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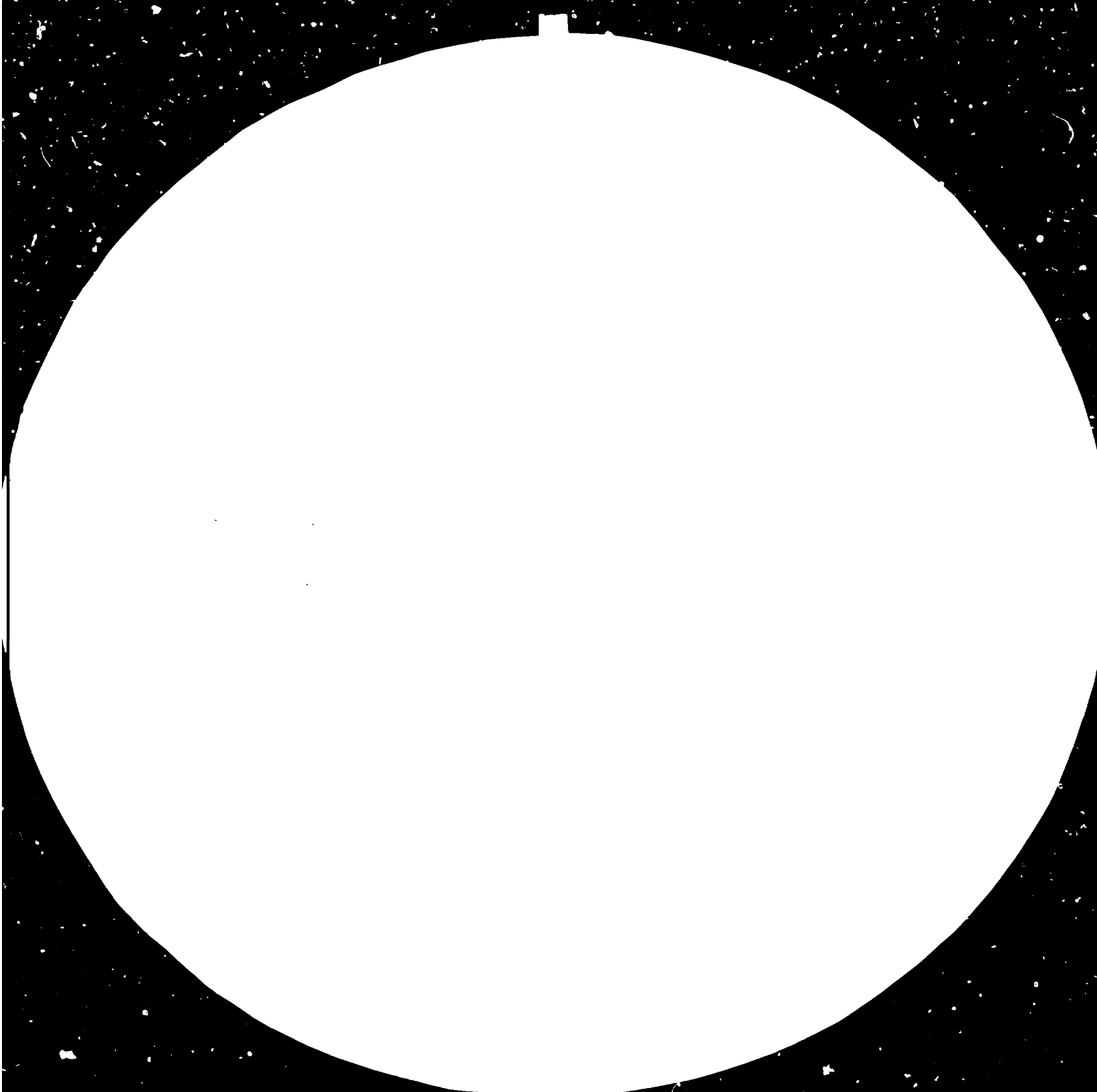
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Item 6 of the provisional agenda

THE INDUSTRIAL DEVELOPMENT DECADE FOR AFRICA: REVIEW OF PROGRESS,  
AND PROPOSALS ON WAYS AND MEANS TO ATTAIN ITS OBJECTIVES

Proposed programme for the implementation phase (1985 - 1990)  
of the Industrial Development Decade for Africa \*/

Submitted by the secretariat of UNIDO

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EXPLANATORY NOTE ON ORGANIZATIONS AND ECONOMIC TERMS

AACB	Association of African Central Banks
ACMS	African Centre for Monetary Studies
ADB	African Development Bank
AIHTTR	African Institute for Higher Technical Training and Research
AIPO	African Intellectual Property Organization
ARCEDEM	African Regional Centre for Engineering Design and Manufacturing
ARCT	African Regional Centre for Technology
ARSO	African Regional Organization for Standardization
AUR	African Union of Railways
BADEA	Arab Bank for Economic Development in Africa
CEAO	Communauté Economique de l'Afrique de l'ouest (West African Economic Community)
CAMFERTEC	Agricultural Mechanization and Rural Technology Centre
CEPGL	Economic Community of the Great Lake Countries
COMFAR	UNIDO Computer for Feasibility Analysis and Reporting
ECA	United Nations Economic Commission for Africa
ECDC	Economic Co-operation among Developing Countries
ECOWAS	Economic Community of West African States
FAO	Food and Agriculture Organization of the United Nations
IDDA	Industrial Development Decade for Africa
Liptako-Gourma	Liptako-Gourma Regional Integrated Development Authority
MPPDU	Master Plan for the Establishment of Metal Processing and Production Development Units Network
NGO	Non-governmental Organization
OUA	Organization of African Unity
OMVS	Senegal River Basin Authority
ORS	Oral Rehydration Salts
R + D	Research and Development
SADCC	Southern African Development Co-ordination Conference
TCDC	Technical Co-operation among Developing Countries
TEMDO	Tanzanian Engineering, Manufacture and Design Organization
TIB	Tanzanian Investment Bank
TIES	Technological Information Exchange System
TILT	Tanzanian Institute of Leather Technology
UDEAC	Customs and Economic Union of Central Africa
UNICEF	United Nations Children's Fund
UNIDO	United Nations Industrial Development Organization
ZISCOSTEEL	Zimbabwe Iron and Steel Company Limited

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## INTRODUCTION

1. This initial programme has been prepared in response to the request contained in resolution 57 (XVIII) adopted by the Industrial Development Board at its eighteenth session and the appeal made by the African Ministers of Industry at their Seventh Conference, in which they asked the Executive Director of UNIDO to prepare and present to the Fourth General Conference of UNIDO recommendations for the implementation phase (1985-1990) of the programme for the Industrial Development Decade for Africa (IDDA). It is conceived as a full-scale technical assistance programme for the African countries providing not only for the full realization of the activities identified for the preparatory phase but also for the launching of a truly effective implementation phase. It should lead to a significant increase in investment in industry, thereby contributing to the attainment of the 1.4 per cent of world industrial production established for the region by the end of the Decade. It is also predicated upon a commitment to the Lagos Plan of Action and a full awareness of the need to assist in the development of a continent which, if unaided, only stands to face still more decades of under-development.

2. The programme constitutes an endeavour to translate into operational terms the aims and objectives of the Lagos Plan of Action and the programme for the Decade as adopted by the African Ministers of Industry. Its conceptual framework is governed by the priorities and guidelines elaborated in the above-mentioned Plan and programme. Its contents should be considered in the light of the issue and background papers on the Industrial Development Decade for Africa submitted to the Fourth General Conference of UNIDO (documents ID/CONF.5/25 and 26) as well as the African Common Position on that Conference (document ID/CONF.5/28). The projects contained in the programme have been derived from: requests received by UNIDO from African countries and intergovernmental organizations; the initial integrated industrial promotion programme at the subregional level (document ID/CONF.5/CRP.1) developed at the four subregional meetings on the promotion of intra-African industrial co-operation within the framework of the IDDA and endorsed by the Seventh Conference of African Ministers of Industry; and proposals prepared by the Secretariat on the basis of its technical co-operation and support activities in Africa.

3. The programme has been structured to reflect a co-ordinated planning process that proceeds from the formulation and/or adjustment of industrial strategies, policies and plans, including appropriate institutional infrastructure, through the rehabilitation of existing plants and/or development of core industries, to the provision of such factor inputs as manpower, energy, technology and financial resources. The projects are grouped according to the priority industrial subsectors and areas spelled out in the programme for the Decade. A brief summary of each project is presented in chapters II, III and IV and more information given in the Compendium of Project Proposals (document ID/CONF.5/CRP.2). In order to avoid repeating information contained in the initial integrated industrial promotion programme at the subregional level, only the titles of those subregional projects contained in that programme are given in this document with appropriate cross-references. The nature of the contribution of UNIDO to their implementation is also briefly described and a preliminary estimate of the cost of the UNIDO inputs indicated. A list of all the projects in the programme is presented in the Annex to this document along with their indicative estimated costs.

4. In keeping with the emphasis set in the Lagos Plan of Action, Chapter II reflects the particular importance attached to the adjustment of appropriate industrial policies, strategies and plans, including the preparation of industrial master plans, and the promotion of the programme for the Decade. Attention is also drawn to the identification of those areas which promote the development of small-scale industries in the rural sector and the strengthening or establishment of effective industrial institutional infrastructure. In Chapter III, summaries are given of projects in core subsectors, particular emphasis being put on the utilization of local raw materials. Emphasis has also been placed on industrial rehabilitation and revitalization. Chapter IV presents projects related to measures that must be taken simultaneously in support of the development of core industries. Of these factors of production, human resources, technological capabilities, energy and packaging are undoubtedly some of the most important. An equally critical input is new investment in industry. Consequently, the preparation of sound investment projects takes on particular importance as this would lead to an increase in the flow of foreign investment into the industrial sector.

5. The total value of the projects in the programme is approximately \$209 million. About 52 per cent of this amount relates to projects concerned with the development of core industries, while another 21 per cent is related to projects directed towards the development of major industrial factor inputs and support areas. Projects related to industrial strategies and policies, planning and institutional infrastructure constitute some 27 per cent of the value of the programme. The priority accorded in the Lagos Plan of Action and the programme for the Decade to the development of the food and agricultural, energy, transport and communications sectors and to the development of human resources and technological capabilities is well reflected in the programme. It is estimated that about 45 per cent of the total value of the programme relates to the development of human resources, while 35 per cent is devoted to the building up of scientific and technological capabilities. About 40 per cent is geared towards the development of the food and agricultural sector; 25 per cent towards the development and utilization of energy resources, and about 20 per cent related to transport and communications. The foregoing percentages are presented as an indication of the magnitude of the identified priorities and have to be considered individually since the programme contains a large number of projects which cover one or more of those priority subsectors and areas. A good number of the projects contained in the programme would also contribute to the development of rural areas and small- and medium-scale industries.

6. Attention needs to be drawn to the fact that projects amounting to a total value of approximately \$55 million were selected at the four subregional meetings on the promotion of intra-African industrial co-operation within the framework of the Decade. If, to these projects, are added the other regional/subregional projects contained in the programme, the total value of all regional/subregional projects included in the programme amounts to about \$98 million, representing 47 per cent of the estimated total value of the programme. This highlights the special importance attached to the promotion of intra-African industrial co-operation and integration. The programme also contains projects totalling some \$31 million which directly address the specific needs of the least developed countries. Furthermore, many regional/subregional projects cover various least developed countries, some of which might eventually be selected to implement those projects for which specific locations have not yet been identified.

7. The programme is designed to provide a framework for discussion and action by the Fourth General Conference of UNIDO. The financial implications cited for each project are only indicative: each of the projects contained in the initial integrated industrial promotion programme at the subregional level and the Compendium of Project Proposals is open to review, and the approach proposed for its implementation can be amended. Since several projects clearly complement each other, their elaboration and implementation would be closely co-ordinated in order to avoid duplication. It is envisaged that the programme would be reviewed periodically, possibly every two years, and realigned with the changing requirements of the African countries. It is sincerely hoped that the international community will seize this opportunity to intensify its industrial co-operation with the African countries by lending full support to the programme.

#### I. INDUSTRIALIZATION IN AFRICA

8. The attention of the international community has been drawn repeatedly to the economic crisis facing the African countries. Awesome statistics reflect this crisis: 34 African countries are prone to drought; 24 African countries are food-deficit states; 26 African countries are listed as least developed countries; 21 are classified as low-income countries by the World Bank; external debts have risen five-fold in the past decade to a total outstanding debt in 1980 of \$77,500 million, while the regions' foreign exchange reserves at the end of 1983 barely sufficed to cover two months of imports.

9. Though rich in both natural and human resources, Africa is unable to point to any significant growth rate or satisfactory index of general well-being over the past 20 years. Virtually, all African economies are still heavily dependent upon the production of one or two primary products for their foreign exchange with the result that their economies are doubly susceptible - first to climatic change and second to the prices paid on world markets for their primary products. This susceptibility is aggravated by the negative impact of international economic development. Low commodity prices, unfavourable terms of trade and heavy debt burdens are an integral part of the picture, while per capita incomes continue to decline. Severe shortage of foreign exchange and domestic budget constraints force many countries to take painful decisions between development and survival, and the diminishing flows of official development assistance fail to fill the gap.

10. These problems have been compounded by sluggish domestic markets, inadequate supplies of raw materials and skilled labour, and shortages of imported materials, spare parts and machinery. So critical is the lack of imported materials and spare parts that many plants are forced to shut down or have been dismantled completely. Furthermore, despite Africa's substantial energy potential, the availability of energy is not always assured. Inadequate transport and communications infrastructure, coupled with the inefficiency of the services sector, constitute further obstacles to the socio-economic development of the region.

11. All this points to the need to take concerted measures to pave the way for the acceleration of economic and social development in Africa. As far back as December 1973, at their second conference, the African Ministers of Industry reaffirmed "the role of industrialization as a dynamic instrument of growth in the strategy of development of African countries". This theme was taken up at subsequent ministerial conferences and after endorsement by the

OAU Heads of State and Government in the Monrovia Strategy for the Development of Africa, it was anchored in the Lagos Plan of Action and the Final Act of Lagos. In adopting the Lagos Plan of Action in April 1980, the OAU Heads of State and Government proclaimed the 1980s as the Industrial Development Decade for Africa, thereby supporting the recommendation made by the Third General Conference of UNIDO which ultimately led to the proclamation of the Decade, at the global level, by the United Nations General Assembly in December 1980.

12. The objectives of the Decade are derived directly from those of the Lagos Plan of Action: the achievement by Africa of at least 1.4 per cent share in world industrial production by 1990 - as against a current share of just over 1 per cent. This strictly quantitative target is supplemented by other goals, such as the achievement by the end of the decade of regional self-sufficiency in food, building materials, clothing and energy so as to satisfy the basic needs of the people of Africa, combat the threat of hunger and ill-health, and overcome the lack of shelter. At the same time, a foundation would be laid for the phased development of basic industries essential for self-reliance, such as agro-industries, building industries, metallurgical industries, mechanical industries, electrical and electronic industries, chemical industries, forest-based industries and the energy industry.

13. In brief, the Industrial Development Decade for Africa can be seen as a major step towards a shift from primary production to increased secondary (industrial) activities, thus contributing to increasing agricultural and food production through the local manufacture and provision of such inputs as fertilizers, insecticides and equipment; stimulating the expansion of other sectors of the economy, such as energy, transport and communications and construction by creating a larger market for their products, supplying the necessary equipment and machinery; and accelerating the scientific and technological advancement of the region.

14. Since no country is endowed with all the natural financial and human resources required for industrial development, it is felt essential that development be focused on priority strategic core projects covering both resource-based and engineering industries. The development of such core industrial projects entails adopting industrial policies and strategies that facilitate market integration and pooling such resources as the raw materials, finance, manpower and technology needed to establish those core industries on a national or subregional basis.

15. The development of core industries calls for effective institutional support in such areas as: the formulation and monitoring of industrial policies, plans and programmes; project identification, preparation and evaluation; development or upgrading of traditional technologies; appraisal, selection, acquisition and adaptation of foreign technologies; regulation of technology; industrial financing; industrial consultancy, management and other services; standardization, testing and quality control; engineering and process design; industrial information; industrial and trade promotion; and industrial training.

