruguay Round agreements have yet to be ascertained, the key issues emerging can be identified as contained in the issue paper entitled "Global trade liberalization: implications for industrial restructuring".¹ These preliminary findings clearly suggest that in order for developing countries to be able to capture and utilize the changing opportunities in the global economy and to respond adequately to the new framework of competition, very significant restructuring of their industrial sectors and their overall policy setting will be required. These emerging restructuring pressures accentuate the need of developing countries to respond to the gradual change of the pattern of competitiveness that has taken place in recent years.

13. Technology is one central issue in this context. The accelerated technological advancement in past years has led to the application of new process and product technologies with far-reaching implications for competition in industry - such as shortened product cycles, further direct labour replacement also in "traditional" industries; specific new approaches to industrial subsectoral developments such as in agro-industry and the pharmaceutical industry through developments in biotechnology; consequences of information technology and of the development of applications; and the changing demand for various minerals and processed commodities due to new materials and new product concepts. These issues and the increasing competition in innovation with its implications for R&D policies and institutional measures have been extensively treated in the literature and are given due attention in the documentation submitted to this Forum.

14. Technological developments have thus assumed a central role for a national economy's and industry's international competitiveness and warrant major attention. Major tangible and intangible investments are required in the coming years by national policy makers, and primarily by the industrial and service sectors themselves in terms of R&D capacities, management of R&D and technology, organizational structures, information systems and - above all - specific human resources.

15. Against this new paradigm of competition, it is however important to recall that the varying scope for, and sustained ability of, different developing countries to compete successfully in the specific fields of high-technology vary considerably. Past overcrowding in narrow niches and failure to reap benefits from specific high-tech-investments clearly show the risks involved. A country's advantages must be assessed and policies so designed that these advantages can be exploited in the form of a competitive mix of industrial activities and technologies. In his paper entitled "Technology, manufactured exports and competitiveness" the author points to this issue and concludes that "development of low productivity lines of production is not an alternative to technological upgrading, but a complement to it".² An enabling policy environment including technology policy has precisely the function to enhance the awareness and the response of the private sector to the multitude of emerging options. Instead of relying on traditional subsector classifications one can in this

¹ See paper IV/1 (ID.WG.542/15).

² Background paper II/1: Charles Cooper. "Technology, manufactured exports and competitiveness" (ID/WG.542/5), p. 40.

context outline a structure of five main industrial production sectors according to different factor inputs and market orientation:

- (1) The non-tradeable goods sectors (with natural protection or other forms of protection from international competition and thus not trade-exposed);
- (2) The unskilled labour-intensive sector (this includes some of the traditional industries where, however, technology is currently changing through increasing automation);
- (3) The capital intensive sector (mostly basic, raw material-based industries);
- (4) The skill intensive sector;
- (5) The R&D intensive sector (this is also the most human capital intensive sector).

16. Obviously, each economy has at any one point of time its own mix of these sectors. Evidently, industrially advanced and "medium-advanced" countries among developed and developing countries strive to move upwards in this structure (moving from 1 towards 5). Declining commodity prices and, consequently, decreasing prospects for developing countries to attain sustained growth on the basis of the primary sector accentuate the need for building up more creative and sophisticated value-adding capacities. Many countries, such as Asian countries, seem to pursue niche strategies in each of these sectors so as not to be blocked off from either high-tech or labour-intensive industrial development. Policy makers in most Central and Eastern European countries are quite concerned about the direction in which their industry is currently moving and they are in the process of searching for and redefining their industrial strategies in this regard. Here the key task lies *inter alia* in promoting the commercial orientation and application of the considerable science and technology capabilities for industrial activities with dynamic competitive advantages. For policy makers and industrialists in each country it is thus of strategic importance to identify which precise industrial structure actually prevails and which pattern of development could or should be pursued within given national constraints and international competition. The specific issues to be addressed concern the choice of industrial strategy and policy which could or should be pursued to enable industry to capture emerging opportunities and utilize the specific dynamic comparative advantages and the measures by which the economic actors can be induced to restructure production towards more competitive and sustainable structures, without reverting to a notion of "picking the winners" or direct government intervention.

17. Against this background of changing or "desirable" future industrial structures, the issue of human resource development (HRD) assumes a critical role. The question needs to be raised which human resource structure and level is required for an economy to be able to pursue a development towards a particular industrial mix of sectors or activities. Past experience in both developed and developing countries shows that skill gaps in particular industrial activities and functions connected with technological advancement of industry and for attracting foreign investment constitute a major constraint on development in most countries.

This shows that forward-looking demand assessments for skills in industry and a close linkage between HRD policies and industrial policies are indispensable.

18. Human resource development will have to be a prime task for developing countries in the coming decades for managing industry and for being able to gradually move the industrial structure to more technologically sophisticated industrial activities so as not to be caught in a low skill/low development trap.

19. It is increasingly recognized that the key determinant of the ability to capture and use the emerging opportunities and thus of the industrial competitiveness of a national economy is the skill level of the human resources in the industrial and business sectors. It will mainly depend on the lack of adequately trained human resources in developing countries and countries in transition will not be able to fully utilize the chances which now emerge in the world trade and production systems.

20. All in all, trends in industrial competition indicate that emphasis will further shift from quantitative to qualitative aspects of industrial development.

21. Whereas raw material endowment and the availability of abundant cheap labour in a national economy tend to lose their competitive edge, other determinants have emerged: quality of products, timeliness of custom-oriented batch production, national and international production networking, technological sophistication, corporate alliances, information systems. These are all built up through "intangible investments" which in turn presuppose the availability of increasingly high skills in very different disciplines than in the past. In this sense, industrial competition can be said to be moving "upstream".

22. At the enterprise level, the requirements for competitiveness concern:

- Core capabilities and skills in production, management and commercial services;
- Efficiency in organization and technical production systems;
- Technological innovation capability in process, product and commercialization systems and any activity valued by clients;
- Efficiency in sourcing, distribution and international networking;
- Total quality control, flexible manufacturing, energy efficiency and environmental protection.

23. Regulatory measures apart, it is important to highlight the connection between the introduction of environmentally sound technologies (ESTs) and enterprise competitiveness. Only by contributing towards enterprise competitiveness, growth and profitability, can ESTs find valuable application in practice.

24. International experience has repeatedly shown that, in fact, the great majority of small and medium enterprises (SMEs) in developing countries do not know what their critical technological needs for sustained competitiveness are. Addressing this

issue requires time, attention, resources, forward-planning and technology-management skills, which are in short supply in the great majority of SMEs in those countries.

25. It needs to be re-emphasized that the small-scale industry segment constitutes an essential part of a dynamic competitive industrial structure in a national economy. The small companies are in principle particularly innovative in product development, can find and utilize market niches, and above all, constitute a nucleus for the future growth of industry. Such a dynamic small-scale industry segment can become a key asset for an economy if properly promoted and supported. It is therefore no coincidence that practically all countries - whether developed or developing - attach particular significance to this sector and pursue a vast range of support schemes for small-scale industry development. Such schemes cover special tax incentives, financial support mechanisms, incubators, industrial estates, technology centres, HRD and management support programmes etc., which usually provide significant support in addition to the general policy framework for industrial development. It is thus noteworthy that in the current liberalized global environment, national Governments attach particular importance to facilitating the establishment and development of small-scale industries.

