OCCASION

This publication has been made available to the public on the occasion of the 50th anniversary of the United Nations Industrial Development Organisation.

DISCLAIMER

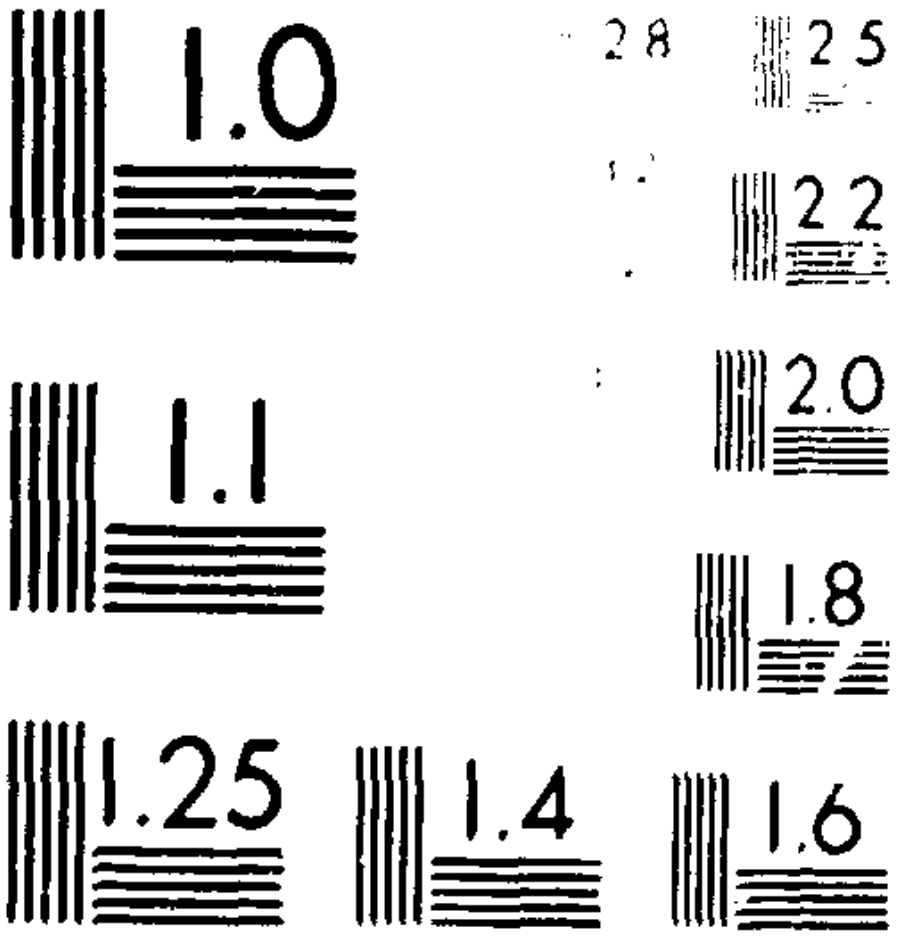
FAIR USE POLICY

CONTACT

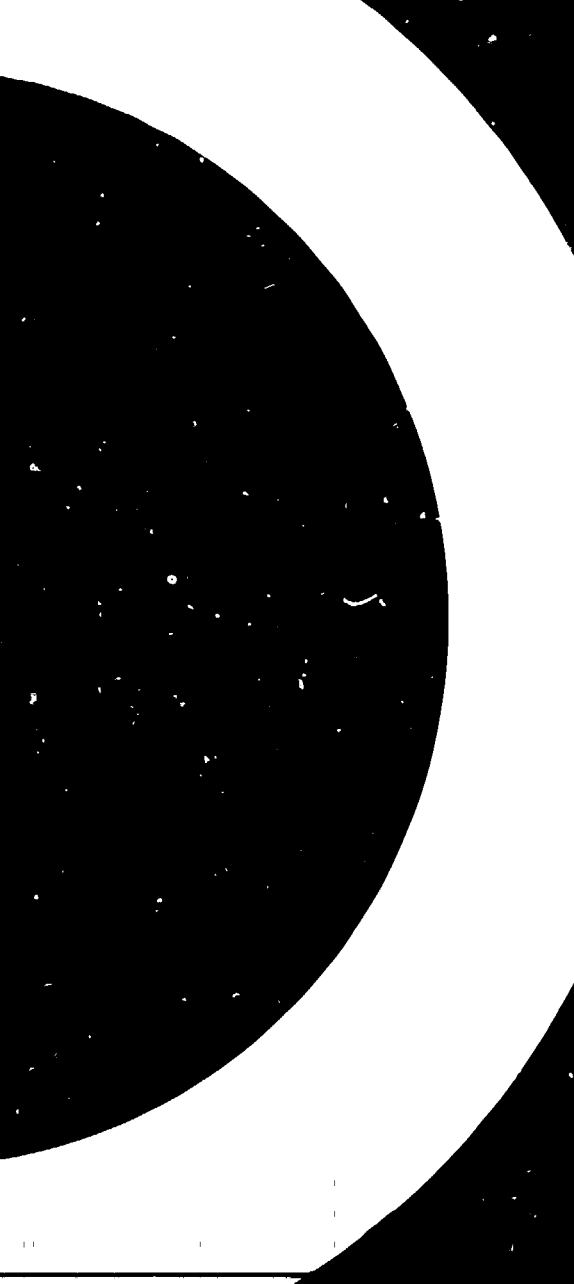
Please contact publications@unido.org for further information concerning UNIDO publications.

For more information about UNIDO, please visit us at www.unido.org

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna International Centre, P.O. Box 300, 1400 Vienna, Austria
Tel: (+43-1) 26026-0 · www.unido.org · unido@unido.org


2.8
2.5
2.2
2.0
1.8
1.6
1.4
1.25
1.1
1.0

A PROGRAMME FOR THE INDUSTRIAL DEVELOPMENT DECADE FOR AFRICA



UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna

A PROGRAMME FOR THE INDUSTRIAL DEVELOPMENT DECADE FOR AFRICA

A framework for the formulation and implementation of programmes at the national, subregional, regional and international levels

Prepared jointly by
the Economic Commission for Africa
the Organization of African Unity
and the United Nations Industrial Development Organization

UNITED NATIONS
New York, 1982

ID/287

EXPLANATORY NOTES

A full stop (.) is used to indicate decimals.

A comma ( ) is used to distinguish thousands and millions.

A slash (/) is used to indicate "per", for example t/a = tonnes per annum.

A slash between dates (for example, 1979/80) indicates an academic, crop or fiscal year.

A dash between dates (for example, 1970-1979) indicates the full period, including the beginning and end years.

References to dollars ($) are to United States dollars.

The following notes apply to tables:

Three dots (. . .) indicate that data are not available or are not separately reported.

A dash (—) indicates that the amount is nil or negligible.

A blank indicates that the item is not applicable.

Totals may not add precisely because of rounding.

In addition to the common abbreviations, symbols and terms and those accepted by the International System of Units (SI), the following have been used:

Organizations and economic terms

AACB	Association of African Central Banks
AATPO	Association of African Trade Promotion Organizations
ABEDA	Arab Bank for Economic Development in Africa
ACM	African Centre for Monetary Studies
ADB	African Development Bank
AFRO	African Regional Organization
AIDF	African Industrial Development Fund
AIHTTR	African Institute for Higher Technical Training and Research
AIPO	African Intellectual Property Organization
APICORP	Arab Petroleum Investment Corporation
ARCEDEM	African Regional Centre for Engineering Design and Manufacturing
ARCT	African Regional Centre for Technology
ARSO	African Regional Organization for Standardization
BADFA	Banque arabe pour le développement économique de l'Afrique (Arab Bank for Economic Development in Africa)
BHC	benzene hexachloride
DDT	dichlorodiphenyltrichloroethane
ECA	Economic Commission for Africa
ECOWAS	Economic Community for West African States
ECWA	Economic Commission for Western Asia
ESARIPO	Industrial Property Organization for English-speaking Africa
FAO	Food and Agriculture Organization of the United Nations
f.o.b.	free on board
GNP	gross national product
IBID	International Bank for Industrial Development
IDEP	Institute for Economic Development and Planning
ILO	International Labour Organisation
INTIB	Industrial and Technological Information Bank
ITC	International Trade Centre
MULPOCs	Multinational Programming and Operational Centres
OAU	Organization of African Unity
PADIS	Pan African Documentation and Information System

PVC	polyvinyl chloride
R and D	research and development
TCDC	technical co-operation among developing countries
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNIDO	United Nations Industrial Development Organization
WACH	West African Clearing House
WHO	World Health Organization

CONTENTS

Foreword

The standard of living in Africa today is the lowest in the world, so much so that the vast majority of the people in the region lead a meagre existence. Their chances of a better future are endangered by the increasingly unsettled international situation and a persistent world economic crisis. Africa is also threatened by a food and energy crisis, the impact of which is aggravated by poor economic management: this, in turn, worsens the region's external debt burden and balance of payments problems. The overall external dependence on development factor input and other goods and services thus contributes to the arrest of progress and the continuing deterioration of living standards in the region.

Under the present circumstances, a major feature which emerges clearly from the Lagos Plan of Action* is the importance of industrial development as a driving force for economic growth and overall development. As such, the effective implementation of the Lagos Plan of Action will, to a large extent, hinge on industry, both as a supplier of essential inputs to the industrial and other sectors and as a user or processor of the outputs of those sectors. The commitment of the Organization of African Unity (OAU) Heads of State and Government in the Lagos Plan of Action to accord a major role to industry reaffirms their determination to change the economic structure of Africa and bring about a better life for its people.

In order to accelerate the achievement of these objectives, the Lagos Economic Summit adopted the years 1980-1990 as the Industrial Development Decade for Africa. At its thirty-fifth session the General Assembly reinforced the decision by adopting resolution 35/66B (see annex I) which proclaimed the 1980s as the Industrial Development Decade for Africa. The essence of any programme for the implementation of the Decade lies in the fact that the stimulation of the economic growth of Africa must come, first and foremost, from within, thereby initiating a process of internally generated, self-sustaining growth through an integrated development strategy which links industry with agriculture, energy, human and physical infrastructure, trade and other sectors.

In full awareness of the complexity of this task and of the difficulty of the hurdles to be overcome, Africa must meet the challenge with determination and exploit to the full its tremendous natural and human resources. To take any other course of action would result in further weakening and impoverishing Africa for future generations.

The proposals presented in the text provide only a common framework for guiding the African countries, individually and collectively, in formulating

---

*References to "Lagos Plan of Action for the Economic Development of Africa 1980-2000" are to the 1981 edition published on behalf of the Organization of African Unity by the International Institute for Labour Studies, Geneva, Switzerland.

programmes for the Decade within the overall context of their own national development plans.

The key to the success of the Decade will depend, in the final analysis, on developments at the country level, since the main responsibility for the implementation of the Decade programme lies with the countries themselves, individually and collectively. Such self-reliance will only come about by determined action. As the Decade programme entails a massive injection of financial and technical resources, beyond the present ability of the African States, substantial assistance will certainly be needed from the international community, including the developing countries, as well as the international organizations which are prepared to increase their efforts to bring about a new international economic order.

In adopting the proposals contained in this document, the Sixth Conference of African Ministers of Industry specified priority actions to be undertaken for the effective implementation of the Decade programme. During the preparatory phase in particular (1982-1984), every Government is to undertake an urgent assessment of national capabilities and formulate new measures and mechanisms for the implementation of the programme at the national, subregional and regional levels. In this connection, machinery for economic co-operation, at present dominated by administrative types of functions, should be reviewed and balanced by instruments for procurement, production, research and development, marketing etc. The main protagonists in this task should include not only Governments as such, but also—and more especially—entrepreneurs in the public and the private sectors, drawn from such bodies as state enterprises, indigenous private business communities, development corporations and banks, universities and multinational development agencies.

This calls for an approach to industrial planning that differs in many respects from the past. In particular, it represents a shift from an excessive preoccupation with foreign exchange problems, which are external to the region, to the development of institutional mechanisms and capabilities for assessing each country's natural resource and raw material endowment and enlarging the range of complementarities along the lines suggested in the Lagos Plan of Action. On this basis, each country should adopt a strategy focused on and limited to a set of core industries appropriate to its resources and raw materials at the national level, while reserving other industries for multinational co-operation. If carefully planned, such a strategy should lead to a selected interlinked and mutually reinforcing system of production, capable of exerting an impact on other areas and sectors as the core expands.

For our part, we pledge that the three secretariats shall continue to work in close co-operation and provide, to the best of their ability and whenever requested, assistance to African Governments and institutions in the successful realization of the Decade objectives.

ADEBAYO ADEDEJI
Executive Secretary of ECA

EDEM KODJO
Secretary-General of OAU

ABD-EL RAHMAN KHANE
Executive Director of UNIDO

Introduction

1. Realization of the need to bring about a major change in the socio-economic development of Africa and recognition of the role of industry in that process of change were reflected in a document prepared by the Economic Commission for Africa in 1975 entitled "Revised framework of principles for the implementation of the new international economic order in Africa".[1] The basic strategy developed in that document was endorsed by the OAU Assembly of Heads of State and Government in Libreville in June 1977, while other inputs were derived from a joint OAU/ECA colloquium on perspectives of development and economic growth in Africa up to the year 2000 and a joint ECA/UNEP seminar on alternative patterns of development and life-styles for the African region.

2. The findings of both meetings were considered, together with other inputs, by the Fifth Conference of Ministers of the Economic Commission for Africa at their fifth meeting held at Rabat, Morocco, 20-28 March 1979, which went on to adopt resolution 332(XIV) on a strategy for the African region in the International Development Strategy for the Third United Nations Development Decade. It was at that meeting that a call was made by the UNIDO delegate, in his general statement, for the declaration of the period 1980-1990 as the Industrial Development Decade for Africa. This call was strongly supported by the delegates of Egypt, Equatorial Guinea, Ghana, Kenya, Morocco and Sierra Leone in their statements, as a result of which the concept of the Decade was included in the strategy for the African region in the Third United Nations Development Decade. The strategy was accompanied by a draft declaration of commitment on guidelines and measures for national and collective self-reliance in social and economic development for the establishment of a new international economic order.

3. The strategy was approved by the OAU Assembly of Heads of State and Government, at its thirty-third ordinary session, in the form of the Monrovia Declaration, and it is now officially known as the Monrovia Strategy for the Development of Africa. Among the proposals it contained was the recommendation that the period 1980-1989 be declared as the African Industrial Development Decade "for the purpose of focusing greater attention and evoking greater political commitment and financial and technical support, at the national, regional and international levels for the industrialization of Africa". When adopting the Monrovia Declaration, the OAU Heads of State and Government also decided to convene an extraordinary session devoted to African economic development matters at Lagos, Nigeria, in April 1980.

[1] E/CN.14/ECO/90/Rev.3.

4. The concept of an Industrial Development Decade for Africa enjoyed growing popularity. At a joint ECA, OAU and UNIDO regional symposium, held at Nairobi in September 1979, to discuss policies and strategies for indigenous and autonomous industrial development in Africa during the period 1978-2000, it was decided that as Africa was the least developed region in the third world, the years 1980-1990 should be named the African Industrial Development Decade, so that national, regional and international resources might be mobilized, co-ordinated and efficiently channelled to African countries to support their efforts to attain autonomous and self-sufficient industrialization by the year 2000.

5. One month later at the Fifth Conference of African Industry a resolution was adopted on the African common position on UNIDO III, in which a call was also made for the African Industrial Development Decade to be declared in the period 1980-1990. In December 1979, a Ministerial Meeting of the Group of 77 was held at Havana, Cuba, in preparation for the Third General Conference of UNIDO, and it likewise called for the adoption of an Industrial Development Decade for Africa during the 1980s.

6. Given these developments, the Third General Conference of UNIDO, which met at New Delhi, India, January-February 1980, adopted a resolution on the Industrial Development Decade for Africa at its 21st plenary meeting on 9 February 1980 (ID/CONF.4/Res.2). In that resolution it was, *inter alia*, recommended to the General Assembly to proclaim the 1980s as the Industrial Development Decade for Africa with the purpose of focusing greater attention and mobilizing greater political commitment and financial and technical support, at the national, regional and international levels for the industrialization of Africa, while the Executive Director of the United Nations Industrial Development Organization (UNIDO) and the Executive Secretary of the Economic Commission for Africa (ECA) were requested to co-operate with the Secretary-General of the Organization of African Unity (OAU), to work out a programme of action for the Decade.

7. At the same time, the question of the translation of the International Development Strategy for the Third United Nations Development Decade into operational terms at the national, subregional and regional levels was the main item on the agenda at the Sixth Conference of Ministers of the Economic Commission for Africa, which took place at Addis Ababa in April 1980. The reports and recommendations of the sectoral ministerial conferences, including that of the Ministers of Industry, were considered at this meeting which adopted a Plan of Action for the Implementation of the Monrovia Strategy for the Economic Development of Africa. This was subsequently submitted to the Assembly of Heads of State and Government of OAU at its second extraordinary session in April that year, and adopted by the Assembly as the Lagos Plan of Action for implementing the Monrovia Strategy for the Economic, Social and Cultural Development of Africa. In paragraph 58 of the Lagos Plan of Action, the Heads of State and Government reiterated their support for the resolution adopted at the Third General Conference of UNIDO and expressed their determination to make the Decade successful.

8. At its fourteenth session, the Industrial Development Board of UNIDO, which met at Vienna in May 1980, also took up the question of the African Industrial Development Decade as part of the follow-up to the New Delhi Meeting. At its 281st plenary meeting on 19 May 1980, the board adopted resolution 51(XIV) on the Industrial Development Decade for Africa. At its second regular session in July 1980, the Economic and Social Council likewise took up this matter and adopted resolution 1980/61 on industrial development co-operation, in which it welcomed the Industrial Development Board resolution 51(XIV) on the Decade, and at the 83rd plenary meeting of its thirty-fifth session the United Nations General Assembly adopted resolution 35/66B which proclaimed the 1980s as the Industrial Development Decade for Africa.

9. In that resolution, the General Assembly called upon UNIDO, ECA and OAU, to formulate proposals to implement the programme for the Industrial Development Decade for Africa and to monitor its progress. A committee was set up by the three secretariats to co-ordinate activities relating to the implementation of joint programmes and projects, and its first task was to prepare proposals for the formulation and implementation of a programme of action for the Decade along the lines set out in the chapter devoted to industry in the Lagos Plan of Action.

10. After a joint meeting in March 1981 at Vienna, at which an agreement was reached on the fundamental principles contained in the Lagos Plan of Action and on its translation into an operational programme, work proceeded on the preparation of proposals for the formulation and implementation of a programme for the Decade. The proposals as presented to an Intergovernmental Meeting of Experts on the Programme of the Industrial Development Decade for Africa and to the Sixth Conference of African Ministers of Industry, held in October and November 1981 respectively, comprised four major working papers entitled: "Framework for the preparation and implementation of the programme"; "Guidelines for the formulation of strategies for major industrial subsectors and areas"; "Monitoring and reporting on the implementation of the programme for the Industrial Development Decade for Africa"; and "Modalities for the implementation of the programme". The four papers constitute the major chapters of this document and they have been duly amended to reflect the findings of the meetings, both of which adopted the proposals put forward in the documents.

11. At the Sixth Conference of African Ministers of Industry, the following conclusions were adopted in respect of the four papers submitted to the Conference.[2]

Framework for the preparation and implementation of the programme (1980-1990)

12. The Conference concluded that there should be two phases for the implementation of the Decade: the preparatory phase lasting from 1982 to about 1984 and an implementation phase covering the period 1985-1989.

[2] E/ECA/CM.8/2, part 2, paras. 5-24.

During the preparatory phase important aspects would include the elaboration of the Decade programme and its popularization not only at the level of the Government, but also throughout the entire community. Action to be taken at the national, subregional, regional, inter-regional and international levels:

Action at the national level

13. At the national level the Conference concluded that:

(a) Countries should undertake the preparation of an investment portfolio of identified core projects so as to facilitate the implementation of the Decade programme. While the identification of projects would largely be at the national level, there would also be a need to concurrently identify industrial projects requiring co-operation at the subregional and regional levels with a view to reaching speedy decisions on intra-African co-operation in projects whose implementation would require co-operation at the subregional and regional levels;

(b) Equal attention be given to the physical infrastructure, institutional mechanisms, environmental considerations, technology and, above all, the manpower requirement for the implementation of the industrial programmes and plans;

(c) Action should be taken in the area of science and technology, the development of industrial and technological manpower, especially at various skill levels in good time so as to prepare the skills, labour force capable of planning, implementation and operation of industrial projects;

(d) An energy development programme should be an integral part, taking into account the need for skilled manpower, management and the development of the requisite industrial infrastructure and technology;

(e) A technology programme should be developed to include research and development, standardization and quality control, engineering design and technology adaptation, and strengthening of negotiating capabilities for the acquisition of foreign technology;

(f) A detailed assessment of the financial requirements should be undertaken as well as appropriate approaches be adopted for the mobilization of domestic and external financial resources in order to implement the Decade programme, especially the investment projects to be identified. Where facilities for doing so do not already exist, efforts should be made to establish such facilities, especially national industrial development banks;

(g) International co-operation should be promoted to include, in particular, technical assistance from the ECA, UNDP and UNIDO as well as all other international organizations and greater financial assistance from international financial institutions to the industrial sector in Africa;

(h) Special efforts should be made to develop and utilize local inputs for local industries as it will contribute to the creation of sectoral linkages;

(i) African countries who have not yet signed the new constitution of UNIDO as a United Nations specialized agency should endeavour to do so as

soon as possible so as to enable it to become a more effective organization for mobilizing more funds and for assisting the developing countries in general and the African countries in particular in the implementation of their industrial development programmes;

(j) All African countries should endeavour to develop their capabilities for standardizing and improving the quality of their products. In this connection African countries should endeavour to become members of the African Regional Organization for Standardization (ARSO) located at Nairobi, Kenya, by the end of 1982, as stipulated in the Lagos Plan of Action;

(k) In view of the valuable contribution which industrial entrepreneurship can make to self-reliant and self-sustaining development, efforts should be made in each country to appraise indigenous industrial entrepreneurial resources in both public and private sectors for implementing the Decade programme; to establish effective communication with industrial entrepreneurs; and to design and set up appropriate incentives, support institutions and services for developing critical industrial entrepreneurial capabilities, capacities and activities.

Action at the subregional and regional levels

14. The Conference concluded that:

(a) Industrial policies and programmes should be prepared within strategic industrial subsectors and areas at the subregional and regional levels for the purpose of promoting industrial complementarity based on specific resources endowment of each African country as well as joint and/or cross participation to optimize limited investment resources and to enlarge the markets;

(b) In support of the recommendation of the seminar for "African Businessmen on the Development of Industrial Entrepreneurship in Africa" which was convened by the ECA from 9 to 14 November 1981 at Addis Ababa, the ECA, ILO, ITC, OAU, UNDP, UNIDO and the relevant international organizations and member States are called upon to give the necessary support to the Bureau of the interim group established by the seminar to facilitate the formation of Regional Associations for African Manufacturers and Businessmen;

(c) An information system should be set up which will promote the exchange of industrial and technological information among African countries with a view to enabling them to strengthen their bargaining positions and secure better terms for acquiring appropriate technology at reasonable cost;

(d) This should be followed by the identification of multinational industrial projects of interest to the countries within the subregion or region, leading to the promotion and creation of African Multinational Industrial Corporations between two or more countries;

(e) Regional and subregional institutions should be strengthened and new ones created only after careful studies have been undertaken;

(f) Intra-African co-operation should be promoted at the regional and subregional levels in the areas of industrial training, energy, engineering consultancy, trade in manufactures, industrial raw materials and inputs, industrial information, science and technology, natural resources and the harmonization of fiscal and trade policies including the elimination of trade barriers;

(g) National industrial development plans should be co-ordinated at the subregional and regional levels to enhance intra-African co-operation as a component of the South-South co-operation. To this end joint committees between two or more countries should be established;

(h) The African Development Bank (ADB) should be requested to participate in financing some of the activities of the Decade programme; this should include devoting a certain proportion of its resources to financing the Decade programme.

Action at the international level

15. The Conference concluded that the flow of external financial resources for industrial investment should be increased.

Industrial consultations and negotiations

16. The Conference concluded that:

(a) Proposals should be formulated for common African positions with regard to South-South as well as North-South negotiations in industrial development, particularly with regard to technology, industrial skills, markets and finances;

(b) An African mechanism should be established for consultations, negotiations and arbitrations which could strengthen and facilitate industrial co-operation first among the African countries themselves at the subregional and regional levels and secondly, between African and other countries. Such a mechanism should be established within the framework of the Final Act of Lagos.

Expected outputs during the preparatory phase

17. The Conference concluded that the result of the actions to be undertaken during the preparatory phase (1982-1984) of the Decade would, as a minimum, include:

(a) The preparation of a coherent and internally consistent set of national, subregional and regional policies, master plans and programmes as well as designing and promoting an institutional machinery to achieve the objectives of the Decade in particular and the Lagos Plan of Action in general;

(b) The popularization of the Decade programme, including the effective use of the mass media;

(c) The elaboration of investment programmes and projects at the national, subregional, regional and international levels for submission to financial and investment institutions and a programme for the strengthening of existing national, subregional and regional financial institutions or the establishment of new ones, as required;

(d) The preparation of an industrial manpower development plan including, in particular, a programme for the training of specialized African industrial and technological skills, at the national, subregional and regional levels;

(e) The adoption of policy instruments for fostering intra-African industrial co-operation, especially in the areas of trade, technology, promotion of African specialization and complementarity, assessment of raw materials, project financing, manpower development, entrepreneurial capabilities, information, consultancy services, and energy;

(f) The establishment of an African industrial consultations, negotiations, and arbitration mechanism within the framework of the Final Act of Lagos.