16. Issues related to the industrialization of Africa are elaborated not only in the Programme for the Decade (document ID/287) but also in the issue and background papers on the Industrial Development Decade for Africa, prepared for the Fourth General Conference of UNIDO (document ID/CONF.5/25 and 26), the special issue of the industrial development survey (document ID/CONF.5/2 or ID/304) also prepared for the Conference and the African Common Position on the Conference.

## II. INDUSTRIALIZATION POLICIES, STRATEGIES, PLANNING AND INSTITUTIONAL INFRASTRUCTURE

### A. Industrial strategies and policies

17. The industrialization strategies and policies in most African countries have, over the years, been mainly geared towards the promotion of import substitution and the manufacture of consumer goods. So far, manufacturing activities have been a mere assembly operation based on imported raw materials and components, which contributes neither to the upgrading of indigenous resources, the development of technological potential, agricultural and food production, nor to ensuring effective linkage between the various sectors of the economy. These policies have therefore merely prolonged the external dependence of the region and made it even more susceptible to fluctuations in the prices of raw materials and imported finished goods. These points are elaborated not only in the Programme for the Decade (document ID/287) but also in document ID/WG.391/12, prepared for the Fourth General Conference of UNIDO.

18. There is thus a need for each African country to review continuously its industrial strategies and policies and to readjust them in accordance with the prevailing needs of its economy, as well as to evaluate the appropriate institutional infrastructure. In such a readjustment process, special emphasis needs to be accorded to the role of small- and medium-sized industries, rural development and the involvement of women in industrialization. The project profiles briefly described below are included in the Compendium of Project Proposals (document ID/CONF.5/CRP.2) as project profiles numbers 1 to 7.

#### Preparation of national programmes in selected African countries for the development of capital goods industries as a key element in the modernization of agriculture, food self-sufficiency and rural development strategy

19. Under this project, at an average cost of some \$150,000 per country, assistance would be provided to national policy-makers in carrying out an analysis of national needs for agricultural, transport, food-processing, irrigation, storage, and construction equipment (with emphasis on equipment for traditional small- and medium-sized farming units and villages). Subsequently, existing manufacturing capacities would be assessed - including repair and maintenance facilities - from artisanal up to large-scale industrial levels. This is expected to lead to the identification, preparation and promotion of investment projects either for the establishment of new manufacturing facilities or the rehabilitation of existing ones. It is expected that eight countries would be assisted and the project would thus require a total amount of \$1.2 million.

#### A programme of economic advisory services for African industrial restructuring and development at the country level

20. Under this programme, to be applied in two African countries per year over a period of five years, at a total cost of \$1,500,000, the countries would be assisted in making a systematic analysis of their industrial production structures and diagnosing the prospects and constraints relevant to industry. Subsequently, a programme for industrial restructuring and development would be drawn up, setting out specific measures to contribute to balanced industrial growth in the medium- and long-term.

Assistance in the adjustment of national industrial strategies, policies and plans including project preparation

21. This project, costing an average of some \$200,000 per country, aims at assisting countries in adjusting their industrial strategies, policies and institutional framework, in accordance with prevailing national needs, so as to: determine the most effective means of strengthening the planning capacity of the Ministry of Industry; foster its co-operative links with parastatal organizations; upgrade its ability to identify, prepare and appraise industrial projects; and encourage the flow of investments to various industrial subsectors, branches and areas. It is expected that this assistance would be provided to ten selected countries at a total cost of \$2 million, including Lesotho which has requested this assistance.

Assistance in the revision of subregional industrial promotion programmes and policies

22. In 1983/84 UNIDO, in co-operation with ECA and OAU, organized four subregional meetings on the promotion of intra-African industrial co-operation within the framework of the Decade, at which initial integrated industrial promotion programmes were prepared for each subregion. At an average cost of about \$150,000 per subregion, this project is designed to assist each of the four subregions in reviewing and up-dating the above-mentioned initial integrated industrial promotion programmes as well as subregional industrial policies and strategies with a view to intensifying regional industrial co-operation and integration, with particular regard to implementation of the above-mentioned programmes. Total cost of the project is \$600,000 for all four subregions.

Strategy for the development of the pharmaceutical industry

23. Under this project, costing an average of about \$400,000 per country, an analysis would be made of current production, quality control, raw materials, markets and other inputs as a basis for the preparation of a detailed strategy for promoting the manufacture of essential drugs and for the long-term overall development of the industry. An integral part of the project comprises preparatory assistance in establishing urgently needed intravenous fluids plants. It is envisaged that assistance would be provided to five selected countries at a total cost of \$2 million, including Angola which has submitted a request to UNIDO for such assistance.

National workshops on the Industrial Development Decade for Africa

24. In order to ensure the incorporation of the priorities and objectives of the Decade in national development plans, workshops would be organized at an average cost of some \$50,000 per country, on the in-depth analysis of current industrialization strategies, policies and programmes, for decision-makers in Government, industry and relevant institutions. These workshops would aim at reviewing and modifying national industrialization objectives in keeping with the priorities and objectives of the programme for the Decade. Total funding required for four countries per year would amount to \$1 million over a period of five years.

Rehabilitation programme - direct assistance to industry

25. Under this project, at an average cost of about \$650,000 per country, a diagnostic analysis would be made of the existing situation and capabilities

in selected subsectors. An assessment would be made of the problems and bottlenecks confronting industrial production. On this basis, a rehabilitation programme would be drawn up with the aim of strengthening, through provision of equipment and intensive training, the technical, financial, production, management and maintenance aspects of the industry. The total cost of the project covering ten selected countries amounts to \$6.5 million.

#### B. Industrial studies and surveys

26. African countries need to carry out studies and research in order to analyse the structure of their economies and industries; assess the effects of the current international economic, financial and monetary crises; and examine the strategies of other countries, particularly in the third world, where new partners may be found. Studies would also have to be carried out to establish the priority needs of each country, its objectives and resource endowments so that an appropriate industrial structure can be developed. Both the positive aspects of traditional technical assistance need to be assessed and more innovative approaches encouraged. Industrial sectoral surveys would have to be undertaken to assess current conditions in key industrial subsectors and areas. Such surveys also need to examine the implications of external economic forces on the industrialization of the country. The project profiles briefly described below are included in the Compendium of Project Proposals (document ID/CONF.5/CRP.2) as project profiles numbers 8 and 9.

##### Programme for the integrated development of the leather industry in African countries

27. Under this project, at an average cost of some \$100,000 per country, ten countries would be assisted in carrying out, on the basis of information already available in UNIDO, an in-depth study of resources and constraints of the leather industry. On the basis of this study, a plan for the integrated development of the leather industry in the country would be drawn up including the identification and preparation of investment projects for promotion among potential investors. Total cost of the project would amount to \$1 million for ten countries.

##### Study of external inputs to industry in Africa and policies for their effective use

28. This study, at an average cost of some \$300,000 per subregion (\$1.2 million for the four subregions), would first entail a thorough assessment of the type and scale of external inputs to the industrialization of the subregion and, second, formulate recommendations on changing or optimizing the way in which such inputs are used.

#### C. Industrial planning

29. The implementation of a well-defined self-reliant industrial development strategy requires the elaboration of a coherent industrial development plan. While a number of African countries have made efforts to elaborate such a plan, the continent as a whole still suffers from a lack of clear and methodical planning. If countries are to make a breakthrough and successfully implement the programme for the Decade, more concerted efforts will have to be devoted to the preparation of industrial master plans in which the various elements, in particular, raw materials, manpower, energy, technology and finance, are well-conceived, systematically integrated within a well-defined

time schedule and intimately linked with the development plans of the other economic sectors. The project profiles briefly described below are included in the Compendium of Project Proposals (document ID/CONF.5/CRP.2) as project profiles numbers 10 to 12.

Assistance in the formulation and implementation of national industrial master plans

30. Under this project, at an average cost of about \$620,000 per country, assistance would be provided in the assessment of the present status, potential and constraints of industrial development. Key subsectors and processing chains which contribute to self-sustaining and self-reliant economic development would be identified, for which the master plan would set targets and provide integrated programmes. Measures would be formulated to support the implementation of the plan. A training workshop on the preparation and implementation of an industrial master plan would be held. The total cost of the project, which would cover five selected countries, is estimated at \$3.1 million.

Master plan for the development of metal products development in Africa to supply the need of the African railways

31. Under phase I of this project, costing an average amount of some \$200,000 per subregion, assistance would be provided, in close co-operation with the African Union of Railways, to survey existing steelmaking facilities and determine the increased product range and output capacity needed to meet the special steel demands of the African railway industries. A technical assistance programme including investment projects would be formulated for increasing local production of special steel to be implemented in a second phase, estimated at a cost of about \$800,000 per subregion, bringing the total cost of the project to \$4 million.

Assistance to the Organization for the Development of the Senegal River (OMVS) for integrated industrial development of the Senegal River basin

32. Through this project, at a cost of \$1 million, assistance would be provided to OMVS countries to prepare an industrial master plan. Under the plan, multinational projects for OMVS countries would be identified and evaluated and promoted among potential investors, pre-feasibility studies carried out, and proposals for technical training and for mobilizing investment funds recommended.

D. Small- and medium-scale industry and rural development

33. In the Lagos Plan of Action and the programme for the IDDA, strong support is expressed for the creation of a network of small- and medium-scale industries and Governments are urged to take effective measures and provide incentives for their development. These industries could contribute to the establishment of forward and backward integration not only of the industrial subsectors but also between the industrial and other economic development sectors. It is also the major means of industrializing rural areas and developing skilled and semi-skilled manpower as well as industrial entrepreneurs.

34. Despite the importance accorded to the development of small- and medium-scale industries, most African countries have not incorporated specific policies in their national development plans for their development. Another



major constraint is the lack of adequate information on the type of goods that could be produced by such industries, the sources of raw materials, the technology involved, production capacity, marketing and distribution systems. Other constraints include inadequate financial, infrastructural and institutional arrangements. It would therefore be desirable for African Governments to adopt appropriate measures, including relevant financial and fiscal facilities, to enable local entrepreneurs to secure investment loans, on favourable terms, for the establishment of small- and medium-scale industries. The project profiles briefly described below are included in the Compendium of Project Proposals (document ID/CONF.5/CRP.2) as project profiles numbers 13 to 15.

Examination of the food processing sector in African countries with emphasis on the revitalization of small- and medium-scale enterprises and co-operatives in development of this sector

35. On the basis of the recommendations adopted at the First Consultation on the Food Processing Industry (Netherlands, 1981), assistance would be provided, at an average cost of about \$120,000 per country, in carrying out a comprehensive analysis of the state of the food processing subsector as well as in identifying major constraints upon development and the actions to increase capacity utilization. Special consideration would be given to small- and medium-scale enterprises and co-operatives and to measures for implementation, during a second phase, to increase the performance of the subsector. It is foreseen that 10 countries would be covered; financial resources required would thus total \$1.2 million.

An integrated programme of packaged industrial services directed towards the accelerated development of small- and medium-scale enterprises

36. Under this large-scale project, at an average cost of about \$835,000 per subregion, a phased, integrated package would be provided comprising four main elements. First, comprehensive training programmes would be formulated and implemented for upgrading local entrepreneurial skills relevant to small and medium-scale industrial enterprises. Second, assistance would be provided in developing and implementing effective industrial extension services. Third, guidelines would be prepared outlining procedures for obtaining external finance and lines of credit. Fourth, investment projects would be identified and prepared for promotion among potential investors in order to increase and promote the flow of external finance via domestic finance institutions to small- and medium-scale industries. The total cost of the project, which would cover all four subregions, amounts to \$3.34 million and the countries to be selected would include Comoros which has submitted a request to UNIDO for assistance to its Development Bank in setting up and running small- and medium-scale enterprises.

Analysis and upgrading of traditional small-scale industrial production techniques in rural areas

37. At an average cost of approximately \$400,000 per country, assistance would be provided, in co-operation with ARCEDEM and ARCT, in identifying and upgrading local traditional technologies for small- and medium-scale industries. This would include setting up pilot demonstration plants to assess suitable local materials for such processing and commercially promoting the local technologies identified among small- and medium-scale industrial entrepreneurs. The total cost of the project, which would cover four selected countries including Mali which has requested such assistance, amounts to \$1.6 million.

### E. Interregional and subregional co-operation

38. Most African countries have come to realize that their domestic markets are far too small and do not dispose of all the factor inputs, especially raw materials, finance, technology and manpower, needed to establish the broad range of industries that characterize a modern economy, hence the need to promote greater co-operation with other developing countries within the framework of ECDC and TCDC. Similarly, industrial co-operation would facilitate the optimum utilization of installed industrial capacities in individual countries and would also lead to subregional economic integration, a key feature in the Lagos Plan of Action, the Final Act of Lagos and the programme for the Decade.

39. The steps to be taken by each country, ranging from the identification of core projects at the national and subregional level to the detailed assessment of financial requirements, are spelt out in detail in the programme for the Decade and in the issue and background papers prepared for the Fourth General Conference of UNIDO on this subject (documents ID/CONF.5/22 and 4) and the African Common Position on the Conference (document ID/CONF.5/28). The project profiles briefly described below are included in the Compendium of Project Proposals (document ID/CONF.5/CRP.2) as project profiles numbers 16 to 18. In addition, a number of core and support projects identified and included under each of the industrial subsectors and areas of this programme provide a wide scope for co-operation among developing countries for their implementation.

#### Promotion of industrial co-operation between African countries and organizations and those in other developing regions

40. In 1983 a programme was formulated for promoting co-operation between Latin American and African countries and organizations in the implementation of the programme for the Decade. A call has been made for a similar programme to be prepared to promote co-operation between African and Asian countries and organizations (including a separate programme with China). Under this project at an estimated cost of \$1 million, assistance would be provided in the implementation of the Latin American/African programme as well as in the formulation and implementation of similar programmes with the Asian countries and China. Assistance would include: the identification, preparation and promotion of specific projects; the mobilization of financial resources for the realization of the projects identified; and the development of joint training programmes to enhance industrial and technological capabilities in African countries, organizations and industrial enterprises.

#### Southern African Development Co-ordination Conference (SADCC) subregional workshop on industrial co-operation and intra-SADCC trade in manufactures

41. This project, costing approximately \$200,000, would entail studies on subjects crucial to industrial co-operation and trade in manufactures within the subregion and would culminate in a workshop for senior policy-makers, industrial strategists, financiers and promoters from the subregion and representatives of multilateral and intergovernmental donors or agencies. The workshop is expected to make recommendations for more effective industrial co-operation among the member states of the subregion based on specific industrial investment projects to be identified, prepared and promoted among potential donors.

Involvement of non-governmental organizations (NGOs) in the implementation of the programme of the Industrial Development Decade for Africa

42. Under this project, costing about \$200,000, two surveys and assessments, (one each for English- and French-speaking African countries), would be undertaken to identify possibilities of co-operation between UNIDO, NGOs and IGOs in Africa. In addition, a number of projects would be identified for discussion and finalization at an NGO Forum to be held in Africa for joint implementation by UNIDO and selected NGOs, and a directory of African NGOs would be prepared.

F. Promotion of the Decade

43. Any national programme for the Decade must necessarily include promotional activities. This is extremely important in order to ensure the maximum involvement of carefully identified target groups in the process of industrialization. These promotional activities which must be well designed could help to: generate new initiatives by indigenous entrepreneurs in industrial activities; demonstrate the practical benefits of industrialization to the rural areas; contribute to developing engineering talents in children; and, by involving national figures in government and business, secure their commitment to and consistent support for the industrialization process.

44. Measures to promote the Decade would include the full involvement of the mass media (radio, television, newspapers) and the national information machinery. Special seminars would have to be organized in different areas in individual countries for various groups covering the entire cross-section of the business community. The preparation and distribution of films and video programmes and other educational and publicity material as well as the declaration of a national "Industry Day" each year should also be considered. The integrated project proposal briefly described below is included as project profile number 1<sup>o</sup> in the Compendium of Project Proposals (document ID/CONF.5/CRP.2).