26. One reason is the recognition that the small-scale industry segment of a manufacturing sector plays a major role as part of an economy's production network. Small-scale industries are in many industrially advanced countries carrying out the function of highly specialized producers and "supporting industries" and constitute thereby an essential basis for the entire industry sector's competitiveness. Such networking requires however, high technical, organizational, financial, communication and marketing skills and the ability to forge dynamic relationships between various actors. Certain small-scale industries see their role as new, innovative producers who can introduce new products and form the nucleus for a potential growth industry. It is quite common that the small innovative enterprises at some stage of their development can be taken over by large industries. Certain small-scale enterprises tend at some point to reach a limit in their financial, managerial, marketing and technical capacity to develop further. A major boost of more resources is then needed to enable them to utilize their growth potentials in other markets and in larger production lines. It is at this stage when stronger "clustering" of the SME's or the acquisition through a large company can be of essential benefit for the overall industrial development process. A national industrial and financial policy framework in support of new entrepreneurship and of such clustering and acquisitions can thus be said to constitute an important precondition for an economy to be able to utilize this particular source of growth and revitalization.

27. It needs to be re-emphasized at this point that if developing countries are to pursue their industrial development through enhanced competitiveness and/or restructuring and modernization in increasingly open and competitive markets for industrial products, they need to devote major attention to the formulation of an overall economic "enabling environment" as well as the particular dimensions of this environment, namely the attraction of foreign direct investment, small-scale industry development and technology.

28. Obviously, within the group of developing countries, a small number of them are already well advanced in these endeavours, but for the great majority this constitutes a formidable task, in a period of scarce resources.

C. External debt

29. The external debt of all developing countries is now expanding more slowly and, as a result of debt restructuring operations, substantial changes in the debt profile have taken place. However, the burden imposed on developing countries by high amounts of accumulated external debts - while no longer a threat to the global financial system - continues to impede their economic development process. The focus of attention has shifted from large-middle income indebted countries to the severely indebted low-income countries: 32 low-income countries, 25 of which are in sub-Saharan Africa, have debt-to-GNP ratios of above 80 per cent and debt-to export ratios of above 220 per cent. Many of these countries, despite their access to long-term borrowing on favourable terms, have not been able to avoid debt defaults. In general, they are also being bypassed by foreign direct investment flows to the developing world.

30. Debt relief, while much required and justified in many cases, such as for African countries, will not in itself be sufficient to trigger off a process of sustainable economic development. What is needed in these countries is international support to the strengthening of productive capacities and to the build-up and diversification of export capabilities which can only be achieved through an increased pace in industrialization.

D. Environmental issues

31. Over the years, growing recognition has emerged in both developed and developing countries of the need to pursue rigorous protection of the environment and of depletable resources, including energy resources. Major efforts by the international community are needed at all levels to solve these growing problems of national, regional and global dimensions. The development and transfer of cleaner technologies, the conservation and more efficient use of energy resources, the phasing out of ozone-depleting substances, the management of toxic substances and many other equally urgent tasks require the build-up of commensurate industrial capabilities. At the same time, it is clear that industrial production, distribution and consumption patterns have a major impact on the use and future availability of natural resources.

32. Industry-related environmental protection covers a wide field of issues, such as:

- Industrial policies and institutional measure to promote environmentally sustainable industrial development;
- Measures to induce cleaner and safe production, *inter alia*, through the transfer of cleaner technologies in specific industrial subsectors;

- Implementation of international conventions, such as the Montreal Protocol on Substances that Deplete the Ozone Layer;
- Technologies for reducing the use of hazardous or toxic substances;
- Increasing energy-efficiency in industrial processes.

33. The issue of energy consumption is intimately connected with the global concerns of environmental protection. Industrialized countries dominate by far the quantifiable world use of energy. However, developing countries are expected to drastically increase their use of energy in coming years. It is estimated that they will triple their energy demand in the period 1985 - 2025. Currently, developing countries invest annually some US\$ 75 billion in energy supply (without the petroleum exploration sector). There is scope for very significant energy savings and also for utilizing new and renewable energy supplies - currently covering only some 7 per cent of global primary energy supply. Major efforts will need to be undertaken by developing countries to this end.

34. With the increasing world-wide application of environment-related regulations and standards, developing countries need to systematically build-up the awareness and response capabilities of their industries in the field. Eco-labelling and ISO 14,000 will require major adaptation efforts by developing-country industries in terms of cleaner production processes and environmentally friendly products, including product commercialization and product application activities.

E. Equitable development

35. It has been recognized that industrial development patterns in developing countries have not so far been able to fully meet key socio-economic objectives. No automaticity prevails for ensuring sustainable and equitable development. Adequate economic policies are needed to create an "enabling" environment for dynamic and more resilient economic and industrial growth and to reconcile international integration and the building up of competitiveness with national socio-economic imperatives.

36. In many developing countries, increasing income disparities between regions, and rural/urban areas and segments of the population demonstrate the need for a stronger emphasis on social aspects in the industrial policies and strategies pursued. The role of women is a case in point. It is only through promotional measures, such as entrepreneurship development and skills upgrading that their role can be enhanced in the process of industrialization. Only by enabling the full participation of all segments of the population in dynamic economic development can social inequalities be countered in a sustainable manner.

37. In many developing countries, past industrialization patterns have led to a heavy concentration of industries and related services in a few metropolitan areas with resulting inefficiency in these areas and mounting regional disparities with accompanying social pressures. As recognized by national policy makers, more balanced regional development needs to be achieved through adequate policies and institutional measures. Thus, industrial policies need to contain a built-in regional development dimension.

38. In general, income and wealth disparities can be effectively reduced, *inter alia*, by adopting industrial development strategies that promote small and medium enterprises, stimulate employment creation in poor rural and urban areas, centre on human resource and entrepreneurship development and are thus oriented towards achieving long-term social objectives through a process of dynamic industrial development. Gearing industrial development towards such socially desirable patterns is a key task of industrial policies at the national level.

39. There is no doubt that the current global trade liberalization is a major force and stimulant for long-term economic and industrial growth in all countries. However, unless a proper response capacity is ensured in developing countries in terms of investment and restructuring of industry, it can in the short run lead to major social disruptions and a risk of "deindustrialization". Here then lies a particular, new challenge for many developing countries.

II. INDUSTRY AS AN ENGINE OF SOCIO-ECONOMIC GROWTH AND TARGET FOR SUPPORT

40. In spite of past, partial setbacks in many developing countries, the key role of industry as the main potential engine of growth and as a basis for a country's social development is beyond question.

41. A sustainable increase in the standard of living of a population, in productive employment, in education, in health and in the supply of basic needs is only achievable through a dynamic industrial development process.

42. The historical impact of industrialization on social change in the developed world holds significant lessons for the developing countries. Industrialization resulted in a momentous social transformation in the industrialized countries and provided the engine of growth for economic and social development. There can be no doubt that a similar transformation will take place as industrialization advances in the poorer sections of the globe.

43. History has shown that the transformation of agrarian societies into industrial economies is the swiftest and most powerful mechanism for generating higher productivity rates and employment levels, combating poverty and meeting other pressing social needs. The process of economic growth and industrialization has multiplier effects and far-reaching consequences for all sections of society.

The role of industry

44. It is important, especially in the context of the current debate on trade liberalization and on reforms in development cooperation, that the particular role and features of industrial development be recalled. As has become evident in past decades, industrial development is a continuous process. It plays a role in all economies whether in a least developed country with only embryonic industrial production structures or in a well advanced country with a highly sophisticated industry and with integrated production and service networks. Industry is generally recognized to be the single most dynamic sector in the economy. It is however also

subject to volatile fluctuations in terms of growth and markets affected by changing national and international policies, financial markets etc. The significant impacts of industrial development on overall socio-economic growth, distribution of income, regional development and environment are evident as is the close interrelationship between industry and the services sector.