Modalities for implementation

18. The Conference concluded that:

(a) A national co-ordinating committee and a focal point within the governmental administrative machinery should be set up, where these do not already exist, for co-ordinating the formulation, implementation and monitoring of the national programme for the Decade;

(b) An intergovernmental machinery should be set up at the regional and subregional levels if this does not exist, for co-ordinating national actions and initiating and monitoring the implementation of regional and subregional activities and projects for the Decade;

(c) The ECA/OAU/UNIDO inter-secretariat committee for the Decade should intensify its efforts to carry out the task entrusted to it.

Technical co-operation

19. The Conference concluded that:

(a) Bilateral and multilateral technical assistance on a North-South and a South-South basis should be promoted to play an important role in advancing the objectives of the African Industrial Development Decade, particularly during the preparatory phase;

(b) International assistance should be promoted with regard to preparation of regional programmes, the identification of priorities and key industrial subsectors and areas, the development of industrial manpower and the requisite institutional machinery; and in strengthening technology and information structures;

(c) The international community, especially the ECA, UNDP, UNIDO and all other international organizations, should intensify their technical assistance and reorient their programmes in Africa with greater emphasis on the industrial sector in accordance with the decisions to declare the 1980s as the Industrial Development Decade for Africa;

(d) Field missions of high-level African experts should be organized to assist individual countries on request, regional and subregional organizations, in the elaboration of their programmes for the Decade.

Guidelines for the formulation of strategies for major industrial subsectors and areas (1980-1990)

A. Major priority industrial subsectors

Food processing industry

20. The Conference concluded that:

(a) Some import substitution industries have played an important role in industrialization but urged that efforts should be made to limit their import contents through substitution by suitable alternative locally available inputs;

(b) Food and agro-industry should be accorded high priority in terms of policies and resource allocation by member States and that efforts to industrialize should give priority to the manufacturing of agro-inputs and processing of agro-outputs, i.e., production and use of fertilizers, pesticides, agricultural machinery and equipment so as to produce more food;

(c) The concept of intra-African food agreement should be inserted in the institutional framework.

Textile industry

21. The Meeting noted that there is a deficit in textile production in Africa in spite of its high potential for textile production and concluded that:

(a) Positive steps should be taken to strengthen co-operation among African countries in textile production and encourage the establishment of joint ventures and other forms of co-operation among African countries;

(b) Urgent action should be taken at the national, subregional and regional levels to promote and protect the African market in textiles not losing sight of improving the quality of production and level of technology.

Forest industries

22. The Conference concluded that:

(a) In the processing of forest products emphasis should be put on the establishment of small-scale plants which are less expensive and can make

increasing use of local forest resources and, for more complex processing, the African countries should establish joint ventures and other forms of co-operation;

(b) A programme for forest industries development should emphasize, *inter alia*, planned exploitation and reafforestation to avoid ecological problems.

Building materials and construction industry

23. Bearing in mind the importance of the building materials and construction industry and the development possibilities based on the use of all possible resources, the Conference concluded that high priority be given to the:

(a) Intensification of the production of certain strategic materials like cement for use on large infrastructural works;

(b) Development of the production of other materials (lime, intermediate building materials, clay or stabilized soil products, wood or vegetable fibre panels) capable of bringing solutions to the needs of the rural and semi-urban population, bearing in mind their financial capacities;

(c) Creation of pilot demonstration and training plants for the production and use of the materials mentioned above;

(d) Promotion of research on building materials and construction;

(e) Upgrading traditional construction materials and techniques;

(f) Organization and development of local building contractors, especially small and medium contractors.

Metallurgical industry

24. The Conference noted the importance of the metallurgical industry which is one of the basic subsectors and concluded that:

(a) High priority should be given to the development of the iron and steel as well as to the copper and aluminium industries;

(b) Research on mini steel plants should be intensified in order to promote accelerated development of the iron and steel industry in Africa;

(c) Joint ventures among African countries should be established to carry out the exploitation and development of raw materials and their actual processing and exploitation;

(d) Existing or new African multinational industrial corporations should, *inter alia*, carry out the following activities:

(i) Identifying, formulating and designing metallurgical projects;

(ii) Promoting and implementing metallurgical projects;

(iii) Commissioning and operating metallurgical plants;

(iv) Marketing and distributing metallurgical products;

(v) Training technical, managerial and administrative personnel;

(vi) Conducting research and development;

(vii) Mobilizing finance for investment;

(viii) Co-operating with mining and other companies engaged in extracting raw materials.

Chemical industry

25. The Conference recognizing the high priority accorded to the chemical subsector during the Decade concluded that the following actions should be undertaken:

(a) Development of production facilities for the priority chemicals (fertilizers, pesticides and pharmaceuticals) as well as chemicals based on biomass;

(b) Development of extraction facilities for oils and essences from plants and development of leather and associated products;

(c) Making provision for minimizing pollution when planning chemical industries;

(d) Establishment of African national and multinational industrial corporations like those proposed for the metallurgical industry.

Engineering industry

26. In view of the fact that the engineering industry is the carrier of technology, provides machinery and equipment to all economic and social activities, the Conference concluded that:

(a) Member States individually and collectively should undertake the manufacture of light and heavy industrial products such as engines, tractors, agricultural implements, trucks, buses, railway equipment, telecommunications equipment, textile machinery, food processing equipment, mining and mineral processing equipment and parts and components;

(b) Supporting engineering service facilities such as foundry, forging, machine shops, toolroom, heat treatment, metal coating and fabrication facilities should be developed;

(c) Mechanisms should be established to eliminate tariff and non-tariff barriers among member States;

(d) African national and multinational industrial corporations like those proposed for the metallurgical industry should be established.

Small-scale industry

27. The Conference concluded that:

(a) Efforts should be made at the national level to develop small-scale industries, including handicraft and cottage industries;

(b) More appropriate technologies should be utilized;

(c) National or subregional special funds should be strengthened or new ones established, as appropriate, to accelerate the development of small-scale industries in Africa, taking into account the existence of the African Industrial Development Fund (AIDF).

B. Major factors and related inputs

28. To achieve the objectives of the Industrial Development Decade, the Conference concluded that the following actions should be undertaken:

(a) The development of capabilities at the national, subregional and regional levels in the research and study areas, to identify the required industrial raw materials available and industrial products to be manufactured in the region;

(b) The adoption of national legislation on investment, which will provide full information on rights and duties of investors;

(c) Preparation of a general directory containing sources of finances and ways and means for mobilizing financial resources at the national and subregional levels;

(d) Dissemination of information on assistance available from the United Nations Organizations and other International Bodies, especially through the Pan African Documentation and Information System (PADIS), the Industrial and Technological Information Bank (INTIB), the African Intellectual Property Organization (AIPO), the Industrial Property Organization for English-speaking Africa (ESARIPO), the African Regional Organization for Standardization (ARSO), the African Regional Centre for Technology (ARCT), the African Regional Centre for Engineering Design and Manufacturing (ARCEDEM), the African Institute for Higher Technical Training and Research (AIHTTR);

(e) Special consideration should be given to the solution of environmental problems connected with the major industrial subsectors through adoption of legislative measures, establishment of national standards for pollution control, monitoring of natural resources depletion, exchange of environmental information for intra-African co-operation.

C. Energy

29. The Conference concluded that:

(a) Comprehensive energy development programmes should be prepared and implemented at the national, subregional and regional levels to support the whole industrialization process in Africa;

(b) Research and development activities should be undertaken and intensified in developing alternative and renewable sources of energy at the national, subregional and regional levels;

(c) Efforts should be made to exploit alternative cheaper sources of energy for the development of the small-scale industry and the rural sector.

Modalities for the implementation of the programme

30. As a result of discussions on the above-mentioned areas, the Conference concluded that:

(a) The above-mentioned document should include a brief summary of key ideas of the Lagos Plan of Action relating to industry, intra-African trade etc.;

(b) The secretariats should prepare, for circulation in all member States, a small pamphlet on the principles of the Lagos Plan of Action in regard to the chapter dealing with industry;

(c) An industrial map of Africa should be prepared which would indicate the location and distribution of raw materials, available industrial skills, level of technology etc. which will facilitate the implementation of the Decade programme;

(d) Further efforts should be made to develop or improve existing mechanisms which will enhance the establishment of multinational industrial corporations and joint ventures between African countries;

(e) Member States should individually and collectively create mechanisms for fostering the formation of indigenous public and private industrial consultancy organizations;

(f) Steps should be taken by member States towards the creation of a data bank in the field of industry at national and multinational levels;

(g) United Nations agencies and other international organizations should reorient their policies and harmonize and co-ordinate their assistance to African countries individually and collectively.

Monitoring and reporting on the implementation of the programme for the Industrial Development Decade for Africa

31. The Conference concluded that:

(a) The planning of the Decade programme should recognize the need of the regular monitoring and reporting on its implementation. Accordingly, the data that will be required for the evaluation of the progress of implementation should be collected on a regular basis and in particular before the commencement of actual operation;

(b) At the national level focal points should be established where they do not exist. In addition each member State should establish a national co-ordinating committee composed of high-level representatives of relevant ministries, public and private sectors, chambers of commerce and industry, universities and financial, research and professional institutions. An inter-ministerial committee should also be established to advise and assist the focal point and the co-ordinating committee;

(c) Member States should issue certificates to private entrepreneurs authorizing them to undertake projects, or when they conclude agreements with

private entrepreneurs, provision should be made for the regular monitoring and reporting of their activities at the plant level;

(d) At the subregional level, the existing institutions like the Multinational Programming and Operational Centres (MULPOCs) or other intergovernmental bodies should undertake the monitoring and reporting, under the direction of the subregional technical committees;

(e) Workshops and review missions should be organized with the assistance of ECA, OAU and UNIDO in collaboration with all other relevant international organizations and the Conference of African Ministers of Industry with its follow-up committee should continue to provide the umbrella for the monitoring activities at the regional level.

32. The Sixth Conference of African Ministers of Industry also adopted a resolution on the formulation and implementation of a programme for the Industrial Development Decade for Africa which reads as follows:[3]

I(vi) The formulation and implementation of a programme for the Industrial Development Decade for Africa

The Conference of African Ministers of Industry,

Recalling United Nations General Assembly resolution A/Res./35/66B proclaiming the 1980s as the Industrial Development Decade for Africa,

Recalling further OAU resolution CM/Res.886(XXXVII) which, *inter alia,* requests all OAU member States to take, with the assistance of UNIDO, the ECA and the UNDP, the necessary measures to draw up and implement specific programmes in the context of the Decade at national, regional and subregional levels,

Guided by the decisions of the OAU Heads of State and Government on accelerated industrialization in Africa as contained in the Monrovia Declaration of Commitment, the Lagos Plan of Action and the Final Act of Lagos,

Noting that the development and implementation of the industrial development programme in African countries are and would be increasingly influenced, *inter alia,* by:

Balance of payments difficulties, rising debts and cost of servicing these debts as well as the monetary systems existing in Africa;

The pattern of consumption which clearly indicates that most African countries consume what they do not produce, and produce what they do not consume;

Agricultural output whose persistent declining trend has resulted, among other things, in a reduction of the essential industrial inputs and in increasing food imports;

Energy whose imports are taking an increasing share of the total import bill;

The cost of imported factor inputs which increasingly constitutes a large proportion of the content of industrial production;

The level of physical and institutional infrastructural development;

The increasing international economic crisis and its impact on African economies, including insurmountable problems which would arise if Africa's supplies of essential goods are cut off;

[3] E/ECA/CM.8/2, part 3.

The complex environmental pollution problems which could emanate from adverse industrialization; and

The development and full utilization of African industrial entrepreneurial capabilities, which are necessary for determining the size and structure of markets, choice of products as well as the processes for producing them.

Determined to structurally transform the African economies which are currently extraverted and heavily dependent on external economies through industrialization,

Taking into consideration the report of the Intergovernmental Meeting of Experts on the Programme of the Industrial Development Decade for Africa which met in Addis Ababa, Ethiopia from 19 to 24 October 1981 to prepare for this meeting.

A. Adoption of Proposals for the Decade Programme

1. *Adopts* the proposals for the formulation and the implementation of the Industrial Development Decade for Africa as well as the conclusions of the Intergovermental Experts Meeting formulated in the light of the documents dealing with the following themes:

(a) A framework for the preparation and implementation of the Decade Programme;[1]

(b) Guidelines for the formulation of strategies for major industrial subsectors and areas;[2]

(c) Modalities for the implementation of the Decade Programme;[3]

(d) Monitoring and reporting on the implementation of the Decade Programme;[4]

2. Agrees to accord high priority during the preparatory phase (1982-1984) to the following measures aimed at attaining self-sufficiency in food production, building materials and textiles and other objectives of the Decade and thereby making operational the industry sector of the Lagos Plan of Action especially the priority subsectors of food and agro-industries, building materials, textiles, energy, forest, metallurgical, engineering and chemical industries, as well as major industrial areas, especially capabilities, institutional infrastructure, technology, industrial financing, information and environment;

(a) Harmonization of current industrial policies and strategies with a view to reorienting them towards the implementation of the strategy for collective self-reliant and self-sustaining development;

(b) A review of the status of industrial development in Africa leading towards the production of an industrial map of Africa consisting of such elements as the location of industrial raw materials and production facilities, availability of skilled manpower and technology;

(c) Development of a favourable environment for industrialization including, in particular, the improvement of physical facilities: transport and communications, industrial utilities, fiscal measures including tax and other incentives to indigenous industrial entrepreneurs and social welfare benefits;

---

[1]Document ECA/CM1.6/INR/WP/1/Rev.1.

[2]Document ECA/CM1.6/INR/WP/2/Rev.1.

[3]Document ECA/CM1.6/INR/WP/4/Rev.1.

[4]Document ECA/CM1.6/INR/WP/3/Rev.1.

(d) Development of a sound national industrial institutional machinery for the effective planning, execution, monitoring and evaluation of industrial development activities and the promotion of small-scale, cottage and handicraft industries;

(e) Development of industrial and technological manpower to cover the entire spectrum of the various skills and expertise required at each stage of industrial development and the elimination of "brain drain";

(f) The preparation and implementation of science and technology plans and programmes at the national, subregional and regional levels, as an integral part of the relevant economic development plans to include the institutional mechanisms for the development or upgrading and commercialization of indigenous technologies, as well as the evaluation, selection, acquisition, adaptation, absorption and regulation of foreign appropriate technologies;

(g) Development of a sound industrial and technological information system and data base on industrial raw materials, energy, manpower, technology, production facilities, financing, investment profiles/projects and trade;

(h) Increased allocation of local financial resources and greater flow of external funds to the industrial sector including the strengthening of existing and the establishment of new financial mechanisms at the national, subregional, regional and international levels for financing the Decade Programme, especially large-scale investment projects and small-scale industries;

(i) Development and rational utilization of energy in industry;

(j) Popularization of the Decade both within Africa and outside Africa;

(k) Intensification of intra-African industrial co-operation and integration, as called for in the Final Act of Lagos, at the subregional and regional levels, especially in the areas of industrial production, trade in industrial raw materials and products, financing, technology, information, training as well as in the establishment of African consultations, negotiations and arbitration mechanisms;

(l) Intensification of efforts for the promotion of African multinational enterprises and joint ventures based on the participation of groups of African countries;

(m) Intensification of international co-operation, especially the increase of technical assistance from international organizations, especially from the UNDP, UNIDO and the ECA, for the formulation and implementation of the Decade Programme;

(n) Strengthening of existing or establishment of new mechanisms and institutions for co-ordinating the formulation and monitoring the implementation of the Decade Programme at the national, subregional, regional and international levels;

(o) Adoption of special measures to minimize the effects of industrialization on the environment through the greater control of, and legislation for, environmental protection from industrial pollution as well as more effective management of water resources in all areas where there is industrial activity.

B. Modalities for the Implementation of the Decade Programme

3. *Calls upon* all member States and the international community to accord special emphasis to, and to take the necessary measures to implement the actions proposed for the Preparatory Phase (1982-1984) of the Decade, especially, those outlined below:

(a) *Actions at the national level*

(i) Incorporation of the concepts and ideas of the Decade Programme in national development goals and objectives;

(ii) In-depth diagnosis and analysis of national industrial policies, plans, programmes and structures as well as existing bilateral and multilateral industrial agreements, with a view to preparing a comprehensive plan and programme for the Decade including a programme for the popularization and promotion of the Decade;

(iii) Strengthening of existing or the establishment of new National Co-ordinating Committees, as appropriate, for the Decade to provide over-all direction and guidance for the formulation, promotion, implementation and monitoring of the Decade Programme and to liaise with international organizations;

(iv) Review and adjustment, where necessary, of the national governmental machinery for industrial development to ensure that there is a focal point which would act as the secretariat of the National Co-ordinating Committee, handle the day-to-day work of the Decade, and would liaise with the organizations charged with co-ordinating the Decade Programme;

(v) Activating and involving the agents of industrial production and distribution, including the strengthening of public and indigenous private industrial enterprises, support measures for increased industrial investment and strengthening and/or developing capabilities for small-scale industrial entrepreneurship;

(vi) Appraisal, as necessary, of the national technological machinery with a view to developing a technology plan, including the requisite institutional infra-structure, in the fields of R and D, standardization in terms of quality control and environmental protection measures through engineering design and consultancy services to enable the machinery to more effectively meet the requirements of the Decade;

(vii) Preparation of an industrial manpower development plan with a view to developing the various entrepreneurial and technical skills required for the Decade;

(viii) Adoption of measures for mobilizing local and external financial resources required to fund the Decade Programme. This would include project identification for the establishment of a portfolio of investment projects on export-oriented industries;

(ix) Co-ordination of action including the designation of national focal points to promote multinational industrial projects, co-operation and joint ventures as well as the identification and preparation of investment project portfolios;

(x) Assessment and improvement in maintenance and repair facilities and production of spare parts of industrial equipment and appliances;

(b) *Actions at the subregional and regional levels*

(i) Assessment of existing intergovernmental arrangements for the promotion of intra-African industrial co-operation with a view to strengthening existing ones and the establishment of new ones, as appropriate, in accordance with the Final Act of Lagos to provide over-all policy direction and guidance for the formulation, execution and monitoring of subregional and regional activities for the Decade;

(ii) Strengthening of existing or establishment of new focal points within existing subregional or regional organizations, or within the MULPOCs where such intergovernmental organizations do not exist, for handling the day-to-day work related to the Decade and to liaise with national focal points and the co-ordinating organizations (OAU, UNIDO and ECA) accordingly;

(iii) Review of the existing industrial policies, activities, projects and institutions with a view to re-orienting them towards the objectives of the Decade Programme for the region or subregion. This should include aspects dealing with

industrial technology, information, training, financing, raw material, the popularization of the Decade and identification of measures for strengthening existing regional and subregional institutions especially the African Institute for Higher Technical Training and Research (AIHTTR), the African Regional Centre for Technology (ARCT), the African Regional Centre for Engineering Design and Manufacturing (ARCEDEM) and the African Regional Organization for Standardization (ARSO), or the establishment of new ones as required;

(iv) Creation of indigenous consultancy organizations and capabilities to provide industrial and management services related to preparation of projects, preinvestment studies, specifications, bids and contracts; assistance to governments in monitoring and assessment of all project activities including scheduling, supervising and synchronizing their implementation at national and multinational levels;

(v) Strengthening of the existing African Industrial Development Fund and establishment of new financial institutions and mechanisms, designed especially to increase the ability of member States to raise the large financial resources needed for the implementation of the Decade Programme and to assist in the organization of investment finance, joint loan guarantee and contracting; and intercountry purchasing agreements. The ADB is requested to allocate a certain percentage of its resources for the implementation of the Decade Programme;

(vi) Assessment of existing intergovernmental industrial agreements with a view to reorienting them towards the achievement of the goals of the Decade;

(vii) Establishment of an African industrial consultations, negotiations and arbitration mechanism in accordance with paragraph II.B.1(b) of the Final Act of Lagos which would receive appropriate technical and other assistance from the OAU, ECA and UNIDO. The focus of this regional mechanism will be two-fold. Firstly, to act as a forum whereby common positions and precise objectives for the African region can be agreed at regional preparatory meetings, with respect to consultations and negotiations in international fora. Secondly, to serve as a nucleus for the promotion of industrial co-operation and trade in industrial raw materials and products among member States of the region or subregion, in attaining these objectives, consultation meetings in selected priority industrial subsectors and areas will be organized at the regional and subregional levels, in co-operation with the appropriate African, international and other organizations.

(c) *Actions at the inter-regional and international levels*

(i) The opportunities provided within the context of technical co-operation among developing countries should be more fully utilized. The more advanced developing countries in the other regions of the world are invited to share their industrial experiences with the African countries. The organization of solidarity meetings in selected African countries for the purpose of rallying assistance from other developing countries, through specific well-prepared projects, to the selected country, should be expanded;

(ii) The African countries are urged to adopt a strong common position in all global and regional negotiations, especially in the UNIDO consultation meetings, and to undertake more proper preparation in these negotiations, thus ensuring that Africa's interests, as reflected in the Framework of the Decade Programme, are fully accommodated. The African countries should set up a permanent machinery both at the national as well as at the regional levels to follow, with vigilance, all the developments in these international industrial negotiations and to ensure their consistent participation at all appropriate practical technical levels;

(iii) The existing economic co-operation agreements between each African country and bilateral or multilateral and/or funding agencies should be reviewed in order to re-adjust them to more fully accommodate, respond to the policy of self-reliance and self-sustaining industrial development;

(iv) The developed countries are called upon to approach industrial consultations and negotiations in all fora with greater conviction and commitment towards the course of genuine benefit to all parties concerned. In this connection, the steps being taken to bring the UNIDO System of Consultations on a continuing and permanent basis and as a form for industrial negotiations resulting in commitment on the part of the participating countries should be finalized;

(v) Bilateral and multilateral agencies are all called upon to adopt the Framework of the Decade Programme as a basis for readjusting their policies and programmes in Africa. Such adjustments should encompass government policies, and through them, the policies of transnational corporations and other investors involved in the industrialization process in Africa. They are also called upon to promote and popularize the Decade among financial institutions and government decision-making bodies so as to facilitate their co-operation with the African countries in the field of industry;

(d) *Actions by international organizations*

(i) The UNDP, UNIDO and ECA, as well as all other relevant international organizations are called upon to undertake a critical examination of their policies, programmes and activities in Africa with a view to reorienting them in accordance with the Framework of the Decade Programme. They should intensify their efforts for raising additional resources for the implementation of special programmes which they should develop to assist the African countries in the implementation of the Decade Programme, as urged in operative paragraph 7 of OAU resolution CM/Res.888(XXXIII);

(ii) The African groups, especially, in New York (UN Headquarters), Vienna, Brussels, Geneva and Rome are called upon to take the necessary measures to ensure that the call by the United Nations General Assembly in its resolution proclaiming the Decade to the Secretary-General of the United Nations to provide appropriate resources for the successful launching of the Decade as well as for the preparation and implementation of the Decade Programme is met and that increased staff and financial resources are made available to UNIDO and the ECA for the Decade;

(iii) The international organizations are, in particular, called upon to assist the African countries in the development and implementation of special programmes for the popularization and promotion of the Decade both within as well as outside Africa as well as for the training of special skills for monitoring the implementation of the Decade Programme at the national, subregional and regional levels;

(iv) As called for in all the various resolutions on the Decade, the United Nations Industrial Development Organization (UNIDO) and the Economic Commission for Africa (ECA) as well as other United Nations agencies are expected to intesify their programmes of technical assistance in the industrial field to the African countries. Such assistance, during the Preparatory Phase of the Decade Programme, should include the fielding of high-level field missions to assist the member States, on their request, in the preparation of their national, subregional and regional programmes for the Decade;

(v) The international organizations are called upon to study the possibility of establishing new mechanisms to increase the flow of external resources with more

favourable terms and conditions to the African countries for the implementation of the Decade Programme. In this connection, UNIDO is called upon to accelerate action towards the early establishment of the proposed International Bank for Industrial Development;

(vi) In order to ensure that the foregoing actions are carried out, African countries are urged to intensify their representation and participation at the policy and other technical meetings of these organizations in order to ensure that their programmes in Africa related to industry are in accordance with the Framework of the Decade Programme. This would also help to ensure that increasing high priority will increasingly be accorded to industrial activities in Africa. In this regard, the African countries should ensure that the industrial sector is accorded high priority in the UNDP country and regional programmes. This requires a constant system of communication between the governments, UNIDO, UNDP and the ECA, and the National Co-ordinating Committees for the Decade could play an extremely important role in this respect.