Preparation of films, video cassettes and other promotional programmes for the Decade (All African countries)

45. This project, spread over five years at a cost of approximately \$2 million, would cover a wide range of activities to create greater awareness, both within and outside Africa, of the priorities, programmes and requirements of the Decade. These activities include: publication of a special newsletter on the Decade; preparation of programmes on films and video-cassettes as well as for radio and television on Decade-related activities, for use not only by the information media but also by educational institutions; involvement of national and selected international journals; publication and distribution of promotional material, etc; and organization of competitions in the Decade. In addition, a conference of national directors of information offices in Africa would be organized to brief them on the programme for the Decade and to draw up a publicity plan for use at national and international levels.

G. Institutional infrastructure

46. The attainment of self-reliant and self-sustaining industrialization requires the development of an effective industrial institutional infrastructure which, at present, is grossly inadequate in most African countries. It is, therefore, necessary to take action, especially at the national level, to strengthen existing or to establish new industrial

institutions. Particular attention needs to be accorded to institutions dealing with: the formulation and monitoring of industrial policies, plans and programmes; project identification, preparation and evaluation; development or upgrading of traditional technologies; appraisal, selection, acquisition and adaptation of foreign technologies; regulation of technology; industrial financing; industrial consultancy, management and other services; standardization, testing and quality control; engineering and process design; industrial and technological information; industrial and trade promotion; and industrial training. Closely related to this matter is the need to develop industrial development centres and the requisite technological institutional machinery. The project profiles briefly described below are included in the Compendium of Project Proposals (document ID/CONF.5/CRP.2) as project profiles numbers 20 to 25.

Assistance in the management of the national industrialization planning process

47. Under this project, at an average cost of about \$200,000 per country, assistance would be provided to ten selected countries in diagnosing the efficiency of existing industry-related institutions and proposing improvements for the more effective formulation and monitoring of industrial strategies, policies and plans. Mechanisms to provide co-ordination between institutions involved in the industrialization process would also be devised along with measures for more effective identification, preparation, promotion and monitoring of industrial projects. The total cost of the project for five countries would amount to \$1 million.

Strengthening and establishment of national standardization, quality control and metrology systems

48. Under this project, at an average cost of about \$500,000 per country, assistance would be provided to each country in: (i) strengthening its existing institutions and/or carrying out a detailed survey of standardization, quality control and metrology requirements, including appropriate institutional arrangements; (ii) drawing up a national programme and certification marking scheme; (iii) drafting a number of national standards; and (iv) providing equipment (for quality control testing) to national laboratories. Training programmes would be organized and fellowships provided abroad to upgrade the skills of national staff at all levels not only in institutions but also in industrial enterprises. The assistance would be provided to six selected countries, including Cameroon, Ivory Coast, Madagascar, Malawi and Togo, which have already requested such assistance of UNIDO. The total cost of the project would amount to \$3 million.

Assistance in the determination and creation of industrial zones and estates

49. At an average cost of about \$115,000 per country, assistance would be provided to ten selected countries including the Central African Republic which has submitted a request to UNIDO for the identification of suitable sites, collation of data on existing and required physical infrastructure, and preparation of projects for infrastructural development in line with the type, size and number of enterprises to be set up. A pre-feasibility study would be prepared for the site selected on the basis of a detailed and comprehensive analysis of the data collected and training provided for national experts. Investment projects would be identified, prepared and promoted among potential investors, especially local entrepreneurs, for establishment in selected zones and estates. The total cost of the project would amount to \$1.15 million.

Assistance in trade and investment promotion

50. This project, at an average cost of about \$500,000 per country, aims at strengthening the capabilities of national industrial trade and promotion organizations and at streamlining their practices in dealing with private foreign investment. Activities would concentrate on improvement of institutional co-ordination; preparation of pre-investment studies; investment follow-up and promotion; and manpower development, including on-the-job training and organization of seminars, fellowships and study tours. The assistance would be provided to six selected countries, including Botswana, which has requested such assistance, with a total cost of about \$3 million.

Establishment of an industrial information service

51. Under this project, at an average cost of about \$500,000 per country, assistance would be provided in setting up a service within the Ministry of Industry to collect, store, process, retrieve and disseminate industrial information to all potential end-users, in particular small- and medium-scale enterprises. The information would cover appropriate technology selection, patents and licences, industrial promotion and management, and machinery and equipment. On-the-job training would be provided for national personnel and training courses organized. The total cost of the project involving six countries would amount to \$3 million.

Assistance to the Joint Nigeria - Niger Commission for Co-operation

52. Under a UNIDO/FAO project (1979-1982), studies were undertaken on the Komodougo Riven Basin related to industrial milling of millet and sorghum. The present proposed project, at an estimated cost of \$1,000,000, is aimed at providing assistance in implementing the recommendations of the studies. This would entail identification, preparation, evaluation, promotion and implementation of industrial projects and training of Commission staff.

Projects identified at the subregional meetings on the promotion of intra-African industrial co-operation within the framework of the Decade

53. The initial integrated industrial promotion programme at the subregional level (document ID/CONF.5/CRP.1) contains a number of projects along with basic information in the area of institutional infrastructure, whose implementation would require UNIDO's assistance. It is envisaged that this assistance would include the identification, evaluation and preparation of industrial investment projects for promotion among potential investors; the preparation of industrial macro and sectoral survey as input for the elaboration of subregional industrial master plans; strengthening of the capabilities of the institutions concerned in the above areas, as well as co-ordinating and monitoring the implementation of subregional industrial plans, programmes and projects. The projects concerned are listed below along with a preliminary estimate (in brackets) of the cost of the UNIDO inputs.

Institutional infrastructure

- Assistance to ARSO, Western, Central, Eastern and Southern Africa (\$1.6 million)
- Assistance in integrated development of the Liptako-Gourma area (\$2.5 million)
- Assistance to OMVS, West Africa (\$1.5 million)
- Assistance to CEAO, West Africa (\$150,000)

- Assistance to ECOWAS, West Africa (\$1 million)
- Assistance to the Customs and Economic Union of Central Africa (UDEAC) (\$1.4 million)
- Assistance to the Economic Community of the Great Lake Countries (CEPGL) (\$1,300,000)
- Establishment of a Mano River Union coastal shipping enterprise, West Africa (\$250,000)

### III. CORE INDUSTRIAL SUBSECTORS

#### A. Agro- and Agro-based industries

54. The development of agro- and agro-based industries is critical to the region's attainment of self-sufficiency in food production, a priority among the priorities in the Lagos Plan of Action. Their development would greatly help to reduce post-harvest losses, increase food availability and contribute to food security in the region. It would also increase opportunities for investment in associated processing industries, as well as stimulate the development of allied subsectors such as engineering, energy and packaging.

55. In the development of agro-based industries, emphasis needs to be accorded to the effective exploitation, development and utilization of such raw materials as cotton, forest, livestock and fisheries, of which Africa has large quantities. All these call for full vertical integrated development in order to maximize the local value added and to minimize the wastage of by-products. The project proposals briefly described below are included as project profiles numbers 26 to 40 in the Compendium of Project Proposals (document ID/CONF.5/CRP.2).

#### Food-processing

##### Technology development: pilot plant production, extension and promotion of improved Cassava-based, traditional fermented foods

56. This project, costing an average of some \$300,000 per country is aimed at upgrading the diet of the rural population and increasing their technological self-reliance by identifying and optimizing the micro-organism mixture for making garri and other cassava-based products which are staple foods in several African countries, and providing low-cost, standard packages of such micro-organisms for home use and small- and medium-scale production. At the same time, expertise and equipment would be provided to set up modern pilot plants for production, demonstration and training. The total cost of the project, which would cover four countries, amounts to \$1.2 million.

##### Pilot plant for extrusion cooking (thermoplastic extrusion) of food

57. UNIDO would, on the basis of experience acquired in a pilot project for the transformation of locally produced cereals and roots into low-cost nutritious foods through extrusion cooking, provide assistance in starting up a pilot plant to demonstrate the local production of these new foodstuffs and give valuable on-the-spot training to stimulate the wider use of extrusion technology. The present proposed project, at an estimated cost of \$525,000, would cover the CEAO countries. It is envisaged that its results would be applied in the other African subregions.

#### Development of the coconut processing industry

58. Under this project, at an estimated cost of \$600,000, assistance would be provided to the Zanzibar Coconut Authority, which has been requested by the Government of Tanzania, in undertaking a detailed review of the coconut production and processing subsector, designing and setting up a copra pilot demonstration unit, and providing training in copra drying for local personnel. Organizational and financial measures would be elaborated to improve the viability of copra production. In a specific oil-making complex, technology and equipment as well as raw material supply and storage facilities would be evaluated and means of improvement specified. A copra and copra product quality control laboratory would be established and training provided to local laboratory staff. A detailed inventory would be made of a solvent extraction plant - currently under installation - and equipment to make the plant fully operational would be detailed, together with investment costs involved. On the basis of the results of this project, it is envisaged to provide similar assistance to other African coconut-producing countries.

#### Pilot plant for dry-salted fish

59. At an estimated average cost of about \$430,000 per country, assistance, including equipment, would be provided to establish dry-salted fish plants. Local staff would be trained in the better management of such plants. It is envisaged to provide this assistance to three selected countries starting with Senegal which has requested and received preliminary assistance from UNIDO. The total cost of the project therefore amounts to \$1,290,000.

#### Managing and programming integrated development of the fish processing industry

60. Under this project, at an average cost of approximately \$120,000 per country, assistance would be provided to five selected countries, bringing the total cost of the project to \$600,000, in collecting information to enable a full assessment of the present structure and other aspects of the fish processing industry. The information collected would be fed into a tried and tested simulation model system to provide a decision-making instrument for designing and managing an integrated programme for the accelerated development of the fish processing industry in the country. The model itself would be made available to the countries selected and the technology for its use transferred in the form of computer hard- and software and operational manuals. Personnel would be trained and the institutional framework for managing the integrated development of the system set up.

#### Development of the meat processing industry

61. At an average cost of some \$120,000 per country, assistance would be provided to six selected countries to carry out a full assessment of the meat processing industry, including slaughterhouse operations and the quality and use of by-products. Based on the results of that comprehensive assessment, a programme for the expansion and improvement of the meat processing industry would be drawn up including the more effective utilization of its by-products. Investment projects would also be identified, prepared and promoted among potential investors. The countries to be selected include Ethiopia which has requested UNIDO's assistance. The total cost of the project would amount to \$720,000.

TextilesPromotion of the textile industry

62. Under this project, at an average cost of about \$100,000 per country, assistance would be provided in the collection and analysis of data on the market, site, type and availability of resources and costs for the textile industry in the country. On the basis of that information, a programme would be prepared for the rehabilitation of existing industries and for the establishment of a fully integrated complex to carry out spinning, weaving, finishing and printing based on local raw materials. Investment projects would be identified and, following carefully prepared financial and economic analyses, promoted among potential investors. The total cost of the projects which would cover ten selected countries, including the Central African Republic which has already requested UNIDO's assistance, would amount to \$1 million.

Pilot project: establishment of small garment manufacturing units

63. To enable women to generate income through the application and upgrading of traditional skills, this project, at an average cost of about \$220,000 per country, would provide assistance in analysing markets and raw materials supply; organizing a centre for garment pattern cutting; distributing cut material to seamstresses, and collecting and distributing finished garments. The garments would be sewn initially in individual homes or in village co-operatives and ultimately in a centre which would become a complete small-scale garment factory. The total cost of the project, which would cover 5 countries, amounts to \$1.1 million.

Establishment of national textile quality control centres

64. Under this project, at an average cost of about \$1.6 million per country, assistance would be provided in setting up a national agency for quality certification of textiles exported from the country. Training would be provided to enable local staff to run process control systems and to test and certify textile products. A twinning arrangement would be adopted between the newly established centre and a more advanced institute abroad. Assistance would be provided to two selected countries, including Sudan which has requested UNIDO for such assistance, bringing the total cost to \$3.2 million.

Assistance in the establishment of textile training centres

65. At the request of the Government of Sudan, this project, costing about \$1.6 million, is aimed at providing assistance in the establishment of a nucleus textile training centre to undertake, *inter alia*, the training of trainers for individual mills and plants. Training would also be provided for higher level technical and supervisory personnel from industrial enterprises, and a comprehensive, national plant-by-plant training plan elaborated. The results of this project is envisaged to stimulate similar assistance to other countries.

Forest-based productsAssistance in the rehabilitation of the paper industry

66. Under this project, with an average cost of about \$1.1 million per country, expertise and equipment would be provided to three selected countries to rehabilitate existing paper mills, bringing output up to designed capacity, and to establish a training programme of in-plant courses for technicians and



operators. In addition, fellowships would be provided for engineers on the application of pulp and paper-making technology to local raw materials such as bapasse. The countries to be selected would include Mozambique which has already requested UNIDO's assistance. The total cost of the project would amount to \$3.3 million.

#### Establishment of a service centre for the furniture and joinery industry

67. This project, at an average cost of about \$500,000 per country, is aimed at providing assistance to the country in identifying, processing and installing tool maintenance and dowel-making equipment for existing workshop facilities. Existing machinery would be adjusted for optimal working efficiency and on-the-job training in tool-room techniques and maintenance of woodworking equipment would be provided for national personnel. In addition, dry kiln units would be installed and tested at existing national workshops for the production of dowels and as a testing plant for wood seasoning by dehumidification. Assistance would be provided to four selected countries per year, including Sudan which has put in a request to UNIDO, bringing the total cost of the project to \$2 million.

#### Leather products

##### Leather industry development

68. Under this large-scale project, costing approximately \$2,360,000, the Somalia Leather Agency would receive assistance, which has been requested by the Government of Somalia, in increasing productivity and plant efficiency by co-ordinating the activities of all enterprises within the subsector. In addition, the Agency would be twinned with a more developed institute abroad; a fully equipped quality control laboratory would be set up, and personnel trained in its operation, including the organization of seminars and workshops. The experience to be acquired in this project would enable the development of similar projects in other countries.

##### Promotion of the leather industry

69. This project, at an average cost of about \$1 million per country, would provide training for key managerial and specialized staff in all aspects of the industry, in order to help it to realize its full potential. Of special importance is the training of trainers in an identified national institution. A fully-equipped information unit would be set up in the institution to carry out research and development work. A twinning arrangement with a more developed institute abroad would also be set up. Assistance would be provided to two selected countries, including Tanzania which has requested such assistance to its Institute of Leather Technology (TILT). The total cost of the project would amount to \$2 million.

##### Rehabilitation of tannery and footwear factories

70. A 1981 UNIDO study on the leather and leather products industry revealed an urgent need for technical assistance to African countries in this sub-sector, in which more efficient use could be made of locally available resources to cut import bills. Under this project, costing an average of about \$1 million per country, assistance would be provided in the rehabilitation of existing plants including training, with the long-term aim of helping to develop an integrated leather industry in the country. Three countries would be selected for assistance, including Angola which has already requested UNIDO for such assistance, bringing the total cost of the project to \$3 million.

Projects identified at the subregional meetings on the promotion of intra-African industrial co-operation within the framework of the Decade

71. The initial integrated industrial promotion programme at the subregional level (document ID/CONF.5/CRP.1), contains a number of projects in the agro- and agro-based industrial sector. Basic information on each project is given in the project profiles included in that programme. It is envisaged that UNIDO's assistance to the respective African countries and/or intergovernmental organizations in the implementation of the selected projects would comprise one or more of the following activities: the assessment of existing pre-investment studies; the definition of terms of reference and evaluation of bids for the conduct of feasibility studies; the analysis of existing production units as a first step towards preparing an integrated rehabilitation programme; the elaboration of investment project profiles to facilitate the mobilization of financial resources; and the evaluation and monitoring of joint venture contracts. The projects are listed below, along with the preliminary estimates of the cost (indicated in brackets) of UNIDO inputs.