45. Through the globalization of industrial products and the connected drastic expansion of trade and financial flows, both the benefits of and problems inherent in industrial development have become not only national but also international concerns. Environmental pollution is a case in point. The industrial production processes and the supplies and use of industrial products in any one national economy have a direct impact on the sustainability of its long-term industrial and socio-economic development, and affect also other countries through transboundary pollution and through trade of products and inputs.

46. Industrial development and the effects of its growth on national and the international economies and social progress are not a matter of automaticity. Investment, choice of technology, the structure of production and trade in manufactures largely result from market-induced decisions by private sector entities. These entities however, operate within the framework of government policies and institutions and international conventions. Moreover, market failures such as the lack of a functioning product or capital market may necessitate specific measures and support by the public sector especially at an early phase of industrial development. Concerns about environmental protection, competition policies, and product standards and, above all, the impact on social development patterns and employment, both at the national and international levels, continue to require suitable, national and international legal and policy frameworks and corresponding support through international cooperation.

47. As has again recently been evidenced in the aftermath of the Uruguay Round and the accompanying international wave of trade liberalization and policy deregulation, significant development opportunities emerge for both developed and developing countries in this changing policy framework. However, a large number of developing countries can not easily capture and utilize these opportunities. Due account must be taken of the varying capacities of countries and their industrial entities to properly respond to market signals and of the constraints in this regard. International investment flows to developing countries, for instance, continue to be directed predominantly to the few already industrially and institutionally more advanced countries and locations. The FDI flows to most other developing countries remain minimal. The volatility of financial markets can cause a developing economy and its industry to collapse and cause further waves of crises to spread to other countries. Advisory services and support in creating an enabling policy environment and effective institutional infrastructure in developing countries could contribute to alleviating some of these constraints.

48. The disparities of development within developing countries, between developing countries and between developed and developing countries seem not only not to be closing but to be widening. Social unrest and conflicts, demographic pressures and unemployment are some indicators of the emerging pattern of development which are of concern not only to national policy makers but also to the international community at large. Again, policy advice for industrial development to facilitate its positive social impact could be of major importance.

49. The currently growing disappointments - after an initial euphoria - about the key role of free markets and sound financial policies for economic development may tempt some countries to return to a route of isolationism, protectionism and regulation. It is crucial for the international community to pave the way for developing countries, especially least developed countries, to pursue and initiate liberalization and private sector development and the orientation of industry to the global markets.

50. Similarly, in some countries in transition in Central and Eastern Europe and the newly independent States of the former Soviet Union, the persistent economic decline after the breakdown of the past system may cause social disruption and unrest unless industrial restructuring and recovery can be rapidly carried out. This requires international support in industrial policies and restructuring and in paving the way for the international integration of industrial production.

51. Industrial development is not - as was argued at one time - a process simply following a number of distinct stages by which an economy advances gradually based on factor costs and other prevailing determinants. A particular stage or structure is not at some point necessarily vacated through the advancement of a particular economy so that another group of countries can easily move "upward" and occupy that vacated place in the international division of labour. No given, fixed position exists in the rapidly changing global economy for any one particular national economy or industry. Comparative advantages are not automatic or static but man-made and dynamic. The poorest countries need to be supported in their endeavours to build up such advantages as a basis for their sustainable industrial development.

52. In this context it is pertinent to point out that this fundamental issue tends not to receive the full attention it deserves in the international debate. In many instances, such as in recent international conferences, the social problems in developing countries have - rightly so - been highlighted and the international community is called upon to provide its support in the educational, health and other social sectors. What must be strongly emphasized is the crucial role of the productive sectors in the developing countries. Besides provision of socially oriented assistance, financial assistance and conflict-prevention support, it is the longer-term concerns of developing countries which must be responded to by the international community.

53. Africa is a case in point. Development in African countries cannot be built up in any sustainable way only through well meant hand-outs for poverty alleviation and food supply. The African productive sectors must be built up through support to the African public and private decision makers and "agents of growth". By building up a dynamic industrial development process, employment and income, investible resources and skills can be generated as the basis for sustainable socio-economic development. The social problems of the rapidly growing population in Africa can only be met through a domestic development process of the productive sectors. The support to these endeavours should be a prime target for international assistance.

54. Global industrial production is not a zero-sum game. National economies benefit from global positive development; industrially advanced countries will benefit from sustainable growth in developing countries. It has been widely

recognized that international support to industrial development in developing countries contributes to creating work opportunities and social progress in these countries and constitutes an investment in the global future.

III. INTERNATIONAL INDUSTRIAL COOPERATION: EMERGING REQUIREMENTS

55. As has been argued above, industrial development in developing countries is in several respects a matter of international concern. International development cooperation for continued industrial development is crucial but it needs to be conceived differently as compared to past decades as conditions have changed and new challenges are emerging. The question arises in which fields and through which mechanisms, actions and institutions a new type of international cooperation can support developing countries and their endeavours to pursue their industrialization in the changing overall global environment in the years to come.

56. Developing countries are confronted with the overall task of achieving high sustainable industrial growth rates. They thereby confront the need:

- (a) To enhance the competitiveness and dynamism of their industry and develop viable structures and international integration;
- (b) To ensure the attainment of social progress through socially sustainable structures;
- (c) To establish environmentally sustainable industrial structures.

57. These objectives must be reconciled from the outset and form a consistent part of an integrated process and need in turn to be pursued within the framework of macro-economic stabilization practices and of international conventions and regulations.

58. International assistance can play an essential role in these endeavours by supporting and facilitating the concerned "agents of industrial growth": government policy makers, institutions and industry itself.

59. In this process the following parameters need to be taken into consideration:

- The significance of the private sector in industrial development;
- The relevant pattern of commercial partnerships and cooperation in industrial development;
- The changing pattern of financing of international cooperation;
- The emerging/desirable division of labour and coordination of multilateral, bilateral and commercial cooperation in respect of the international support to private sector development. Private industry itself will have to play a major role in identifying and formulating the actual assistance requirements and modes of services provided. The services will have to be provided directly and speedily to the

industrial entities according to the terms and conditions prevailing in the private sector.

60. In the context of discerning the trends in international cooperation the question arises first, what are the most essential areas for technical assistance to the development of the private industry; secondly, it needs to be assured that the technical assistance is carried out in conformity with the market and that no distortions are created in terms of selection of recipients, costing of services and competition with commercial entities; and thirdly, the most suitable modalities including financing schemes for assistance to private industry need to be found.

61. Three different levels can be distinguished at which international organizations can make contributions to strengthening the role of the private sectors in industrial development: (a) the overall policy level, (b) the institutional level; and (c) the company level.

62. At the overall policy level, international organizations can provide essential analytical inputs and policy advisory services to Governments that have embarked upon strategies to promote private industry. This involves both general advice on conducive macro-economic and industrial policies and specific assistance concerning privatization and/or deregulation programmes. Such impartial advice and assistance in designing consistent privatization policies and measures would also include:

- (a) Training of government staff in the mechanics of privatization, including reorganization techniques, methods of company valuation, formation of joint ventures, offer of shares in the market, underwriting etc.
- (b) The development of capital markets and of development finance institutions (DFIs); and
- (c) Assessment of rehabilitation/modernization requirements of the subsectors and companies to be privatized. Such pre-privatization company audits - to be carried out by neutral analysts - would be a critical input for take-over decisions by interested private investors. They could establish which specific action is required and at what cost in order to secure the long-term viability of individual companies.

63. At present, a number of international organizations are actively supporting ongoing privatization and deregulation programmes. This includes both financial assistance provided by the World Bank and the regional development banks in the framework of Industrial Sector Programme Loans and technical assistance as provided by UNDP and UNIDO and other organizations.