(e) *Monitoring of the implementation of the Decade*

4. *Urges* all member States and the co-ordinating organizations (ECA, OAU and UNIDO) to strengthen existing or establish new mechanisms for the co-ordination and continuous monitoring and reporting on the implementation of the Decade Programme at the national, subregional, regional and international levels. The following actions should be given particular attention:

(a) *Actions at the national level*

(i) The National Co-ordinating Committee for the Decade should, as one of its regular activities, undertake over-all periodic assessment of the status of implementation of the Decade Programme and should report to the relevant national economic development policy-making bodies accordingly;

(ii) The national operational focal points for the Decade should establish a system for the collection and analysis of information and data on the implementation of the Decade Programme. It should send six-monthly reports to the National Co-ordinating Committee and to organizations charged with monitoring the Decade's Programme;

(b) *Action at the subregional and regional levels*

(i) Co-ordination and monitoring of the implementation of the Decade Programme at the subregional and regional levels should be undertaken within the context of the Intergovernmental Co-ordinating machineries already existing or to be established;

(ii) Meetings of Ministers of Industry should be convened in each African subregion in order to monitor progress in implementing the programme for the Decade in the subregion. Such meetings should be held at least biennially, i.e., 1983, 1985, 1987, 1989 and 1991;

(iii) The focal points within subregional and regional organizations for the Decade should establish a system for the collection and analysis of information and data on the status of implementation of the Decade Programme. Subregional and regional specialized agencies should be closely associated in this exercise. Six-monthly reports should be made and submitted to the Intergovernmental Co-ordination Committee for the Decade as well as to the OAU for the Co-ordinating Organizations (OAU, ECA and UNIDO);

(c) *Action at the regional level*

(i) At the regional level, the Conference of African Ministers of Industry and its Follow-up Committee on Industrialization, should continue to provide the over-all policy guidance on all matters relating to the implementation of the Decade Programme in the context of the regional machinery for the over-all co-ordination and monitoring of the implementation of the Lagos Plan of Action and the Final Act of Lagos;

(ii) The 1982 meeting of the Follow-up Committee on Industrialization in Africa should take place during the second half of the year, to review the progress in initiating the preparatory phase of the Decade. Participation in the meeting is as usual open to all countries whose delegations should include national directors of economic and industrial planning. It is considered essential that this meeting should also be attended by officials from African regional and subregional intergovernmental organizations and Specialized Agencies as well as the organizations of the United Nations system;

(iii) A review and appraisal of the preparatory phase for the implementation of the Decade Programme should be undertaken in 1984; a review of the actual implementation of the programme be undertaken in 1987 (the mid-term review), while the terminal review and appraisal should be undertaken in 1991;

(iv) As in the past, the OAU, ECA and UNIDO should continue to prepare and convene meetings of the Conference of African Ministers of Industry and the Follow-up Committee on Industrialization in Africa, within the context of the Joint Committee of the OAU/ECA/UNIDO secretariats for the Decade;

(d) *Action at the international level*

(i) With regard to monitoring of the implementation within the United Nations system, it is expected that ECA and UNIDO, in collaboration with OAU will initiate and co-ordinate activities and inputs, within the United Nations system, including technical and financial assistance in support not only of the national programmes but also of the regional programmes;

(ii) In order to maximize the contributions that would be made by other relevant organizations within the United Nations system in the development and implementation of the Decade Programme and related activities, an appropriate *ad hoc* co-ordinating arrangement within the United Nations system, should be set up to assist and advise UNIDO and ECA in co-ordinating and monitoring the inputs from the United Nations system;

(iii) Periodic reports, at least annually, should be prepared and submitted to UNIDO for the Joint OAU/ECA/UNIDO Committee on the status of implementation of their programmes for the Decade;

C. General Provisions

5. *Requests* the Secretary General of the OAU, the Executive Secretary of the ECA and the Executive Director of UNIDO to:

(a) Transmit, in accordance with the established procedures of these organizations this resolution along with the proposals for the formulation and implementation of a programme for the Industrial Development Decade for Africa, respectively to:

(i) The Nineteenth Regular Session of the Assembly of Heads of State and Government of the OAU for endorsement;

(ii) The United Nations General Assembly;

(iii) The Industrial Development Board of UNIDO; and

(iv) Other relevant African and international organizations;

(b) Undertake all measures to popularize the resolution and the programme for the Decade; and

6. *Requests further* the Bureau of the Conference to report to the seventh Conference of African Ministers of Industry on steps taken and the results achieved.

33. On the occasion of the Sixth Conference of African Ministers of Industry, an agreement was signed pertaining to the formal establishment of a joint committee of the ECA, OAU and UNIDO secretariats on the implementation of the programme for the Industrial Development Decade for Africa within the framework of the Lagos Plan of Action. Designed to strengthen co-operation between the three secretariats in the development of more effective programmes of work for the implementation of the Lagos Plan of Action and General Assembly resolution 35/64 and 35/66B, the Joint Committee shall, in summary *(a)* recommend to the heads of the three organizations, policies and strategies for the implementation of the Decade programme; *(b)* propose ideas and programmes covering all requirements for the implementation of the Decade; *(c)* submit proposals on consultations and negotiations for industrial collaboration and development; *(d)* co-ordinate all the activities of the three secretariats related to the implementation of joint programmes and projects; and *(e)* monitor and review progress in the implementation of these activities, as well as assist in the overall monitoring, review and appraisal of the implementation of the Decade programme.

34. The Joint Committee met early in January 1982 and discussed the immediate actions arising out of the resolution 1(vi). At that meeting, it was re-affirmed that the responsibility for implementing the Decade programme rested with the Governments and recognized that any activities undertaken should also ensure the maximum involvement of national experts. The Joint Committee also agreed that in selecting activities to be undertaken in the preparatory phase, it should be ensured that such activities: *(a)* contribute to the basic policy objectives of collective self-reliance and self-sustaining development; *(b)* reduce dependence on external factor inputs; *(c)* induce changes in the pattern of technical assistance programmes so as to accelerate the reduction of external dependence; *(d)* recognize the role of market-widening and raw material sourcing as a means of improving the range and level of production; *(e)* contribute to the development of national, subregional and regional productive capacities; *(f)* ensure the development of a core of integrated projects for structural change, with maximum linkage to agriculture and transportation and related to current national project ideas; and *(g)* promote the development of local capabilities.

35. In the light of the discussions at the Sixth Conference of African Ministers, agreement was reached on the activities to be initiated during the preparatory phase at the national, subregional, regional and international levels. These ranged from the establishment of national co-ordinating committees and operational focal points at the national level to the identification of specific

priority areas for immediate co-operation, taking full account of current national project ideas and ongoing projects, and their synthesis as a first step towards the preparation of regional and subregional programmes. The mobilization and optimal use of financial resources and technical manpower were seen to be essential to the success of the Decade programme at all levels, and particular emphasis was attached to ensuring the effective popularization of the Decade programme. This publication was seen to be an essential element in the latter activity.

36. In conclusion, it should be emphasized that in the four main chapters of this document ideas are put forward that could contribute to the action to be undertaken by the African countries, individually and collectively. Chapter I describes the overall framework for the preparation and implementation of the Decade programme. Chapter II puts forward guidelines for the adoption of strategies for major industrial subsectors and areas, and for the identification of key industrial subsectors. Chapter III presents proposals for the implementation of the Decade programme at the national, subregional, regional and global levels, while chapter IV describes methods for co-ordinating, monitoring and reporting on that implementation. The suggestions advanced in these chapters are by no means exhaustive, nor do they pretend to provide a single solution for each country, subregional or regional organization. They do, however, contain important elements which need to be carefully examined in the context of each particular country when decisions are taken to adopt measures and actions to ensure the success of the Decade.

I. Framework for the formulation and implementation of the Decade programme

1. Introduction

1. Realizing the dangers of continuing with past policies and the imperative need for a change of course, the Economic Commission for Africa (ECA) prepared, in 1975, a document entitled "Revised framework of principles for the implementation of the new international economic order in Africa" (E/CN.14/ECO/90/Rev.3). The strategy spelt out in this document focused on developing a structure of basic industries which not only reinforced each other but also promoted the growth of other industries and sectors, in particular agriculture and rural transformation. The revised framework was approved by the Executive Committee of ECA in 1976 and endorsed by the OAU Assembly of Heads of State and Government in Libreville in June 1977.

2. Early in 1979, the OAU and ECA jointly sponsored a colloquium on perspectives of development and economic growth in Africa up to the year 2000. This was soon followed by a joint ECA/UNEP seminar on alternative patterns of development and life-styles for the African region. The findings and recommendations of both the colloquium and the seminar were considered by the Fifth Conference of Ministers of the ECA at its meeting at Rabat, Morocco, in March 1979. That conference elaborated a draft strategy for the African region in the International Development Strategy for the Third United Nations Development Decade contained in ECA/Res. 332(XIV). The strategy was approved by the OAU Assembly of Heads of State and Government in the Monrovia Declaration (CM/Res.722(XXXIII)) of July 1979, and it is now officially known as the Monrovia Strategy for the Economic Development of Africa. In order to achieve the African objectives and priorities, it is recommended in the Monrovia Strategy, *inter alia*, that the period 1980-1989 be declared as the African Industrial Development Decade "for the purpose of focusing greater attention and evoking greater political commitment and financial and technical support, at the national, regional and international levels for the industrialization of Africa" (Resolution 332(XIV), annex A). In adopting the Monrovia Declaration of Commitment, the OAU Heads of State and Government also decided to convene an extraordinary session devoted to African economic development matters at Lagos, Nigeria, 28-29 April 1980. The Lagos Economic Summit adopted the Lagos Plan of Action for the Economic Development of Africa and the Final Act of Lagos which are of fundamental importance to the development of the region for the remaining part of this century as they set in perspective the challenge facing Africa in its industrial sector. A further decisive element was the fact that the Second General

Conference of UNIDO had agreed that the developing countries' share of world industrial production should be increased to the maximum possible extent and as far as possible to at least 25 per cent by the year 2000.

3. The Fifth Conference of African Ministers of Industry meeting at Addis Ababa, 17-21 October 1979, adopted resolution 5(v) pertaining to the African common position on UNIDO III which, *inter alia,* called for the proclamation of the 1980s as the Industrial Development Decade for Africa. Following the endorsement of this proposal by the Ministerial Meeting of the Group of 77 at Havana, Cuba, December 1979, which had been convened to adopt a common position on UNIDO III, the Third General Conference of UNIDO, which met at New Delhi, January-February 1980, recommended, in resolution ID/CONF.4/PFS.2, that the 1980s be proclaimed as the Industrial Development Decade for Africa "with the purpose of focusing greater attention and mobilizing greater political commitment and financial and technical support, at the national, regional and international levels for the industrialization of Africa". This decision was endorsed by the Heads of State and Government of the OAU in paragraph 58 of the Lagos Plan of Action, and reaffirmed by the international community when the United Nations General Assembly adopted resolution 35/66B at its thirty-fifth session on 5 December 1980.

Objectives of the Lagos Plan of Action and the Final Act of Lagos

Up to the year 1990

4. As reflected in paragraph 66 of the Lagos Plan of Action and the Final Act of Lagos, African countries intend, during the present decade, to lay the foundation for industrial integration at the subregional and regional levels and to achieve a minimum of 1.4 per cent of world industrial production by 1990. At the same time, they intend to do all within their power to attain self-sufficiency in the food, building materials, clothing and energy sectors. They have set themselves the following targets:

(a) Creation of a solid base for self-sustained industrialization at the national and subregional levels;

(b) Development of human resources to ensure that they are fully mobilized in the industrial development process;

(c) Production in sufficient quantities of agricultural inputs such as fertilizers, pesticides, agricultural tools and machines;

(d) Production in sufficient quantities of building materials for the construction of decent urban and rural housing for the continent's growing population and in general to meet the economy's requirements in terms of building materials;

(e) Development of the intermediate and capital goods industries, particularly those intended for other industries and infrastructure building;

(f) On-the-spot processing and upgrading of an increasingly large proportion of the continent's raw materials;

(g) Satisfaction of industry's energy needs by developing the different forms of energy available in the region;

(h) Satisfaction of textile requirements.

5. As an illustration of the implications of these targets, requirements during the Decade in three industrial branches fundamental to the building materials sector would involve investment of *(a)* $1,800 million in the structural steel industry to produce an additional 6 million tons per year of galvanized sheets, steel girders, tubes and bars; *(b)* $6,500 million in the cement industry to raise output by 40 million tons per year; and *(c)* $876 million in the saw mill, wood and primary wood products industry to increase output by 3.4 million cubic metres per year. In the food sector, the introduction of modern processing and preservation methods would require about $2,630 million alone for the milling and processing of food grains and tubers to yield about 26 million tons annually, and a further $233 million for the canning and preserving of about 1 million tons of fruit and vegetables annually. Furthermore, the structural steel industry and the production of machines, tools, spare parts and other metal inputs for the food processing, building materials, clothing, transport, energy and other industries are all based on the iron and steel industry, which would need to increase its output in the present decade by some 20 million tons annually, involving a cumulative investment of some $8,000 million.

Up to the year 1985

6. African countries have already achieved the 1 per cent target set for 1985 in the Lagos Plan of Action. Accordingly, in pursuing their medium- and long-term industrial development objectives,[1] they intend to lay the foundation for the phased development of basic industries essential to self-reliance. It is necessary to establish which of the industries listed below can be developed in the short term on a national or subregional basis, and which must be developed in the long term and require subregional or regional co-operation:

Food and agro-industries;
Building industries;
Metallurgical industries;
Mechanical industries;
Electrical and electronic industries;
Chemical industries;
Energy industry;
Forest industries;
Textile industries.

[1] Lagos Plan of Action, paras. 62-66.

2. Strategy of self-reliance and self-sustainment

7. The OAU Member States have noted[2] that the majority of African countries still suffer from underdevelopment and have little manufacturing activity. Industrial activities initiated by foreign investors, such as the manufacture of certain industrial products, have failed to meet the basic needs of the population: they have not made for an integrated economy nor have they contributed to the modernization of African society. The legacy of colonialism has perpetuated at best an economic structure featuring a comparatively small modern sector and a large backward agricultural sector; in fact, in many countries the industrial sector hardly exists.

8. Import substitution has been confined to the manufacture of products suited to the demands of a relatively small affluent group and its application has failed to integrate the agricultural sector into the growth process. Furthermore, the capital-intensive manufacture of sophisticated products has heightened the region's dependence on foreign manpower, capital and technology. This assessment of African socio-economic development prompted the Member States of the OAU to adopt the Lagos Plan of Action and the Final Act of Lagos for the collective industrialization of Africa, based on the twin principles of self-sustained and self-reliant industrialization.

9. The principle of self-reliance involves the use of indigenous raw materials, indigenous labour and management, domestic and regional markets etc. Self-sustainment relies on internal as opposed to external requirements and stimuli. Ever since political independence, foreign (private) enterprises have done most of the exploring for natural resources and they have exported raw materials in an unprocessed form—much to the detriment of the development of domestic industries.

10. Self-reliance calls for the maximum utilization of indigenous resources—physical and human—before resorting to foreign resources. The peoples of Africa have to rely mainly on their own efforts and make external assistance subservient to their development strategy. In pursuing this policy, Africa does not intend to isolate itself from the world of foreign science and technology. While striving to increase its scientific and technological links with the technologically advanced countries, Africa must develop its own scientific and technological capabilities. It must also be selective in seeking out international techno-scientific exchanges and co-operation, and develop both governmental and non-governmental contacts in all fields on the principle of equality and equal benefit. The attainment of self-reliance presupposes the institutionalization and intensification of integration and co-operation schemes among countries of the same subregion.

11. Self-reliance, therefore, implies a will to reduce the extent of dependence on former metropolitan powers in particular and on developed countries in general. No claim to self-reliance can be made by a country whose industrial

[2] *Ibid.*, paras. 50-52.

structure is dominated by foreign investment, where the bulk of industrial output is produced by affiliates of foreign corporations, transnationals or entities owned by non-residents, and where no scientific and technological capability, whether receptive or contributory, exists.

12. A limited scientific and technical knowledge of the natural resource and raw material base in a country reduces the level of national and multinational complementarity of industrial raw materials, the range of industrial production and the opportunities for national participation in multinational production and trade. It should also be noted that complementarities at the national and multinational levels also depend on national and multinational capabilities to extract, and organize intra-African trade in, industrial raw materials.

13. In Africa, the role of education and training institutions and the policy of state scholarships, as well as the technical assistance requested and supplied, have little bearing on the systematic development of national capabilities, in modern terms, for the identification, evaluation and management of the natural resource base for the extraction of raw materials or for their conversion into semi-finished and finished products.

14. The extent of external dependence in terms of equipment can be assessed by visualizing the region being cut off from its developed country suppliers of equipment of all kinds, including spare parts, simple tools and implements. Of significance is the extent to which equipment imports relate to general purposes rather than to industrial and agricultural production and the needs of the people. Furthermore, present economic co-operation arrangements still reflect geographical patterns inherited from the colonial era and are less concerned with the central issues (of restructuring the natural resource and raw material base, promoting raw materials complementarities through intra-African trade in industrial raw materials, developing indigenous factor inputs and establishing institutions) than with either Africanizing (or effecting minor repairs to) inherited structures and formulating common positions on demands to be made of developed countries.

Self-sustained industrialization

15. Since economic development cannot proceed at the same speed on all fronts, the strategic economic sectors which will serve as a base for stimulating other sectors must be identified.

16. In the Lagos Plan of Action emphasis is placed not only on industrial growth but also on self-sustained industrialization designed to meet domestic need, and a number of strategic measures are proposed such as:

(a) The building up of an industrial production structure capable of meeting changing domestic needs, especially in terms of food, building materials and clothing, through the preparation and implementation of an integrated industrial development programme, based on the development, processing and utilization of natural resources with a view to promoting

linkages between various industrial subsectors and between industry and other sectors at the national level, as well as linkages between national productive capacities at the subregional and regional levels, especially in the field of basic and capital goods industries;

(b) The establishment of a core of production, marketing, research and development and similar activities, which provide the impetus for economy-wide growth processes and facilitate the development of international linkages and complementarities;

(c) The selection of products appropriate to the satisfaction of the basic needs of the mass of the population (who have low incomes) and to the promotion of self-sustaining development;

(d) The expansion and restructuring of domestic markets by integrating the rural economy with the modern sector through the construction of the necessary infrastructure, thus facilitating the processing of agricultural raw materials, the distribution of agricultural and industrial goods and services throughout the rural areas, as well as the establishment of food-processing plants based on indigenous raw materials. In this connection, the formulation of a food policy as an integral part of the process of self-reliance and self-sustaining development would enable a country to select processed food products commensurate with the nutritional needs of the majority of the population;

(e) Subregional economic integration aimed at developing basic and capital goods industries in integrated subregional markets, thus boosting intra-African trade in industrial raw materials and extending the manufacture of industrial products;

(f) The generation and use of information and data related to internal resources, conditions and potentialities as well as to foreign trade, aid, investment, lending terms and trends, as required by Governments in their economic planning and decision-making. This information should include such data as inventories of natural resources, household budget and expenditure surveys, as well as surveys on population, production capacities and patterns, specialized labour, employment and unemployment.

Self-reliant development

17. The call for self-sustainment in the Lagos Plan of Action is matched by that for self-reliance which entails a pattern of economic development and growth consistent with the natural resources and human needs of the region, as well as with its socio-economic and socio-cultural potential.

18. Self-reliant industrial development presupposes indigenous industrialization whereby industrial production is adjusted to the needs of the population. This contrasts sharply with the existing international division of labour which has led to the promotion of *(a)* the production of raw materials for export; and *(b)* light assembly industry oriented towards consumption patterns in the developed countries.

19. Self-reliance implies the introduction of a mechanism for income equalization commensurate with the needs of both the urban and rural population. The production of basic consumer goods takes priority over the manufacture of luxury goods. In this respect, industry should, *inter alia*, modernize agriculture and accord priority to the needs of society. The role of planning, including the decentralization of economic activities, is fundamental since structural change in rural areas is a prime objective of the Industrial Development Decade for Africa.

20. A strategy of self-reliance also entails the joint planning, financing and location of major educational institutions in countries in the same economic grouping so as to provide for the education and training of engineers, scientists, technologists and other skilled workers on the basis of comparative advantage. Self-reliance in technology means developing indigenous capacity to evaluate various industrial techniques and to select the technology most appropriate to local demands. It also covers the adaptation and improvement of imported technology and the creation of indigenous technology.

21. States should thus invest in science and technology with a view to raising African standards of living and combating extreme poverty in rural areas. Measures should also be taken to ensure the development of an adequate scientific and technological base and infrastructure as well as the appropriate application of science so as to spearhead development in key industrial branches. In this connection, top priority should be given to the development of human resources, and steps taken to tackle the root causes of the "brain drain". Governments should devote at least 1 per cent of their gross national product (GNP) to the development of their scientific and technological capabilities and establish a national science and technology development fund.

22. Indigenous entrepreneurs, both public and private, should be fully involved in and assume responsibility for the industrialization of Africa. To this end, Governments should enhance the participation of public and private entrepreneurs as well as other indigenous economic agents in this process by assisting them in the identification of relevant projects, the preparation of market and feasibility studies, the mobilization of investment funds, and the training of skilled labour for the production and commercialization of industrial products.

23. The attainment of the objectives of self-reliant and self-sustaining industrialization hinges upon, *inter alia*, the securement of the requisite finance. As indicated in table 1, the volume of industrial investment is enormous. Experience has shown that industrial investment in Africa has too often given rise to benefits which have been unequally distributed between the host country and various external suppliers and partners as a result of weakness in negotiations; all too frequently, industrial investment benefits the supplier far more than the African buyer. The high import content of investment includes: importation of capital goods and equipment; preference of foreign enterprises for imported raw materials and intermediate inputs; payment of royalties; transfer pricing; technical fees for project design and feasibility studies; spare

parts; management fees; technical fees associated with the selection and purchase of equipment; and repatriation of profits by foreign agents of production and distribution. This system is self-perpetuating.

TABLE I. SOME IMPLICATIONS OF THE DEVELOPMENT OF SELECTED PRIORITY PROJECTS IN AFRICA, 1980-1990

Subsector	*New investment 1980-1990 ($ million)*	*Additional output processed or manufactured by the year 1990*	*Additional manpower required*
Food processing			
Cereals (incl. tubers etc.)	2 630	26 million tons	n.a.
Oils and fats	955	6 million tons	n.a.
Fruit and vegetables	233	1 million tons	n.a.
Sugar	4 750	3.4 million tons	n.a.
Textile industry			
Cotton ginning	1.3	1.84 million tons	n.a.
Forest-based industry			
Saw mills and wood-based panels	876	3.4 million m^3 sawn timber, 958 000 m^3 plywood, 131 000 m^3 particle boards and 136 000 m^3 fibreboards per year	30 580
Furniture	4	350 000 units per year	600
Pulp and paper	7 500	3 million tons paper	270 000
Training in forest industry	150	20 vocational training centres and 1 technical college	—
Building materials			
Cement	6 500	40 million tons	n.a.
Structural steel	1 800	6 million tons	n.a.
Glass	450	7 million square metres	n.a.
Metals			
Iron and steel	8 000	20 million tons	100 000
Alumina	1 300	1.8 million tons	2 250
Aluminium	900	300 000 tons	3 400
Copper	900	300 000 tons	2 200
Lead and zinc	600	500 000 tons	2 400
Tin	120	15 000 tons	750
Chemicals			
Nitrogenous fertilizers	1 750	2 million tons	3 500
Phosphate fertilizers	1 500	1.7 million tons	5 000
Potash fertilizers	500	1.2 million tons	1 000
Engineering and agricultural equipment			
Tractors	3 750	687 000 tons	150 000
Power operated agricultural implements and machinery	450	75 000 tons	1 500
Irrigation equipment	1 000	various	50 000
Tools, implements and accessories	66	164 000 tons	7 000
Engineering core industries			
Small machine tools	375	156 million units	17 000
Metal-coating plants	140	5 000 units[a]	8 500
Foundries	500	650 000 tons	16 000
Toolroom complexes	100	60 000 units	2 000
Forging	180	210 000 tons	7 500

TABLE 1 *(continued)*

Subsector	*New investment 1980-1990 ($ million)*	*Additional output processed or manufactured by the year 1990*	*Additional manpower required*
Transport equipment			
Railway equipment	3 000	6 400 units[a]	250 000
Passenger cars	6 000	800 000 units	150 000
Buses	3 000	400 000 units	200 000
Lorries and trucks	5 000	266 690 units[a]	300 000
Other vehicles	700	400 000 tons	150 000
Ships and boats	1 000	758 331 tons[a]	100 000
Energy equipment	27 000	64 000 MW	n.a.
Telecommunication equipment	750	various	45 000
Textile machinery	5 000	1.44 million units	n.a.
Total investment	approx. 99 000		
Additional investment in industry not included above	41 000		

Notes: The investment and output calculations for the various industrial branches identified above and which would go a long way towards meeting the needs of the people, are based on data prepared by the United Nations Economic Commission for Africa.

n.a. = not available.

[a]Estimate based on the Lagos Plan of Action targets (1.4 per cent of the world production).

Pre-requisites for change

24. The process of developing an integrated industrial structure in Africa calls for far-reaching and complex changes. During a period of transition, the economies of African countries will need to be modified. The trading structure inherited from the former colonial powers will have to be dismantled and an African trading sector created which controls the large African multinational trading companies. In the context of self-reliance, commerce also determines the distribution of industrial products, the growth of national income, domestic capital formation and the volume of investment. Import substitution should be abandoned since it perpetuates colonial consumption patterns and restricts benefits. Key industrial sectors will have to be developed and controlled by African countries through the establishment of African multinational enterprises, thus creating viable industrial structures at the country level.

25. The national objective will be to create an integrated industrial structure with strong linkages between various industrial branches and with close ties between industry and other sectors, especially the agricultural sector. Production at the subregional level must provide the goods needed in domestic markets.

26. Apart from being an important element in collective self-reliance for industrialization, the establishment of complementary industrial production structures offers a large potential for growth in trade among member countries

in the same economic community on account of the heterogeneity of resources endowments, while trade preferences encourage inter-industry and intra-industry specialization.

27. Self-sufficiency in food and other basic requirements calls for various measures. At the national level, the rural economy must be developed as quickly as possible, agricultural productivity increased and small-scale, cottage and handicraft industries (linked to domestic equipment and capital goods producers) set up to satisfy the needs of the rural population. At the subregional and regional levels, river basin development is an important factor as it ensures availability of large irrigated areas for agricultural and agro-industrial development.

28. As stipulated in the Final Act of Lagos, the African countries agreed to strengthen existing regional economic communities and establish other economic groupings with the ultimate objective of creating an African Common Market and an African Economic Community by the year 2000. These economic communities would accelerate economic integration among countries and economic groupings in the same subregion.

3. Proposed framework for the formulation of an operational programme of action

29. The Lagos Plan of Action needs to be translated into an operational programme for the industrialization of Africa. An analysis of the preamble and the chapter of the Lagos Plan of Action devoted to industry confirms the importance of the political and economic objectives set by the Heads of State and Government and provides a conceptual and strategic framework for the development of Africa. The concept of integrated self-reliant development which rejects the existing forms of over-dependent development leads on to a set of objectives and actions in the short, medium and long term and at the national, subregional and regional levels.