Food-processing

- Integrated complex for poultry production, Liberia (\$100,000)
- Food-processing plant, Guinea (\$100,000)
- Fruit-processing plant, Guinea (\$100,000)
- Rehabilitation and extension of the sugar industry, Angola (\$200,000)
- Upgrading of a sugar factory, the Congo (\$100,000)
- Establishment of a distillery, Burundi (\$100,000)
- Development of integrated meat processing and allied industries in Western and Central Africa (\$750,000)
- Integrated development of the fish- and other seafood-processing industry, Central Africa, West, Eastern and Southern Africa (\$2,000,000)
- Establishment of an agro-industrial complex processing cassava, Central African Republic (\$150,000)
- Establishment of sugar mills, the Sudan (\$250,000)
- Promotion of the food-processing industry, Northern Africa (\$500,000)

Textiles

- Establishment of a spinning mill, North Africa (\$150,000)
- Expansion of a kenaf sack production plant, the Sudan (\$150,000)
- Establishment of a knitwear factory, North Africa (\$150,000)
- Establishment of a garment factory, North Africa (\$150,000)
- Development of the cotton textile industry, West Africa (\$500,000)

Forest-based products

- Establishment of a pulp and paper board factory, the Ivory Coast (\$500,000)
- Establishment of a wood-processing complex, Central Africa (\$500,000)
- Establishment of a paper factory, the Sudan \$250,000)

Leather products

- Establishment of a footwear production plant, North Africa (\$150,000)
- Subregional centre for hides, skins, leather and leather products, (Leather Research Institute, Zaria, Nigeria (\$1,200,000)
- Upgrading of the Tunisian National Centre for Leather and Footwear into a subregional centre (\$1,000,000)

## B. Building materials

72. The promotion of the building materials industry in the region would contribute to the satisfaction of one of the population's basic needs - housing. It would also contribute to the exploitation of local natural resources and create a solid base for self-sustained industrialization in the region by helping to meet the requirements of other sectors. In this regard, special emphasis needs to be placed on the development of the cement industry. At present, cement and cement products are widely used in the region, gradually displacing stone, mud, bricks and other traditional materials. This increased use of cement, especially in the construction industry (dams, infrastructure, buildings, etc.) has led to the growing use of structural steel and the displacement of timber as the traditional reinforcing material. In fact, so great is the demand for cement that most countries in the region have to import cement at increasingly high cost given the lack or inadequacy of local production. In addition to cement, there is a need to develop other forms of local building materials. Several industrial wastes and agricultural residues can be processed into effective low-cost building materials and thus help to relieve the inordinate demand for cement. In this regard, attention also needs to be drawn to the increasing demand for ceramics, tiles and glass products. The project profiles briefly described below are included in the Compendium of Project Proposals (document ID/CONF.5/CRP.2) as project profiles numbers 41 to 44.

### Assistance to the cement industry

73. Since UNIDO last provided assistance to the Malbaza cement works in 1972-1976, demand for cement has increased in Niger, but the plant output has fluctuated for several reasons. Under this project, costing about \$950,000 and at the request of the Government, the equipment in the existing plant would be upgraded, modern maintenance and checking systems introduced, and training provided for administrative and technical personnel. It is envisaged that similar assistance would be provided to other countries.

### Mobile plant for brick production

74. On the basis of a pilot project being carried out in Tanzania in 1984, the local assembly and/or manufacture of mobile brick production plants would be promoted in selected countries. This project, costing an average of about \$400,000, would be implemented in close co-operation with national, sub-regional and regional institutions (e.g. ARCEDEM). Assistance would be provided for examining raw material availability and infrastructure and for the selection and supply of equipment for the plant. Trial operations would be carried out and conditions for local assembly/manufacture of the plant examined and specific recommendations formulated. Assistance would be provided to three selected countries, bringing the total cost to \$1.2 million.

### Promotion of local manufacture of building materials

75. This project, at an average cost of some \$1 million per subregion, is aimed at assisting each of the four subregions in identifying possible fields for local production of building materials and in setting up small production units, especially in rural and semi-urban areas. Qualitative and quantitative evaluations of raw materials (mineral, organic, wastes) and resources would be carried out, together with evaluation of building techniques and traditional materials. The assistance would also include the transfer of skills, improvement of production methods, and dissemination of results through the

organization of subregional seminars. Project profiles, pre-feasibility studies and plans for production units would be drawn up, and pilot production plants set up to demonstrate processes for the local manufacture of building materials. Training would be provided in different manufacturing techniques. The countries to be selected in each subregion for the establishment of subregional production units would include Cameroon and one CEA0 country which have requested such assistance. The total cost of the project would amount to \$4 million.

#### South-East African centre for development of clay-based industries

76. Under this project, at an estimated cost of about \$600,000, assistance would be provided to the SADCC Secretariat, first to carry out a survey to identify the needs of the subregion for clay-based industrial products. On the basis of that survey, a detailed proposal would be elaborated for the establishment of a subregional centre, based on an existing national facility. The assistance would include the provision of a library, laboratory and pilot plant equipment for the establishment and operation of the centre. Training would be provided for experts at the centre as well as to entrepreneurs, supervisors and other technical personnel in industry.

#### Projects identified at the subregional meetings on the promotion of intra-African industrial co-operation within the framework of the Decade

77. The initial integrated industrial promotion programme at the subregional level (document ID/CONF.5/CRP.1), contains a number of projects with information on the building materials industrial sector. The nature of UNIDO assistance to the respective African countries and organizations would essentially be the same as that identified in paragraph 71. The projects in question are listed below along with a preliminary estimate of UNIDO inputs (in brackets).

#### Cement

- Mauritian Cement Corporation (\$100,000)
- Establishment of a subregional cement factory in the Liptako-Gourma region (\$250,000)
- Expansion of the Loutete cement plant, the Congo (\$100,000)
- Expansion of the Mashyuza cement plant, Rwanda (\$100,000)
- Reactivation of the Katana cement plant, Zaire (\$150,000)
- Establishment of the Port Sudan cement factory, the Sudan (\$150,000)
- Establishment of a plant to produce white cement, Tunisia (\$100,000)
- Utilization of steel plant waste for the production of slag-cement, Eastern and Southern Africa (\$150,000)
- The improvement of the cement industry, Eastern and Southern Africa (\$500,000)

#### Ceramics and tiles

- Establishment of a ceramics factory, Togo (\$50,000)
- Manufacture of marble tiling, the Sudan (\$150,000)

#### C. Metallurgical industry

78. As is well known, the metallurgical industry provides linkage upstream to industries processing raw materials (mining, energy, water) and downstream to metalworking and engineering subsectors and is therefore basic to the

industrialization process. The manufacture of metal consumer goods and equipment in the region requires accelerated growth of the intermediate industries providing such inputs as iron and steel, aluminium and other metallurgical products which, in turn, depend on the exploitation of the vast mineral resources of the region, in particular iron ore, bauxite, copper, tin, manganese and lead. At present, a very limited amount of these minerals are processed in the region while the majority are exported as raw or semi-finished products.

79. The development of the metallurgical industry encompasses the development of iron and steel, aluminium, copper, tin and other metal industries. This covers a wide range of highly capital and technology intensive operations requiring co-operation between several African countries, especially in the mobilization of financial resources and the development of the requisite manpower to ensure their effective total vertical integrated development. In the project profiles briefly described below, a significant number are of a subregional nature. They are included in the Compendium of Project Proposals (document ID/CONF.5/CRP.2) as project profiles numbers 45 to 47.

Master plan for the development of mineral and metallurgical industries including the ferro-manganese and the sponge iron steel industry based on domestic resources of iron ore and natural gas/oil

80. Under this project, costing an average of \$170,000 per country, the Government would be assisted in establishing priorities for the selection and development of industries in the above-mentioned subsectors, based on evaluation of available domestic resources. In addition to the formulation of a master plan, a capital financing plan would be prepared and techno-economic analyses made of individual projects to be identified and promoted among potential investors. Assistance would be provided to five selected countries, including Gabon which has put in a request to UNIDO. The total cost of the project would amount to \$850,000.

Development of a master plan for the establishment of metal processing and production development units (MPFDU)

81. Under Phase I of this project, at an average cost of some \$200,000 per subregion, assistance would be provided to each of the four subregions to identify sites for production development centres and peripherals; basic products and services required in the area and their distribution; and workshops and plants which may be incorporated into a subregional network. Financial analyses would be undertaken and manpower needs assessed. Under Phase II, which could cost up to \$800,000 per subregion, detailed projects and training programmes would be prepared, for each MPFDU centre, together with financial analyses. The estimated cost of the project per subregion would amount to \$1 million bringing the total cost to \$4 million.

Establishment of subregional welding centres

82. Under this project, costing some \$1.640 million for all four subregions, assistance would be provided in carrying out a survey of existing welding institutes and facilities to determine one or two to be upgraded to form subregional welding centre(s). A workshop would be convened, bringing together experts from Africa and abroad, to elaborate a programme for the centre, particularly with respect to: adaptation of new technology; training programmes in welding techniques; and establishment and maintenance of welding standards in the subregion. Equipment would be provided for the centre and,

in the initial stages of its development, assistance would be provided for the adaptation of welding technology and the training of welders. Eventually, the established programme of work would be carried out by locally trained specialists and welding technicians.

Projects identified at the subregional meetings on the promotion of intra-African industrial co-operation within the framework of the Decade

83. The initial integrated industrial promotion programme at the subregional level (document ID/CONF.5/CRP.1), contains a number of projects, along with basic information, in the metallurgical industrial sector. The nature of UNIDO assistance to the respective African countries and/or organizations would essentially be the same as that identified in paragraph 71. The projects concerned are listed below along with preliminary estimates of the cost (in brackets) of UNIDO inputs.

Metallurgical industry

- Upgrading and diversification of products from ZISCOSTEEL, Zimbabwe (\$250,000)
- Expansion of iron and steel mill, Uganda (\$250,000)
- Integrated iron and steel mill, Kenya (\$250,000)
- Establishment of a sponge iron plant, West Africa (\$300,000)
- Installation of electric arc furnace plants, West Africa (\$300,000)
- Installation and expansion of re-rolling mills, West Africa (\$250,000)
- Establishment of an integrated iron and steel plant for flat and tubular products, West Africa (\$250,000)
- Establishment of foundries, West Africa (\$500,000)
- Rehabilitation of the Maluku steel plant, Zaire (\$250,000)
- Integrated development of the aluminium industry, Cameroon (\$250,000)
- Expansion of a tin plant, Rwanda (\$150,000)

D. Chemical industries

84. The chemical industry makes an important contribution to the satisfaction of basic needs, primarily food and health. Production in the region of essential chemicals such as fertilizers, pesticides, pharmaceuticals and petrochemicals based on domestic resources (natural gas, coal, phosphate, potash and energy) would also stimulate the development of agriculture, industry and other sectors, whose viability cannot be assured using imported chemical inputs. In this regard, projects related to the establishment of ammonia, phosphate and potash fertilizer plants deserve particular priority in the region since, unlike many other chemical plants, they are not restricted to mixing and formulating imported products, but can use local raw materials. Furthermore, their economies of scale and investment requirements are such that they are best suited to operations at the subregional level since their optimal scale of production exceed the requirements of most individual countries in the region.

85. Despite the fact that Africa is endowed with abundant raw materials, it is still at a very early stage of development with respect to the manufacture of basic chemicals such as sulphuric acid, caustic soda, chlorine and soda ash, without which such priority industries as food-processing, pesticides manufacture or forest-based industries cannot develop. In addition, the production of pesticides takes on particular importance: all the more so as imports of pesticides are increasing at an average annual rate of 20 per cent. With regard to the pharmaceuticals industry, most African countries are

practically wholly dependent on the outside world for their supplies mostly in the form of ready-made medicines. In some regions there is not a single active ingredient factory, and only a few countries have formulation centres processing pharmaceuticals that are imported in an unprocessed form to produce pills, capsules, liquid preparations and ointments. It is therefore necessary and urgent for steps to be taken to improve the situation and utilize more effectively the raw materials available in the region. The same goes for the petrochemicals industry. The project profiles briefly described below are included in the Compendium of Project Proposals (document ID/CONF.5/CRP.2) as project profiles numbers 48 to 59.

#### Basic chemicals

##### Women's assistance programmes for salt production

86. At an average cost of about \$370,000 per country, assistance would be provided in the installation of brine and drinking water tanks, pumps and equipment to monitor solar evaporation of brine. Training for women would be provided in India where salt is made from brine wells. The project, which would also improve working conditions for women engaged in the salt industry, would be carried out in four selected countries, including Nigeria which has requested such assistance from UNIDO, bringing the total cost to \$1,480,000.

##### Subregional salt and marine chemical institute for SADCC member countries

87. There is a recognized need for a central institute in the SADCC subregion to meet the subregion's requirements for the design and development of salt technology, the training of personnel, and the collection and dissemination of data on salt. Under this project, at an approximate cost of \$1.1 million, an existing salt laboratory in Tanzania would be upgraded through provision of expert services, equipment, and extensive manpower training, including fellowships and training workshops.

#### Fertilizers

##### Development of fertilizer production in Africa: application of mini fertilizer plants

88. Based on a UNIDO study on mini fertilizer plants, this project, at an average cost of \$180,000 per country, would enable the preparation of in-depth studies in three selected countries, including pre-feasibility studies for ammonia/urea/ammonium nitrate mini fertilizer plants. Investment estimates for pilot plants would be made and bankable investment projects identified, prepared and promoted among potential financing agencies and/or investors. The total cost of the project would amount to \$540,000.

##### Pilot plant for the production of compost from municipal solid waste

89. The composting of urban refuse can provide readily available fertilizer and help rationalize the use of soil moisture in an area threatened by rampant desertification. Under this project, at an average cost of approximately \$1,050,000 per country, assistance would be provided to two selected countries, including one located in the Sahelian zone, in the formulation, construction, and total operation of a pilot plant. Important performance data for the design of future plants would also be collected and put at the disposal of other African countries. The total cost of the project would amount to \$2.1 million.

PharmaceuticalsLocal production of essential drugs

90. Through this project, at an average cost of about \$920,000 per country, equipment and services would be provided for adapting and demonstrating production technologies for tablets, capsules, syrups and ointments in three selected countries, including Cameroon which has requested such assistance. The setting up of an analytical laboratory would permit testing of raw materials, in-process controls and analyses of drugs. Training would be provided for local personnel. The total cost of the project would amount to \$2,760,000.

Assistance in the utilization of medicinal and aromatic plants for the industrial production of pharmaceuticals

91. Following a joint UNIDO-Romania Centre project (RP/RAF/79/005), it is planned, under this project costing an average of about \$870,000 per country (total \$4,350,000), to assist the Governments of five countries in the development of research and production techniques for plant-based pharmaceuticals and train nationals in the technology involved. The necessary physical infrastructure would be set up to enable the country to use local raw materials for the production of essential drugs. Existing facilities would be upgraded by providing assistance in: modern methods of production, the establishment of a central regulatory and control body to cover licensing, inspection, laboratory testing, analysis and quality control of medicines, and the establishment of pilot plants for extraction of active ingredients from local raw materials. Also under this project, co-operation between research and development centres and industry would be strengthened to enhance the development of the subsector. The countries to be selected would include Liberia and Sudan which have requested UNIDO's assistance.

Filling, packaging and quality control of vaccines

92. Under this project, at an average cost of \$925,000 per country, assistance would be provided in re-modelling existing production facilities and setting up blending, filling and packaging machinery, thus enabling savings to be made by bulk purchasing of vaccines. On-the-job training for production and quality control of vaccines would be provided and follow-up actions defined to pave the way for full-scale vaccine manufacture at a later stage. Assistance would be provided to three selected countries, including Madagascar and Cameroon which have put in requests to UNIDO for such assistance. The total cost of the project would amount to \$2,775,000.

Production of oral rehydration salts (ORS)

93. Under this project, estimated at an average cost of some \$470,000 per country, which is based on a UNIDO study prepared in 1983, assistance would be provided in the design, establishment and start-up of a production plant for oral rehydration salts (ORS) currently donated by UNICEF to several African countries. Raw materials and packaging materials would be provided for about 3 million sachets of ORS per country and local personnel trained. Assistance would be furnished to four selected countries, including Tanzania which has requested such assistance, bringing the total cost to \$1,880,000.



## Petrochemicals

### Recycling waste oil

94. Under this project, estimated at an average cost of about \$1.4 million per country, an assessment would be made of quantities of used oil and the ways in which the oils are contaminated in order to evaluate the feasibility of setting up a recycling plant. At the same time, the type of recycling technology to be applied would be determined and a plan prepared for a collection system. On the basis of the above investigation, an integrated oil recycling system would be recommended and set up along with advice on packaging and marketing of the recycled products and the training of local technical personnel. Assistance would be provided on a pilot basis to two selected countries/subregions, bringing the total cost to \$2.8 million.