64. At the institutional level, international organizations - drawing on their experience in a multitude of countries in different regions and at different levels of development - can assist in building up efficient forms of private industry representation and organization. Particularly in LDCs where such institutions are often lacking or malfunctioning, industrial associations and chambers of industry and commerce need to be established and typically need some seed funding as well as expert advice and operational support in the initial stage. The existence of

efficient industry associations is essential for various reasons, including (i) to deliver services to member companies; (ii) to act as representatives of private industry in policy dialogues and negotiations with the Government; and (iii) to function as a counterpart for technical assistance and other promotional programmes by international organizations. In a way, therefore, in many countries the latter are facing the challenge of first having to create the institutional conditions under which technical assistance can subsequently be delivered to private industry.

65. It is crucial that international organizations work out modalities to cooperate with private industry without compromising their own impartiality and without distorting competition. Implementing projects together with industry associations would seem to be a logical approach to ensure that these objectives are met by spreading the benefits derived from assistance projects to a wide range of industrial companies.

66. International organizations can in principle also work directly with private manufacturing companies through providing plant-level assistance. So far, UNIDO is unique among the United Nations agencies in this respect based on its mandate to support "industrialization in the public, cooperative and private sectors".

67. As concerns support to private companies operating in highly competitive markets a speedy delivery of highly specialized and flexible assistance inputs is required. In this respect international organizations need to adjust their administrative procedures which were primarily geared to large-scale and long-term assistance projects serving government institutions.

68. International organizations must also ensure that no market distortions are created. Therefore, the full costs for company-level services should be borne by the recipient enterprises (possibly through the involvement of the banking sector or other entities).

69. A further aspect in this context refers to the potential competition between international organizations and domestic consultancy companies. The former - given their special reputation and mandate as unbiased neutral advisers - should not act as just another consulting firm. First, they should concentrate on particularly demanding segments of consultancy services requiring sophisticated international expertise and access to multilateral information networks. Complex procurement services or feasibility studies involving international market assessments would be cases in point. Second, within their advisory services to the private sector, international organizations should seek to involve, to the maximum extent possible, existing domestic consultancy firms and local experts, e.g. through sub-contracting arrangements thereby extending training and support to their further development. In the case of large-scale projects, it would also appear appropriate to cooperate with big international consulting firms - a model that could be referred to as "Consulting" in analogy with the co-financing of development projects.

A. Industrial partnerships

70. The trade liberalization and the trends in global industrial production and competition are accompanied by the formation of various types of collaboration schemes and partnerships. First, a drastic increase in the number of (sub)regional

free trade areas and other cooperation programmes is noticeable in developing countries. These programmes entail not only trade issues but also industrial restructuring, synchronization of industrial policies including foreign investment policies, joint initiatives in science and technology, HRD programmes, locational policies, environmental protection policies, and other joint activities. In all these areas the demand for international advice and assistance is growing and it could be crucial for the United Nations system to facilitate the building up of such larger, integrated markets and institutions in developing countries - within a multilateral framework. Secondly, global industrial enterprise cooperation is expected to expand further in the years to come in the form *inter alia* of foreign direct investment, technology transfer agreements, production sharing, subcontracting, corporate strategic alliances, and research consortia. In order to facilitate the participation of industrial enterprises in developing countries and companies in transition in these global cooperation and integration arrangements and avoid the further marginalization of, in particular, the least developed countries, international assistance could be essential. This assistance can comprise policies and multifunctional support for paving the way for enterprise cooperation, and the use of information systems and direct contact-creating programmes to facilitate the identification of enterprise-to-enterprise cooperation opportunities and national and international networking of production and marketing. Thirdly, international twinning of various types of industrial institutions such as those specializing in technology, human resource development, cleaner production technology, subsectoral-specific issues and industrial standards is an important and promising approach for developing countries for enhancing their institutional infrastructure. The building up of such twinning arrangements and dovetailing of counterpart experiences would require support through international development assistance and promotional programmes. Fourthly, an increasing interest is noted in respect of cooperation between particular municipalities and entire regions in developing countries with similar entities in other countries. Also in this field the role of the United Nations as an honest broker and contact-creating forum would be of major importance for facilitating the development of such partnerships.

B. South-South cooperation

71. In recent years the prospects for South-South cooperation in the field of industry have finally been fully recognized. Intraregional investment and technology flows particularly in Asia have grown dramatically. To assist developing countries in the identification of ECDC/TCDC opportunities and enable the participation of least developed countries, international support can be of crucial importance. It must be noted, however, that the modalities, conditions and actors - such private industrial enterprises - of ECDC and TCDC are changing and that new innovative concepts and approaches for international assistance and information services are therefore needed.

C. Financing of international development support

72. The financing of international technical cooperation has in recent years been undergoing major changes. First, a general decline is noticeable in official development assistance volumes in terms of funding. Secondly, past modalities of funding of technical cooperation programmes of United Nations agencies through

UNDP have been replaced by other arrangements. This means that the specialized agencies of the United Nations to a large extent no longer have direct access to the central United Nations financial resources for funding other technical assistance. Thirdly, a significant share of total resources made available to the United Nations is allocated to peace-keeping and emergency programmes, with resources for development assistance declining or stagnating. Fourthly, the resources actually available for the regular budget of many specialized agencies of the United Nations are increasingly scarce and unstable, including the particular component for technical assistance. This makes it very difficult for such agencies to conceive longer-term cooperation programmes. Fifthly, a continued trend towards increasing bilateralism in technical cooperation financing is discernible with the risk of dispersal of funds and loss of specific know-how.

73. For the coming years it would be essential to devise more rational financing modalities for international cooperation in parallel with the overall structural reform of the United Nations system. The following mechanism could be considered:

- (a) A further specialization and clearer division of labour between United Nations specialized agencies, including the Bretton Woods institutions so as to differentiate between technical and funding organizations and utilize the "comparative advantages" of various agencies. This would mean that United Nations agencies would form a clearly conceived and transparent network of specialized units, with UNDP as overall coordinating body and the financial organizations acting as banks and financial authorities and utilizing the technical agencies for rendering specific services of a "technical" nature. Such improved structures of coordination, professional specialization and greater transparency would enable more rational use of scarce resources, greater accountability of agencies and better quality of services.

In this connection it must be emphasized that this improved division of labour between United Nations agencies and the Bretton Woods institutions cannot rest on a simplistic principle of designating to the United Nations the role of dealing with humanitarian and social issues and subordinating it to the Bretton Woods institutions which, in turn, would be solely responsible for "hard core" economic development matters. Not only are United Nations specialized agencies mandated to carry out programmes on economic development issues of the respective sectors but they are also experienced in and focused on such specific programmes. UNIDO is a case in point. It has been entrusted in its constitution, adopted in 1979, "to initiate, coordinate and follow up the activities of the United Nations system with a view to enabling the Organization to play the central coordinating role in the field of industrial development". Over the years UNIDO has accordingly built up very specialized functions and skills which are essential for assisting in industrial development. These functions have been carefully scrutinized and focused on selected areas during the recent reform process in consultation with member States. The establishment of expertise, data and interventional linkages has been an important

investment. To dismantle these functions and expertise and to rebuild these functions in a (few) centralized mega organizations can at best be regarded as inefficient, costly and contrary to the now generally accepted organizational principle of specialization, decentralization and accountability. The scaling down of large organizations and the creation of integrated networks of smaller specialized entities in the private sector and public administration has become an accepted and most effective approach which the United Nations system should adapt for itself;

- (b) Official development assistance (ODA) has to be seen in its totality, i.e. including bilateral programmes and the assistance provided by regional organizations (such as the European Union). The total funding available would need to be used in a much more rational and efficient manner. To this end professional specialization and a greater reliance on the network of specialized agencies for particular programmes of development cooperation are called for. Financing arrangements for joint multilateral/bilateral programmes should be more systematically pursued so as to avoid duplication of efforts and to achieve the desirable efficiency through specialized bodies of "critical mass";
- (c) With the increasing role of the private sector in industrial development in developing countries and countries in transition and with the growing need to direct international support towards private sector development, it is obvious that financing by the recipient private sector entities themselves should be designed and pursued.