30. From a conceptual standpoint, it is impossible to set about immediately establishing programmes of action since such programmes depend wholly upon objective political, economic and social conditions which constrain the formulation of industrial plans and policies at the national, subregional, regional and inter-regional levels. Self-reliance implies the mobilization of the people: it is through such mobilization that the latent energy of the people can be focused on overcoming objective constraints. This mobilization of the people is fundamentally an internal matter: the United Nations system, in responding to the legitimate objectives defined in the Lagos Plan of Action, stands ready to act upon national requests for assistance in clarifying and refining industrial plans and policies. It is clearly recognized that too often in the past, such initiatives have been insufficiently rooted in objective conditions and have been fostered by forces external to Africa. Moreover, once the sovereign states of Africa have seized the initiative and defined the national

guidelines for industrial plans and policies, assistance must be provided in realizing those plans and implementing the policies. The neeed for these initiatives is not only implicit in the definition of self-reliance, but also explicit in the Lagos Plan of Action, which in paragraphs 60, 67 and 69 stresses, *inter alia*:

(a) The urgent need to implement a plan for the collective industrialization of Africa based on the concept of self-reliance;

(b) The need "to lay the foundation for the phased development of the basic industries which are essential for self-reliance, since they produce inputs for other sectors. It is, therefore, important to conduct studies that will establish those basic industries which can be developed in the short term on a national or subregional basis, and those which must be developed in the long run and require subregional or regional co-operation. The modalities for the creation of these basic industries must be studied and established";

(c) The necessity, at the national level, of "designing a national industrialization policy which lays down priorities, targets and the human, financial and institutional resources required".

31. In the light of these concepts of self-reliance and the broad guidelines offered by the Lagos Plan of Action, the following suggestions are made.

Proposed framework for a national programme

32. On the basis of the Lagos Plan of Action and the nature of self-reliance, certain interdependent key requirements can be identified:

(a) Establishment of a self-reliant national policy and strategy;

(b) Establishment of an integrated industrial structure for the long term;

(c) Elaboration and implementation of national policies, plans and programmes encompassing the key factors of raw materials and energy, science and technology, manpower and entrepreneurship;

(d) Industrial institutional infrastructure.

Implementation of a self-reliant national industrial development strategy

33. Implementation of a self-reliant industrial development strategy must first be viewed in terms of its implications for each sector as well as for the entire industrial structure, national or subregional. Before transition to an economic system based upon self-reliance can be effected, the constraints upon the existing economy must be recognized, as should the means by which the guiding principles can be brought to bear upon the fulcrum of the national economy, decision-making processes and planning mechanisms. For example, given the various economic and non-economic forces, the effect of such a strategy on income distribution must be assessed. The role of industry as an integrative factor in the economy as a whole must be identified as must the basic relationship between industry and agriculture, as well as between

industrial development and rural development. Attention should also be paid to the degree of compatibility between self-reliant development and the international divison of labour, particular heed being paid to the impact on African economies of world events, strategies adopted by industrialized countries and foreign firms, and the realities of international trade. Equally important are the consequences these have for education and professional training. These factors go some way towards defining the constraints within which a self-reliant framework must be built.

34. These problems cannot be solved by thinking in general terms or by entering into sterile academic debate. Concepts of real substance must be developed appropriate to the realities of each country and subregion, defining indicative strategic frameworks which can serve as reference points for the national, subregional and regional decision-makers of Africa. Central to this will be consideration of the means by which a sustained move could be made towards the creation of an integrated economy with elements of an industrial base in each country, particularly since individual states may not have the natural resources to support specific industrial sectors. In such cases, this consideration can be the starting point for co-operation arrangements at the subregional and regional levels.

Need for industrial planning

35. 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. Often what is referred to as a plan is nothing more than a mere collection of project ideas with some indication of the financial implications. If Africa is to make a breakthrough and implement a self-reliant and self-sustaining industrialization strategy, more concerted efforts will have to be devoted to industrial planning. In an industrial planning process, the various elements, in particular raw materials, manpower, 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. In this regard, the plan must include the development of the various institutions and services required for its execution and monitoring. An important action to be undertaken in this connection relates to the disaggregation of the Lima target for Africa into regional and subregional targets as well as into targets for each industrial subsector and area. The planning and implementation of national industrial programmes and projects involves, *inter alia*: the preparation of industrial studies, the development of natural resources, the identification of priority industries, the diagnosis of existing industrial structures, the development of indigenous industrial capabilities, the development and transfer of technology, the development of an adequate industrial institutional infrastructure, the mobilization of financial resources, the provision of energy, and the development of negotiating capabilities.

Industrial studies

36. Studies and research must be undertaken in order to: *(a)* arrive at a better understanding of agro-industrial relationships guided by self-reliance; *(b)* analyse the structural dependence of African economies and industries; *(c)* assess the effects of the current international economic, financial and monetary crises; and *(d)* examine the strategies of other countries, particularly in the third world, where new partners may be found. Means have also to be found of increasing the net benefits accruing to those states which permit the activities of multinational corporations. Studies will also have to be carried out to establish the priority needs of the African countries, their objectives and resource endowments so that an appropriate industrial structure can be developed. Obviously, the participation of African experts, senior industrial officials, planners and decision-makers in the discussion and analysis of these factors in various forms is essential. In-depth assessments will also be required in specific African countries. Both the positive aspects of traditional technical assistance and more imaginative developments should be encouraged. In the establishment of an integrated long-term industrial development structure, a key problem is the determination of products commensurate with the objectives of self-reliant industrialization. This choice can only be made after an assessment of a country's industrial structure and its resource endowment has been made by national experts and decision-makers; if required, assistance can be provided by external experts.

37. This domestic assessment should consider current conditions in key industrial sectors (energy, processing of mineral resources, food production, textiles, chemicals, capital goods and building materials) within the various industrial sectors and with other sectors of the economy. It should also examine relationships between industrial activities and the utilization of local raw materials, the needs of the population, the nature of dependence on external economic forces and agents (for example, imports of semi-finished products or machines, patents, management and engineering capacities, and finance) and the role of substitution industries which encourage patterns of consumption detrimental to self-reliance and self-sufficiency.

Natural resources

38. Priority should be given to the total integrated development of natural resources. This requires conducting an inventory of each country's natural resource endowment and using modern techniques to identify those natural resources which could be processed so as to satisfy the basic needs of the population and to replace products imported at prohibitive prices. It is from this natural resource base that several alternative approaches to industrialization would emerge and choices could be made. The full development of natural resources requires, *inter alia*, finance, technology and skilled manpower. Emphasis, therefore, needs to be placed on the development and acquisition of these inputs, an area in which intra-African co-operation could play a particularly important role (see chapter II, section 3, Major factor and related inputs).

39. In most African countries little is known of the region's natural resource potential, the distribution and location of industrial production facilities, technical skills, level of technology and other factor inputs for industrialization. Consequently, an industrial map of Africa should be drawn up providing information on the above factor inputs, thus contributing to enhanced intra-African industrial co-operation and integration.

40. Particular attention should be paid to harnessing water power since at present energy is in short supply while vast untapped water resources exist in many countries. The management of the region's water resources is also of crucial importance to the development of industry, not only should steps be taken to ensure the availability of water for industrial use, but measures should also be taken to prevent pollution from industrial residues. Further to formulating master plans for water supply and its protection from environmental degradation, countries should strengthen any subregional organizations, such as river-basin or lake commissions, devoted to the integration, development and management of water resources, including conservation and protection of the environment.

Identification of priority industries

41. The selection of key industries must be governed by the objectives of self-reliant industrial development. Industrial activities upstream and downstream of agriculture are of crucial significance. This is especially true of the iron and steel, copper and aluminum industries, on which mechanical industries can be based, leading to the production of agricultural machinery and implements as well as to the production and maintenance of agricultural processing equipment. Industrial plants producing fertilizers, pesticides, insecticides, irrigation equipment and packaging materials are essential, as are plants manufacturing inputs to the transportation sector.

42. Full use should be made of natural resources, such as agricultural produce (cereal grains, sugar cane, fruit and vegetables, oil-seeds and cotton), animal and fish resources, minerals and energy (biomass from tropical forests and savannahs). Industrial activities should be developed in order to satisfy the needs of the people—the production of textiles, building materials and energy. The modern industrial sector should be integrated with small-scale industry, metal processing industries (iron and steel, metallurgy, mechanical and electrical industries) or those in the chemical sector (basic chemical industries and intermediate petrochemical industries).

43. High priority should be given to manufacturing products that meet the needs of the people in rural areas and reduce net imports. In this connection, small-scale handicraft and cottage industries have a vital role to play. The importance of these industries and the contribution they make to the effective utilization of local resources, generation of employment and diffusion of technology are underscored in the Lagos Plan of Action.[3]

[3] *Ibid.*, para. 69.

Elaboration of subsectoral industrial development strategies

44. Subsectoral industrial strategies at the branch level will have to be elaborated, identifying the potential, constraints, financing and measures necessary in other sectors, whereafter an integrated programme of action can be prepared. This programme might, for example, be concerned with the processing of agricultural and fishery resources—an area in which immense possibilities exist for integrated industrial development in Africa. Another example is the cotton subsector where integration calls for the planning and implementation of upstream mechanical industries such as workshops for maintenance and spare parts, as well as of downstream industries, such as spinning and weaving. Even at the village or small town level, by-products of the cotton industry can be used as a base for cotton oil-seed crushing and soap making.

45. International organizations need to gear their technical co-operation activities towards integrated programmes of assistance (rather than simple isolated industrial projects) involving strategy, planning, project identification, scientific research, transfer of technology, training, promotion, financing, negotiation and implementation. This may call for closer operational collaboration between those bodies within the United Nations system responsible for such areas as industry, agriculture, finance and training. Integrated industrial programmes of this kind could be conceived at the subsectoral level, as well as in terms of industrial "blocs" (industries linked to agriculture, chemical and petrochemical industries, steel and mechanical industries), or even at the level of industrial sectors. It is also clear that such integrated programmes call for integrated national policies and programmes encompassing training, technology, finance and energy.

Development of indigenous industrial capabilities

46. 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. With the existing inadequate industrial structure and for want of clearly defined industrial development plans, Africa is currently suffering from an inordinate shortage of industrial and technological capabilities, in terms of both quantity and quality. The existing educational system is not conducive to the development of the industrial capabilities required. Their development calls for new African initiatives in industry; the development of domestic technical and management capabilities as well as the requisite industrial training programmes. This will require a reorientation of existing educational policies, systems and programmes as well as national compensation schemes. Training programmes should place 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. In this

connection, a system of rewards and incentives for the talented should be so structured as to meet the demand for scientific and technological development applicable to African conditions.

African initiatives in industry

47. The traditional concept of an entrepreneur assumes a certain motivation (and behaviour) to produce goods in return for some benefit as well as a certain managerial capability to identify inputs and organize the production and marketing of final products. It says nothing about the purely technical operations of conducting costly pre-feasibility and feasibility studies. Underdevelopment and the increasing complexity of production mean that if the African countries are to achieve anything, some of these burdens must be borne by someone who is a true partner in the national, subregional and regional development and whose destiny is tied to that of the society via links that are deeper than commercial relations.

48. In African society, at present, the quality and number of entrepreneurs are poor and low, while risk perception is high. Consequently, the volume of industrial investment, its quality as well as the indigenization of the industrial sector are largely determined by the supply, as cheaply as possible, of complete services for project preparation and engineering works.

49. This situation could be overcome if national consultant engineering companies were to be set up which could contribute significantly to the promotion of resource-based industries by preparing complete project designs at a reasonable cost for potential indigenous entrepreneurs and enterprises. In order to create competitive African firms, national consultancy companies should look for training facilities in consultancy services in third world countries and enter into joint ventures with these firms. As a matter of government policy, all large consulting contracts awarded to foreign management enterprises and consultant engineers should provide for the placement of African graduates in the consultants' offices where work related to the project is carried out, thus facilitating the transfer of technical know-how and skills. Where appropriate, preference should be given to the award of consultancy and other service contracts to external firms which establish joint ventures or enter into partnership arrangements with domestic partners.

Increasing indigenous technical and management capabilities

50. The implementation of programmes and projects is governed by the number, goals, motivation and behaviour of the organizations, as well as by the technical capacity of the private, public and co-operative agents of production and distribution to generate and organize financial, physical and human resources. Governments should encourage those agents to become effective in implementing policies and strategies aimed at the social objectives of self-reliance and self-sustaining development. This can be done by taking measures

to ensure that those projects which constitute the core or driving force behind self-sustaining development and self-reliance are implemented primarily by indigenous agents of production and distribution—be they private, semi-private, public or co-operative enterprises—while non-indigenous enterprises should adopt a supplementary role.

51. At the same time, high priority should be given to the establishment of effective industrial extension services in order to provide financial, technical and marketing advice to small-scale, handicraft and cottage enterprises, thus contributing to effective rural development. These services should be complemented by training schemes to upgrade the requisite entrepreneurial, managerial and technical skills.

Industrial training

52. Self-reliance and 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 must be established, with the support of international organizations, as well as of developed and other developing countries. Emphasis should be placed on training:

(a) Industrial leaders, entrepreneurs, policy-makers and planners to conceive, implement and monitor industrial and technological programmes in accordance with national goals and priorities, as well as to negotiate technology transfer agreements;

(b) Project designers to prepare, evaluate and select projects for implementation which contribute optimally to national objectives;

(c) Technologists and technicians to construct and operate plants efficiently, and to provide technical support services in such areas as industrial research, quality control, standardization, metrology, patent law, engineering design, repair and maintenance, as well as in the appraisal, selection, adaptation and diffusion of foreign technologies;

(d) Managers, cost accountants and financial analysts to run public and private enterprises profitably and conduct business negotiations on the terms and conditions of joint ventures;

(e) Multi-disciplinary teams of extension workers to provide guidance and assistance to rural and small-scale enterprises in their day-to-day operations, as well as in the long-term planning and programming of their operations;

(f) Market and marketing experts to identify growing domestic and international demand for industrial products and thus ensure efficient programmes of production.

53. Accelerated training programmes should be set up for those industrial sectors heavily dependent on expatriate skills. Special attention should also be paid by project sponsors and decision-makers to the training component of new industrial projects in those priority sectors identified in the Lagos Plan of Action. Training at the national level is necessary; however, for certain

industrial branches, training at the subregional level is also cost-effective and can lead to other forms of subregional and regional co-operation. Particular attention should also be paid to the training of trainers.

54. In order to achieve the foregoing, each African country needs to undertake a number of measures, the most important of which would include:

(a) Analysing in detail national industrial and technological manpower requirements, with a view to initiating action for industrial development. This would include an assessment of the existing educational systems, training facilities and programmes and the industrial enterprises' contribution to industrial training;

(b) Establishing multi-purpose training institutions as well as specialized institutions to meet the requirements of specific industrial subsectors, such as the building materials, chemicals, metallurgical, leather and textile industries;

(c) Ensuring that indigenous experts participate in the complete project design and planning process, contract negotiations, and project implementation;

(d) Upgrading the social status of industrial and technological personnel and reducing the "brain drain";

(e) Securing sound and continued financial support for industrial training.

55. Intensive practice-oriented short-term training programmes should also be prepared for the training of civil servants responsible for industry-associated activities in such fields as industrial planning, project preparation and evaluation, financing, and the promotion of industry and trade.[4]

Science and technology

56. The application of science and technology to development is a means to an end, the end being the development goals of each country. It is vitally necessary to integrate science and technology with economic and social development through linkages with development goals. In a sense, this is more important and fundamental than the mere consideration of mechanisms employed to promote the development of science and technology. Despite international actions and the efforts made by the African countries, both individually and collectively, the science and technology base in Africa is still very weak. Experience in the industrialized countries 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. The key element in the process of integrating science and technology with

[4]The joint UNIDO/OAU Study on the Development of Industrial and Technological Manpower in the African countries; a Proposed Framework of Action (ECA/IDD-1/INR/BD/5: ECA/CM1.6/INR/BD/5) which was circulated at the Sixth Conference of African Ministers of Industry.

industrial development is the adoption of appropriate strategies and policies, as well as the stimulation of the interest and awareness of all partners and decision-makers involved in the process of industrial development. It is largely through such integration, both conceptually and practically, that the application of industrial technology can make the most effective contribution to industro-economic development. In this connection, the African Regional Centre for Technology at Dakar, Senegal, will have a major role to play.

57. It is largely within the context of such basic considerations that science and technology can be applied realistically and effectively. Three major elements can be identified in promoting the application of technology at the national and international level. First, the linkage of technology to industrial development and, through industrial development, to overall development goals, can only be successful in the context of the formulation of relevant policy measures by the national governments; consequently, technology policy and planning become important elements. Secondly, the development of technological capabilities in each country is a pre-requisite for the selection, acquisition, adaptation, absorption or development of industrial technology. This involves, *inter alia*, the establishment of technological institutions and the training of industrial and technological manpower. Thirdly, the appropriate choice of technology is of crucial importance, since inappropriate choice will not only be expensive, but it will also distort the pattern of development.

58. 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. For many years to come African countries will continue to import foreign technology. 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. In order to ensure the achievement of an African strategy for self-reliant and self-sustaining industrialization, it is imperative that African countries ensure greater control over technological activities within their borders. This inevitably entails the development of equitable technology policies and plans, institutional machinery, manpower and environment, thus enhancing the development of the countries' total technological capabilities. Issues of particular significance relate to the choice of technology and research, engineering and process design, and the development and commercialization of R and D results.

Technology choice

59. Technological choice does not solely relate to the choice of products and equipment at one specific stage of technological advancement. It also relates, and increasingly so, to the assessment of the comparative advantages of investing in long-proven or advanced modern science-based technologies.

Ministries and many African States, as well as private entrepreneurs have been left to their own devices or given biased external advice when deciding whether to invest in technological advancement, ranging from the most elementary to the extremely sophisticated. As a result, they have purchased defective products, plant and equipment that was reconditioned or overpriced, technologies that were inappropriate in terms of labour, capital or resource endowments, or processes unsuited to local raw materials or environment. Another serious problem is posed by the difficulty of obtaining spare parts for imported goods. Action is thus needed to combat the following deficiencies:

(a) Generally inadequate purchasing and procurement policies;

(b) Lack of means for gathering data on sources and prices of major factor inputs and on technological changes in foreign markets;

(c) Disorganized contract negotiating expertise and contractual practices.

60. Attention should, therefore, be given to mastering the assessment, selection and transfer of technologies and to developing appropriate national scientific and technological capabilities. If science and technology are to serve industrial development, scientists, technologists, design engineers and planning economists must be associated with the evaluation and selection of technologies for a broad spectrum of industrial sectors in order to adapt external technologies to local conditions and technologies. Consequently, African countries should accord highest priority to the training of design engineers, through appropriate contractual provisions with foreign consulting firms and contractors who have been, or will be, awarded service, supply or construction contracts, as well as through the African Regional Centre for Engineering Design and Manufacturing (ARCEDEM).

61. The African countries should adopt precise contracting, procurement, and purchasing policies as an integral part of their development strategy. It is essential that national expertise be developed for contract formulation, negotiation and procurement, while arrangements should be made at the subregional and regional level for the joint negotiation and acquisition of technology.

Research, engineering and process design and development, and the commercialization of R and D results

62. Another technical gap in Africa is the lack of activities and capacities for appropriate industrial R and D, as well as for engineering and process design and development. (The agricultural equivalent of the activities involved here are well known and include seed and animal selection, breeding, adapting new strains or upgrading livestock or crops through cross breeding and hybrids.) These activities would include techniques and processes for local adaptation, testing and developing indigenous techniques, introducing standardization, quality control and metrology, scaling-down imported equipment, and studying the adaptation of carefully selected imported products, studying the use of alternative materials in production designing new models and processes, as well

as testing and manufacturing prototypes. A critical element in this area is the need to forge links between R and D and actual production: this calls for the active participation of managers from the production sectors in the governing bodies of R and D institutes, and the financing of such institutes to a significant degree by privately and publicly owned enterprises.

63. All these activities are designed to link techniques to local resource endowments, to develop products consistent with the socio-cultural character of the local population and at prices they can afford, to create greater productive capabilities and to raise income and living standards. It is therefore essential that attention be given to:

(a) Concentrating on a number of priority products;

(b) Strengthening collaboration with such organizations as ARCEDEM, and subregional and national institutions.

64. Launching R and D activities and institutions that are inappropriate, irrelevant or marginally useful stifles rather than contributes to raising the standard of living and it imposes a strain on scarce resources. Moreover, since more than 90 per cent of the technology related to the needs of African countries is not patented and available freely to those who choose wisely, the choice and design of technology deserve extreme care. Basic consideration should be given to the fact that:

(a) Cost-effective R and D solutions can be found to respond to problems and needs which arise at plant or factory level; users should and would be prepared to pay to support R and D. No split must occur between agents of production and R and D. It is essential that R and D should not create its own demand; it must respond to real demand;

(b) All major innovations occur at the plant level under production conditions as producers try to solve specific problems; there should be feedback between R and D and factories;

(c) All R and D activities must be complementary with specific mutually reinforcing links;

(d) R and D activities which offer a potential increase in returns (when resources are scarce) must be concentrated in a limited area, with a specific target and maximum linkage, so that R and D results have an immediate impact on production activities;

(e) Foreign firms do not usually undertake R and D activities locally. It should thus be government policy to place their young scientists and engineers, through appropriate contractual arrangements, in the R and D departments of foreign enterprises so as to ensure the transfer of know-how and the applicability of R and D results to local socio-economic and natural resource conditions.

65. The tasks of commercializing R and D—the introduction of newly created processes and products into mass markets—calls for mass production based on prototypes adapted to local use. Commercialization often calls for new tools, reorganization of shop floors, possibly special training for key technicians, and

often new specially designed or adapted equipment. The companies or corporations entering into operations beyond the production of standard, well-tried products are high-risk capital structures, which require special incentive systems and protection. They frequently need direct links with R and D institutions. Besides the sale of the new or improved products, the firms also earn revenue by selling licences to other firms or providing technical assistance to companies wishing to use their products. In this way, the commercialization of R and D constitutes one of the main channels for the practical diffusion of technology.

66. Proposals for strengthening technological capacities in Africa in order to achieve self-reliance were presented to the Joint OAU/UNIDO Symposium on Industrial Technology for Africa held in November 1980 at Khartoum, Sudan.[5] These might serve as a basis for the preparation of operational programmes.

Industrial institutional infrastructure

67. 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 in Africa, especially at the national level, to develop new, or strengthen existing, industrial institutions. Particular attention should 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 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 institution machinery.

Industrial development centres

68. Each African country should establish industrial development centres or strengthen those already in existence. These national centres can serve to implement the integrated industrial development programme and prepare sectoral development programmes. They should provide for project identification, preparation and evaluation, as well as for the preparation of feasibility studies for priority projects (where appropriate, in collaboration with the project sponsors), and follow up the implementation of those projects, a particular feature being the provision of consultancy services and management advice.

69. The services offered by these industrial development centres would relate not only to assistance in the development of small- and medium-sized

[5] ECA/IDD-1/INR/BD/4; ECA/CM1.6/INR/BD/4.

enterprises, but alsc to the problems of industrial decentralization and the introduction of industrial units into rural areas, in particular through the adoption of policy measures which encourage and facilitate domestic industrial initiatives; for example, an appropriate and efficient administrative, fiscal, financial and marketing framework.

Technological institutional machinery

70. It is recommended that each African country set up institutional machinery for the development or upgrading and commercialization of indigenous technologies, as well as the evaluation, selection, acquisition, adaptation, absorption and regulation of foreign appropriate technologies. Such a national institutional machinery should include institutions dealing with:

Technology policies and plans;

Industrial and technological research and development;

Standardization, quality control and metrology;

Regulation of technology;

Commercialization of indigenous technologies;

Industrial and technological information;

Industrial and engineering design, including product and process adaptation.

71. The institutional machinery should also provide for the establishment of pilot production units for selected industrial goods as well as for spare parts and components. Controlled experiments could be carried out with a view to making appropriate changes in design and processes for the upgrading of traditional technology and adaptation of imported technology. Equally important is the establishment of technological information networks on low-cost technology and technologies adapted from other developing countries and regions, and the setting up of a system for monitoring on a continuing basis the costs, terms and conditions of technology transfer so as to strengthen national capabililties for negotiating the efficient transfer of imported technology.

Industrial information

72. One of the pre-requisites for self-sustaining and self-reliant industrial development is the availability of industrial and technological information. The supply of information is vital to the development, choice, acquisition and transfer of industrial technology. This information has to be furnished to the decision-makers by national information institutions which may need to be established or strengthened. Information has to be evaluated and packaged suitably if it is to be of use to the decision-makers.

73. Since the users of industrial and technological information are varied, the information has to be diverse in nature and scope, encompassing socio-economic data and statistics as well as financial, legislative, market, techno-

logical and management information. The institutions must have an effective industrial and socio-economic orientation; they must identify sources of information and communicate with them, and through the efficient analysis, assessment, storage and retrieval of information, they should be able to provide end-users with the right information in the right form at the right time.

74. An appropriate framework for a national industrial and technological information network with a well-defined focal point must be established. Whereas much effort has been devoted throughout the world to developing information systems and services geared to the needs of scientific personnel, the lack of adequate "industrial and engineering" information and the inability to utilize effectively the information available are problems common to many of these systems. Improvement in the use of scarce research and development resources is possible only when the capacity has been created to collect, store, retrieve, interpret and use available knowledge—through information of the type needed by industrial engineers and technologists which differs from that needed by persons involved in pure research or science. Industrial technology is available on a world-wide scale and national institutions require a constant flow of outside information and support.

75. Any programme for the development of a sound industrial and technological information and data base in the African countries will have to be undertaken in the context of international action, such as the UNIDO Industrial and Technological Information Data Bank or the Pan-African Documentation and Information System. It may, however, be noted that a significant amount of work still needs to be done in determining the actual technological information requirements in each country and developing a system or network linked with foreign sources in order to provide in an efficient manner and at the appropriate time the information required at each stage of the industrialization process.