### Establishment of a synthetic fibre research and development centre at Kaduna Polytechnic

95. At the request of the Nigerian Government, this project, costing about \$2,350,000, would make use of an existing institution to expand the country's production capacity of man-made fibres and provide integrated training courses in this vital field. Equipment and machinery would be provided to the centre, which would subsequently be able to provide manpower trained in product development to industrial and research establishments for not only Nigeria but also in other African countries. A twinning arrangement is proposed between the centre and similar, more advanced centres abroad.

### Regional centre for Africa in plastics in agriculture and water management

96. On the basis of experience acquired in the establishment of a plastics development centre in Egypt, assistance would be provided through this project, at an estimated cost of \$1.1 million, in preparing quality control standards for plastics and introducing technological developments, especially concerning plastics in agriculture and water management in the African countries. Performance and efficiency of plastics production units in selected countries would be improved and training provided for local personnel.

## Non-metallic mineral products

### Establishment of a ceramic pilot plant for the demonstration of the manufacture of electrical household appliances

97. With a view to promoting the use of more cost-efficient electrical energy, this project is designed to provide assistance in carrying out a full assessment of requirements and set up a pilot plant for the production of electric cooking utensils. An investment project would be prepared and promoted among potential investors, especially local entrepreneurs. On-the-job training would be provided, covering production, quality control and marketing techniques. Assistance would be provided, at an estimated average cost of \$570,000 per country, to three selected countries, including Ethiopia which has put in a request to UNIDO for such assistance, bringing the total cost to \$1,710,000.

### Projects identified at the subregional meetings on the promotion of intra-African industrial co-operation within the framework of the Decade

98. The initial integrated industrial promotion programme at the subregional level (document ID/CONF.5/CRP.1), contains a number of projects, along with

basic information, in the chemical industrials sector, whose implementation would require UNIDO's assistance similar to that described in paragraph 71. The projects in question are listed below along with a preliminary estimate of the cost (in brackets) of the UNIDO inputs.

#### Basic chemicals

- Production of caustic soda, Kenya (\$100,000)
- Establishment of salt/soda production, Mano River Union (\$100,000)
- Establishment of a lithopone production plant, Tunisia (\$150,000)

#### Fertilizers

- Potash project, Ethiopia (\$100,000)
- Multinational ammonia/urea project, Tanzania (\$150,000)
- Phosphate fertilizer plant, Uganda (\$100,000)
- Phosphate fertilizer plant, Zimbabwe (\$150,000)
- Establishment of a phosphoric acid plant, Togo (\$150,000)
- Subregional ammonia project, West Africa (\$250,000)
- Establishment of a phosphate fertilizer plant, West Africa (\$250,000)
- Production of ammonia fertilizers, Central Africa (\$150,000)

#### Pharmaceuticals

- Establishment of a pharmaceutical plant, Sierra Leone (\$100,000)
- Establishment of a pharmaceutical plant, Nigeria (\$250,000)
- Rehabilitation and extension of the Sereddu station, Guinea (\$50,000)
- Establishment of a laboratory for pharmaceutical products, Central African Republic (\$150,000)
- Pharmaceutical industry development centre, ECOWAS, West Africa (\$2,500,000)
- Assistance to the Burundi Regional Pharmaceutical Laboratory (\$1,000,000)

#### Pesticides

- Plant for phytosanitary products, Upper Volta (\$150,000)
- Development of the production of active ingredients for pesticides and insecticides, Central Africa (\$250,000)

#### Petrochemicals

- Establishment of a petrochemical complex for the manufacture of plastic products, Gabon (\$250,000)
- Expansion of a petroleum refinery, the Congo (\$200,000)

#### Other chemicals

- Upgrading potash deposits for the manufacture of chemicals, the Congo, \$200,000)
- Production of calcium carbide, Rwanda (\$200,000)
- Establishment of a methanol production plant, Zaire (\$300,000)
- Pilot project for the production of alcohol, Rwanda (\$500,000)

#### Non-metallic mineral products

- Sheet glass production, Madagascar (\$150,000)
- Manufacture of glass containers, West Africa (\$250,000)

- Manufacture of glass containers, Liberia (\$100,000)
- Expansion and diversification of production at a glass manufacturing plant, the Congo (\$200,000)
- Establishment of a sheet glass production unit, the Sudan (\$150,000)

#### E. Engineering industry

99. The integrated development of engineering industries in Africa, such as the metalworking, mechanical, electrical and electronic branches, is indispensable to the manufacture of basic equipment and machine tools, as well as intermediate and capital goods for use in food production and in such priority subsectors as the agro-based, building materials and metallurgical industries. It would also contribute to the promotion of the automotive industry. Engineering industries, through such facilities as foundries, forging and heat-treatment shops, tool-rooms, metal fabrication shops, machine shops and metal-coating shops, ensure the supply of spare parts, components and accessories to all sectors of the economy. With the development of engineering industries in the region, natural resources (basic metal from ores) would be increasingly utilized, capital formation accelerated, the production of essential components, parts, machinery and equipment (that are currently imported) promoted, and the development of science and technology enhanced.

100. One of the main reasons for low productivity in the agricultural sector and in food production, in particular, is the lack of the necessary engineering inputs such as machinery, implements and tools. In view of this and the crucial importance of agricultural machinery, equipment and implements, emphasis needs to be accorded to the development of this industrial branch. The import of transport equipment accounts for a large proportion of the total imports of the African region which has, practically, no manufacturing units for road transport equipment, although trucks, lorries and tractors are assembled in some countries. In this regard there is a need to develop appropriate and cheap means of transport for rural areas which has so far received little attention. Given the current high imports of railway equipment, there is also a need to accord high priority to the development of the railway industry in Africa. This has been recognized by the Union of African Railways and, along with the development of other transport equipment (especially by road and water), it is an important feature of the United Nations Transport and Communications Decade in Africa.

101. In order to meet the growing demand for energy, the programme for the Decade underscores the need to establish manufacturing units producing turbines, transformers, switchgear, transmission and distribution cables, as well as towers and poles. Furthermore, the demand for household energy appliances, including such replacement parts, is expanding. The development of other engineering industries as well as the manufacture of spare parts for capital goods hinge upon the availability of machine tools and related metalworking and woodworking machinery, most of which are currently imported. At present, conventional machine tools and equipment are manufactured on a very limited scale in only a few countries in the region.

102. The successful implementation of the project profiles briefly described below should contribute towards alleviating the serious constraints posed by the low level of the engineering industry to African industrial development. The project profiles are included in the Compendium of Project Proposals (document ID/CONF.5/CRP.2) & project profiles numbers 60 to 68.

Agricultural machinery, equipment and implements

Strengthening repair and maintenance capacities for the pool of tractors and other heavy mobile agricultural equipment

103. At the request of the Government of Upper Volta and based on a UNIDO study on maintenance of agro-equipment in the country, this large-scale project, costing about \$2,170,000, would provide assistance in the creation of two centres for all aspects of repair and maintenance in industry. Metallurgy and repair skills would be introduced through on-the-job training and the manufacture of certain simple spare parts would be initiated. It is envisaged that similar projects would be developed in other countries, if requested.

Assistance in establishment of a subregional network for agricultural tools, implements and machinery

104. Under this project, costing about \$460,000 and at the request of SADCC, assistance would be provided to its industrial unit in identifying in each member country, the need and institutional arrangements for the development of agricultural tools, implements and machinery. SADCC technical expert group and policy meetings would be organized at which a proposal for a comprehensive programme for establishing the network, including modalities for implementation, would be finalized.

Assistance in agricultural modernization

105. Under this project, at an average cost of about \$1 million per country, assistance would be provided in initiating a comprehensive programme for: the design, adaptation and development of agricultural implements; the manufacture and evaluation of prototypes; the testing of machinery; the provision of technical advisory services to industry on the design, testing and other technical and production aspects of agricultural tools, implements and machinery. This assistance would be provided to four selected countries (one in each subregion), including Tanzania which has requested such assistance to its Agricultural Mechanization and Rural Technology Centre (CAMERTEC). The total cost of the project would amount to \$4 million.

Road and rail transport equipment

Promotion of local manufacture of spare parts and components for motor vehicles, engines, motorcycles, tractors and trucks

106. Under this project, estimated at a cost of \$630,000, assistance would be provided to the four subregions, in co-operation with ARCEDEM, in the formulation of a long-term programme for each subregion for the rationalized development of the subsector. This would entail: an assessment of existing stocks of engines, trucks, motorcycles and tractors and spare parts requirements over the next 8-10 years; systematization of common components for these products; analysis of existing and potential local manufacture of the components and elaboration of a production programme, including the identification, preparation and promotion of inter-country investment projects. Training would be provided for local personnel through a regional workshop.

### Energy equipment

#### Pilot manufacture and rural demonstration of improved clay-metallic, wood/charcoal burning cooking stoves

107. Improved cooking stoves would reduce firewood requirements by 60 per cent, provide a healthier environment in rural areas and encourage small-scale industrialization and entrepreneurial development. Under this project, at an estimated cost of \$1 million, ARCEDEM will be assisted to carefully assess rural needs and a pilot production system designed, fabricated and demonstrated in selected countries, especially those of the Sahelian zone. Investment projects would be identified, prepared and promoted among potential investors, especially local entrepreneurs. Local staff would receive training in the repair and maintenance of the stoves and group training programmes introduced.

#### Pilot plant for the demonstration of water desalination through the use of solar energy

108. Conventional desalination technologies are unsuited to isolated communities, especially in the Sahelian and island countries, as they require electricity or liquid fuel which may be difficult to transport. Under Phase I of this project, costing about \$70,000, ARCEDEM will be assisted to make an assessment of the overall potential for solar desalination technology in the Sahelian and island countries. Sites and types of units would be identified for the establishment of a pilot demonstration plant under Phase II costing approximately \$1 million, and training provided for local personnel. The total cost of the project amounts to \$1,070,000.

#### Manufacturing of equipment for mini hydro-power plants in Africa

109. One of the major constraints upon exploiting Africa's abundant hydro-electric resources has been the high cost of equipment for small-scale hydro-power stations. Under this large-scale project, costing approximately \$2,520,000, assistance would be provided to ARCEDEM in conducting an in-depth survey of local facilities and capabilities for the design and manufacture of mini hydro-power generation equipment; the design and establishment of a pilot manufacturing facility; and training of local experts in the repair and maintenance of the equipment. Investment projects would be identified, prepared and promoted among potential investors.

### Machine tools and allied machinery

#### Promotion of the capital goods industry in Africa

110. Following the recommendations of the consultation meeting on the capital goods industry to organize a regional consultation meeting on that industry in Africa, it is proposed, under this project estimated at a cost of \$750,000, to undertake a detailed demand/supply survey of the capital goods industry in each of the four subregions of Africa. The survey would include an identification of the type and sources of capital goods as well as the associated problems. Institutions dealing with the production of capital goods in the subregions would be identified along with investment projects. On the basis of the information collected from the above survey, a comprehensive programme consisting of the identified investment projects, support services and a strategy for implementation would be prepared and presented for consideration and adoption at the regional meeting to be convened on the sector. The project would be undertaken in co-operation with ARCEDEM and other competent national and subregional institutions.

Strengthening of African institutions dealing with engineering, design and manufacturing

111. Under this project, at an average cost of about \$750,000 per country, assistance would be provided in: organizing a design office; assessing the needs of industry; preparing lists of equipment and other requirements; outlining a work programme for the office; and training local personnel, including study tours and fellowships so as to enable them to exchange experience and obtain training in engineering R + D institutes and manufacturers outside the country and identify products with potential for local design and manufacture. The assistance which would be provided to four countries, including Tanzania which has already submitted a request to UNIDO for such assistance, would amount to \$3 million.

Projects identified at the subregional meetings on the promotion of intra-African industrial co-operation within the framework of the Decade

112. The initial integrated industrial promotion programme at the subregional level (document ID/CONF.5/CRP.1), contains a number of projects in the engineering industry sector along with basic information. The implementation of those projects would require UNIDO's assistance whose nature would essentially be the same as that identified in paragraph 71. The projects concerned are listed below with an indication (in brackets) of the preliminary estimates of the cost of the UNIDO assistance.

Agricultural machinery and equipment

- Manufacture of agricultural machinery (four-wheel tractors), Zimbabwe (\$150,000)
- Manufacture of pumps and irrigation equipment, Zambia (\$150,000)
- Manufacture of four-wheeled tractors, Senegal and Nigeria (\$250,000)
- Manufacture of agricultural tools and implements, Sierra Leone (\$100,000)
- Manufacture of diesel engines for irrigation pumps and generators, Guinea (\$100,000)
- Manufacture of agricultural implements and equipment, Nigeria (\$250,000)
- Production of mobile mini palm-oil mills, Mano River Union (\$250,000)
- Manufacture of agricultural machinery and equipment, Rwanda (\$100,000)
- Establishment of tractor assembly plants, Egypt and the Sudan (\$250,000)
- Manufacture of pumps for irrigation purposes, North Africa (\$150,000)

road and rail transport equipment

- Manufacture of diesel engine-mounted chassis for lorries, trucks and buses, Ethiopia, Mozambique and Tanzania (\$250,000)
- Manufacture of diesel engines for tractors, trucks, lorries and buses, Zimbabwe or Kenya (\$300,000)
- Manufacture of low-cost, standard multipurpose vehicles, Botswana, Madagascar, Mozambique, Uganda and Zambia (\$150,000)
- Manufacture of railway wagons, Senegal and Upper Volta (\$250,000)
- Manufacture of diesel engines for tractors, trucks, lorries and buses, Nigeria (\$250,000)
- Manufacture of diesel engine-mounted chassis for lorries, trucks and buses, Nigeria (\$250,000)
- Manufacture of low-cost, standard multipurpose vehicles, Guinea and the Ivory Coast (\$250,000)
- Establishment of a central press workshop, Nigeria (\$150,000)

- Manufacture of diesel engines for tractors, trucks, lorries and buses, North Africa (\$150,000)
- Establishment of a diesel engine manufacturing plant, Tunisia (\$200,000)
- Feasibility study on the manufacture of railway equipment in the Central African subregion (\$250,000)
- Manufacture of rolling stock for passengers and freight, North Africa (\$150,000)
- Regional forge for the production of wheels and axles, North Africa (\$200,000)

#### Energy equipment

- Re-rolling mills for sections and bars for high-tension electricity transmission, Eastern and Southern Africa (\$250,000)
- Copper fabrication plant, Zambia (\$150,000)
- Manufacture of transformers, Zambia (\$150,000)
- Manufacture of aluminium conductors and cables, Ghana and Guinea (\$200,000)
- Manufacture of power transformers, Togo (\$150,000)
- Manufacture of steel towers, Nigeria (\$200,000)
- Manufacture of hurricane lamps, Senegal (\$100,000)
- Assistance to CEPGL countries in the manufacture of electrical equipment (\$250,000)
- Establishment of a compressor plant, North Africa (\$200,000)

#### Precision engineering

- Manufacture of watches and watch components, Central African Republic (\$150,000)

#### Machine tools and allied machinery

- Manufacture of lathes and milling machines, Morocco (\$50,000)
- Manufacture of woodworking machinery, Tunisia (\$50,000)
- Assistance to ARCEDEM, Eastern and Southern, Central, Northern and Western Africa (\$1,500,000)

### IV. MAJOR FACTOR INPUTS AND RELATED AREAS

#### A. Development of human resources

113. The achievement of the strategy for self-reliant and self-sustaining industrial development will depend, to a large extent, on the development of the requisite indigenous industrial capabilities. This, of course, is contingent upon the pattern of industrial production which determines the number and type of industrial skills required. The development of industrial manpower requires a reorientation of existing educational policies, systems and programmes, with greater emphasis on science and technology education, and its interaction with national industrial policies in order to develop the skills required to cope qualitatively and quantitatively with the entire spectrum of industrial activities.