IV. ROLE AND FUNCTION OF UNIDO

74. UNIDO was established some 30 years ago under different premises and a different policy environment. Over the years, UNIDO has pursued its programmes according to the general mandate, policies and special priorities determined by its legislative bodies and the precise requests for services by individual developing countries. However, just like any other entity active in the dynamic process of industrial development, UNIDO has thereby undergone gradual changes. The nature of services, the specialization of its internal and external expertise, its client orientation, its organizational structure and the modalities of its operations have been subject to major shifts. The most radical and far-reaching reforms undertaken were, however, initiated and launched by the then newly appointed Director-General, Mauricio de Maria y Campos, in 1993, and approved by consensus by the fifth General Conference of UNIDO in December 1993. The basis for this initiative was the endeavour to flatten the hierarchical structure and streamline procedures and above all to reorient the Organization to the new, emerging demand patterns for its services and expertise in a few critical areas in which the Organization was perceived to have a comparative advantage and crucial role versus national and other international actors in the year to come.

75. The recent achievements of UNIDO were fully acknowledged in General Assembly resolution 49/108 of 19 December 1994. The General Assembly unanimously welcomed the role of UNIDO and stressed the "importance of

industrialization as a dynamic instrument of growth that is essential to the rapid economic and social development of developing countries". The fundamental role of industrialization was reaffirmed at the fifth session of the UNIDO General Conference in which Member States voiced unanimous support for UNIDO as the central coordination agency in the United Nations system for the promotion of the industrialization of developing countries, and all member States pledged their political and financial support to the revitalized UNIDO.

76. As part of its reforms, UNIDO has set up five development objectives for its programmes:

- The first objective, "Industrial and technological growth and competitiveness", covers *inter alia* the following services: creation of an enabling policy environment; enhancing productivity and competitiveness; industrial enterprise restructuring; supportive quality control, standardization and metrology; enhancing technological innovation capabilities; services to support agro-based industry, chemical industries, engineering and metallurgical industry; and information services for industry.
- The second objective, "Development of human resources for industry", focuses on the provision of services relating to policies for industrial human resource development; strengthening institutional capabilities for skill creation for international development; and enhancing the role of women in industrial development.
- The third objective, "Equitable development through industrial development", addresses the need for assistance in the promotion and strengthening of SMEs and entrepreneurship development and in supporting rural industrial development.
- The fourth objective, "Environmentally sustainable industrial development", entails integrating environmental considerations into industrial strategies and programmes; providing advice on cleaner production techniques and technologies and enhancing energy efficiency and conservation.
- The fifth objective, "International cooperation in industrial investment and technology", covers services relating to investment and technology promotion and cooperation and the use of the UNIDO network of Investment Promotion Service offices; a particular dimension of these services concerns economic and technical cooperation between developing countries (ECDC/TCDC).

77. These five objectives provide the rationale and conceptual framework for the services of the Organization and establish its developmental activities in relation to those of other United Nations organizations and agencies. Above all, they establish a close link with the developmental concerns and endeavours of the developing countries in the various regions in the current decade.

78. While these mandated priorities provide the broad and diversified framework, seven specific programmatic themes are foreseen to constitute the thematic focus of UNIDO in the 1996-1997 biennium:

Strategies, policies and institution-building for global economic integration;
 Environment and energy;
 Small and medium enterprises: policies, networking and basic technical support;
 Innovation, productivity and quality for international competitiveness;
 Industrial information, investment and technology promotion;
 Rural industrial development;
 Africa and least developed countries: linking industry with agriculture.

79. These programmatic themes are described in an annex to the present paper.

V. AN OUTLOOK

80. Current trends in the global economy and in the industrial development process of developing countries as well as the emerging new overall policy framework and financing of international cooperation clearly indicate the need for changes in the role and functions of UNIDO as the lead agency of the United Nations in the field of industrial development. Although UNIDO had gradually adjusted its programmes over the years in response to changing patterns in demand, it was through the recent, far-reaching reform process initiated in 1993 and pursued in 1994 and 1995 that the Organization departed distinctly from past structures and embarked on a new course for its programmes. This course is to be followed in the years to come and will be further accentuated in line with changing parameters.

81. The future role, scope and structure of UNIDO's services are thus already discernible and these trends can be summarized as set out below.

82. First, the current overall constraints on financing and the prevailing uncertainties of UNIDO's regular budget indicate that the number of Professional staff which can be maintained will be limited to around 300. Of this number a growing share will have to be allocated to field offices.

83. With such a relatively small overall number of Professional staff at UNIDO Headquarters it is imperative that the staff is of the highest professional calibre and of the precise specialization required for UNIDO's core programmes. Moreover, these Professionals should to a maximum degree be involved in substantive activities with minimal administrative burdens. Effective processes and a lean organizational structure are thus a basic requirement. Major endeavours in this direction are currently being undertaken and will be continued with streamlined procedures and decentralized decision-making as major features.

84. The priorities currently set for UNIDO services in the years to come will need to be further focused on the basis of evolving trends in demand and the experience gained from UNIDO's programme team approach. More flexible personnel policies will be required to ensure up-to-date knowledge in fields of evolving specialization. The core Professional staff resources financed from the regular budget will continue to be supplemented by staff financed from the operational budget. In accordance with the principles established for the 1996/97 biennium, these staff resources are to be allocated primarily to income-generating activities under the operational budget.

85. The UNIDO field representation, which has been subject to a series of reviews is to be systematically enhanced as has been outlined in recent documents. The building up of stronger field offices is to cater to the growing need for UNIDO to not only pursue its programming and "marketing" functions in the field including the mobilization of financial resources but primarily to be able to respond to the increasing demand for services and industrial information to be provided direct by UNIDO field staff to public and private entities concerned with industrial development in the respective countries. The trend is to use increasingly field offices supported by local staff as a key link between entities in the individual countries, UNIDO Headquarters and various agents at the international level.

86. This networking approach is emerging as a general feature of UNIDO's programmes. Given the narrow resource base and the more focused programmes of the Organization and the similar developments under way in other agencies and parts of the United Nations system, including in the Bretton Woods institutions as well as in bilateral agencies, it is necessary and indeed expected that tighter links, a more precise "division of labour" and more efficient cooperation will be developed between the various specialized parts of the United Nations "network".

87. The UNIDO international technical and information networks which have been built up over the years are to be significantly enhanced. Some of the specific fields of activities which are or will be subject to such increased networking - with UNIDO Headquarters playing a catalyst, promotional and facilitating role - are as follows.