Mobilization of financial resources

76. Finance is essential: it constitutes a basic parameter directly influencing the whole production process, the transfer and choice of technology, product selection, corporate form and, above all, the negotiating position vis-à-vis the outside world. In Africa, this problem is aggravated by the often precarious state of a country's balance of payments, its public finance and budget, as well as the low level of economic transaction in most economic sectors, in particular the agricultural sector.

77. Governments should endeavour to mobilize their internal financial resources through effective and efficient tax or revenue-earning measures, or through the implementation of fiscal, industrial and other policies which stimulate savings and investment. Institutional arrangements and in particular appropriate policies, need to be implemented to stimulate domestic initiatives in the small-scale and rural industrial sectors. Activities in these sectors can play a significant role in the achievement of self-reliance and self-sufficiency in

agriculture. It is imperative that each country develop, establish or strengthen its own industrial development bank, the basic role of which would be to mobilize savings for industrial investment. By offering loan and equity capital in its own institution as well as in the enterprises in which it invests (convertible debentures), industrial development banks would be able to interest import-export houses, commercial and transport enterprises, insurance companies, commercial banks and local entrepreneurs in participating and sharing in the risks and rewards of industrial development.

78. By providing technical assistance and training, various international organizations could assist by:

(a) Estimating the financial resources required to achieve the short-, medium- and long-term industrial objectives;

(b) Elaborating a national policy and establishing institutional mechanisms necessary to mobilize national resources and savings;

(c) Locating and directing foreign financial resources, especially those from oil-producing countries, towards African countries and increasing their direct contribution to the financing of industrial projects in Africa;

(d) Promoting industrial projects where foreign partners are required, including partners from other African and third world countries.

79. Other important measures to increase industrial capital formation could include:

(a) Formulation of reinvestment policies in respect of direct foreign investment, joint ventures, as well as indigenous enterprises, not only to achieve other national policy goals but also to ensure greater reinvestment out of corporate savings;

(b) Transfer of corporate savings from those sectors to which relatively low development priorities have been accorded, to sectors with higher priorities, particularly in industry;

(c) Increase in savings of public corporations by monitoring and keeping their performance under continuous review and rigorous scrutiny with the aim of upgrading entrepreneurial capabilities.

80. In the introduction to this chapter, some illustrations were provided of the investment required in selected branches of industry, such as iron and steel and building materials in order to approach self-sufficiency and self-reliance and the target share of 1.4 per cent in world industrial output by 1990. However, at present almost all African states face balance of payments deficits; indeed, many states face balance of payments crises. It is against this background that conservative estimates have been made of the investment required to attain the target share of 1.4 per cent; this amounts to about $20 billion annually or a total of some $140 billion during the Decade. It should be noted that these figures refer solely to industrial investment: they do not include investment in energy, agriculture, transport and such physical and social infrastructure as schools, hospitals, railways and roads.

81. A start to obtaining these vast sums of investment finance must be made in self-reliance: domestic savings leading to investment must increase. But even if domestic savings and investments were to amount through superhuman efforts to over 30 per cent of gross domestic product—the peak reached by both China and the Union of Soviet Socialist Republics in the years when these two countries made extraordinary efforts to lay the foundations for their own self-reliance—an investment gap would still remain. This gap would be all the more severe since, of the cumulative investment estimate of $140 billion, a significant portion would be in foreign exchange. Africa is currently more dependent than other regions on the import of capital equipment. Moreover, Africa's earnings of foreign exchange, dependent as they are on the downward drift of commodity prices and inflation in the developed countries, show the serious net deficits identified above. It is against this background of massive foreign exchange and investment requirements for Africa's industry, that the proposal for the establishment of an International Bank for Industrial Development[6] as a mechanism for recycling the financial surpluses of both the North and the South must be considered. Such a mechanism has the potential for making a crucial contribution to meeting the massive investment requirements identified above. This would also help to support proposals for the establishment of an African Solidarity Fund for Industry[7] (see also chapter II).

Energy

82. The continuous rise in the prices of petroleum and capital equipment has gravely affected the economies of most African countries. At present, about 25 per cent of Africa's foreign exchange earnings are used to pay for imported fuels; and in certain countries this figure is much higher. This situation is seriously undermining the development of industry in the non-petroleum producing African countries where hydrocarbons are used as a direct industrial input as well as in the production of electricity. It is, therefore, imperative that integrated industrial development be linked to the adoption of energy policies and that energy be made available to industry at a reasonable cost. Energy is indispensable to industrialization since some 30 per cent of total world energy is consumed by industry.

83. The above is particularly relevant in view of the fact that the African continent is rich in energy resources, such as petroleum, coal, hydro-electric power, peat, radio-active materials (particularly uranium) and non-conventional sources of energy (solar, geothermal, wind and biogas). 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 potential, Africa remains the least developed continent with regard to meeting its energy requirements. Most of the energy exploration, exploitation and marketing is in the hands of multinational corporations.

[6] ID/B/261/Add.7. Proposal for setting up an International Bank for Industrial Development, UNIDO, Vienna, 1981.

[7] See OAU document CM/11-34(XXXVII), Annex I, Operational Work Programme for the Period 1982-1983 for the Implementation of the Lagos Plan of Action and the Final Act of Lagos, para. 78, March 1981.

84. The basic problem is the total lack of energy planning. In fact, some African countries buy energy which they do not need or whose sources they already have. Comprehensive energy policies and plans must be developed which should contain:

(a) A clear identification of energy requirements, particularly in industry;

(b) Measures, including research and development, to produce the energy needed to meet indentified requirements from alternative conventional, non-conventional and renewable sources;

(c) Priorities among the various sources of energy;

(d) Programmes for the training of technical personnel for the exploration, exploitation, production, commercialization and marketing of energy;

(e) Energy forecasts;

(f) The local manufacture of energy-producing equipment, spare parts and related components;

(g) Research and development activities for the development of alternative sources of energy, particularly to serve the rural areas and to replace the use of wood as a fuel;

(h) Measures for conserving energy, particularly the non-renewable sources of energy, such as petroleum, coal and radio-active materials;

(i) Energy-saving measures.

85. The African countries should survey their energy resource potential and development possibilities. Bearing in mind the needs of the industrial sector over the short, medium and long term, they should elaborate appropriate energy production programmes. The decision of the OAU Heads of State and Government to establish an African energy commission and fund will greatly contribute to this effort. The establishment of small-capacity hydro-electric plants in rural areas and the use of new and renewable energy sources, such as water-operated crushing mills, could contribute decisively to rural industrialization and self-sufficiency in food production. The adoption of an energy policy, based on the increased use of the country's hydro-electric resources, the location of other sources of energy and the production of energy equipment, spare parts and components, would ensure the realization of an integrated industrial development policy. In this regard, the measures outlined in chapter XI of the Lagos Plan of Action and the programme adopted by the African countries for the United Nations Conference on New and Renewable Sources of Energy are particularly relevant (see chapter II).

Negotiations and self-reliance

86. National self-reliance means taking domestic initiatives to bring about development, particularly industrial development, in harmony with other essential sectors of the economy. Since Africa is overdependent on the developed countries for the resources of technology, capital and management skills, the first step should be to improve the terms and conditions on which

these resources are obtained. This improvement in terms of resources available can be obtained through successful negotiations based upon collective self-reliance between African states at the subregional and regional levels, as well as between Africa and the third world, an expression of third world solidarity at the inter-regional level.

87. Successful negotiation is dependent on a strong bargaining position and on the ability to make use of this bargaining position. Strength in negotiations is the main means through which improvements in resource transfers can be obtained. One way by which negotiations may be strengthened in the interests of self-reliance in industry is through a forum for negotiation and consultation. Through this forum, negotiating positions can be strengthened with respect to a single industrial project or branch or at the level of the industrial sector as a whole. Moreover, successful negotiation also hinges upon the availability of information on present and future market conditions, on the experience of other purchasers of equipment and services, and on alternative sources of supply, particularly from other developing countries. However, this kind of privileged information is not readily available, not even from experienced foreign consulting firms or technical assistance agencies

88. More specifically, improved arrangements are required for the procurement of capital equipment, technology transfer, management and marketing services, finance and training in all the priority industrial branches identified in the Lagos Plan of Action. These improved arrangements are obtained by changing "the rules of the game": altering the legal, financial and technical terms and conditions of contracts, adopting collective bargaining positions; obtaining information on strategies for, and assistance in negotiations with, suppliers; and identifying alternative suppliers of technology, plant and equipment, capital and services.

89. In the light of the above, the African countries must adopt appropriate measures at the national level to enhance their negotiating power and to exercise greater control over the importation of foreign technology. In this connection, special consideration should be given to the establishment of some form of national focal point, such as a national office for technology, which would co-ordinate activities related to the appraisal, selection, negotiation, acquisition and regulation of foreign technology importation, by both public and private enterprises.

Promotion and popularization of the Decade

90. The national programme for the Decade must of necessity include promotional activities to popularize the Decade. This is extremely important in order to ensure the maximum possible involvement of the entire population in the process of industrialization. These promotional activities which must be carefully designed could, for example, 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 convince national political leaders, thereby ensuring their commitment to, and consistent support for, the industrialization process.

91. A number of measures need to be adopted to promote and popularize the Decade. These include the full involvement of the mass media (radio, television, newspapers) and the national political machinery. The organization of special seminars in different parts of the country for various groups covering the entire cross-section of the population would have to be envisaged. The distribution of advertising materials (posters, T-shirts, balloons) as well as the declaration of a national "Industry Day" should also be considered. Radio, television and press interviews should be held with various national authorities involved with industrial development as well as the Decade. The development and implementation of these promotional and popularization activities require financing, and must be included in the national programme for the Decade.

Proposed framework for programmes at the subregional and regional levels

92. The establishment of a subregional structure will be one of the cornerstones for the industrialization of Africa. In the Lagos Plan of Action particular emphasis is placed on industrial co-operation between African countries as a means of establishing conditions conducive to collective self-reliance at the subregional and regional levels. Industrial co-operation should permit the African countries to lay the foundation for the phased development of the basic industries which are essential to self-reliance, since they produce inputs for other sectors. This co-operation will also permit the gradual development of capital goods industries, thus strengthening national and subregional development activities and the optimal use of the limited resources of the various member states. The Final Act of Lagos defines the framework for this industrial co-operation: existing groupings should be strengthened and made more effective by appropriate policies and incentives, while new economic groupings should be created where necessary. Interim measures should also be taken, encompassing a limited number of industrial sectors as a step towards more extensive arrangements.

93. In paragraph 70 of the Lagos Plan of Action, various concrete measures are proposed for promoting industrial co-operation at the subregional and regional levels. Prior to their implementation, however, decisions should be taken on the detailed evaluation and planning of subregional industrial activities, together with an analysis of the means needed to implement subregional programmes.

Development and planning of industrial activities at the subregional level

94. The development of industrial activities at the subregional level, complementary to those at the national level, is a key objective of the Lagos Plan of Action.[8] This calls for: the creation of industrial structures with a high

[8] Lagos Plan of Action, para. 57.

degree of linkage and mutual complementarity: the expansion of the linked economic activities in the transformation of raw materials into semi-finished and finished goods; the selection of specific product lines to meet domestic needs, especially of mass consumption goods; the exploration of the benefits of innovation by local agents of production and distribution; and the internal generation of effective demand for skilled manpower to make formal training cost-effective through expansion of employment opportunities. Subregional industrial efforts should aim first and foremost at strengthening national industrial structures, at integrating national economies and at promoting subregional self-reliance.

95. The methodology for the establishment of a subregional industrial programme is based on the identification of priority branches and requisite intersectoral structures within a subregion: these might include basic sectors such as the iron and steel, metallurgical, chemical, petrochemical, mechanical and electrical engineering, capital goods, agro-related, forest products and building materials industries. For example, the development of the chemical industry is essential to meeting the basic needs of the African population. It provides the fertilizers and pesticides needed to increase agricultural productivity and reduce losses in crops. It produces pharmaceuticals as well as chemical products for water and sewage treatment which are used to protect the population and livestock from disease. It supplements the population's need for clothing by making man-made fibres: it provides them with cement, glass and paint for buildings, paper and ink for education, fuel and tyres for transportation, and chemicals for purifying drinking water.

96. An important stage in the achievement of the above objectives is the preparation of subsectoral industrial master plans. This exercise would include:

(a) Forecasting subregional demand for the product based on an analysis and projection: for example, the consumption of ammonia in existing and projected nitrogenous fertilizer plants in the various countries;

(b) Estimating present and future production in the subregion;

(c) Calculating the quantities required to meet demand by comparing projected demand with existing capacities, thus determining whether production at the subregional level is justified and the number of units required;

(d) Identifying other key industrial projects which utilize these basic products as inputs.

97. In planning these priority industrial branches on a subregional scale, one should first identify at the branch level those activities suited to national operations. A study of processing chains related to mineral resources permits the identification of industries with a high threshold of technical efficiency and those with a lower threshold. It is important to analyse the successive processing operations which, commencing upstream with the raw mineral or vegetable material, emerge downstream, several stages later, as final products. In the processing of iron, for example, five industrial activities are involved: *(a)* extraction of concentrate; *(b)* reduction (smelting); *(c)* smelting and casting (steelworks); *(d)* rolling or initial processing; *(e)* secondary processing (final

product). Certain processing stages involving blast furnaces and oxygen steelmaking exceed the scope of national markets thus making for a multinational approach, while others such as rerolling and wire-drawing can be adapted to national markets.

98. The establishment of the industries listed below would ensure integration of the whole economy by creating effective linkages between industry and agriculture, industry and transport, industry and natural resources, and industry and energy:

(a) Industries contributing to the development of agriculture and an increase in food supplies, involving the manufacture of storage and processing equipment, transport equipment, construction and maintenance equipment (such as bulldozers, dumpers and rollers for feeder roads), agricultural tools, implements and machinery, irrigation equipment, fertilizers and pesticides;

(b) Industries contributing to the development of transport and communications involving the manufacture of railway tracks, rolling stock, trucks, buses, motor cars, bicycles, carts, telecommunication equipment (including radio and television receivers) boats and road construction equipment (including tractors and earth-moving equipment);

(c) Industries contributing to the development of natural resources involving the manufacture of equipment for geological investigations and mineral exploration, mining equipment and machinery, mineral processing equipment, machinery and plants, and ancillary facilities such as foundries, forge shops, maintenance and repair facilities;

(d) Industries contributing to the development of energy involving the manufacture of turbines, generators, transformers, switch gear, transmission and distribution cables, and pylons.

Pre-requisites for the implementation of subregional industrial programmes

99. In the Final Act of Lagos, African states pledged themselves to strengthening the existing economic communities such as the Economic Community of West African States (ECOWAS) and to establishing economic groupings in the other regions of Africa (Central Africa, East Africa, Southern Africa and Northern Africa). These subregional economic communities will set up optimal subregional economic areas capable of self-reliant economic development and responsible for the subregional industrial programmes.

100. The subregional communities will be responsible for the consultations and negotiations needed to set up multinational industrial enterprises. The subregional communities will also establish the appropriate structures for monitoring progress towards industrialization at the subregional level and undertaking the studies required.

101. During the first phase, emphasis will be placed on co-ordinating industrial development strategies, plans and policies of the countries concerned, bilaterally and multilaterally, and gradually developing an institutional mechanism for such co-operation.

Mobilization of financial resources

102. The implementation of subregional plans and the resultant major industrial projects will require considerable investment capital. Given the financial needs of the national development plans, it is highly unlikely that individual countries can finance from their national budgets their share of the capital needed for subregional enterprises. It is therefore imperative that an effective subregional mechanism for mobilizing funds be established if large subregional projects are to be implemented. It is equally essential that subregional development banks be set up so as to assist in the mobilization of financial and other resources, from within the subregion and without including financial and technical partners from the more advanced developing countries and the capital-surplus developing countries. In this connection, the Association of African Central Banks (AACB), the African Centre for Monetary Studies (ACMS) and the African Development Bank (ADB) could play a crucial role. In particular, the African Development Bank is requested to allocate a certain percentage of its resources to financing the implementation of the Decade programme. Furthermore, the establishment of an International Bank for Industrial Development is of critical importance, and all States, particularly those in Africa, should lend full support to the early establishment of this new international industrial financing mechanism.

103. Subregional banks could participate in the establishment of an embryonic industrial financial market for the subregion by encouraging the participation of multinational industrial corporations, national development banks, commercial banks, insurance companies, various Governments within the economic community and, if possible, public enterprises and large private enterprises. It would also be essential for those institutions controlled by developing countries such as the Arab Bank for Economic Development in Africa (BADEA) to reinforce their initiatives for financing industry and to make full use of existing national and subregional financial institutions in Africa.

104. It is estimated that attainment of the minimum of 1.4 per cent of world industrial output by the year 1990 would require an investment of $140,000 million.[9] This figure is based on an estimated investment of $99,000 million required for the development of the major branches of industry as indicated in table 1, as well as an investment of $41,000 million required for the development of the remaining industrial branches; the processing of raw materials, the manufacture of goods for export and the development of an entire range of industrial capabilities and services required for self-reliant and self-sustaining development during the Decade. Self-reliant development does not ignore exports: it focuses on the satisfaction of the needs of the people, with the export sector supplying the foreign exchange required for imported capital goods. However, capital goods are also required for the production of exports; Africa recognizes the necessity, within the strategy of collective self-reliance, to move from the export of raw materials to the export of processed or semi-finished products without falling into the trap of export-led industrial development.

[9]The figure of $140,000 million is an estimate derived from a UNIDO study, of the amount required to achieve Africa's share of at least 2 per cent in world industrial output by the year 2000.

Industrial training

105. The area of industrial training is one that lends itself to intra-African co-operation, at both the subregional and regional level. It calls for the co-ordination of specialized training programmes in advanced institutions and schools of engineering which should be located in the economic communities according to the industrial specialization of the subregions, provision being made for the exchange of students and trainees. Various industrial technology institutes could be created within the different communities, such as institutes for metallurgy, mechanical engineering, non-ferrous metals and food processing which could be linked with a network of industrial management institutes in each community. Serious consideration might also be given to the establishment at the subregional level, of advanced technology institutes, as well as the introduction of specialized training programmes for African engineers and managers within each subregion. In this connection, Governments should note that the African Institute for Higher Technical Training and Research is expected to train personnel up to the highest level of technical skills who will not only be capable of introducing and adapting technology but also of innovating and developing indigenous technology.

106. More specifically, co-operation at the subregional and regional levels in the area of industrial training could include:

(a) Harmonization of national policies and programmes for the development of industrial and technological manpower;

(b) Preparation of an inventory of industrial and technological manpower with a view to promoting its development and exchange within the region as a whole;

(c) Establishment, at the regional and subregional levels, of multi- and uni-sectoral training centres, particularly for industrial managers, technologists and technicians, and of facilities for the identification, preparation and evaluation of feasibility studies;

(d) Establishment of regional training programmes and institutions, including multinational teaching companies, within the principal sectors and priority subsectors, closely associated in their operational activities with universities, polytechnics and educational and other training institutions;

(e) Establishment of linkages between institutions within the region involved in the upgrading of technical capabilities in order to eliminate duplication of effort and, more importantly, to enable their staff to share their experience with others;

(f) Pooling of national training facilities, especially for educational planning and reform, the training of trainers and training in specialized industrial skills.

Development, adaptation and transfer of industrial technology

107. Since the technical expertise, financial and other requirements for the development and application of science and technology to economic devel-

opment are so vast and varied, intra-African co-operation at the subregional and regional levels in this area becomes imperative. As indicated in paragraphs 185 and 258 of the Lagos Plan of Action, a number of regional and subregional technological institutions have already been established. These include the

Institute of Economic Planning and Development (Dakar, Senegal);

African Regional Centre for Technology (Dakar, Senegal);

African Regional Centre for Engineering Design and Manufacturing (Ibadan, Nigeria);

East African Mineral Resources Development Centre (Dodoma, United Republic of Tanzania);

African Institute for Higher Technical Training and Research (Nairobi, Kenya);

African Regional Organization for Standardization (Nairobi, Kenya).

108. The above-mentioned initiatives need to be reinforced with new programmes which could include:

(a) Exchange of expertise, information and programmes;

(b) Joint acquisition of technology;

(c) Joint development and financing of R and D projects;

(d) Harmonization of R and D policies;

(e) Establishment of multi-purpose and specialized regional technological institutions and centres of excellence;

(f) Preparation and publication of an inventory of African science and technology experts, organizations and programmes;

(g) Setting up of a regional machinery for the exchange of information on terms and conditions of technology contracts and the joint acquisition of technology;

(h) Setting up of a science and technology information network, particularly on patent information.

In this regard, particular consideration should be given to proposals for the publication of an encyclopaedia of African technologies and an African science and technology journal, the establishment and maintenance of an African science and technology museum; the holding of a pan-African science and technology fair; and the establishment of an African science and technology prize.

Industrial information

109. The need for intra-African co-operation at the subregional and regional levels in industrial and technological information cannot be over-emphasized. Suggestions have been made at various fora for the establishment of an African industrial and technological information network. The exchange among African countries of information and experience, especially regarding the terms and conditions of industrial contracts, would greatly strengthen the bargaining

position of the countries. There is generally a tacit understanding between licensors and licensees that the terms of a contract should be kept confidental. Industrial contracts, however, are purely commercial arrangements and as long as proprietory or confidential technical information is not divulged, no legitimate objection exists to the sharing of information among national regulatory agencies. The disclosure of commercial terms by one national technology regulatory agency to another would not normally constitute a breach of the licensor's or licensee's interests but would enable the technology regulatory agencies to take decisions in the light of the wider experience of other African countries.

110. African countries should also exchange information on legislative or administrative measures introduced in each country, on guidelines for technology evaluation being compiled in each country, and on indigenous technologies and services which could be utilized by other developing countries. In this connection and in order to facilitate the exchange of information and permit effective analysis and dissemination, the African Regional Centre for Technology could, with the assistance of UNIDO and ECA, be responsible for receiving, processing, analysing and distributing the information supplied by African countries.

111. The development of indigenous technologies is an area in which co-operation among African countries could be highly productive. The exchange of information on available indigenous technologies and on the research and development programmes of their institutions could help to maximize the utilization of scarce resources and promote the pooling of experience. Co-operative research possibilities could be identified and promoted.

The importance of trade to African regional integration

112. Trade expansion was one of the priorities selected by the OAU Economic Summit, at Lagos, in 1980. There are two major linkages between trade and industrialization, the first of which is through the provision of markets, market outlets, market access and trade facilities with a view to reducing excess capacities in existing plants and expanding markets for new manufacturing plants and industrial enterprises processing raw material so as to make them economically viable. In this way, an increase in regional and subregional demand for manufactures and an increase in industrial demand for raw materials and intermediate goods contribute to intra-African trade expansion. Secondly, certain industrial production inputs can only be acquired through the expansion of trade: given the unequal natural resource endowments, trade facilitates complementarity in raw materials and related inputs so that individual African countries do not have to depend, for their industrialization, on their own natural resources alone, nor does the exploration of natural resources which raises value added depend entirely on markets outside the African region and domestic market.

113. The major constraints on intra-African trade are seen to include: deficiencies in physical (transport and communications) and institutional (commodity exchanges, clearing houses etc.) infrastructure; tariff and non-tariff

barriers; lack of adequate information on products; relatively high prices of African manufactures and the need for competitive prices; lack of facilities for trade and export credit; inadequate marketing and distribution channels; instability of supply; and payment difficulties.

114. Subregional economic communities should adopt trade policies and incentives and initiate promotion activities for harmonizing customs tariffs and reducing trade barriers so that economic integration can be achieved first at the subregional level and later at the regional level. A number of institutions have been established so as to promote intra-African trade, such as the Association of African Trade Promotion Organizations (AATPO) and the West African Clearing House (WACH), while steps are being taken to establish the preferential trade area for Eastern and Southern African states, and a development bank for the same countries.

115. The following measures should be envisaged:

(a) Identification and analysis of demand for and supply of industrial products, industrial raw materials and intermediate and consumer goods that meet the needs of African countries;

(b) Production of industrial goods in keeping with the needs and complementarity of African markets;

(c) Adoption of incentives that will assist African exporters and importers to increase intra-African trade;

(d) Establishment and strengthening of State or semi-State trading houses that will spearhead intra-African trade and promote the marketing and distribution of raw materials, semi-processed and manufactured goods;

(e) Strengthening AATPO, which will promote trade among African countries by bringing together buyers and sellers, promoting trade fairs and disseminating data and information;

(f) Strengthening the activities of the subregional clearing house that will provide African exporters and importers with short- and medium-term credit facilities.

Furthermore, by establishing transportation and communication links between countries and by eliminating trade barriers in the various subregions, subregional economic integration would be facilitated, the market for industrial products enlarged and industrial growth stimulated.

Regional co-operation in high-priority sectors

116. Within the key sectors of natural resources, technology and financing, a call is made in the Lagos Plan of Action for strengthening certain subregional and regional institutions, such as the African Regional Centre for Technology, the African Regional Centre for Engineering Design and Manufacture, the African Industrial Development Fund and the African Development Bank.[10]

[10] *Ibid.*, para. 70*(d)*.

117. The functions and programmes of these subregional and regional institutions should be assessed in terms of industrial raw material and energy needs and the industrial technology requirements of the Decade. Such requirements include the training of African technologists in priority industrial branches and the urgent adaptation of various technologies so as to bring about structural change in certain areas, such as the production of mini hydro-electric plants to supply rural areas and to initiate industrial decentralization on a national scale.

118. In the Lagos Plan of Action it is also proposed that an African regional centre for enginering consultancy and industrial management services be established.[11] The establishment of such a centre is one of the pre-requisites for self-reliance. The elaboration of subregional sectoral master plans and the establishment of integrated industrial programmes should be undertaken by senior African planners in collaboration with appropriate regional consultancy and management organizations

119. At the same time, new emphasis must be lent to the African Industrial Development Fund and the African Development Bank. The implementation of the programme for the Decade will require a considerable amount of funds for projects to be launched at the national, subregional and regional levels. In this connection, the success of the proposal for an International Bank for Industrial Development can be of fundamental importance to strengthening the financial base of the African Development Bank.