114. Self-reliant and self-sustaining industrial development cannot be attained without well-planned and integrated programmes for industrial training at various levels. Training programmes closely linked to existing

industry and adjusted to future industrial plans need to be established, with the support of international organizations. Such training programmes should be developed to train industrial leaders, entrepreneurs, policy-makers and planners; technologists and technicians; managers, cost-accountants and financial experts; extension service workers and market and marketing specialists.

115. There is thus a need for each country to: analyse, in detail, national industrial and technological manpower requirements, with a view to initiating action for the development of a comprehensive national industrial training programme which should include a readjustment of existing educational systems, training facilities and programmes; the contribution of industrial enterprises to industrial training; strengthening of existing or establishment of training institutions; the full participation of indigenous experts in project design and planning process, contract negotiations, and project implementation; and measures to secure sound and continued financial support for industrial training.

116. The question of human resources development, which is considered to be the central issue at the Fourth General Conference of UNIDO, is elaborated in the issue and background papers (documents ID/CONF.5/21 and 9) on accelerated development of human resources for industrial development prepared for the Conference as well as in the African Common Position on UNIDO IV (document ID/CONF.5/28). In order to avoid undue duplication, only the highlights of issues related to human resources have therefore been briefly described in this short introduction. The project profiles briefly described below have been included in the Compendium of Project Proposals (document ID/CONF.5/CRP.2) as project profiles numbers 69 to 72. It is however important to emphasize that these projects represent only a small portion of the efforts directed to industrial training in this programme. Practically all projects, especially those related to the development of core industries, technological capabilities and institutional infrastructure, are also concerned with industrial manpower development. In fact, they constitute the bulk of the industrial training efforts envisaged in the programme.

Development of training programmes for policy-makers and entrepreneurs in the negotiation and acquisition of technology in the African region

117. Under this project, at an average cost of about \$120,000 per country, assistance would be provided to ten selected African countries or institutions to review and adapt their existing training programmes and to conduct training courses for potential project negotiations and senior officials involved with the management of industrial development programmes. The total cost of the project amounts to \$1.2 million.

Regional centre for the provision of training and refresher courses for national accountants and for the promotion of small- and medium-scale industrial enterprises

118. Most African countries lack experts with practical accounting experience. Small- and medium-scale enterprises, in particular, often have to train their own financial administrators. The project, with an estimated cost of \$960,000, is aimed at assisting African countries in setting up subregional centres to provide training for trainers in the field of industrial accountancy refresher courses for accountants in line with the existing recognized subregional standardized accounting systems, and in developing model programmes for training of accountants at the national level. In addition, industrial accounting manuals would be prepared and published.



Mobile training teams for female managers in the small- and medium-scale industrial sectors

119. In view of their multiple responsibilities (e.g. household and child care and professional life), African women cannot easily absent themselves for long periods to upgrade their management skills. Under this project, costing about \$270,000, local training needs for women would be assessed and assistance provided in selected countries in the organization of mobile one/two-week training courses for women in key aspects of enterprise organization and management.

Training workshops in industrial project preparation, evaluation, financing and implementation

120. Under this project, at a cost of \$1,750,000, 25 workshops would be held over a five-year period to train officials of national institutions in practical methods of preparing industrial investment projects - particularly, fully-pledged techno-economic feasibility studies - and in all major aspects of marketing, financial and technical analysis, and project promotion and implementation, including the use of the UNIDO Computer Model for Feasibility Analysis and Reporting (COMFAR).

Projects identified at the subregional meetings on the promotion of intra-African industrial co-operation within the framework of the Decade

121. The initial integrated industrial promotion programme at the subregional level (document ID/CONF.5/CRP.1) contains a number of projects with basic information in the area of industrial manpower development. The implementation of these projects would require UNIDO's assistance to the respective African regional and subregional organizations and centres in the form of one or more of the following activities, as appropriate: survey and analysis of the industrial manpower needs; identification, evaluation, selection and strengthening of suitable national, subregional or regional training institutions; formulation of short-, medium- and long-term industrial manpower development programmes at the national, subregional and regional levels; up-dating of a directory of small-scale industrial project profiles to stimulate the development of local industrial entrepreneurship; and the formulation and implementation of programmes for the development of local industrial consultancy and management capabilities. The projects in question are indicated below along with a preliminary estimate of the cost (in brackets) of UNIDO inputs.

- Assistance to AIHTTR, Eastern and Southern Africa (\$1 million)
- Inventory of subregional training facilities, Eastern and Southern, Central, Western and Northern Africa (\$500,000)
- Managerial and technical personnel training, Eastern and Southern, Central, Western and Northern Africa (\$1.5 million)
- Development of industrial consultancy and management capabilities, Eastern and Southern, Western, Central and Northern Africa (\$1 million)
- Development of local industrial entrepreneurship (Directory of small-scale industrial project profiles), Eastern and Southern, Western, Central and Northern Africa (\$250,000)
- Assistance in the development of industrial training programmes for Eastern and Southern, Western, Central and Northern Africa (\$750,000)

## B. Strengthening of scientific and technological capabilities

122. International experience indicates that technological and industrial development cannot evolve unless the national scientific base has reached a minimum level. A concerted effort, therefore, has to be made at the national level to accelerate the development of a scientific base and thereafter the application of science and technology to industrial development. In this regard, the development of a sound science and technology strategy, policy, plan and programme for the rapid development of technological capabilities is a prerequisite. Despite the efforts being made to develop and upgrade traditional technologies in Africa, some time will pass before those technologies constitute the principal source of technology for industrial development. African countries will therefore continue to import foreign technology. Unfortunately, most countries do not yet dispose of the appropriate personnel, both in quantity and quality, to evaluate, acquire, adopt, diffuse and absorb foreign technologies, which is a highly technical and sophisticated discipline. Only very few countries have taken steps to develop the necessary institutional machinery needed to promote the development and upgrading of indigenous technology, or the acquisition and regulation of foreign technologies.

123. The need to strengthen the scientific and technological capabilities of developing countries for industrial development is fully considered in the issue and background papers (documents ID/CONF.5/5 and 6), prepared for the Fourth General Conference of UNIDO on the subject. This, together with the high priority accorded to it in the African Countries Position and the Conference (document ID/CONF.5/28), points out the necessity for the African countries to develop suitable technology policies and plans, institutional machinery, manpower and environment, thus enhancing the development of the countries' technological capabilities and to ensure greater control over the technological activities within their borders. Issues of particular significance relate to the choice of technology; engineering and process design, and the development and commercialization of R + D results. The project profiles briefly described below are geared towards assisting African countries and relevant institutions in improving their technological capabilities and capacities. They are included as project profiles numbers 73 to 81 in the Compendium of Project Proposals document ID/CONF.5/CRP.2. It is also to be noted that several projects contained in the programme, especially those related to the development of core industries and institutional infrastructure, are also concerned with the development of technological capabilities.

### Development of a technology support programme for the Decade

124. In accordance with the recommendation meeting at the regional symposium on the promotion of industrial technology in Africa held in Khartoum in 1980, it is proposed, under this project estimated at a cost of \$550,000, to organize a workshop, consisting of five working groups, on selected priority sectors to develop technology programmes in the selected sectors. The deliberations of the workshop would be based on a draft programme to be prepared following missions to be sent to selected countries to identify and assess the technologies, both traditional and modern, currently in use in each of the sectors, the related institutional framework and to identify investment and support projects. Account would also be taken of the implications of new and advanced technologies in the development of the selected sectors. It is expected that the workshop would adopt a programme for application in the African countries, both at the national and subregional level, with the support of the international community.

Preparation of guidelines for the negotiation and acquisition of technology in the priority sectors identified in the Lagos Plan of Action and the Programme for the Industrial Development Decade for Africa

125. In keeping with the policy on development and transfer of technology outlined in the Lagos Plan of Action (paras. 151, 152), this project, at an average cost of about \$150,000 per priority sector, would provide assistance in the appropriate development of local entrepreneurship. Desk studies, field visits and support studies in countries participating in TIES would be carried out to examine current practices in technology transfer, negotiations and acquisition for each sector. Approaches to specific issues would be outlined and the results presented for approval at a meeting of the African Regional TIES. The total cost of the project, which would initially cover about eight selected industrial subsectors/branches, amounts to \$1.2 million.

Technological advisory services during preparation and negotiation of technology transfer contracts in the priority sectors identified in the Lagos Plan of Action and the Programme for the Industrial Development Decade for Africa

126. Under this project, at an average cost of about \$30,000 per advisory mission, UNIDO staff and outside experts would assist during the critical stages of negotiations with the aim of increasing the bargaining position of public and private entrepreneurs in the acquisition of technology. It is expected that ten such missions would be undertaken per year over a six-year period, to be complemented by a promotional programme for these activities in the region. The total cost of the project would be \$1.8 million.

Assistance in industrial and technological information

127. As part of a large-scale project to set up a coherent industrial data system, the present proposed \$630,000 project, which has been requested by the Government of Nigeria, would provide assistance within the framework of the national industrial data bank in identifying important industrial and technological information and data for national planning and development; elaborating standards for denotation and codes for geographical units in Nigeria and for the most important products; equipping the data bank and in carrying out training for national experts. It is envisaged to extend this assistance to other interested countries.

Assistance in the establishment of National Technology Offices in Africa

128. Under this project, costing an average of some \$40,000 per country, assistance would be provided to selected African countries in assessing existing technological infrastructure and services and in preparing recommendations for an appropriate national technology transfer structure covering the wide range of activities involved in the entire process of technology development, acquisition, adaptation and assimilation. It is envisaged that assistance would be provided to fifteen countries, bringing the total cost of the project to \$600,000.

Promotion of software development and circuit design in African countries

129. Under this project, at an average cost of about \$182,000 per country, assistance would be provided in assessing the country's needs and potential with regard to software, including the existing level of software education.

The site for a software development centre would be proposed and a programme of the centre's activities drawn up. Investment projects would also be identified, prepared and promoted among potential investors, especially local entrepreneurs. It is envisaged to initially cover five selected countries bringing the total cost of the project to \$910,000.

#### Promotion of the micro-electronics industry in Africa

130. Under this project, estimated at a cost of \$300,000, a demand and supply survey would be carried out on the micro-electronics industry with a view to determining the short-, medium- and long-term requirements of African countries and to assess the current situation with regard to sources and volume of importation of micro-electronic equipment, components and spare parts. The information to be collected in the survey, which would include identification and assessment of existing institutions dealing with micro-electronics, would provide the basis for the preparation of a programme for the development of that branch. The draft programme would be presented for discussion and adoption at a regional technical meeting.

#### African regional network of solar research institutes

131. Under this large-scale project, costing about \$1,630,000, appropriate solar energy research institutes would be identified to harmonize their activities. The activities of the project would also include the organization of a workshop; training of personnel; international exchange of scientists; monitoring of technologies and dissemination of information; demonstration of selected technologies through local construction of prototypes and pilot plants; and commercialization of research results by local entrepreneurs. The above-mentioned activities would be harmonized with those of the African Regional Centre for Technology as well as with those of the African Regional Centre for Solar Energy, to be established under the auspices of the ECA.

#### African regional network for biomass technologies

132. This large-scale project, costing about \$1,120,000, would provide assistance in the identification, evaluation and selection of institutions active in the field of biomass to serve as subregional focal points. A meeting of these and other national institutions would be held to establish an African Regional Network, whose members would receive UNIDO assistance in the preparation of a comprehensive work programme, covering all industrial aspects of biomass utilization, including provisions for exchange of information between members, co-operative research programmes and other joint activities. Training would be provided through fellowships and the organization of study tours and training workshops.

#### Projects identified at the subregional meetings on the promotion of intra-African industrial co-operation within the framework of the Decade

133. The initial industrial promotion programme for Africa (document ID/CONF.5/CRP.1) contains a number of projects along with basic information directed towards the development of technological capabilities. Their implementation would require the same type of UNIDO's assistance as that described in paragraph 121. The projects in question are listed below, along with a preliminary estimate of the cost (in brackets) of the UNIDO inputs.

- Transformation of Serere Research Station into a subregional R + D centre for the processing of cereals and rootcrops, Uganda (\$1.5 million)
- Establishment of a Mano River Union Technology Centre (\$1 million)
- Assistance to the African Intellectual Property Organization (AIPO) (\$1.5 million)
- Assistance to ARCT, Eastern and Southern, Central, Western and Northern Africa (\$2.4 million)
- Establishment of an industrial and technology fair serving the member states of the Mano River Union (\$250,000)
- African Regional Centres for Genetic Engineering and Biotechnology, all African countries (\$1 million)

### C. Mobilization of financial resources

134. The implementation of the programme for the Decade will require considerable investment capital. In that programme, it is estimated that attainment of the minimum of 1.4 per cent of world industrial output by the year 1990 by the African countries would require \$140,000 million of new investments. This calls for the development of effective national and subregional mechanisms for mobilizing funds, from both local and external sources. It is equally essential that national and subregional development banks be strengthened so as to assist in the mobilization of financial and other resources, from within and outside the region, including financial and technical partners from the more advanced developing countries and the capital-surplus developing countries. In this connection, the African Development Bank (ADB), the Association of African Central Banks (AACB), and the African Centre for Monetary Studies (ACMS) could play a crucial role. Action also needs to be initiated towards the establishment of an industrial financial market for the African countries and to reinforce co-operation with those institutions controlled by developing countries such as the Arab Bank for Economic Development in Africa (BADEA), the Islamic Bank and the OPEC Fund for financing industrial projects.

135. The importance of mobilizing financial resources for industry in the developing countries is highlighted in the issue and background papers (documents ID/CONF.5/19 and 13) prepared for the Fourth General Conference of UNIDO on the subject. The special needs of the African countries, especially the least developed countries, are emphasized in those documents as well as in the African Common Position for the Conference (document ID/CONF.5/28). The mobilization of funds from both local and external sources for the implementation of the programme for the Decade depends on the quality of projects. Any programme of assistance to the African countries for the mobilization of financial resources therefore needs to place emphasis on the identification, evaluation and preparation of sound bankable industrial investment projects. Hence, it is not by coincidence but by design that special focus has been accorded to these aspects in the project profiles briefly described below which would reinforce the measures to be taken in mobilizing financial resources for the implementation of the initial integrated industrial promotion programme at the subregional level and the investment projects to be identified during the implementation of this programme related to core industries. The project profiles are included in the Compendium of Project Proposals (document ID/CONF.5/CRP.2) as project profiles numbers 82 to 85.

Assistance in the mobilization of financial resources for the development of specific priority industrial branches in Africa within the framework of the Decade

136. Under this project, costing an average of about \$200,000 per industrial branch, representatives from interested industrialized and developing countries would participate in identifying specific industrial branches and manufacturers and institutions engaged in the selected branch who would be interested in co-operation with African countries in the promotion of specific investments. African countries in which the chosen branches have been accorded priority would be identified and national teams, with UNIDO assistance, would prepare country papers and identify specific projects for promotion with potential investors. The total cost for five priority branches would be \$1 million.

Advisory/consultancy service for carrying out pre-feasibility and feasibility studies on the establishment of new industries as well as rehabilitation of existing industries

137. This project, at a cost of approximately \$1,600,000 (for 10 studies), aims at assisting the Government in carrying out a field survey in the country concerned on the establishment of new industries and the rehabilitation of existing ones. The results of the survey would be fed into COMFAR, for which a COMFAR specialist would supply financial data. A complete study would then be compiled and presented to the Government for discussions and follow-up with UNIDO's assistance, as appropriate.

Establishment of a regional industrial advisory service to African development banks

138. Under this project, at a cost of about \$3 million over a three-year period, a nucleus of UNIDO staff and recruited experts, assisted by specialists appointed on an ad hoc basis, would assist African development banks in identifying investment projects, evaluating feasibility studies, recommending financing, following up on project implementation, including preparation and evaluation of bids and tenders, monitoring project performance, and carrying out other tasks related to industrial promotion. Such assistance would also include the analysis of existing systems and procedures for the appraisal of pre-investment studies and the elaboration and introduction of integrated project development systems, including the possible use of computer programmes, to enable the development banks to make "accept-or-reject" investment decisions. Training would be provided for technical staff of the banks involved, and assistance provided in preparing and conducting courses on industrial financing for experts from industrial enterprises on industrial financing. The countries to be assisted would include Tanzania which has requested UNIDO's assistance to its Investment Bank (TIB).