- (a) Industrial information: enhanced networking between commercial and public entities active in industrial development in general and technology issues in particular;
- (b) Investment promotion: further enhancement of the existing Investment Promotion Service (IPS) network, connecting parties interested in promoting and supporting international investment flows;
- (c) Technology development and transfer: the current endeavours linking industrial research and technology institutes in various countries and facilitating their cooperation will be further expanded. Both existing and newly emerging technologies are covered. Environmentally cleaner technologies will be a specific niche for UNIDO's networks which will *inter alia* be connected with the cleaner production centres in various countries;
- (d) Industrial subsector networks will be further developed connecting associations and institutes in several countries and enabling UNIDO to channel specific technical, advisory and information services to developing countries on request; a particular segment of industry being given major attention are the small and medium enterprises through their various associations and institutions;
- (e) Industrial standardization and quality institutes: UNIDO is to further promote the development of such institutes in developing countries and connect them worldwide;

- (f) Human resource development: with the ongoing efforts to strengthen and focus UNIDO's activities in this field, a range of specialized training institutes in developed and developing countries will be increasingly used as subcontracted parties for various types of training.

88. These examples show the increasing emphasis of UNIDO on connecting and involving actors around the world and on utilizing potential synergy effects. In particular, the experience, know-how, capabilities and resources which developing countries have accumulated in the field of industry over the years will be more systematically utilized by UNIDO within and between countries on a cost-efficient basis.

89. Another important endeavour of the Organization is to proceed with the work on normative functions and utilize UNIDO's status for supporting the development of international standards and guidelines. Examples of current normative activities are given in the following list:

- UNIDO has been designated the Task Manager for chapter 16 of Agenda 21, which deals with the environmentally sound management of biotechnology. UNIDO initiated and guided the establishment of the International Centre for Genetic Engineering and Biotechnology (ICGEB), which has become an autonomous centre of excellence. On behalf of the Informal UNIDO/UNEP/WHO/FAO Working Group on Biosafety, UNIDO has developed a Voluntary Code of Conduct for the Release of Organisms into the Environment.
- UNIDO established and now operates the Biosafety Information Network and Advisory Service (BINAS), a technical assistance service that monitors global developments in biosafety, advises national authorities on the formulation of biotechnology regulations, and provides information for assessing the safety of biotechnological applications.
- UNIDO is a major implementing agency - alongside the World Bank, UNDP and UNEP - of the Montreal Protocol on Substances that Deplete the Ozone Layer and is recognized as having the technological edge in its implementation in different industrial sectors.
- Within the International Chemical Safety Network (in the context of the International Programme on Chemical Safety), UNIDO addresses the safe handling, substitution and prevention of emissions of toxic chemicals.
- The Leather and Leather Products Industry Panel (representing international industry associations) has requested UNIDO to develop impartial international technical standards for eco-labelling, complementing existing national and regional standards.
- UNIDO is building up a programme on industrial water conservation and management and develops joint operational activities with other

agencies in the context of the Subcommittee on Water Resources of the Administrative Committee on Coordination.

- UNIDO assists developing countries in establishing and strengthening standardization bodies and in assessing industrial enterprises for certification of ISO 9000.
- UNIDO has been designated the official United Nations repository of industrial statistics for all developing countries and countries in transition with a view to ensuring the international comparability of industrial data and setting and disseminating standards for their collection, processing and reporting.
- The UNIDO methodology for investment project appraisal is internationally recognized and applied, as specified in the Computer Model for Feasibility Analysis and Reporting (COMFAR), a software package developed by UNIDO .
- UNIDO is developing, with strong technical support from Latin American and Caribbean countries, a regional code for the design of timber structures modelled on a similar European Union code.

90. In conclusion, UNIDO is ready to further adapt its role, functions and programmes to service developing countries in their continued and complex industrialization process -the prime road leading to their sustainable socio-economic development. UNIDO is a multilateral organization and as such directed to serve its shareholders - the member States. The close dialogue on industrial development issues and the role of UNIDO as:

- An honest broker for industrial cooperation;
- A centre of excellence on industrial development issues; and
- A global source of industrial information

will be the basis for the work of the Organization at the turn of the century.

Annex**SEVEN MAJOR PROGRAMMATIC THEMES, 1996-1997****Theme 1: Strategies, policies and institution²³-building for global economic integration**

This theme is addressed through two component programmes:

- (a) Industrial strategy and policy advice;
- (b) Advisory and institutional support services addressing the industrial implications of global and regional economic agreements.

Industrial strategy and policy advice. UNIDO supports developing countries in elaborating and implementing industrial strategies and policies conducive to creating an enabling environment for industrial growth and overall socio-economic development. This takes into account the need to integrate a number of related policy domains such as trade (with regard to manufactured goods), competition, investment promotion (with emphasis on foreign direct investment as one mechanism of global economic integration), technology and location of industry. Special emphasis is placed on building institutional capacities aimed at fostering private sector development, including capacities to design and implement effective privatization policies and programmes. The target group for this is, above all, countries with weak private sectors, including economies in transition.

Advisory and institutional support services addressing the industrial implications of global and regional economic agreements. UNIDO offers services for analysing the impact of trade liberalization trends on the development prospects of industry in various developing countries. UNIDO is currently elaborating programmes for industrial restructuring, with a view to enhancing competitiveness. Special emphasis is given to African countries and to those industrial sectors with the potential to develop an export capability.

At the regional and subregional level, economic integration and cooperation between developing countries is being pursued with renewed vigour. The Member States of the Association of South-East Asian Nations (ASEAN), the Common Market of the Southern Cone (MERCOSUR) in Latin America and the Common Market for Eastern and Southern Africa (COMESA) are cases in point. In forging and strengthening their economic ties through harmonization of industrial policies and institutional measures, these and other subregional groups seek support from UNIDO, whose neutral position is highly valued.

UNIDO thus places special emphasis on assisting subregional cooperation groups, *inter alia*, through:

- (a) Subsectoral studies on the impact of trade liberalization on patterns of competitiveness;
- (b) Advisory services on institutional requirements and mechanisms to enhance industrial cooperation and complementarities in industrial production; and

(c) Operational advice on the harmonization of industrial and environmental policies, laws and standards.

Theme 2: Environment and energy

This theme addresses four component programmes:

- (a) Environmentally sustainable industrial development (ESID) strategies;
- (b) Cleaner and safe production;
- (c) Implementation of international conventions;
- (d) Environmentally sound use of energy.

Environmentally sustainable industrial development. UNIDO supports developing countries in their endeavours in the following areas:

- (a) Collection and analysis of data and information;
- (b) Formulation of ESID strategies to establish environmental goals and action plans, in close consultation with the government agencies responsible and based on a review of existing industrial and environmental policies;
- (c) Determination of the appropriate mix of specific policy instruments, such as regulatory measures, economic incentives and policies related to industrial location;
- (d) Development of institutional structures for integrated industrial and environmental decision-making and policy implementation, involving Governments, non-governmental organizations (NGOs) and industry associations;
- (e) Development of monitoring and enforcement mechanisms;
- (f) Training in environmental management tools such as environmental auditing, environmental impact assessment, information systems design and public awareness campaigns.

An increasing number of developing countries are embarking upon the elaboration of national Agenda 21 strategies and programmes. UNIDO supports these initiatives at both the conceptual and implementation stages through strategy advice and operational support.

Cleaner and safe production. The key issue is how to improve the efficiency of industrial production by reducing waste and redesigning products to make them less polluting and easier to recycle. The need is particularly great in small- and medium-sized enterprises.

UNIDO supports cleaner and safe production both through sector-wide programmes addressing industry at large and through subsectoral-specific programmes.

A new programme has been launched to support national cleaner production centres, hosted by such existing institutions, in approximately 20 countries for a five-year period. Such centres will play a coordinating and catalytic role in cleaner production by improving awareness of pollution prevention requirements, providing technical information and advice, demonstrating cleaner production techniques and technologies at the enterprise level, and training industry and government professionals.