120. In the spirit of intra-African co-operation, the African Development Bank should allocate more of its resources to the financing of multinational industrial projects. Thus, it is essential to study the ways and means of increasing the financial resources of the African Development Bank by mobilizing the continent's financial resources or tapping foreign capital.

121. In the Lagos Plan of Action particular emphasis is placed on the energy sector.[12] Using very conservative assumptions as to population growth, peak demand factors, 1977 unit prices and transmission and distribution requirements, it has been estimated that electrical generating capacity requirements could necessitate investments of more than $40 billion. The programme for the Decade should ensure that the decisions taken at Lagos are rapidly put into effect, such as the creation of an African energy commission to co-ordinate all energy-related activities in Africa, the establishment of an African organization for nuclear energy, the creation of a regional centre for geothermal energy, and the setting up of a regional centre for solar energy and, finally, the establishment of an African development fund for energy. The feasibility of these regional centres and their establishment should be studied. In the search for a solution to the energy problems, the programme for the Decade should accord top priority to sites with major hydro-electric potential which are closely linked with the networks of several countries. In the long term, high-voltage networks should be inter-connected at the national, subregional and ultimately

[11] *Ibid.*, para. 70(*f*).

[12] *Ibid.*, paras. 284-294.

regional levels, so as to ensure better utilization of hydro-energy as well as reduce the consumption of oil and coal in thermal power stations. This would not only meet urban requirements but also boost the electrification of the railways.

African consultation arrangements

122. During the last three decades, African countries have attempted to establish different forms of economic groupings such as free trade areas, customs unions, common markets and economic unions on a subregional and regional basis: practically all forms of economic co-operation and integration have been tried. These attempts, which were initially welcomed with great enthusiasm, eventually ended in failure, often on account of similar recurrent problems. Despite these problems, if Africa is to achieve its industrial development objectives, it has no alternative but to establish multinational industrial enterprises in priority industrial sectors.

123. In order to overcome the problems hindering the establishment and operation of multinational industrial enterprises, a proposal has been made[13] for setting up machinery for industrial consultations and arbitration which could assist Governments in negotiating agreements on multinational industrial projects and in resolving, preferably at the level of Heads of State and Government, industrial conflicts between African countries. This machinery could also initiate consultations at the subregional and regional levels for intra-African co-operation in the development of major industrial sectors. In addition to harmonizing national policies and approaches and pooling scarce financial, technical and human resources, these consultations could also lead to the adoption of measures for the development of the industrial subsectors and areas, such as the establishment of associations of manufacturers and consumers, and the establishment of institutions for training, information and R and D.

124. In connection with the above, a significant contribution could be made by the UNIDO System of Consultations. For example, the first regional Consultation on the agricultural machinery industry will be held in Africa. The purpose of this regional Consultation, which will be attended by representatives of ministries of agriculture and industry, manufacturers and associations from Africa, more advanced developing countries and industrialized countries, will be to discuss all the implications, technical and financial, of advancing from one stage of production to another. Moreover, it is expected that a programme of action for Africa will be prepared for the development of this industrial sector based on intensified co-operation between countries of the region and between these countries and developed countries. In addition, the secretariats of ECA, FAO, OAU and UNIDO have all participated in the preparation of this first regional Consultation.

[13]See OAU document CM/1134(XXXVII), Annex I, OAU Operational Work Programme for the Period 1982-1983 for the Implementation of the Lagos Plan of Action and the Final Act of Lagos, paragraph 55, March 1981.

125. Depending on the success of this Consultation, other regional Consultations are suggested for those sectors of industry of particular interest to Africa during the Decade. Attention can thus be directed towards the possibility of regional Consultations in Africa during the Decade in respect of the food processing, textile, building material, wood, iron and steel, capital goods, pharmaceuticals and fertilizer industries, as well as such common topics as energy, industrial manpower training and industrial financing. In addition, regional preparatory meetings prior to future global Consultations are foreseen for certain industrial branches so that African countries can elaborate a common position.

126. It should be noted that attention at past Consultations has been directed, *inter alia*, towards:

(a) The changing pattern in the sector and the main trends governing future development;

(b) Estimates of world demand in the sector up to the year 2000 and the share in total world production that developing countries might achieve, as well as consideration of ways of overcoming the short- and long-term problems encountered by developing countries;

(c) Recommendations for expanding and enhancing international co-operation so as to increase the share of the developing countries in the sector, together with the expansion of production in a manner which might reduce dislocation in export markets;

(d) Negotiations of model forms of contract for the supply of various types of plant and equipment, together with various forms of contractual arrangements and guidelines.

Industrial co-operation with other developing regions

127. Self-sustained and self-reliant industrialization in Africa will not be understood in the short term by industrialized countries. Multinational mining corporations exploiting the natural resources of Africa have always opposed the establishment of both basic and capital goods industries in the region. These corporations not only dominate markets, but they also control the use of technologies. In order to combat this unrelenting opposition to industrial development in Africa, African countries should co-operate with other developing regions which have achieved a more advanced stage of industrialization to the mutual advantage of all parties. Owing to their strategic importance to African industrialization, co-operation arrangements (with such countries as Brazil, China, India, Mexico and the Republic of Korea at the industrial branch level could take the form of participation in the financing of industrial projects, technology transfer, assistance and advice in negotiations (at both the individual project and branch level) with developed countries on the acquisition of capital equipment and technology, organization of joint technical training programmes, and long-term industrial co-operation agreements for finished and semi-finished products.

128. A suggestion was made earlier that bargaining positions and skills can be developed and improved through participation in fora at which negotiations take place. In the field of industry, one such forum is that provided by the UNIDO System of Consultations. More specifically, the mechanism of the System of Consultations can be used by the states of Africa as a group, or by Africa together with other countries of the third world, to improve arrangements for industrial co-operation with developed countries. Formal and informal arrangements for co-operation, regional and inter-regional, can be initiated through, and facilitated by, the System of Consultations.

129. For example, a co-operation programme with Brazil, China, India or Mexico in the manufacture of locomotives could without doubt accelerate the exploitation of the immense African iron-ore resources and facilitate the development of a continental railway network. A co-operation scheme serving the interests of both African and Arab oil-exporting countries could be set up to channel financial resources to strategic industrial projects in Africa, whereby the Arab countries would be assured a supply of the semi-finished products they need for their own industrialization, such as alumina, timber products or basic raw materials.

130. Studies should be commissioned by ECA, OAU and UNIDO as a preliminary step towards preparing specific proposals for strengthening co-operation between African Governments and advanced developing countries on the one side, and Arab oil-producing countries on the other, with a view to developing basic and capital goods industries in Africa.

Promotion and popularization of the Decade

131. In earlier paragraphs emphasis was placed on the importance of launching promotional and popularization activities at the national level. A number of proposals were presented, some of which lend themselves to intra-African co-operation at the subregional and regional levels. These include the joint production of radio and television programmes, the publication of promotional material such as periodicals on both general and specific aspects of the Decade, and the joint organization of seminars and other promotional activities.

132. It is therefore important that, in the elaboration of their programmes for the Decade, regional and subregional organizations should devote special attention to the promotional aspect of the Decade and include concrete activities in their programmes together with the necessary financing. In this regard, the international organizations could be of great assistance to the regional and subregional organizations in identifying, elaborating, implementing and even financing these activities.

4. Establishment of the programme for the Industrial Development Decade

133. The Lagos Plan of Action and the Final Act of Lagos should be transformed into a programme of action for the African countries and intergovernmental organizations, whereby goals are set for each country and subregional group, and means determined for attaining these goals, including the contribution to be made by the international community and the major international organizations involved in the industrialization of Africa. It is not a question of merely attaining all the structural changes essential to industrialization based on self-sustainment and self-reliance—all policy measures should be directed towards their attainment. For many countries and economic communities, existing plans, programmes and policies would need to be modified so as to facilitate the introduction of new national and subregional industrial strategies, the formulation of industrial development plans, and the establishment of the institutions needed to develop African potential in the design, definition and implementation of priority programmes aimed at satisfying the priority needs of the region.

Formulation and implementation of the programme

134. It is necessary to distinguish between two phases in the programme for the Decade: the preparatory phase extending from 1982 to 1984, and the implementation phase extending from 1985 to 1990.

The preparatory phase

135. The preparatory phase is essential to the success of the Decade During this period, the regional, subregional and national strategies and programmes will be established, commensurate with the basic objectives of the Lagos Plan of Action and the Final Act of Lagos, while African industrial development will be reoriented towards self-reliance and self-sustainment.

At the national level

136. At the national level, it will be necessary to:

(a) Prepare and implement a programme for the promotion and popularization of the Decade;

(b) Prepare or update integrated industrial development plans comprising: a diagnosis of the existing industrial structure, policies and incentives from the viewpoint of the priority given to self-reliance; a survey of the country's natural resources; the identification of priority industrial branches; and the establishment of sectoral strategies and instruments (including the identification of specific industrial projects);

(c) Develop a national technology programme;

(d) Establish a financing programme for national industrial projects;

(e) Introduce a national energy development programme and policy;

(f) Establish or strengthen national industrial development centres;

(g) Prepare an overall consultation and negotiation framework and strategy through which national objectives can be obtained by industrial co-operation with the external world.

It is recognized that while the attainment of the above objectives are desirable for all countries, this may be a very difficult task for some. However, it is desirable that all countries make maximum progress towards meeting the objectives. ECA, OAU, UNDP and UNIDO as well as other international and African organizations are called upon to provide the necessary assistance, when requested, in the above task.

At the subregional level

137. At the subregional level, it will be necessary to intensify the efforts already made, with the assistance of ECA, OAU, UNDP and UNIDO, to:

(a) Prepare sectoral policies and programmes within the strategic industrial branches;

(b) Identify major industrial projects of interest to the countries in the subregion;

(c) Establish or strengthen subregional institutions for the promotion of subregional industrial integration.

New activities including promotional and popularization activities would also need to be developed and implemented to facilitate the achievement of the objective of intra-African co-operation and integration.

At the regional level

138. At the regional level, steps should be taken to identify and formulate common strategies for the development of priority heavy industries, such as capital goods, needed by the region as a whole. A consultation and negotiation mechanism should be established within the framework of the OAU. ECA, UNDP, UNIDO and other relevant international organizations should assist in setting up these African consultation and negotiation arrangements and in strengthening the following ECA sponsored institutions:

Institute of Economic Planning and Development;

African Regional Centre for Technology;

African Regional Centre for Engineering Design and Manufacture;

African Industrial Development Fund;

African Development Bank;

African Institute for Higher Technical Training and Research.

139. Furthermore, it will be necessary to establish other regional institutions especially in the areas of energy, industrial and technological information, engineering consultancy and management, and industrial training.

Industrial policy and planning meetings

140. It is proposed that the Follow-up Committee on Industrialization in Africa should meet during the second half of 1982. Participation in the meeting should be open to all countries whose delegations should include directors of economic and industrial planning institutes. It is also essential that this meeting be attended by Ministers or other competent authorities responsible for national economic planning as well as officials from subregional organizations and multi-sectoral intergovernmental organizations. These meetings will allow the responsible officials to become acquainted with the goals of the Decade and to adopt appropriate measures to implement the general programme.

141. The progress made in elaborating specific industrial programmes and projects established at the national and subregional levels should be reviewed at the regular meetings of the Follow-up Committee on Industrialization in Africa and of the Conference of African Ministers of Industry in 1983, both of which should be scheduled to take place during the second half of the year. Participation in these meetings should also be in accordance with the proposals made in the previous paragraph. A review and appraisal shall be made of the preparatory phase in the implementation of the Decade programme in 1984.

Regional Consultations in Africa

142. It is proposed to convene, during the Decade, regional Consultations in Africa covering the following industries: iron and steel, food processing, textiles, building materials, wood and wood products, capital goods, pharmaceuticals, fertilizers and energy. Regional Consultations on industrial manpower training, industrial financing and industrial and technological information should also be convened. The organization of the above regional Consultations should be linked with the schedule of UNIDO Consultations.

143. The primary purpose of the Consultations should be to provide a forum for African countries to address themselves to African problems in the selected industrial subsector and area. It is therefore envisaged that they will be organized in two phases. First, a regional preparatory meeting for each UNIDO sectoral or global Consultation will be held to define a common African position and to adopt measures to strengthen co-operation with other members of the third world on the one hand, and the developed countries on the other. Secondly, a regional follow-up meeting will be held to assess the results of the respective UNIDO Consultations. At this meeting, appropriate policy, institutional, financial and other measures will be adopted, as will a programme of action (based, in part, on the recommendations of the UNIDO Consultations) to promote intra-African co-operation in the subsequent development of the industrial subsector, branch or area in Africa.

Inter-regional Consultations

144. Consideration should also be given to holding, in the middle of the Decade, an inter-regional Consultation in order to review and determine how other third world countries could increase their industrial co-operation with African countries in boosting the region's priority industries, it being recognized that Africa is the least industrialized region in the world.

145. The $3 million earmarked for the Industrial Development Decade by UNDP in the preliminary list of regional projects for the Third Programming Cycle should contribute to financing the work to be carried out in the preparatory phase of the Decade programme. The main activities to be carried out during the preparatory phase are outlined in the chapter entitled "Modalities for the implementation of the Decade programme". Furthermore, during the preparation of the UNDP country and regional programmes for Africa (1982-1986) and following UNIDO programming missions to different countries and regional organizations in Africa, a certain number of project proposals and concepts at the national, subregional and regional levels were included in the appropriate country and regional programmes. Thereafter, they were submitted to the UNDP for approval in principle. A similar exercise was carried out by ECA which also outlined a number of regional proposals and concepts. The OAU has also submitted a number of projects and UNDP has agreed, in principle, to finance some of its activities related to the promotion of intra-African co-operation which are of relevance to the work of the Decade.

The implementation phase

146. The second phase will comprise the implementation of industrial projects and other activities defined during the preparatory phase. It will encompass the identification of technical partners, the preparation of joint feasibility studies as appropriate, as well as the mobilization of financial resources, be they from within Africa or from developed countries, or from elsewhere in the third world. It will also witness the implementation of promotional activities for the popularization of the Decade. A mid-term review of the implementation of the Decade programme shall be made in 1987, followed by the terminal review and appraisal in 1991.

147. ECA, OAU and UNIDO will organize biennial meetings of Ministers of Industry in each African subregion in order to monitor progress in implementing the programme for the Decade in the subregion. Such meetings would be held in 1983, 1985, 1987, 1989 and 1991 and, where possible, these meetings should be organized in conjunction with other related meetings convened by subregional organizations and MULPOCs.

148. In order to assist African countries in the implementation of their national and multinational industrial projects, ECA, OAU and UNIDO will also organize Consultations in the African subregions involving African

financial institutions, industrialists and government officials, investment promotion organizations from semi-industrialized countries and international financial institutions.

149. Pursuant to the various mandates formulated at the international level, ECA and UNIDO are the two organizations in the United Nations system jointly responsible for the preparation and implementation of the programme for the Decade. Their two secretariats, together with that of the OAU, will continue their close co-operation in finalizing and implementing the programme.

150. It is for this reason that ECA, OAU and UNIDO decided to establish a Joint Committee on the Implementation of the Programme for the Industrial Development Decade for Africa. This committee will co-ordinate the activities of the three secretariats related to the implementation of joint programmes and projects as well as monitor and review progress in the implementation of the activities of the Decade. Finally, it will assist in the overall monitoring, review and appraisal of the implementation of the programme.

Promotion and popularization of the Decade

151. As indicated earlier, it would be necessary to launch a comprehensive programme of promotional activities at the national, subregional, regional and global levels, in order to popularize the Decade. In addition to these proposals, it may also be worthwhile to produce a series of films at the regional level highlighting the important contribution of industrial development to the economic development of Africa, particularly in the rural areas. Such films or film strips should be widely circulated throughout Africa and arrangements made for their screening either in commercial cinemas or on television. It would also be useful to produce a number of radio programmes to be broadcast on national radio networks in each country as well as by the United Nations and other international radio stations. Additionally, an information bulletin such as "Industry: Africa" as well as other magazines, periodicals and publicity material should be published and widely circulated both within Africa and without.

152. Demonstrations are among the most effective means of publicity. The promotional programme for the Decade at the national, subregional and regional levels should, therefore, include a series of seminars, study tours, industrial fairs, mobile industrial demonstration units, competitions, industrial prizes and displays of indigenous industrial products. These activities, which should be directed towards the various categories of people involved in industrial development, especially political leaders, economic and industrial planners, potential industrial entrepreneurs, rural development authorities, primary schoolchildren, secondary school and university students, women and youth, would contribute to the exchange of experience. They would help to create new African initiatives in industry, bring about a greater awareness of the contribution that all members of society can make to industrial development, and highlight the important contribution of industry to economic development.

153. The international organizations will play an extremely important role in popularizing the Decade, not only within Africa but also within the entire international community. They could arrange for: the more effective distribution of their publications to industrial enterprises, universities and public libraries in Africa; publish and circulate widely special information bulletins on African industrial development, organize and finance industrial popularization seminars and study tours, both within Africa and without; and broadcast programmes through the United Nations and other international media (radio and television).

II. Guidelines for the formulation of strategies for major industrial subsectors and areas

1. Introduction

1. This chapter is not intended as an industrial programme for Africa, a region which comprises 50 independent states at different stages of economic development and with varying resource endowments. Those who have been drafting industrial development plans in their own countries will appreciate the virtual impossibility of such an exercise.

2. In the first section it attempts to identify major industrial project ideas in the priority subsectors: food, textile, building materials, energy, forest-based, metallurgical, chemical, engineering and small-scale industries. The project ideas were selected on the basis of one or more of the following factors: priorities given in the Lagos Plan of Action; provision of inputs to other industrial and economic activities, particularly agriculture; optimum utilization of domestic resources mainly for African use following the objective of self-sustainment; substitution of essential imported inputs in those member States where import capacities are becoming increasingly limited; and exploitation of the multiplier effect of basic industries.

3. The second section which comprises two parts, deals with the implications of factor inputs. The first part covers natural resource inputs, raw materials and energy: the basis for self-reliant, self-sustaining, integrated, interlinked and internalized development of industry. The second part deals with other factor inputs needed in the development, promotion and implementation of projects, such as manpower, institutional and financing capabilities and capacities.

2. Major priority industrial subsectors

4. The import substitution strategy invariably adopted by African countries has resulted in the creation of an industrial structure increasingly dependent on inputs such as capital goods, intermediate products, spare parts, other supplies and expertise. With the fast dwindling availability of foreign exchange, such industries are becoming liabilities.

5. It has become abdundantly clear that African countries cannot and should not continue along the well-trodden path of import substitution which is

leading them to disaster. They have to change the existing structure drastically and aim at collective self-reliant and self-sustaining development. This can only be done by developing resource-based priority and key industries that have a multiplier effect and maximum linkage to other economic sectors.

6. The project ideas identified under each subsector in this chapter were selected mainly for their potential contribution to increased productivity in the agricultural sector, particularly food, the area accorded the highest priority in the Lagos Plan of Action. Approximate indications of capacity, investment and manpower implications are given for some of the project ideas. Activities to be undertaken are suggested as is the institutional framework required to implement the project ideas.

Food processing industry

7. Since self-sufficiency in food, the development of industry and the training of human resources are basic priorities in the Lagos Plan of Action, the development of viable food processing industries becomes vital.

8. The Lagos Plan of Action underscores the drastic deterioration in supplies, the severe shortages of food,[1] decline in per capita consumption to levels below basic nutritional requirements, large post-harvest food losses and the rapidly increasing dependence on food imports over the past two decades. Among the major reasons for this state of affairs are Governments not having accorded the necessary priority to food and agriculture in resource allocation and policies,[2] the absence of strong political will as an integral part of the development process, the inadequate spread of improved and adapted technologies; a lack of infrastructure, and a lack of viable investment proposals.

9. A food industry development strategy and programme as an integral part of the national policy for socio-economic development based on self-sustainment can substantially reduce food losses, increase food production and supply through improved marketing and distribution, and enhance income distribution. Furthermore, the food processing industry can contribute effectively to overall economic development through its widespread internal linkages.

Current situation

10. The food processing industry, especially for staple foods, is characterized by relatively small economies of scale, high labour productivity and relatively low capital investment in the range of $1 million to $5 million.[3]

---

[1] Lagos Plan of Action, para. 16.

[2] *Ibid;* para. 7.

[3] United Nations Centre for Transnational Corporations, *Transnational Corporations in Food and Beverage Processing* (ST/CTC/19), pp. 194-195.

11. The need for food processing generally arises first from the fact that basic foods, most of which are perishable, are produced in locations far away from the centres of high consumption. Secondly, harvest times generally precede the dates of consumption by months—and sometimes by years. Thirdly, food production, particularly in Africa, where production depends on rainfall rather than irrigation, is subject to wide variations in harvests—some years witness heavy surpluses and others dismal failures. Given these factors, the introduction of food processing makes for better storage which reduces food losses by limiting spoilage and cuts costly transportation by making food available in different parts of the country. As indicated above, this, together with increasing nutritional levels relative to population growth, has the effect of widening and stabilizing the food market and thus stabilizing the prices of production which in turn encourage farmers to produce.

12. The formulation of a "food policy" as an integral part of the self-reliance and self-sustaining development process would thus enable a country to identify and choose food products for processing with a view to meeting the nutritional needs of the majority of the population, and to concentrate on processing indigenous food crops that are grown by the majority of the rural population in different ecological zones of the country. The choice of a flexible, but wide national "diet basket" and its promotion would thus tie food research to production by the largest number of the rural population under different ecological regimes so as to generate rural incomes. This income and production policy would, in turn, through proper marketing and distribution, widen the domestic market for processed and unprocessed foods. By making potential demand effective, this widened national food market would be a reliable incentive for farmers to adopt new production techniques and increase productivity. In this way, by producing what they consume, the African economies would become their own best and most reliable markets, thereby initiating the internal feedback required for self-sustaining development.

13. In the absence of an effective national nutrition and food policy, food and agricultural production has been oriented towards exports to advanced economies. The choice of product lines for local processing is often based on external demand which sometimes encourages the local production of non-indigenous crops. Most of the processed foods are for consumption by a high-income urban élite rather than the mass of the population. Malnutrition is prevalent as a result and more than 1 million Africans are estimated to have died in 1981 from undernutrition and malnutrition.

14. In aiming at the priority goal of food self-sufficiency, it must be recognized that the food production-processing-marketing system represents an integrated and inter-dependent relationship since no area can be developed in isolation. Viable food industries depend on steady supplies of raw materials of suitable quality, plus a steady demand for the final products. The inter-dependence inherent in this food "system" means that several government ministries, agencies and other bodies are involved, with the result that the system is sometimes not efficiently organized.

15. Some foodstuffs need not be processed, if they are promptly consumed locally. However, it is essential that foodstuffs be processed if their preservation, handling, storage, distribution and marketing are major elements in the system. Food processing is also important to "food security" schemes.

16. Food and agro-industries have developed slowly in Africa. Most of the agricultural products are exported as raw materials and, given the increasing prices of manufactured goods, more and more agricultural products will have to be exported in exchange for manufactured goods imported.

17. Developing food industries in African countries will improve food supplies and reduce imports. It will contribute to increased self-reliance by reducing food losses, adding value to the raw materials, increasing export earnings, raising employment levels and improving incomes. It will further ensure better market opportunities, stimulate production and rural development, reduce urban migration, improve nutrition standards both qualitatively and quantitatively, increase opportunities for investment in agriculture and processing industries, and stimulate the development of allied sectors of the economy.

18. All five Conferences of African Ministers of Industry to date have accorded the highest priority to the development of food and agro-industries. The Conference of African Ministers of Industry is the only body representing African industry as a whole; thus, its continued designation of the food and agro-industrial sector as one of topmost priority means that the development of that sector must be taken seriously and programmes relating to its development effectively implemented. In view of the foregoing, food and agro-industries should continue to be accorded high priority in terms of policies and resource allocations, and industrialization efforts should give priority to the manufacture of agro-inputs and processing of agro-outputs.

19. This notwithstanding, progress is not commensurate with the expressed need. Food processing accounts for up to 60 per cent of the value added in all African industrial manufacturing.

20. From the foregoing, the essential strategy can be seen. It is fundamental that production, processing and marketing be viewed as an integrated and interdependent system in any food processing activity. An ever larger degree of local processing of indigenous raw food materials must be sought. The trend should be towards smaller-scale, rather than larger-scale, processing units, which are both suited to and sited in the food-producing rural areas, and provide greater employment. More appropriate equipment, either produced locally or within Africa, should be used, while a sustained effort should be made to identify and establish co-operative food processing, marketing and distributing activities involving two or more neighbouring countries.

Project ideas[4]

21. Ten specific goals are given in the Lagos Plan of Action, of which the following project ideas cover six: *(a)* reduction of post-harvest food losses (processing, preservation and storage facilities, distribution and marketing); *(b)* national food security; *(c)* cereal production to reduce dependence on wheat (and barley) imports; *(d)* training; *(e)* inter-country co-operation, including food trade, marketing and distribution as well as training; and *(f)* external assistance (investment, technical assistance and training).

22. The main project ideas relate to:

Cereals, roots and tubers;
Edible oils;
Fruit and vegetables;
Animal feed;
Meat, milk and dairy products;
Marine products;
Training in the various aspects of processing these commodities.

Processing of locally produced cereals, roots and tubers to produce flours for existing, new and varied local products, as well as in combination with wheat flour, for "composite flour" bakery and allied products.

23. Imports of wheat to Africa rose in volume at an average annual rate of 14 per cent (1970-78), totalling over 13.4 million metric tons in 1978; an average annual value increase of 26 per cent (1970-78) valued at over $2 million in that year. Sixty to eighty per cent of these imports are used in the manufacture of bakery products.

24. The alarming rate at which cereals—especially wheat—are being imported into Africa is best demonstrated by the fact that wheat imports in 1978 reached a level that had been estimated that very same year as the figure for 1990.