Organization and follow-up of investment promotion and solidarity meetings

139. Over the years, UNIDO has organized a number of investment promotion and solidarity meetings aimed at promoting investment projects among potential investors and donors. The results so far achieved point to the need for these meetings to be continued, especially during the implementation phase of the Decade Programme as one means of mobilizing financial resources for the implementation of the identified Decade-related projects. Under this project, estimated at an approximate cost of \$2 million, it is planned to organize, in

co-operation with the OAU, ADB, relevant regional and subregional organizations and development banks in the countries concerned, six subregional investment promotion meetings and ten national solidarity meetings over a period of five years. Assistance would also be provided, within the framework of the project, to countries and subregional organizations in the elaboration of and follow-up to projects receiving positive consideration by potential investors and donors at these meetings.

#### D. Energy

140. The constant increase in the cost of energy and equipment has gravely affected the economies of most African countries. It is, therefore, imperative that integrated industrial development be linked to the adoption of appropriate energy policies and for energy to be made available to industry at a reasonable cost, since some 30 per cent of total world energy is consumed by industry. This is particularly relevant in view of the fact that the African continent is rich in energy resources. It is estimated that Africa has about 30 per cent of the world's total hydro-electric power potential. In spite of its immense energy resources, Africa remains the least developed continent with regard to meeting its energy requirements. The basic problem is the total lack of energy planning. The above and other important factors are elaborated in the issue and background papers (documents ID/CONF.5/15 and 7) prepared for the Fourth General Conference of UNIDO on energy in which the special needs of the African countries are emphasized, as well as in the African Common Position in the Conference contained in document ID/CONF.5/28.

141. There is, thus, an urgent need for each African country to elaborate, on the basis of its identified industrial energy needs, a short-, medium- and long-term energy development programme. Such a programme should include the establishment of mini hydro-electric generation plants, especially in rural areas; the use of new and renewable energy sources; the location, development and utilization of other sources of energy; and the production of energy equipment, spare parts and components. The project profiles briefly described below constitute a first step towards the development of a comprehensive secretariat energy programme for Africa. They are included in the Compendium of Project Proposals (document ID/CONF.5/CRP.2) as project profiles numbers 86 to 89. It should, however, be noted that several projects related to energy are included in other parts of this programme especially in those related to engineering industries and strengthening of scientific and technological capabilities.

#### Promotion of intra-African co-operation in mini hydro-power generation

142. The purpose of this phase of the project, costing \$100,000, is to convene a senior expert group meeting to promote intra-African co-operation in mini hydro-power generation. The possibility of eventually establishing a network of African institutions working in this field would be examined. Such a network could help to devise a programme for implementation during the second phase of the project to: (a) foster the local manufacture of mini hydro-power equipment (b) foster research and development activities (c) arrange training (d) provide information and advisory services, and (e) organize co-operation and linkages with relevant regional and international organizations. The second phase of the project is estimated to cost \$1 million, bringing the total cost of the project to \$1.1 million.

#### Pilot experimental briquetting station

143. Under this project, costing an average of about \$250,000 per country, assistance would be provided to set up pilot plants equipped with presses and laboratory testing facilities, and to prepare briquetting procedures. Testing would be carried out to establish methods of cost control, and local personnel trained in all aspects of production and marketing techniques. It is envisaged to provide this assistance to four selected countries, including Sudan which has put in a request to UNIDC. The total cost of the project therefore amounts to \$1 million.

#### Biofuels demonstration programme

144. As a follow-up to a preparatory project currently under implementation in Ethiopia, it is proposed under this project, costing about \$1 million, to provide assistance in the installation and initial operation of a pilot biomass-based energy demonstration plant. Training would be provided in the relevant conversion technologies and, once completed, the plant would serve as a subregional demonstration plant for training of experts from other countries in the subregion. It is also envisaged, on the basis of the experience to be acquired in Ethiopia, to provide similar assistance to one other country, bringing the total cost to \$2 million.

#### Industrial energy management and conservation

145. Under this project, costing \$750,000, existing institutions would be strengthened and a regional network established on industrial energy conservation. Direct assistance would be provided to selected industries in the assessment of their energy consumption and in applying energy-saving measures. Existing training programmes would be intensified and specialized training provided in energy auditing and conservation.

#### Projects identified at the subregional meetings on the promotion of intra-African industrial co-operation within the framework of the Decade

146. The initial integrated industrial promotion programme at the subregional level (document ID/CONF.5/CRP.1) contains a project with basic information on the development of peat resources in Burundi, Rwanda and Zaire. The implementation of the project would require the assistance of UNIDO in carrying out a study to identify and ascertain the quantity of the peat resources in the countries involved and to propose a programme for co-operation, including such aspects as manpower, technology, finance and trade. The study would also propose an appropriate approach for the elaboration of a master plan for the development and effective utilization of the peat resources including the identification, selection, evaluation and preparation of investment and support projects for this purpose. It is estimated that the cost of UNIDO inputs would amount to \$2.1 million over a period of three years.

#### E. Packaging

147. Manufacturing and processing industries cannot be established without a parallel packaging industry. Achievement of self-sufficiency in food production depends not only on the production of food, but also on its safe delivery to the consumer. Most fresh food products in Africa which are moved in bulk or by artisanal packaging methods are fragmentally used which lead to serious losses and wastage of no less than 35 per cent. The use of suitable



packaging methods, which is indispensable to the development of a programme for self-sufficiency in food, is also applicable to all other processing industries, particularly those producing hazardous materials such as chemicals. In the light of the above, the project proposal briefly described below should contribute towards the promotion of the packaging industry in African countries. It is included in the Compendium of Project Proposals (document ID/CONF.5/CRP.2) as project profile number 90.

Promotion of the establishment of a packaging information and pilot demonstration plant in Africa

148. Under this project, at a cost of approximately \$4 million for the four subregions, a survey of the main types of packaging materials in use in the countries concerned would be made, with a view to adopting a rationalized approach to the development of the packaging industry in the subregion as well as to the national standards. Prototypes of non-sophisticated equipment for the manufacture of packaging material from local natural resources would be designed, tested and promoted among potential investors and models of small-scale production facilities and pilot demonstration plants established, their exact nature depending on the various needs of the selected subregion.

CONCLUSION

149. In their most recent resolutions on the Industrial Development Decade for Africa, the Industrial Development Board, the OAU Council of Ministers and the Conference of African Ministers of Industry expressed their deep concern at the scarcity of resources which had resulted in the limited progress in implementing the preparatory phase of the programme for the Decade. The projects described in this programme reflect a concerted attempt by the Secretariat of UNIDO to assist countries in the full and effective implementation of the activities identified for the preparatory phase of the programme for the Decade and to launch an effective implementation phase. Successful implementation, however, hinges upon a decisive commitment by all countries and bilateral and multilateral agencies to strengthen their industrial co-operation with African countries, as well as upon decisive steps to be taken by the African countries themselves to determine the strategy and destiny of their economic development in general, and industrial development in particular.

150. It should be recalled that the Lagos Plan of Action states that "the industrialization of Africa in general, and of each Member State in particular, constitutes a fundamental option in the total range of activities aimed at freeing Africa from under-development and economic dependence". The creation of a sound industrial base thus takes on particular importance, and the effective implementation of the projects described in this programme, complemented by other industrial activities at the national, subregional and regional levels, mark a first step towards the goal of collective self-reliance.

151. It should be stressed that the present programme should not be regarded as exhaustive or definitive. As indicated in the introduction, it represents an initial attempt to develop a full-scale technical assistance programme in support of the individual and collective efforts of the African countries for the implementation of the programme for the Decade. It is expected that it would contribute towards the mobilization of a significant increase in the flow of financial resources into the industrial sector in the region. It is therefore being presented for discussion and endorsement by the Fourth General Conference of UNIDO.

## ANNEX I

LIST OF PROJECT TITLES AND ESTIMATED COSTSII. INDUSTRIALIZATION POLICIES, STRATEGIES, PLANNING  
AND INSTITUTIONAL INFRASTRUCTURE

## A. Industrial strategies and policies

1.	<u>Preparation of national programmes in selected African countries for the development of capital goods industries as a key element in the modernization of agriculture, food self-sufficiency and rural development strategy</u>	\$ 1,200,000
2.	<u>A programme of economic advisory services for African industrial restructuring and development at the country level</u>	1,500,000
3.	<u>Assistance in the adjustment of national industrial strategies, policies and plans including project preparation</u>	2,000,000
4.	<u>Assistance in the revision of subregional industrial promotion programmes and policies</u>	600,000
5.	<u>Strategy for the development of the pharmaceutical industry</u>	2,000,000
6.	<u>National workshops on the Industrial Development Decade for Africa</u>	1,000,000
7.	<u>Rehabilitation programme - direct assistance</u>	<u>6,500,000</u>
	Sub-total (A)	<u>14,800,000</u>

## B. Industrial studies and surveys

8.	<u>Programme for the integrated development of the leather industry in African countries</u>	1,000,000
9.	<u>Study of external inputs to industry in Africa and policies for their effective use</u>	<u>1,200,000</u>
	Sub-total (B)	<u>2,200,000</u>

## C. Industrial planning

10.	<u>Assistance in the formulation and implementation of national industrial master plans</u>	3,100,000
11.	<u>Master plan for the development of metal products development in Africa to supply the need of the African railways</u>	4,000,000

12.	<u>Assistance to the Organization for the Development of the Senegal River (OMVS) for integrated industrial development of the Senegal River basin</u>	1,000,000
	Sub-total (C)	8,100,000
D. Small- and medium-scale industry and rural development		
13.	<u>Examination of the food-processing sector in African countries with emphasis on the revitalization of small- and medium-scale enterprises and co-operatives in development of this sector</u>	1,200,000
14.	<u>An integrated programme of packaged industrial services directed towards the accelerated development of small- and medium-scale enterprises</u>	3,340,000
15.	<u>Analysis and upgrading of traditional small-scale industrial production techniques in rural areas</u>	1,600,000
	Sub-total (D)	6,140,000
E. Interregional and subregional co-operation		
16.	<u>Promotion of industrial co-operation between African countries and organizations and those in other developing regions</u>	1,000,000
17.	<u>Southern African Development Co-ordination Conference (SADCC) subregional workshop on industrial co-operation and intra-SADCC trade in manufactures</u>	200,000
18.	<u>Involvement of non-governmental organizations (NGOs) in the implementation of the programme of the Industrial Development Decade for Africa</u>	200,000
	Sub-total (E)	1,400,000
F. Promotion of the Decade		
19.	<u>Preparation of films, video cassettes and other promotional programmes for the Decade (All African countries)</u>	2,000,000
	Sub-total (F)	2,000,000
G. Institutional infrastructure		
20.	<u>Assistance in the management of the national industrialization planning process</u>	1,000,000
21.	<u>Strengthening and establishment of national standardization, quality control and metrology systems</u>	3,000,000

22.	<u>Assistance in the determination and creation of industrial zones and estates</u>	1,150,000
23.	<u>Assistance in trade and investment promotion</u>	3,000,000
24.	<u>Establishment of an industrial information service</u>	3,000,000
25.	<u>Assistance to the Joint Nigeria - Niger Commission for Co-operation</u>	<u>1,000,000</u>
	Sub-total	<u>12,150,000</u>

Projects identified at the subregional meetings on the promotion of intra-African industrial co-operation within the framework of the Decade

	<u>Institutional infrastructure development</u>	
	Assistance to ARSO, Western, Central, Eastern and Southern Africa	1,600,000
	Assistance in integrated industrial development of the Liptako-Gourma area	2,500,000
	Assistance to OMVS, West Africa	1,500,000
	Assistance to CEAO, West Africa	150,000
	Assistance to ECOWAS, West Africa	1,000,000
	Assistance to the Customs and Economic Union of Central Africa (UDEAC)	1,400,000
	Assistance to the Economic Community of the Great Lake Countries (CEPGL)	1,300,000
	Establishment of a Mano River Union coastal shipping enterprise, West Africa	<u>250,000</u>
	Sub-total	<u>9,700,000</u>

Sub-total (G) 21,850,000

TOTAL FOR INDUSTRIALIZATION POLICIES, STRATEGIES, PLANNING AND INSTITUTIONAL INFRASTRUCTURE 56,490,000

III. CORE INDUSTRIAL SUBSECTORS

A. Agro- and agro-based industries

Food-processing

26.	<u>Technology development: pilot plant production, extension and promotion of improved Cassava-based, traditional fermented foods</u>	1,200,000
27.	<u>Pilot plant for extrusion cooking (thermoplastic extrusion) of food</u>	525,000

28.	<u>Development of the coconut processing industry</u>	600,000
29.	<u>Pilot plant for dry-salted fish</u>	1,290,000
30.	<u>Managing and programming integrated development of the fish processing industry</u>	600,000
31.	<u>Development of the meat processing industry</u>	720,000
	Sub-total	4,935,000

Textiles

32.	<u>Promotion of the textile industry</u>	1,000,000
33.	<u>Pilot project: establishment of small garment manufacturing units</u>	1,100,000
34.	<u>Establishment of national textile quality control centres</u>	3,200,000
35.	<u>Assistance in the establishment of textile training centres</u>	1,600,000
	Sub-total	6,900,000

Forest-based industries products

36.	<u>Assistance in the rehabilitation of the paper industry</u>	3,300,000
37.	<u>Establishment of a service centre for the furniture and joinery industry</u>	2,000,000
	Sub-total	5,300,000

Leather products

38.	<u>Leather industry development</u>	2,360,000
39.	<u>Promotion of the leather industry</u>	2,000,000
40.	<u>Rehabilitation of tannery and footwear factories</u>	3,000,000
	Sub-total	7,360,000

Projects identified at the subregional meetings on the promotion of intra-African industrial co-operation within the framework of the DecadeFood-processing

Integrated complex for poultry production, Liberia	100,000
Food-processing plant, Guinea	100,000

Fruit-processing plant, Guinea	100,000
Rehabilitation and extension of the sugar industry, Angola	200,000
Upgrading of a sugar factory, the Congo	100,000
Establishment of a distillery, Burundi	100,000
Development of integrated meat processing and allied industries in Western and Central Africa	750,000
Integrated development of the fish- and other seafood-processing industry, Central Africa, West, Eastern and Southern Africa	2,000,000
Establishment of an agro-industrial complex processing cassava, Central African Republic	150,000
Establishment of sugar mills, the Sudan	250,000
Promotion of the food-processing industry, Northern Africa	<u>500,000</u>
Sub-total	<u>4,350,000</u>
<u>Textiles</u>	
Establishment of a spinning mill, North Africa	150,000
Expansion of a kenaf sack production plant, the Sudan	150,000
Establishment of a knitwear factory, North Africa	150,000
Establishment of a garment factory, North Africa	150,000
Development of the cotton textile industry, West Africa	<u>500,000</u>
Sub-total	<u>1,100,000</u>
<u>Forest-based products</u>	
Establishment of a pulp and paper board factory, the Ivory Coast	500,000
Establishment of a wood-processing complex, Central Africa	500,000
Establishment of a paper factory, the Sudan	<u>250,000</u>
Sub-total	<u>1,250,000</u>
<u>Leather products</u>	
Establishment of a footwear production plant, North Africa	150,000
Subregional development centre for hides, skins, leather and leather products (Leather Research Institute, Zaria, Nigeria)	1,200,000
Upgrading of the Tunisian National Centre for Leather and Footwear into a subregional centre	<u>1,000,000</u>
Sub-total	<u>2,350,000</u>
Sub-total (A)	<u>33,545,000</u>

## B. Building materials

41. <u>Assistance to the cement industry</u>	950,000
42. <u>Mobile plant for brick production</u>	1,200,000
43. <u>Promotion of local manufacture of building materials</u>	4,000,000
44. <u>South-East African centre for development of clay-based industries</u>	<u>600,000</u>
Sub-total	<u>6,750,000</u>

Projects identified at the subregional meetings on the promotion of intra-African industrial co-operation within the framework of the Decade