UNIDO assists developing countries to minimize the generation of hazardous waste and to develop environmentally safe and sound management systems for such wastes when they arise.

Special emphasis is placed on those categories of hazardous substances where UNIDO has acquired recognized special expertise, such as waste oils used in various manufacturing processes (used engine oils, solvents, degreasing agents, cutting fluids and polychlorinated biphenyls-based transformer oils) and sulphate and chlorine used in conventional pulping and bleaching technologies. Working with a network of international and bilateral organizations as well as NGOs, UNIDO focuses on environmental impact assessments for hazardous waste management programmes and on human resource development.

The problems related to water pollution and industrial water management are of a complex nature and often involve the pollution of entire rivers and coastlines as well as the contamination of soils and groundwater. UNIDO focuses its support on two levels, viz. the overall management of water pollution for industry affecting larger areas and the efficient utilization of water in industrial operations. The UNIDO response to the first level includes monitoring and analysis of industrial sources of water pollution, drawing up pollution reduction/prevention strategies, and helping government agencies in formulating and enforcing regulations. On the second level, industry itself is supported in efficiency-enhancing programmes that reduce water consumption and water-borne pollution, treat residual waste water, and improve the quality of process water through environmentally sound treatment methods. The contribution of engineering industries to water management is specifically studied.

Environmentally sound management of toxic chemicals. UNIDO supports both Government's and industry in monitoring and controlling the handling of toxic chemicals, particularly in the fields of pesticides and their formulation, pharmaceuticals, petrochemicals and polymers, and dyes and dye intermediaries.

Environmentally sound management of biotechnology. Together with other United Nations entities, UNIDO concentrates on developing guidelines on biosafety and industrial bioresource development and on capacity-building for biotechnology research and its application. It also facilitates, *inter alia*, through its specialized technology centres, cooperative research programmes and global information networks in specific areas of biotechnology commercialization.

Implementation of international conventions. UNIDO has an increasingly important function in supporting developing countries in their endeavours to meet commitments resulting from international conventions, protocols and action plans for the protection of the environment. Concentration is on international environment-related policy initiatives or legislation that concerns the phasing out of ozone-depleting substances (Montreal Protocol on Substances that Deplete the Ozone Layer), the alleviation of chemical risks and enhancement of chemical safety (International Programme on Chemical Safety), the conservation of freshwater resources and the need to mitigate the effect of greenhouse gases on climate change (United Nations Framework Convention on Climate Change) partly funded under the Global Environment Facility.

A major challenge for UNIDO is the phasing-out of ozone-depleting substances under the Montreal Protocol, where the Organization is focusing on preparing subsectoral phase-out strategies and on supporting enterprises in retrofiting, maintenance, recycling and training of technical personnel. Priority application areas include refrigerants, foams, solvents and fumigants. A considerable volume of technical cooperation is expected to be approved for UNIDO implementation based on its specialized expertise.

Environmentally sound use of energy. UNIDO concentrates on the provision of adequate, environmentally sound energy supplies where lack of energy is a barrier to development and enables developing countries to address local, regional and global environmental concerns arising from the increased consumption of energy, particularly when the energy source is fossil fuels.

UNIDO concentrates on:

- (a) The development and production of new and renewable sources of energy, specifically solar energy, hydrogen energy, biomass energy and wind energy;
- (b) The development and promotion of clean coal technology (increasing efficiency and minimizing the environmental impacts of low-grade coal utilization); a review will be undertaken of clean coal technologies suitable for application in developing countries;
- (c) Energy auditing and increasing energy efficiency in industrial processes, with special emphasis on small and medium enterprises.

Theme 3: Small and medium enterprises: policies, networking and basic technical support

This theme is addressed through four components:

- (a) Policy analysis and advice;
- (b) SME support systems and institutions;
- (c) Networking between SMEs;
- (d) Basic technical support for enterprise upgrading.

Policy analysis and advice. UNIDO assists Governments in the formulation of strategies, policies and programmes to promote and support the development and growth of SMEs. In particular, it aims at facilitating the cooperation of Governments with the private sector in order to improve the framework of incentives and regulations. Gender-related issues are addressed to ensure the promotion of the equal participation of both women and men in SME development activities, as SMEs form a major opportunity for initiatives by women.

To ensure that the advice given by UNIDO continues to be of high quality and up to date, its SME programme will be continuously reviewed and updated through an international network that exchanges information, and observes and analyses global trends, new strategies, policies and institutions.

SME support systems and institutions. UNIDO supports the organization and restructuring of SME development agencies to ensure their effectiveness. UNIDO also advises on and supports the organization of decentralized networks of

technical and financial support services at the country level. The SME development agencies and other providers of services to SMEs are further supported by technological information and advice through the technology services of UNIDO including the Technological Information Exchange System and the Industrial and Technological Information Bank. These will be expanded and special attention will be paid to SMEs. SME development agencies are also assisted in the promotion of (mainly medium-scale) investment opportunities through the UNIDO investment promotion network.

Selected support organizations are approached to host training activities and to implement the thematic programme on "Women entrepreneurs for growth". Advice on training approaches, and specialized training of trainers are made available to SME development agencies and other focal points of assistance to SMEs.

Networking between SMEs. UNIDO promotes and advises on the development of mechanisms to help SMEs identify partnerships and subcontracting arrangements, as well as to organize themselves in flexible clusters.

Enterprise upgrading. Basic technical support is rendered by UNIDO in terms of enhancement of productivity, quality and competitiveness; restructuring requirements and employment generation; technological absorption and innovation; and energy efficiency and environmental protection in the SME sector. The necessary technical cooperation and advisory services are primarily channelled through sectoral and/or regional associations.

Theme 4: Innovation, productivity and quality for international competitiveness

This theme is addressed through three component programmes:

- (a) Quality management;
- (b) Enterprise restructuring and rehabilitation;
- (c) Research and development for industrial innovation.

Quality management. UNIDO has built up a widely recognized support programme in this area of vital importance for industrial competitiveness. Assistance is provided to:

- (a) Governments in the elaboration of quality control, standardization and metrology policies as well as in establishing related institutions and ISO 9000 certification bodies;
- (b) Metrology bodies in their overall rehabilitation and upgrading of existing reference standards and procedures;
- (c) Industry associations in the establishment of sectoral laboratories and capacity-building in applying various quality management tools;
- (d) Groups of enterprises in setting up specialized laboratories, implementing a systems approach to continuous quality improvements, and meeting ISO 9000 certification requirements.

UNIDO develops integrated support programmes that capitalize on combining its general expertise on quality management with subsectoral-specific knowledge. A further innovative element is statistical quality control techniques on which three to five larger technical cooperation programmes are expected to be implemented in the next biennium.

Enterprise restructuring and rehabilitation. Assistance will be provided to groups of predominantly SMEs with transparency and dissemination of results ensured through the involvement of industry associations and chambers. Also, training programmes will be launched with local institutions, and local consultancy companies will be significantly involved and their capacities enhanced.

Research and development for industrial innovation. UNIDO provides advice on technological innovation policies, and support in building up the required institutional infrastructure. Special emphasis is placed on identifying innovation constraints and innovation strategies for SMEs with a view to stimulating the creation of technology-based industries.

Guidelines are to be developed on the commercialization of biotechnology in developing countries. In the field of solar energy technology (and drawing on the specialized expertise of centres of application for solar energy), opportunities for research consortiums and investment and technology partnerships will be developed. The revitalization and reorientation of existing industrial and technological research institutions in developing countries will receive special attention.

Theme 5: Industrial information, investment and technology promotion

The theme is addressed through three components:

- (a) Technological and investment information;
- (b) Investment promotion;
- (c) Technology promotion.