25. The advantages of bakery products made from composite flour over those made from 100 per cent wheat flour are many. All or most of the advantages listed below hold true for any African country which imports wheat in increasing quantities, yet grows cereals, roots or tubers suitable for use in composite flour:

(a) Reduction of dependency of local bakeries and associated industries on wheat imports, thus leading to savings in foreign exchange;

(b) Increased utilization of indigenous production, thus providing an incentive to produce;

(c) Increased industrial investment, thus generating more employment;

[4]Most figures cited in this section are based on those given in Food and Agriculture Organization of the United Nations, *Agriculture: Towards 2000* (C79/24, Rome, July 1979).

(d) Increased food self-sufficiency;

(e) Increased food "security" when imported wheat is scarce or the production of a particular cereal or tuber crop used for composite flour has been reduced;[5]

(f) Convenience as a "vehicle" for improved nutrition through the addition of flour(s) from proteinacious legumes etc.

26. It is estimated that the additional volume of cereals to be processed in Africa in the years 1990 to 2000 is almost 26 million tons—an annual growth of more than 4 per cent. The gross annual investment in cereal processing will increase from $224 million in 1980 to $331 million in 1990, including an increase in the annual gross foreign exchange requirement from $171 million to $229 million over the same period.

27. A village-scale dehuller-hammer mill system, such as the Botswana mill, with an annual capacity (one shift) of 1,400 metric tons sorghum or millet would require one mill manager, one mechanic and 1-3 labourers. Moreover because many milling units of this type would be required in rural areas, considerable employment would be created, with investment per unit amounting to about $5,000 (in 1980).

28. The operation of a medium-size wheat-flour mill with a daily (24 hours) capacity of 120 metric tons would require two engineers and ten skilled workers, while a medium-size baking plant with a daily capacity of 340 kg would require two engineers and four skilled workers.

Processing of edible oil-bearing materials at present partly processed locally

29. A characteristic of the edible oil processing industry in Africa is that a significant percentage of the oil is exported in bulk after initial processing to developed countries where it is finally processed, packaged and marketed. (Often the finished product is shipped back to its country of origin and sold.) Obviously the producing country loses in terms of employment, value added and foreign exchange, further to which it has to pay more for the finished product.

30. It is estimated that the additional volume of vegetable oil alone to be processed in Africa in the years 1980-1990 is 6 million tons—a growth of 3.9 per cent annually. The annual gross investment in oil crushing facilities will increase from $77 million in 1980 to $122 million in 1990, including an increase in the annual gross foreign exchange requirement from $58 million in 1980 to $84 million in 1990.

[5] As composite flour can be made from one or more indigenous raw materials, a shortage or absence of one can be made up for by an increase in another.

Fruit and vegetable processing

31. Both domestic demand and export opportunities for processed fruits and vegetables are good. However, this particular sector often lacks assured supplies of raw material of a quality that meets the requirements of developed country markets. Furthermore, in the villages and areas with insufficient production, attention should be given to mobile processing units.

32. It is estimated that the additional volume of fruit and vegetables to be processed in Africa in the years 1980-1990 is 1 million tons—an annual growth of 6.8 per cent. The gross annual investment in processing facilities in this sector will increase from $15 million in 1980 to $37 million in 1990, including an increase in the annual gross foreign exchange requirement from $12 million in 1980 to $27 million in 1990.

33. An orange-juice processing plant with a daily capacity of 800 kg (8 hours) of concentrated juice would require five engineers and ten skilled workers.

Animal feed production

34. While a certain amount of animal feed is imported into Africa, greater amounts (principally oil cake) are exported. Thus, a good basis exists for both intra-African and increased export trade in this sector. Certainly, African self-sufficiency in animal feed is attainable, and necessary variations in formulation can be achieved using the processing by-products of the commodities previously mentioned (cereals, roots, tubers, vegetable oil seeds, fruit and vegetables).

35. An animal feed manufacturing plant with a monthly capacity of 1,000 metric tons of various feeds would require three engineers and 15 machine operators.

Meat, milk and dairy products

36. The development of the meat industry which is considered to have a high potential in Africa can only be successful if all the aspects of the industry —production and supply of suitable raw material, handling, processing, packaging, storage, distribution and marketing—form an integral whole. Failure of even one of the production stages can easily result in fragmentation and have adverse effects on the viability of the whole project.

37. The meat industry is still at an early stage of development in most African countries, which is reflected by the few industrial slaughterhouses and meat processing industries and their small production of meat and, in particular, of processed meat products. However, the meat industry is none the less very important to the economies of some countries. In other countries, the potential has not yet been fully exploited, whereas in others the meat industry is almost non-existent.

38. Many surveys on the prospects of the meat industry in African countries have been conducted and have resulted in several project proposals, pre-feasibility and feasibility studies. However, at a regional level the development of the meat industry has not been successful despite the great potential.

39. It seems, therefore, that a more integrated approach to the development of meat industries is required in order to realize the optimum utilization of available livestock and other meat resources and also to ensure that scarce financial resources are more fully and effectively channelled into sound and economically viable projects.

40. Considerable amounts of dairy products are imported into Africa from developed countries. Thus, investment in milk and dairy product processing can save foreign exchange, provide employment and reduce product cost. A milk processing plant with a capacity of 6,000 litres (6 hours) would require three engineers and one skilled worker.

Marine products

41. Fish, crustacea, seaweed and other marine food products represent an important source of protein which, in general, is only available in coastal areas. Owing to the rapid spoilage of fish in hot climates, a system must be developed for the chilling, cold storage and refrigerated transportation of fish, as well as its processing by salting, smoking, and canning; provision should also be made for the production of fish meal. Such a system would preserve the fish and permit its distribution to more distant regions. Standard ice-making and cold storage plants and refrigerated transport vehicles would be needed, and considering the length of the African coast, their number might be in the order of thousands. Consequently, local or regional manufacture of such units should be considered.

Activities

42. Among the activities that need to be undertaken are:

(a) Formulation of national nutritional targets and food industry policies;

(b) Enactment of appropriate legislation to encourage and facilitate investment in the food industry at the national and subregional levels;

(c) Continuous review of projected demand for processed foods as well as of prices and subsidies so that agricultural production of basic crops can be stimulated, and food processors ensured a reasonable profit;

(d) Formulation of national food industry development programmes establishing effective links between food research and food processing activities, and the commercialization of research results, every care being taken to ensure linkage between agro-industries and the other industrial sectors;

(e) Continuous supply of raw materials of a suitable quality and in the requisite quantities;

(f) Formulation of development programmes for the support, establishment and strengthening of indigenous food-processing and distribution companies;

(g) Integration of food production, processing and marketing into a system, and provision for that system in day-to-day government activity, and appropriate organization so that food supply and demand are balanced;

(h) Provision of major impetus needed to increase the flow and volume of investment;

(i) Preparation of manpower profiles and appropriate co-ordination of education and training programmes to meet the technical and managerial needs of the food industry.

Institutional framework

43. The following are examples of institutional arrangements that could be considered.

(a) A cabinet-level, interministerial food and nutrition council (or equivalent) to review the deteriorating food situation, take policy decisions and issue directives;

(b) An industrial project preparation facility concentrating in part on the food industry and linked to facilities for food industry investment and food product marketing;

(c) Institutions (goal-oriented and dictated by food industry needs) to carry out research and development and provide training related to such areas as food science and technology, product development, and packaging;

(d) A national engineering design and production centre to develop capabilities with respect to the production of food processing equipment.

44. It is suggested that consideration be given to promoting intra-African co-operation in food production and trade as well as to establishing an intra-African agreement on food that would facilitate exploitation of internal markets in the region and provide impetus to the mobilization of the food processing sector.

Textiles

45. Textiles (clothing), one of the major basic needs, is one of the four industrial subsectors in which Africa will do everything within its power to attain self-sufficiency in the decade 1980-1990.[6]

[6]Lagos Plan of Action, para. 66.

Current situation

46. As shown in table 2, the consumption of textile fibres in Africa increased from 952,000 tons in 1971 to 1.23 million tons in 1979, at an average annual growth rate of 3.3 per cent. Comparison of consumption (952,000 tons) with output (330,000 tons) in 1971 reveals a huge gap of 622,000 tons.

TABLE 2. CONSUMPTION OF TEXTILE FIBRES IN AFRICA

(Fibre quantities in thousands of tons)

		Natural fibres				*Man-made fibres*			*Grand total*		*Population*	
		Cotton	*Wool*	*Flax*	*Total*	*Synthetics*	*Artificial*	*Total*	*Quantity*[a]	*Per cent*	*Total*	*Per cent*
Africa	1971	625	57	13	695	130	127	257	952	4.0	350	9.2
	1979	626	240	12	878			353	1 231	4.6	455	10.5
World	1971	11 808	1 644	3 471	16 923	5 854	757	6 611	23 375	100.0	3 799	100.0
	1979	14 200	4 210	607	19 017			7 862	26 879	100.0	4 335	100.0

Sources: Compiled from figures in Food and Agriculture Organization of the United Nations, *Per Capita Fibres Consumption*, various issues, *Production and Trade Yearbook*, various issues, and Economic Commission for Africa, *Textile Industry in Africa*, 1969.

[a]The 1979 grand totals were arrived at using 1971 per capita availability of all fibres (2.7 kg for Africa and 6.2 kg for the world).

47. Although the consumption of textiles is low in most African countries (accounting for about 4 per cent of world consumption), the reliance on imports is high. On the basis of their current status and the possible development of domestic textile industries, African countries can be divided into the following three groups:

(a) Countries that are almost self-sufficient in cotton textiles and display potential for exports. These countries are likely to place emphasis on export activities in addition to meeting the increasing domestic demand;

(b) Countries that have a domestic supply of raw cotton but still import considerable amounts of cotton fabrics. Most countries belonging to this group display potential for successful import substitution activities and, at a later date, they would also be able to export considerable quantities of cotton fabrics;

(c) Countries whose domestic cotton production is inadequate. Such countries can supplement their needs by importing from other African countries with excess cotton.

It should be pointed out, however, that in most of these countries the processing capacity installed is underutilized, thus necessitating that particular attention be paid to overcoming this problem in the interests of advancement in this subsector.

48. The evolution of the textile industry in African countries can be seen as passing through three stages: import substitution for the products most readily manufactured locally; self-sufficiency in meeting domestic requirements; and

promotion of textile exports. In this connection, it should be noted that the trend in textile technology is likely to stimulate rapid structural change: the textile industry is becoming increasingly capital-intensive and technologically sophisticated. Manpower requirements per unit of output are likely to decline, but a higher proportion of the labour force will have to be technologically skilled. This combination of capital intensity and technological sophistication makes it all the more essential to select carefully the right kinds of technology so as not to aggravate the current unemployment situation in Africa.

49. The textile industry uses different kinds of raw materials such as cotton, wool, silk and man-made fibres. Cotton, the most widely used raw material, is locally produced in quantities adequate to sustain a developing textile industry in the African region. This, coupled with the fact that the production of fibres from non-renewable hydrocarbons is capital-intensive and such synthetic fibres are expected to become increasingly expensive, implies that most African countries would be advised to concentrate on developing cotton-based textile mills. Some of the countries with forest resources should look into the possibility of producing cellulosic-based (artificial) man-made fibres, particularly viscose rayon. It should be noted that the manufacture of such fibres can be linked with pulp mills and offers scope for co-operative development among member States. Attention should also be given to the production of hard fibres for use in the packaging industry, particularly for applications related to the food-processing industry.

50. According to FAO,[7] an additional 1.84 million tons of cotton fibres will be needed during the period 1980-1990, while investment in cotton ginning plants required to produce this quantity, it has been estimated, will increase from $100,000 in 1980 to $170,000 in 1990, including an increase in the annual gross foreign exchange requirement from $100,000 to $140,000 over the same period. It is apparent that these figures would be much higher, if account were taken of the investment in growing cotton and other natural fibres as well as in developing production facilities for man-made fibres and fabrics. The African countries should try to increase substantially the production of local raw materials, including cotton and man-made fibres, instead of importing them from countries outside the region.

Activities and projects

51. Among the activities that need to be undertaken are:

(a) Assessment of labour needs and the organization of training at the national and multinational levels;

(b) Intensification of efforts directed towards the development and efficient utilization of local raw materials;

(c) Assessment of textile consumption and demand and production capacity, including those for cotton ginning, spinning and weaving, man-made fibres and textile finishing;

---

[7] *Agriculture: Towards 2000...*

(d) Formulation and implementation of cotton and other natural fibre-based textile projects, taking into account integration with the production of natural fibres;

(e) Assessment of the feasibility of linking the manufacture of cellulosic fibres, particularly viscose rayon, with pulp and paper projects (in forest-rich countries);

(f) Assessment of the possibility of integrating the manufacture of synthetic fibres, particularly polyesters and acrylics, with petrochemical products (major oil-producing countries).

Institutional framework

52. The following are examples of institutional arrangements that could be considered:

(a) National textile corporations;

(b) Mechanism for collective negotiation of the elimination of tariff and non-tariff barriers in developed country markets;

(c) Network for the exchange of technical and market information on fibres and textiles, including a centralized information facility to serve Governments;

(d) National and multinational training institutions;

(e) Research and development institutions for natural fibres;

(f) Standardization and quality control mechanisms under the aegis of the African Regional Organization for Standardization;

(g) Mechanism for promoting intra-African trade, protecting African markets and fostering exports to countries outside the region;

(h) Arrangements for promoting intra-African co-operation in the production of textiles, including the establishment of joint ventures.

Forest-based industries

53. In the Lagos Plan of Action emphasis is placed on the utilization of local natural resources.[8] The forest and varied climatic and soil conditions of Africa are such that, if used properly, they could provide the basis for the integrated development of forest industries, which were among the industrial subsectors given priority in the Lagos Plan of Action.[9]

54. The major wood-based products resulting from the significant transformation of wood are wood-based panels (veneer, plywood, particle-board and fibreboard), pulp and paper (including viscose rayon fibres, lacquers and nitrocellulose), furniture and joinery (including timber engineered products and

[8] Lagos Plan of Action, paras. 56*(b)*, 59*(c)*, 66*(f)*, 68*(l)*, 70*(b)* and 71.

[9] *Ibid.*, para. 67*(b)*, (vii).

structures), charcoal and its by-products, chemicals, matches, gums and tanning materials. Forest-based industries can thus be seen to provide products that meet basic needs in shelter, clothing, education and food preparation.

55. The degree of processing in forest-based industries ranges from the simple cutting of trees into logs (regional industrial round wood production accounting for between 3.0 and 3.4 per cent of world production) to complex chemical processing into viscose rayon fibres. In Africa, most of the wood is used as fuel, a small part thereof in the form of charcoal. In 1977, for example, out of a total of 383 million m^3 of round wood production, 336 million or 89 per cent was used as fuel wood and charcoal.[10] The processing of the balance is generally limited to simple transformation into products used for building and construction (timber), furniture and joinery, electricity and telegraph poles, and railway sleepers.

56. A limited number of countries have ventured into more complex processing. Although some countries produce paper, some of their paper mills are based on imported pulp. There is, therefore, plenty of scope for expanding and developing the forest-based industry in Africa. In this connection, particular attention should be given to the development of small-scale industries in this sector. For more complex processing operations, however, consideration should be given to co-operation between a number of countries, including the pooling of resources and, as appropriate, the establishment of joint ventures.

57. The achievement of a measure of self-sufficiency in forest-based products, based as they are on renewable resources, would help African countries to reduce their imports of such products and enable them to import capital goods so essential to their economic development. In this connection, it should be noted that regional (excluding South Africa) imports of forest products increased fivefold from $221 million in 1967 to $1,074 million in 1978, while the corresponding export figures rose threefold from $266 million to $837 million over the same period. In 1970-1978, on average, pulp and paper accounted for 50 per cent of the imports and round wood for about 71 per cent of the exports. In terms of quantity, pulp and paper imports averaged 1.5 million tons per year during the period 1973 to 1978.[11] From these figures it is clear that while unprocessed wood (logs) dominate Africa's exports, its imports are dominated by manufactured products with a much higher value-added content.

Problems and constraints

58. Some of the major problems and constraints which have prevented full development of the forest industry are:

(a) Unplanned land utilization resulting in the destruction of forests (thus making it difficult to plan for forest industries and to ensure supplies of wood);

[10]Food and Agriculture Organization of the United Nations, *Yearbook of Forest Products* (Rome, 1978).

[11]Derived from *Yearbook of Forest Products* . . .

(b) Domination of industry by expatriate firms;

(c) Shortage of trained labour;

(d) Lack of financial resources including foreign exchange;

(e) Political instability and interference in industry and trade;

(f) Lack of complete forest inventories and lack of knowledge about use of some of the available trees;

(g) Small domestic markets and lack of intra-African trade as well as obsolete and restrictive standards or specifications;

(h) International trade barriers.

Strategy for the regional development of the woodworking industry

59. Some parts of Africa are endowed with forest resources. Self-sufficiency in forest products can be attained within the region, given planned exploitation, afforestation and reforestation.

60. In view of the prevailing ecological conditions, which vary from dense forest to desert, forest industry development offers large scope for trade in forest products from those member States endowed with forest resources to those with none or inadequate supplies.

61. On the other hand, while the major problem leading to deficits in Africa is the lack of resources in major market subregions, small and poor production infrastructure is prevalent in those zones with surplus timber resources.

62. An obvious development priority is further investment in the rejuvenation of the existing industry and the creation of new capacities in timber-rich zones, especially Yaoundé and Gisyeni.

63. However, these two timber-rich MULPOC zones have a small population and it so happens that the subregions' economies are limited. Consequently, they cannot independently finance the degree of investment in infrastructure and production facilities required to generate adequate, reliable production.

64. The major deficits in wood products and timber resources are in North Africa, a region with considerable surplus income from petroleum. Mutually beneficial co-operation should therefore be possible, with North Africa supplying the finance, and Central Africa the resources. North Africa would be assured sustained and reliable wood supplies at prices in which they have some say, while Central Africa would enjoy access to financing for infrastructure and manufacturing facilities they could not afford to develop independently as their limited budget priorities lie elsewhere.

65. Similar schemes could also be arranged with other affluent countries such as Nigeria whose own resources will soon be unable to support local demand.

66. The above linkage agreements would meet the hardwood requirements of most of North Africa and the semi-arid zones of West Africa in terms of sawn timber, veneer and plywood, particle-board and fibreboard, but would leave untouched the softwood lumber deficit.

67. In this case, timber-deficit MULPOC countries would co-operate with either Central Africa (tropical softwoods to be replanted on lands cleared of hardwood) or with East and Central Africa. The latter already have experience in plantation forestry and, in several cases, large softwood plantations originally intended for a pulp market which is no longer favourable.

68. It should be noted, however, that such co-operative ventures are doomed to failure unless the problem of intra-African transport is settled simultaneously. The aspects requiring most attention are African coastal shipping, port facilities and rail links.

Project ideas

69. As Africa possesses large reserves of timber suitable for processing into various products needed in the region as well as overseas, many opportunities exist for increasing trade in forest products. Based on past local production, import statistics, future potential, economies of scale, capital intensity, relatively complex processing and the need for multinational co-operation, the following appear to be the major forest products that should be given special consideration when planning forest industries at the national and multinational levels:

(a) Saw mills and wood-based panel mills: Products comprise sawn wood and wood-based panels (veneers, plywood, particle-board and fibreboard). Production of panels is dominated by veneers for export, which accounted for 6 per cent of wood production in 1977, whereas the region was a net importer of the other types listed. Expansion of output should be based, wherever possible, on the utilization of logs which might otherwise be destroyed when forests are cleared for agricultural development. The basis for expansion is additional saw mill capacities of 3.4 million m^3 and 4.7 million m^3 in 1990 and 2000 respectively. Total investment for the period 1980-2000 is estimated at about $3 billion, while manpower requirements are more than 30,000 persons.

(b) Furniture: Production of high quality furniture or furniture components for export is possible and practical using the beautiful woods available in African natural forests and plantations. It is suggested that four pilot plants (one in West, two in Central and one in East Africa) be set up to enable the developing countries of Africa to produce high-grade furniture that can compete with other exports to OECD and African countries not endowed with forest resources. A total investment of $6 million and a workforce of 600 persons will be needed. Depending on the success of these plants, their number can be increased.

(c) Pulp and paper: According to FAO,[12] the consumption of paper is expected to increase from 1 million tons in 1980 to 4 million tons in 1990 and

[12] *Agriculture: Towards 2000* . . .

to 7 million tons in 2000. Large scope thus exists for expanding the production of pulp and paper in Africa for regional consumption. Wood from plantations as well as mixed forest wood can be used to produce pulp for paper and viscose rayon. Total new capacity of 3 million tons is envisaged to be in operation by 1990 and this will increase by a further 3 million tons by 2000. The investment requirements for each 3 million tons has been estimated at $6 billion to $9 billion, and workforce needs at 30,000 persons.

(d) Charcoal: An increase in charcoal production should be planned so as to utilize forest industry residues and the large quantities of wood which are otherwise wasted when clearing forests for various land uses. Some of the production units should be of the retort type so that chemical by-products can be recovered. A retort unit with a capacity ranging between 3,000 and 40,000 tons per year would require investment between $300,000 and $10 million.

(e) Training for saw milling and wood panel industries: It has been estimated that by the year 2000 some 16,730 skilled workers, technicians and technologists will be required for these industries. To meet such a huge demand for trained personnel, it has already been proposed that 45 vocational training centres and 2 technical colleges be set up at a cost of $294 million (at 1980 prices).[13] Training should also be provided in respect of secondary wood-processing industries. The curricula should be changed so as to train a greater percentage of woodworking machine operators and correspondingly fewer carpentry joiners. Furthermore, training should be introduced for middle and top management in all specializations and at all levels so as to accelerate the process of Africanization.

Activities

70. Among the activities that need to be undertaken are:

(a) Formulation of national policies and strategies for developing and exploiting rationally the forest resources;

(b) Determination of priority forest-based products for domestic and export purposes to be produced locally, taking into account the forest resources and infrastructure available;

(c) Formulation of afforestation and reforestation programmes (to supply timber in perpetuity), based on trees suitable for industrial purposes;

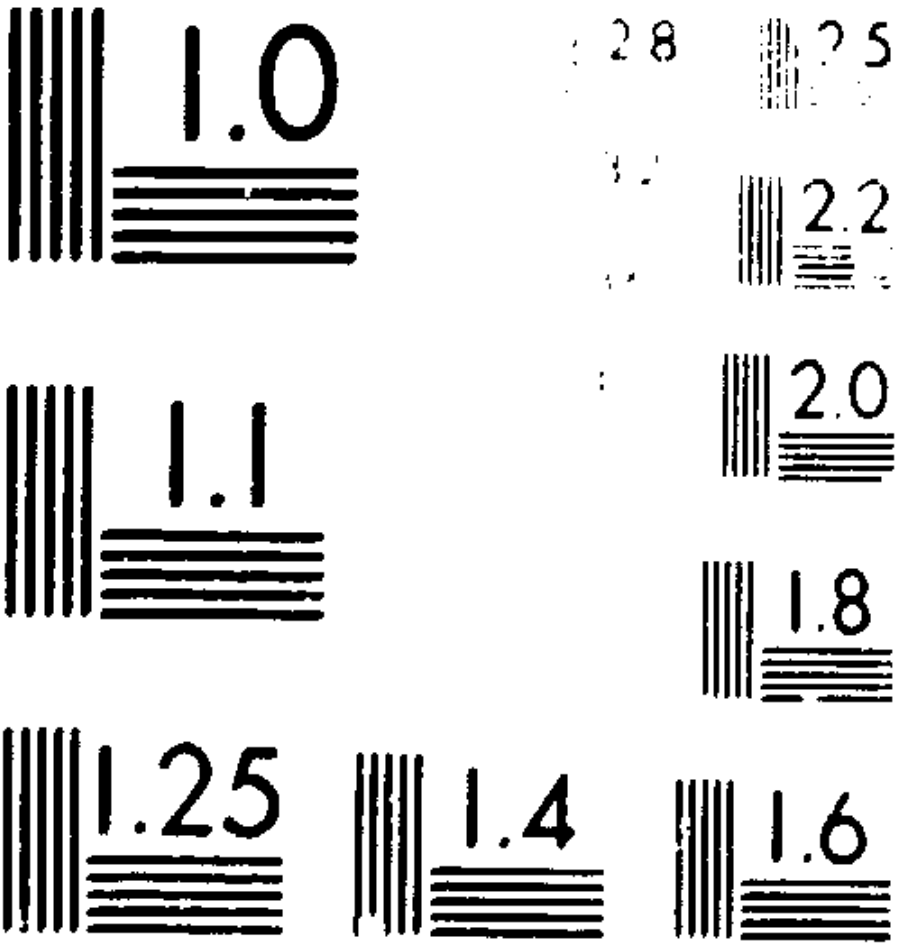
(d) Formulation of a programme for the development of production units for products selected in *(b)* above taking into account the needs of forest-deficient African countries and export possibilities outside the region. The programme will include case studies for the establishment and operation of small-scale woodworking plants;

(e) Promotion of national woodworking projects to serve as models for the development of the forest industries sector in the region;

(f) Stimulation of co-operation between wood-deficit and wood-abundant countries in the region.

---

[13] Proposal made by the FAO/ECA Forest Industries Advisory Group for Africa.


1.0
2.8
2.5
2.2
1.1
2.0
1.8
1.25
1.4
1.6

Institutional framework

71. The following are examples of institutional arrangements that could be considered:

(a) Incorporation of a forest-based industry unit within a national body responsible for project planning, preparation and appraisal;

(b) Establishment of organizations responsible for forest conservation and management;

(c) Establishment of research, development and training centres for the efficient utilization of forest resources, including making pulp from mixed tropical woods;

(d) Establishment of forest industry corporations to initiate, promote, and implement forest-product projects and operate production facilities;

(e) Establishment of timber organizations at the national, subregional and regional levels to promote trade in timber and forest products within Africa and without.