Cement

Mauritian Cement Corporation	100,000
Establishment of a subregional cement factory in the Liptako-Gourma region	250,000
Expansion of the Loutete cement plant, the Congo	100,000
Expansion of the Mashyuza cement plant, Rwanda	100,000
Reactivation of the Katana cement plant, Zaire	150,000
Establishment of the Port Sudan cement factory, the Sudan	150,000
Establishment of a plant to produce white cement, Tunisia	100,000
Utilization of steel plant waste for the production of slag-cement, Eastern and Southern Africa	150,000
The improvement of the cement industry, Eastern and Southern Africa	<u>500,000</u>
Sub-total	<u>1,600,000</u>

Ceramics and tiles

Establishment of a ceramics factory, Togo	50,000
Manufacture of marble tiling, the Sudan	<u>150,000</u>
Sub-total	<u>200,000</u>

Sub-total (B) 8,550,000

## C. Metallurgical industry

45. <u>Master plan for the development of mineral and metallurgical industries including the ferro-manganese and the sponge iron steel industry based on domestic resources of iron ore and natural gas/oil</u>	850,000
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46.	<u>Development of a master plan for the establishment of metal processing and production development units (MPPDU)</u>	4,000,000
47.	<u>Establishment of subregional welding centres</u>	1,640,000
	Sub-total	6,490,000

Projects identified at the subregional meetings on the promotion of intra-African industrial co-operation within the framework of the Decade

Metallurgical industry

Upgrading and diversification of products from ZISCOSTEEL, Zimbabwe	250,000
Expansion of iron and steel mill, Uganda	250,000
Integrated iron and steel mill, Kenya	250,000
Establishment of a sponge iron plant, West Africa	300,000
Installation of electric arc furnace plants, West Africa	300,000
Installation and expansion of re-rolling mills, West Africa	250,000
Establishment of an integrated iron and steel plant for flat and tubular products, West Africa	250,000
Establishment of foundries, West Africa	500,000
Rehabilitation of the Maluku steel plant, Zaire	250,000
Integrated development of the aluminium industry, Cameroon	250,000
Expansion of a tin plant, Rwanda	150,000

Sub-total 3,000,000

Sub-total (C) 9,490,000

D. Chemical industries

Basic Chemicals

48.	<u>Women's assistance programmes for salt production</u>	1,480,000
49.	<u>Subregional salt and marine chemical institute for SADCC member countries</u>	1,100,000
	Sub-total	2,580,000

Fertilizers

50.	<u>Development of fertilizer production in Africa: application of mini fertilizer plants</u>	540,000
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51. <u>Pilot plant for the production of compost from municipal solid waste</u>	2,100,000
Sub-total	2,640,000

Pharmaceuticals

52. <u>Local production of essential drugs</u>	2,760,000
53. <u>Assistance in the utilization of medicinal and aromatic plants for the industrial production of pharmaceuticals</u>	4,350,000
54. <u>Filling, packaging and quality control of vaccines</u>	2,775,000
55. <u>Production of oral rehydration salts (ORS)</u>	1,880,000
Sub-total	11,765,000

Petrochemicals

56. <u>Recycling waste oil</u>	2,800,000
57. <u>Establishment of a synthetic fibre research and development centre at Kaduna Polytechnic</u>	2,350,000
58. <u>Regional centre for Africa in plastics in agriculture and water management</u>	1,100,000
Sub-total	6,250,000

Non-metallic mineral products

59. <u>Establishment of a ceramic pilot plant for the demonstration of the manufacture of electrical household appliances</u>	1,710,000
Sub-total	1,710,000

Projects identified at the subregional meetings on the promotion of intra-African industrial co-operation within the framework of the Decade

Basic chemicals

Production of caustic soda, Kenya	100,000
Establishment of salt/soda production, Mano River Union	100,000
Establishment of a lithopone production plant, Tunisia	150,000
Sub-total	350,000

Fertilizers

Potash project, Ethiopia	100,000
Multinational ammonia/urea project, Tanzania	150,000
Phosphate fertilizer plant, Uganda	100,000
Phosphate fertilizer plant, Zimbabwe	150,000
Establishment of a phosphoric acid plant, Togo	150,000
Subregional ammonia project, West Africa	250,000
Establishment of a phosphate fertilizer plant, West Africa	250,000
Production of ammonia fertilizers, Central Africa	<u>150,000</u>
Sub-total	<u>1,300,000</u>

Pharmaceuticals

Establishment of a pharmaceutical plant, Sierra Leone	100,000
Establishment of a pharmaceutical plant, Nigeria	250,000
Rehabilitation and extension of the Sereddu station, Guinea	50,000
Establishment of a laboratory for pharmaceutical products, Central African Republic	150,000
Pharmaceutical industry development centre, ECOWAS, West Africa	2,500,000
Assistance to the Burundi Regional Pharmaceutical Laboratory	<u>1,000,000</u>
Sub-total	<u>4,050,000</u>

Pesticides

Plant for phytosanitary products, Upper Volta	150,000
Development of the production of active ingredients for pesticides and insecticides, Central Africa	<u>250,000</u>
Sub-total	<u>400,000</u>

Petrochemicals

Establishment of a petrochemical complex for the manufacture of plastic products, Gabon	250,000
Expansion of a petroleum refinery, the Congo	<u>200,000</u>
Sub-total	<u>450,000</u>

Other chemicals

Upgrading potash deposits for the manufacture of chemicals, the Congo,	200,000
Production of calcium carbide, Rwanda	200,000
Establishment of a methanol production plant, Zaire	300,000
Pilot project for the production of alcohol, Rwanda	<u>500,000</u>
Sub-total	<u>1,200,000</u>

Non-metallic mineral products

Sheet glass production, Madagascar	150,000
Manufacture of glass containers, West Africa	250,000

Manufacture of glass containers, Liberia	100,000
Expansion and diversification of production at a glass manufacturing plant, the Congo	200,000
Establishment of a sheet glass production unit, the Sudan	<u>150,000</u>
Sub-total	850,000
Sub-total (D)	<u>33,545,000</u>

## E. Engineering industry

Agricultural machinery, equipment and implements

60. <u>Strengthening repair and maintenance capacities for the pool of tractors and other heavy mobile agricultural equipment</u>	2,170,000
61. <u>Assistance in establishment of a subregional network for agricultural tools, implements and machinery</u>	460,000
62. <u>Assistance in agricultural modernization</u>	<u>4,000,000</u>
Sub-total	6,630,000

Road and rail transport equipment

63. <u>Promotion of local manufacture of spare parts components for motor vehicles, engines, motorcycles, tractors and trucks</u>	<u>630,000</u>
Sub-total	<u>630,000</u>

Energy equipment

64. <u>Pilot manufacture and rural demonstration of improved clay-metallic, wood/charcoal burning cooking stoves</u>	1,000,000
65. <u>Pilot plant for the demonstration of water desalination through the use of solar energy</u>	1,070,000
66. <u>Manufacturing of equipment for mini hydro-power plants in Africa</u>	<u>2,500,000</u>
Sub-total	<u>4,570,000</u>

Machine tools and allied machinery

67. <u>Promotion of the capital goods industry in Africa</u>	750,000
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68. <u>Strengthening of African institutions dealing with engineering, design and manufacturing</u>	3,000,000
Sub-total	3,750,000

Projects identified at the subregional meetings on the promotion of intra-African industrial co-operation within the framework of the Decade

<u>Agricultural machinery and equipment</u>	
Manufacture of agricultural machinery (four-wheel tractors), Zimbabwe	150,000
Manufacture of pumps and irrigation equipment, Zambia	150,000
Manufacture of four-wheeled tractors, Senegal and Nigeria	250,000
Manufacture of agricultural tools and implements, Sierra Leone	100,000
Manufacture of diesel-engines for irrigation pumps and generators, Guinea	100,000
Manufacture of agricultural implements and equipment, Nigeria	250,000
Production of mobile mini palm-oil mills, Mano River Union	250,000
Manufacture of agricultural machinery and equipment, Rwanda	100,000
Establishment of tractor assembly plants, Egypt and the Sudan	250,000
Manufacture of pumps for irrigation purposes, North Africa	150,000
Sub-total	1,750,000

<u>Road and rail transport equipment</u>	
Manufacture of diesel engine-mounted chassis for lorries, trucks and buses, Ethiopia, Mozambique and Tanzania	250,000
Manufacture of diesel engines for tractors, trucks, lorries and buses, Zimbabwe or Kenya	300,000
Manufacture of low-cost, standard multipurpose vehicles, Botswana, Madagascar, Mozambique, Uganda and Zambia	150,000
Manufacture of railway wagons, Senegal and Upper Volta	250,000
Manufacture of diesel engines for tractors, trucks, lorries and buses, Nigeria	250,000
Manufacture of diesel engine-mounted chassis for lorries, trucks and buses, Nigeria	250,000
Manufacture of low-cost, standard multipurpose vehicles, Guinea and the Ivory Coast	250,000
Establishment of a central press workshop, Nigeria	150,000
Manufacture of diesel engines for tractors, trucks, lorries and buses, North Africa	150,000
Establishment of a diesel engine manufacturing plant, Tunisia	200,000

Feasibility study on the manufacture of railway equipment in the Central African subregion	250,000
Manufacture of rolling stock for passengers and freight, North Africa	150,000
Regional forge for the production of wheels and axles, North Africa	<u>200,000</u>

Sub-total 2,800,000

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Energy equipment

Re-rolling mills for sections and bars for high-tension electricity transmission, Eastern and Southern Africa	250,000
Copper fabrication plant, Zambia	150,000
Manufacture of transformers, Zambia	150,000
Manufacture of aluminium conductors and cables, Ghana and Guinea	200,000
Manufacture of power transformers, Togo	150,000
Manufacture of steel towers, Nigeria	200,000
Manufacture of hurricane lamps, Senegal	100,000
Assistance to CEPGL countries in the manufacture of electrical equipment	250,000
Establishment of a compressor plant, North Africa	<u>200,000</u>

Sub-total 1,650,000

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Precision engineering

Manufacture of watches and watch components, Central African Republic	<u>150,000</u>
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Sub-total 150,000

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Machine tools and allied machinery

Manufacture of lathes and milling machines, Morocco	50,000
Manufacture of woodworking machinery, Tunisia	50,000
Assistance to ARCEDEM, Eastern and Southern, Central, Northern and Western Africa	<u>1,500,000</u>

Sub-total 1,600,000

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Sub-total (E) 23,530,000

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TOTAL FOR CORE INDUSTRIAL SUBSECTORS 108,660,000

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IV. MAJOR FACTOR INPUTS AND RELATED AREAS

A. Development of human resources

69. <u>Development of training programmes for policy-makers and entrepreneurs in the negotiation and acquisition of technology in the African region</u>	1,200,000
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70.	<u>Regional centre for the provision of training and refresher courses for national accountants and for the promotion of small- and medium-scale industrial enterprises</u>	960,000
71.	<u>Mobile training teams for female managers in the small- and medium-scale industrial sectors</u>	270,000
72.	<u>Training workshops in industrial project preparation, evaluation, financing and implementation</u> (All African countries, with preference for least developed countries)	1,750,000
	Sub-total	4,180,000

Projects identified at the subregional meetings on the promotion of intra-African industrial co-operation within the framework of the Decade

	Assistance to AIHTTR, Eastern and Southern Africa	1,000,000
	Inventory of regional training facilities, Eastern and Southern, Central, Western and Northern Africa	500,000
	Managerial and technical personnel training, Eastern and Southern, Central, Western and Northern Africa	1,500,000
	Development of industrial consultancy and management capabilities, Eastern and Southern, Western, Central and Northern Africa	1,000,000
	Development of local industrial entrepreneurship (Directory of small-scale industrial project profiles), Eastern and Southern, Western, Central and Northern Africa	250,000
	Assistance in the development of an industrial training programmes for Eastern and Southern, Western, Central and Northern Africa	750,000
	Sub-total	5,000,000

Sub-total (A) 9,180,000

B. Strengthening of scientific and technological capabilities

73.	<u>Development of a technology support programme for the Decade</u>	550,000
74.	<u>Preparation of guidelines for the negotiation and acquisition of technology in the priority sectors identified in the Lagos Plan of Action and the Programme for the Industrial Development Decade for Africa</u>	1,200,000

75.	<u>Technological advisory services during preparation and negotiation of technology transfer contracts in the priority sectors identified in the Lagos Plan of Action and the Programme for the Industrial Development Decade for Africa</u>	1,800,000
76.	<u>Assistance in industrial and technological information</u>	630,000
77.	<u>Assistance in the establishment of National Technology Offices in Africa</u>	600,000
78.	<u>Promotion of software development and circuit design in African countries</u>	910,000
79.	<u>Promotion of the micro-electronics industry in Africa</u>	300,000
80.	<u>African regional network of solar research institutes</u>	1,630,000
81.	<u>African regional network for biomass technologies</u>	1,120,000
	Sub-total	8,740,000

Projects identified at the subregional meetings on the promotion of intra-African industrial co-operation within the framework of the Decade

Transformation of Serere Research Station into a subregional R + D centre for the processing of cereals and rootcrops, Uganda	1,500,000
Establishment of a Mano River Union Technology Centre	1,000,000
Assistance to the African Intellectual Property Organization (AIPO)	1,500,000
Assistance to ARCT, Eastern and Southern, Central, Western and Northern Africa	2,400,000
Establishment of an industrial and technology fair serving the member states of the Mano River Union	250,000
African Regional Centres for Genetic Engineering and Biotechnology, All African countries	1,000,000
Sub-total	7,650,000
Sub-total (B)	16,390,000

## C. Mobilization of financial resources

82. <u>Assistance in the mobilization of financial resources for the development of specific priority industrial branches in Africa within the framework of the Decade</u>	1,000,000
83. <u>Advisory/consultancy services for carrying out pre-feasibility and feasibility studies on the establishment of new industries as well as rehabilitation of existing industries</u>	1,600,000
84. <u>Establishment of a regional industrial advisory service to African development banks</u>	3,000,000
85. <u>Organization and follow-up of investment promotion and solidarity meetings</u>	2,000,000
Sub-total (C)	<u>7,500,000</u>

## D. Energy

86. <u>Promotion of intra-African co-operation in mini hydro-power generation</u>	1,110,000
87. <u>Pilot experimental briquetting station</u>	1,000,000
88. <u>Biofuels demonstration programme</u>	2,000,000
89. <u>Industrial energy management and conservation</u>	<u>750,000</u>
Sub-total	<u>4,860,000</u>

Projects identified at the subregional meetings on the promotion of intra-African industrial co-operation within the framework of the Decade

<u>Development of peat resources (Burundi, Rwanda, Zaire)</u>	<u>2,100,000</u>
Sub-total	<u>2,100,000</u>

Sub-total (D) 6,960,000

## E. Packaging

90. <u>Promotion of the establishment of a packaging information and pilot demonstration plant in Africa</u>	<u>4,000,000</u>
Sub-total (E)	<u>4,000,000</u>

TOTAL FOR MAJOR FACTOR INPUTS  
AND RELATED AREAS

44,130,000



SUMMARY**INDUSTRIALIZATION POLICIES, STRATEGIES, PLANNING  
AND INSTITUTIONAL INFRASTRUCTURE**

A. Industrial strategies and policies	14,800,000
B. Industrial studies and surveys	2,200,000
C. Industrial planning	8,100,000
D. Small- and medium-scale industry and rural development	6,140,000
E. Interregional and subregional co-operation	1,400,000
F. Promotion of the Decade	2,000,000
G. Institutional infrastructure	21,850,000

Sub-total	56,490,000
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**CORE INDUSTRIAL SUBSECTORS**

A. Agro- and Agro-based industries	33,545,000
B. Building materials	8,550,000
C. Metallurgical industry	9,490,000
D. Chemical industries	33,545,000
E. Engineering industry	23,530,000

Sub-total	108,660,000
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**MAJOR FACTOR INPUTS AND RELATED AREAS**

A. Development of human resources	9,180,000
B. Strengthening of scientific and technological capabilities	16,390,000
C. Mobilization of financial resources	7,600,000
D. Energy	6,960,000
E. Packaging	4,000,000

Sub-total	44.130,000
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<b>GRAND TOTAL</b>	<b><u>209,280,000</u></b>
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