Technological and investment information. There is a strong need to provide to Member States as well as to the United Nations system assessed information on industrial development. UNIDO will undertake special efforts in the coming biennium to ensure the integrated processing and dissemination of the wealth of industrial information generated in its various programmes and activities. The main instruments will be the further strengthening of the Industrial and Technological Information Bank (INTIB) and the Industrial Referral System on specialized sources of information.

In several developing countries, national INTIB focal points will be expanded into information networks. Training on information resource management will be provided. Cleaner technologies will receive special attention as part of the INTIB database and through the issuance of special Technology Monitors. The Energy and Environment Information System (EEIS) will be strengthened. The database on investment opportunities and on investment project sponsors in developing countries will be expanded.

The use of modern information service technologies and electronic networking will be promoted and projects will be designed aimed at providing information services particularly to SMEs. INTIB will also act as an agent for promoting interregional cooperation in industrial information. In the preparation and implementation of Techmarts, information support on specific technology options and related investment opportunities will be essential.

Special emphasis will be placed in the biennium on upgrading and networking through the various UNIDO information services to allow the rapid transmission of multidimensional information between Headquarters and UNIDO offices abroad and, upon request, to external clients. This also involves the World Investment Network Services (WINS) for which UNIDO will develop an interactive CD-ROM.

Investment promotion. UNIDO will support these endeavours through a variety of services in an integrated approach. In addition to providing advice on investment policies and codes (which is addressed under theme 1), this includes the strengthening of investment promotion institutions in developing countries; the formulation and screening of project profiles based on feasibility studies; and the presentation of investment proposals to potential foreign investors, *inter alia*, through investment forums. Training of investment promotion staff from developing countries receive special emphasis through group training and delegates' programmes.

The investment promotion work of UNIDO pays special attention to the growing role of small- and medium-sized investment companies, to the investment potential in specific regions within countries (see also component (a) of theme 6) and, within an ECDC/TCDC perspective, to the increasing potential of investment flows between developing countries at different stages of industrial development. *Industrial Development Reviews* will continue to contribute economic analyses in support of investment promotion efforts.

The establishment of new UNIDO Investment Promotion Service offices, increasingly also in developing countries with a view to promoting both inward and outward investment, will be a key activity in the next biennium. These offices are interconnected through a communication network.

Technology promotion. UNIDO provides advisory services on the formulation of technology policies that are conducive to stimulating the absorption of new technologies in industry. The focus is on new cross-sectoral technologies, such as telecommunications, biotechnology and innovative energy technologies, with a view to ensuring their efficient industrial application.

A major activity is geared towards supporting the actual process of technology acquisition. The UNIDO training material on technology transfer and joint venture negotiations will be upgraded and applied to the training of trainers. New and innovative build-operate-transfer (BOT) schemes and strategic alliances will receive special attention.

The UNIDO Techmart programme will be continued as an effective mechanism to familiarize, in particular, SMEs with new technological options and

to initiate and conclude business contracts. The link between Techmarts and investment forums will be strengthened.

Theme 6: Rural industrial development

This theme will be addressed through three component programmes:

- (a) Regional development;
- (b) Agro-processing;
- (c) Building materials and low-cost housing.

Regional development. UNIDO will concentrate on the development of concepts and policy approaches, based on experience in different parts of the world. Based on this, UNIDO will make available advisory and technical cooperation services. It will emphasize the linkages between industry and other productive sectors of the economy as this provides key opportunities for industrial development.

In specific less developed regions UNIDO will, on request, analyse the situation, render advice on the specific policy measures to be taken and identify specific opportunities for development. Where appropriate, integrated development programmes for such regions may be developed and implemented.

In selected regions, investment forums may be organized based on identified, formulated and screened investment proposals on the lines of the successful forums carried out recently in different provinces of China. Tailor-made training activities targeted at enhancing the integration of rural population groups into industrial development will be undertaken as part of integrated development programmes, or as an ad hoc activity when justified.

Agro-processing. The emphasis evidently lies on small- and medium-scale industries where UNIDO can play a major role in making technology information more accessible, ensuring that cleaner technologies are used as well as facilitating an environment conducive to SME development.

Where appropriate, integrated programmes will be implemented in individual regions or countries comprising analysis and policy advice, technical cooperation and investment promotion for product groups or specific approaches addressing rural development issues in several countries.

Building materials and low-cost housing. UNIDO will promote the production and use of composite building materials, specifically in rural areas, which given the wide variety of locally available materials (soils and clays), need to be almost tailor-made for each locality. Raw materials include agricultural waste materials, soils and clays, and low proportions of cement and binders. These materials, and certain composites using agricultural (fibrous) wastes are very suitable for manufacture by farmers and agricultural labour, providing productive employment at times when agricultural activity is low.

The essential approach of UNIDO is working through local institutions and national experts. Basic technology is transferred from other countries with similar

conditions and raw materials to such institutions along with advice on dissemination methods and equipment options. Information on materials and basic technologies is made available through the UNIDO technology database. Assistance may be given in the local application of transferred technology.

**Theme 7: Africa and least developed countries:
linking industry with agriculture**

This theme will be addressed through four component programmes:

- (a) Analytical activities and industrial policy advice;
- (b) Agro-processing (including food, leather, wood, natural fibres etc.);
- (c) Agricultural equipment;
- (d) Fertilizers and pesticides.

Analytical activities and industrial policy advice. UNIDO supports the formulation of industrial sector policies that create an enabling environment for industrial development in general, and in the areas indicated in particular. This includes policy initiatives to enhance private sector development and the promotion of foreign direct investment, as well as the development of human resources. Special attention will be paid to ensuring that the equal participation of women in industrial development is promoted.

Studies are carried out in relation to the specific issue of industry-agriculture linkages at the subregional and national levels.

Special surveys are carried out for agro-related industry branches to identify opportunities and requirements for assistance. This analytical work is expected also to lead to integrated development programmes at the country level.

Agro-processing. UNIDO assists Governments and the private sector in analysing the situation and its potential for development, and based on this develops an integrated package of UNIDO contributions including policy advice and technical cooperation addressing such issues as choice of appropriate, cleaner and competitive technology, product design, quality management and development of human resources, as well as complementary investment promotion activities.

Agricultural equipment. Integrated programmes are developed in selected countries incorporating product design, technical cooperation in mechanical engineering and production processes, human resource development for industry, and advice on promotional policies and distribution arrangements as well as related repair and maintenance and spare part manufacture. For the simpler tools and equipment, emphasis placed on small- and medium-scale producers in smaller urban and rural areas.

Special attention will be paid to agricultural equipment and manufacturing technology in the INTIB database and the technological information exchange system network. Specifically for the southern African region, ECDC/TCDC may provide opportunities for involving industrial investment from South Africa. For more advanced machinery, international partners will be sought through the

investment promotion activities of UNIDO, including an investment forum when sufficient opportunities have been identified.

Fertilizers and pesticides. The main objective for UNIDO is not primarily the production of fertilizers and pesticides but making key agrochemicals available to the agricultural sector on a cost-efficient basis. At the national level this may frequently mean that industrial activity may be limited to the blending of imported fertilizer components and/or the production of some components based on locally available raw materials, formulation of pesticides based on imported active ingredients and appropriate packaging of fertilizers and pesticides in appropriate sizes.

Special attention will be paid to the production of low-risk, low-volume chemicals and bio/botanical pesticides. Supporting information on the most advanced and state-of-the-art developments of such agrochemicals and their production will be a subject for targeted information products prepared in consultation with the Food and Agriculture Organization of the United Nations.