Building materials and construction

72. In the Lagos Plan of Action emphasis is placed, *inter alia,* on the satisfaction of the population's basic needs and the exploitation of local natural resources, and a call is made for the creation of a solid base for self-sustained industrialization at the national, subregional and regional levels.[14] In this context, it calls for the production of sufficient quantities of building materials for the construction of decent urban and rural housing for the region's growing population and in general to meet the economy's requirements in terms of building materials by 1990.[15] The development of building materials and construction industries is also one of the short-term priorities whereby the foundation must be laid for the rapid development of basic industries.[16] Moreover, there is no sector of activity in which building materials and construction services do not play a part, and this sector is well-suited to both large- and small-scale units whereby the former should not be promoted at the expense of the latter. Be it the creation or improvement of the basic structures for economic development or the satisfaction of socio-cultural requirements, the construction industry lays the ground for the establishment of conditions favourable to that creation or improvement.

73. The links between consumption, production and construction show that economic growth and social equality are dependent on construction. The activities of the construction industry are not confined to the construction of dwelling houses, but extend to infrastructure, equipment and services as well as their repair and maintenance. Thus, construction is a powerful stimulator of social growth and well-being. It is therefore not surprising that in the developed

[14]Lagos Plan of Action, para. 56.

[15]*Ibid.*, para. 66.

[16]*Ibid.*, para. 67.

countries investment in the construction sector, including building materials, is higher than in any other sector (over half the total investment). Considering the other factors needed for the smooth operation of the construction industry, such as the goods produced by other industries, manpower and other inputs, it is easy to see why this sector is so sensitive to socio-economic conditions and why political leaders attach so much importance to controlling its development by formulating and adopting clearly defined policies and strategies. Reciprocally, it can be said that, because they have in the past misjudged or are still misjudging the importance of the building materials and construction industries sector and its primary links with other socio-economic sectors, some countries, despite their material resources, have repeatedly made unsuccessful experiments in the field of construction which, instead of serving as an instrument of development, represents, in the last analysis, a bottomless pit swallowing up their wealth and efforts and constitutes no more than a socio-economic dead weight.

General characteristics of the construction industry in Africa

74. The construction industry appears twice in national accounts: first as part of capital formation by type of asset, and secondly as a component of GDP by industrial origin. In terms of capital formation, recent information shows that in the African region, the construction industry constitutes 40-56 per cent of total capital formation, whereas in European countries it constitutes between 51-66 per cent of capital formation. As far as GDP is concerned, the contribution of this sector in African countries varies between 4-11 per cent, whereas in the industrialized countries it ranges between 5-9 per cent.

75. It is well known that the construction industry usually employs a high proportion of labour. Because much building does not pertain to the industrial sector as such (repairs and maintenance in developed countries, the construction of rural and peri-urban dwellings in developing countries), it is extremely difficult to quantify the exact share of labour employed in the construction sector. However, in most highly industrialized countries, if nearly 10 per cent of the available labour finds employment in the construction industry at a time when its rate of growth is markedly slowing down, the job opportunities which this sector might offer in African countries can be appreciated, especially if labour-intensive techniques were to be promoted. A recent ECA study has established the share of labour working in the construction industry at between 3-5 per cent for African countries as against the figure of 10 per cent mentioned above for European countries.

76. In terms of its general characteristics, the construction industry in Africa is flexible and can expand and contract significantly in response to fluctuations in demand. Such substantial annual fluctuations in the output of certain sectors of the industry can be observed following the initiation and completion of major infrastructural works, such as dams, large irrigation schemes, airports and harbours. For such projects, the industry relies on vast reserves of unskilled labour, easily recruited when a job is started, and dismissed as work nears completion. The price it pays for this ability to adapt to demand is high

in terms of the effective use of human, technical and financial resources. Major works may also include jobs relating to the manufacturing industry, transport, trade, roads, public health, education and other public services. The major works subsector accounts for between 65-70 per cent of all building and has a direct impact on the development of the construction industry in African countries. Unfortunately, it is to all intents and purposes controlled by foreign firms which usually dispose of the whole panoply of technical and financial resources exclusively available to the large multinationals of the industrialized countries.

77. Housing accounts for about 30-35 per cent of the output of the building industry. Here a distinction can be made between traditional and modern structures. Little information is available on the volume of activities in the traditional sector, in which the work performed by most African people can be classified. The activities of this sector are basically characterized by the self-help construction of buildings, whose type varies from region to region. The most common constructions are stone walls, various types of mud walls, mud roofs on wooden rafters, and roofs of palm thatch.

78. Although various efforts are made in some countries to improve the building methods and materials used in the traditional sector, most African Governments seem to pay more attention to the problem of urban housing. Some countries have launched commendable programmes for the construction of inexpensive dwellings as an emergency measure aimed at meeting the needs of urban dwellers, the majority of whom are living in run-down housing. Most of the time, however, problems occur in connection with the high cost of buildings, the absence of a systematic approach to the needs of users and occasionally flagrant errors in building methods. These housing programmes also point up the great gap in terms of style and of cost, between the buildings constructed under such programmes and rural dwellings. One possible solution to these housing problems lies in the efforts which can be made to eliminate the gap between programmes for the construction of urban dwellings and those for the construction of rural dwellings, by introducing much more suitable building materials.

79. Information on the breakdown of building costs by production factor varies widely, depending on the type of work involved and the period in which it is performed. As for the construction of buildings, the breakdown of costs for reasonable well-finished dwellings, with electricity and plumbing fully installed, shows that building materials represent 45-65 per cent of total costs, whereas labour accounts for 20-25 per cent and equipment and overheads represent 15-25 per cent.

Major characteristics of African building materials industries

80. The building materials used to varying degrees in the African region are as follows: natural stone; agricultural fibre waste; timber; common clay and soil blocks; burnt clay bricks; tiles; lime; cement and cement products, including

asbestos-cement sheets; corrugated-sheet iron; sheet aluminium; structural iron, steel and aluminium; sheet glass and ceramics (sanitary ware, tiles, pipes). The choice of materials is determined by the particular environment of their utilization (rural, urban and peri-urban), functional considerations, their availability, cost and facilities used.

81. Cement and cement products are the most widely used basic materials: they have displaced stone, mud, brick, and other traditional indigenous materials. The use of cement has also led to the widespread use of steel in the form of structural steel, resulting in the gradual displacement of the traditional timber reinforcing material. The glamour of cement has escalated demand to such a degree that it now has to be imported to most African countries owing to inadequate domestic production.

82. In a similar manner, corrugated-sheet iron (and in some cases aluminium sheet) has become the principal material for roofing and other purposes, with the difference that, unlike cement, it has become an essential item for peri-urban and even rural sections of the population as well as for urban squatter settlements. Most countries have to import this item.

83. Of the other materials, glass and ceramics are secondary building materials with exclusive functions. Demand for them is at present confined to urban constructions, but it will eventually spread to rural areas. These materials are generally imported. Table 3 gives a rough idea of the trends of consumption, production and imports of some building materials, and it shows the efforts required to achieve self-sufficiency in the production of certain materials, such as cement.

84. Except in sophisticated urban constructions and in the use of building materials such as cement, steel and aluminium, all of which are derived from foreign systems, no hard and fast technology applies in building systems or in the production of building materials—it varies greatly from country to country. Consequently, much construction work in Africa seems to be based on antiquated methods and lacks a scientific approach to the production of building materials and their use. Many building materials, for example bricks and tiles, are of indifferent quality and fail to conform to recognized standards, thereby affecting the quality and durability of construction and necessitating repeated building repairs and expenditure

85. Another common problem in the peri-urban sector and in parts of the urban sector is that design criteria barely fulfil the minimum construction standards as embodied in building regulations and do not come up to the health and safety standards governing thermal insulation and protection from natural hazards such as rain and water seepage, heavy winds, earthquakes, and atmospheric corrosion. The situation is even worse in the case of rural constructions most of which are self-designed and self-made and do not come under building codes and regulations.

86. Clearly, the new materials and new techniques for using traditional materials have not caught on sufficiently to justify expectations of achieving self-reliance in the present century. This situation arises from the following

TABLE 3. CONSUMPTION, PRODUCTION AND IMPORT TRENDS IN RESPECT OF SELECTED BUILDING MATERIALS IN THE AFRICAN REGION

Material	*Unit*	*1975*	*1976*	*1977*	*1980**	*1985**	*1990**	*1995**	*2000**
Cement, lime and plaster									
Consumption	Mt	34.3	34.7	38.2	46.7	68.7	105.3	162.1	250
Production	Mt	23.4	23.5	25.1	30.7	50.0	88.0	162.0	260
Imports (net) Quantity	Mt	10.9	11.2	13.1	16.0	18.7	17.3	nil	nil
Value	$ million	522.5	532.7	850.3	—	—	—	—	—
Structural steel (rods, bars, sheets, pipes, joints, wire etc.)									
Consumption	Mt	5.0	4.5	4.7	5.7	8.3	13.4	21.6	34.8
Production	Mt	2.5	2.7	2.9	3.7	5.6	8.9	14.3	35.6
Imports (net) Quantity	Mt	2.5	1.8	1.8	2.0	2.7	4.5	7.3	nil
Value	$ million	2 278.6	2 106.1	2 309.0	—	—	—	—	—
Structural clay products									
Consumption	Mt	—	15.0	18.0	23.9	38.5	62.0	99.8	160.6
Production	Mt	—	11.6	13.5	19.2	34.6	62.3	100.3	161.0
Imports (net) Quantity	Mt	—	3.4	4.5	4.7	3.9	nil	nil	nil
Value	$ million	139.4	101.6	136.6	—	—	—	—	—
Glass									
Consumption	Mt	1.7	1.6	2.2	2.9	4.9	8.9	16.0	29.0
Production	Mt	negligible				2.5	6.6	16.0	29.0
Imports (net) Quantity	Mt	1.7	1.6	2.2	2.9	2.4	2.3	nil	nil
Value	$ million	67.9	63.7	87.4	—	—	—	—	—

Notes: Quantity of imports has been deduced from published value of imports. Source of information for imports: Yearbook of International Trade Statistics, 1978, vol. II. Statistical Office, DIESA. Source of information for consumption and production: World Statistics in Brief. Statistical Office, DIESA (United Nations publication: Sales No. E.78.XVII.9).

*ECA estimates.

major weaknesses: absence of special policies and back-up (direction, promotion and dissemination); institutional gaps; inadequate knowledge and utilization of local raw materials; shortages of project finance, professional skills and trained labour; lack of organized information flow and communication and technology development; lack of quality control and standardization systems; lack of an appropriate research base; and inadequacy of requisite co-operation arrangements between countries.

Production of building materials

Binders

87. As far as the production of building materials is concerned and taking into account the conditions prevailing in the African region, the guiding principles should be: diversification, decentralization, balanced plant size matching the size of local markets within reasonable distance, efficient utilization of capacity, quality standardization, and linkages with other industries. Although some materials, such as brick and cement, are intended

exclusively for consumption by the construction industry, others such as iron, steel, wood and glass may be used in a number of sectors. A material such as lime is widely used in foundries, acids, non-ferrous metals, glass, heat-resistant materials, wood pulp, soda, ammonia, oil, fats, cosmetics, fertilizers and food processing industries. It is also used to purify or neutralize water, to serve a number of purposes in fish-breeding and pharmacology, to control epidemics and fulfil other purposes, apart from its various utilizations in the construction industry itself, including road and railway construction. Taking into account these multiple uses of lime and some other factors, such as the wide range of raw materials which can be used for its production, the broad range of technologies available, the low capital investment cost (see table 4), lime is certainly one of the building materials the production of which should be given high priority in each country.

88. Similarly, and for the purpose of diversification, technologies are available for the production of cement substitutes based on the utilization of lime. The most important of these products is lime-pozzolana which could be produced in almost every country and could advantageously replace cement in most urban, peri-urban and rural housing programmes, including human settlements improvement schemes.

89. Because cement is universally used in all types of building and civil engineering projects, the cement industry is an important subsector of the building materials industry. The process of manufacturing cement is simple, but nowadays it is so highly mechanized that, most of the time, a large capital outlay is required. For this reason and also taking into account other factors such as the availability of raw material resources, energy, and market, the pooling of which might necessitate joint actions at the subregional level, split-location of cement production should be encouraged whereby clinker produced in large clinker plants could be ground in plants set up near the points of consumption, whereas the use of pozzolanas in existing cement plants as a means of improving their profitability and increasing availability of cement for construction (by making pozzolana cement) should be considered by African countries. Similarly, the utilization of rice husk or other agricultural residues to produce ash-masonry cement on the basis of technology developed by some developing countries should also be considered by countries where these waste materials are available.

90. Moreover, in some cases, and for the exploitation of small limestone deposits at various locations, consideration could be given to setting up mini cement plants to match the limited availability of power, water and other inputs and to meet the demands of a local captive market, thereby reducing the strain on the national transportation network, permitting the participation of local smaller entrepreneurs and helping to boost the local economy. Nevertheless, the setting up of mini cement plants should be preceded by comprehensive techno-economic and social studies to ensure sound decision-making. In this connection, it might be necessary first to set up, with the assistance of relevant international organizations, a few demonstration-cum-training pilot plants. The same approach could be adopted in respect of the production of the cement substitutes mentioned above.

TABLE 4. COMPARATIVE CAPITAL INVESTMENT COST IN THE PRODUCTION OF SELECTED BUILDING MATERIALS

Material	*Investment cost ($ per tonne)*	*Basis of plant size in arriving at investment cost (tonnes per day)*	*Cost of material ($ per tonne)*	*Source of information*
Cement	150	100 (rotary kiln)	72[a]	Intermediate technology group, London
	200	600 (rotary kiln)		Intermediate technology group, London
	50	600 (rotary kiln)		India
	25	100 (shaft kiln)		India
Burnt clay bricks	98	60 (Hoffman kiln)	24	UNIDO
	110	60 (tunnel kiln)	26	UNIDO
	48	125 (Hoffman kiln)	19	India
Stabilized soil blocks	3[b]	—	384 CFA/m^3	Togo
Cement blocks	5[b]	—	494 CFA/m^3	Togo
Lime	8[b]	—	17	United Republic of Tanzania
Sand-lime bricks	3	—	12	India
Cellular concrete (lime and flyash)	13/m^3	1.7 million m^3	—	India
Lime-pozzolana (Surkhi)	14	20	22	India
Clay-pozzolana	8	20	10	India
Sisal-cement sheet	5[b]	—	2	United Republic of Tanzania
Asphalt roofing sheet	0.3/m^2	2 million m^2	1.4/m	India/United Republic of Tanzania
Corrugated-iron sheet	300	—	4.2/m	United Republic of Tanzania
Corrugated-aluminium sheet	300	—	4.93/m	United Republic of Tanzania
Gypsum plaster	12.4	10 (rotary kiln)	22	India
Sheet glass	50 (Fourcoult)	40	—	India
	80 (PPG)[c]	40	2	India

Notes: Lime-pozzolana can replace up to 40 per cent Portland cement. Clay-pozzolana can replace up to 25 per cent Portland cement. Stabilized soil blocks can replace up to 75 per cent cement blocks. Corrugated asphalt/sisal-cement sheets can replace up to 50 per cent corrugated-iron or aluminium sheets in roofing. Machine-made clay bricks can reduce cement consumption by 10 per cent.

[a] Cost prevailing in United Republic of Tanzania in 1980.

[b] ECA estimates of investment cost.

[c] Pittsburgh Plate Glass process.

Clay-based products

91. Apart from binders and their components, clay-based products constitute another group of building materials, the development of which is likely to have an immediate impact on the promotion of the African building materials industries. Of these materials, special attention should be given to the production of burnt bricks and roofing tiles, at reasonable cost and using the various technologies available, as a viable alternative to the conventional materials currently used, particularly cement and cement products. Depending

on the location, needs and requirements, the Bull's Trench kiln or the clamp kiln could be adopted using, as much as possible, wood or agricultural wastes as fuel.

Wood and wood-based products

92. As far as the utilization of wood and wood-based products is concerned, national and subregional efforts should concentrate on the need to:

(a) Draft and adopt building codes that allow the rational use of timber in construction. Measures should be taken to promote the use of wood, whenever applicable, including a wider range of species and applications than hitherto. National and regional standards for manufactured timber components should be drafted and adopted;

(b) Develop low-cost timber engineering designs in the construction industry both for urban and rural areas;

(c) Produce wood-based panels from secondary species and forest and saw mill residues;

(d) Introduce the rational groupings of species and grading (including stress grading) of timber;

(e) Introduce scientific processing techniques.

93. Since the region contains both countries with abundant forest resources and others with a lack of forests, the use of timber in construction in the latter countries should be combined with other materials. Panels should be produced from agricultural residues. Considerable savings could be obtained in timber utilization through the rational design and use of shuttering forms (using whenever applicable appropriately surfaced panels) for concrete work.

Other building materials

94. Similar to other products such as iron and steel and allied materials, the production of glass, sanitary-ware, electrical fittings and accessories should be envisaged in the framework of other sectors and mainly on a subregional basis.

95. Tables 4 and 5 give some indication of the comparative investment costs for production of selected building materials as well as an estimate of investment requirements for the development of additional capactity.

Research

96. Above all, the smooth and rapid development of the African building materials and construction industries based on the utilization of locally available resources can only be achieved through the development of research (up-grading existing national research facilities and setting up subregional

TABLE 5. ESTIMATE OF INVESTMENT REQUIREMENTS FOR THE DEVELOPMENT OF ADDITIONAL BUILDING MATERIALS CAPACITY

(In millions of dollars)[a]

Material	*1980-1985*	*1985-1990*	*1990-1995*	*1995-2000*	*Total*
Cement	2 000	4 560	11 100	16 600	34 260
Structural steel	600	1 155	2 160	10 650	14 565
Sheet glass	125	387	940	875	2 247
Structural clay products	316	692	1 140	2 428	4 576
Total	3 041	6 794	15 340	30 553	55 648

[a]Cost escalation factor included.

building and building materials research centres). The initiative undertaken by ECA in this respect should be strengthened and widened. In any case, research priorities should include: techniques for optimizing the production of critical building materials (primarily cement) from existing plants; new technologies for using traditional building materials and local materials for improving the quality of rural buildings; development of techniques for material substitution and conservation of scarce resources; techniques for converting agricultural and industrial wastes into building materials; methods of reducing building costs; medium- and small-scale production of building materials; and the reformulation of building codes and regulations.

Training

97. The development of the building materials and construction industries in the African region depends on the technical, managerial and organizational know-how of the local construction personnel. Lack of financial support is usually due to the above deficiencies. However, in the final analysis, it is the local contractors who will encourage local production and utilization of building materials. It is therefore essential that these contractors be trained or retrained at the national and subregional level in courses offered periodically in specific subjects. The same also applies to middle-level technicians and workmen who experience great difficulty in using new materials.

98. The training programmes should also include the exposure of all technicians concerned to the successful experience of some developing countries outside the African region. Here again the initiative undertaken by ECA should be strengthened and widened.

Activities

99. Based on the project ideas above, the following major activities should be undertaken:

(a) Assessment of long- and short-term requirements for building materials, component and construction services, taking into account those

aspects of national economic development plans directly or indirectly related to construction activities;

(b) Conducting of studies and surveys of such factor inputs as basic raw materials, resources and other inputs, production and infrastructural facilities and skilled manpower, on the basis of which gaps can be identified;

(c) On the basis of the assessment in *(a)* above, completion of an overall evaluation of the sector's development, clearly indicating requirements and possibilities, the relationship between consumption and production, and the methods for developing the factor inputs cited in *(b)* above;

(d) Identification of the developmental actions required with particular regard to:

(i) Raw material exploration, investigation, mining, and beneficiation;

(ii) Energy, water and other resources;

(iii) Transport and communications infrastructure;

(iv) Production of essential building materials, such as cement, bricks, tiles, lime, building stone, and durable roofing materials in the first stage of development, followed by the manufacture of glass, ceramics and metallurgical products at subsequent stages;

(v) Marketing and distribution systems and services designed to satisfy consumer needs;

(vi) Development of skills for the production of materials and construction services.

(e) Promotion of the rationalization of construction systems through the reformulation of building codes, regulations and building standards, thus leading to greater utilization of local building materials and helping to reduce construction costs;

(f) Organization of and support for research and development and training activities geared to the development of indigenous building materials and appropriate techniques for their utilization in construction;

(g) Keeping abreast of developments in the building materials and construction industries in other parts of Africa and other developing regions, with particular reference to co-operation arrangements between countries;

(h) Conducting of studies into traditional housing systems and techniques in order to promote those suitable for industrial production.

Institutional framework

100. The institutional mechanism, in particular at the national level, essential to the successful implementation of the projects and activities identified above include the following:

(a) Introducing a "nodal mechanism", as part of the government apparatus, responsible for the comprehensive and co-ordinated planning of the building materials and construction sector, due account being taken of the

needs of other economic sectors. This mechanism, which will bring together all major sectors involved in various aspects of the building materials and construction industry, will facilitate the identification of operational and other constraints upon project programming, execution, evaluation and follow-up and indicate to the decision-making and executing agencies policies to be adopted as well as the means;

(b) Setting up and strengthening research, development and training institutions so as to promote the rational and efficient utilization of local resources in construction, thereby increasing construction industry output and reducing construction costs;

(c) Establishing and strengthening institutional capabilities for project elaboration, engineering and management, product standardization, quality control, raw material investigations, building materials production and distribution.

101. The development of a mechanism at the subregional level, for example, through the establishment of a building materials and construction industries development council within the framework of the existing and planned economic groupings might constitute an appropriate framework for promoting joint subregional activities, harmonizing policies and elaborating methods for project planning and execution in areas of common interest. These mechanisms should be co-ordinated at the regional level.

102. Steps should be taken to establish a regional network with subregional and national linkages for information on building materials and construction industries.

Metallurgical industry

103. According to the Lagos Plan of Action, in order to create a pattern of self-sustaining industrialization, it is essential that local raw materials be processed domestically and that many of the intermediate and capital goods be entirely or partially manufactured locally.[17] The industrialization of Africa requires the creation of an industrial base aimed at satisfying the basic needs of the people,[18] and it is expected that in the period of 1980-1990, Governments will strive to achieve 1.4 per cent of world industrial production and attain self-sufficiency in food, building materials, clothing and energy.[19] The modalities for the creation of basic industries, such as the metallurgical, mechanical, electrical and electronic industries, should be worked out,[20] in particular intra-African industrial co-operation, and the establishment of multinational production facilities in industries such as the metallurgical industries, whose cost and production capacity normally exceed national

[17] *Ibid.*, para. 56*(b)* and *(d)*.

[18] *Ibid.*, para. 56*(a)*.

[19] *Ibid.*, para. 66.

[20] *Ibid.*, para. 67*(b)*.

financial and absorptive capacity, should be encouraged.[21] In this respect, high priority will be given to the development of the iron and steel industry, as well as the copper and aluminium industries.

Characteristics of the metallurgical industry

104. When laying down policy for the development of the metallurgical industry, the following special characteristics of the industry must be taken into account:

(a) Alternative processes for the production of the same product;

(b) Complex and sophisticated technology involving processing and production control;

(c) Need for large-scale supporting infrastructure;

(d) Capital intensity, highly subject to economies of scale;

(e) High energy requirements for certain production processes;

(f) Large proportion of highly qualified personnel required;

(g) Diversity of product-mix and viability dependent on integrated approach and economically sized markets;

(h) Effects of process units, each requiring process optimization;

(i) Close linkages with the engineering industry and other sectors of the economy;

(j) Requirements for pollution abatement.

105. In order to be competitive, metallurgical production facilities, particularly iron and steel plants, should satisfy the economies of scale for both integrated and non-integrated plants. The economic scale for integrated plants far exceeds the demand of individual countries and the investment costs are extremely high. It is therefore necessary to evolve workable modalities for co-operation among Governments in the development of integrated plants. At the same time, research into mini steel plants of different capacities should be intensified and their establishment as viable production units promoted.

Links with an impact on other economic activities

106. The manufacture and development of final consumer goods and equipment in Africa require the simultaneous growth of the intermediate industries providing inputs such as iron and steel, aluminium and other metallurgical products which, in turn, depend on the exploitation of the continent's vast mineral resources. At present, the bulk of these minerals are exported as raw and semi-finished products to the developed countries. The percentage of the demand for basic metals, intermediate and final products satisfied by domestic production is estimated at about 7-10 per cent for the

[21] *Ibid.*, paras. 70*(a)* and *(c)*.

African region. Given the industrial growth in Africa, the domestic market for industrial minerals and processed products will definitely increase. This means that vertical integration from mining to refining and fabrication may become more important and economically attractive.

107. It is a fact that the consumption of metal products, particularly steel, is an indicator of the level of economic development: the higher the stage of economic development attained, the more critical the role of the metallurgical subsector. It has been estimated that the demand for engineering goods tends to increase at least one-and-a-half times the rate of GDP. This fact applies to the metallurgical industry, the output of which serves as an intermediate input into the engineering industries.

108. The development of the metallurgical industry, particularly the iron and steel industry, is a *sine qua non* for the industrialization of Africa because the subsector provides effective linkages and is essential to the production of basic equipment and machine tools. The most dynamic users of basic metal intermediate and final products are construction, transport and communications, agricultural machinery and equipment, construction equipment, electrical and electronic equipment, mining equipment and other metal-working equipment sectors (see figure I).

109. The economic viability of the metallurgical industry in Africa, where the size of the domestic market is a major constraint, is dependent on the size, growth, structure and management of industry and other economic sectors. Demand for the final products of industry constitutes the indirect determinant of the establishment of viable metallurgical industries in Africa.

Identification of basic priority products

110. The metallurgical industry is a supplier of metallic and alloyed materials to all the sectors of the economy. Selection and application of these materials are determined by economic considerations. As indicated earlier, metallic and alloyed materials are essential inputs into the whole industrialization process.

111. Steel is the least costly and most readily available engineering material for the construction and fabrication of equipment, machinery and plant. Steel is consumed and used in many shapes and sizes in industrial construction, machine building, manufacturing and other industries, transport and infrastructure.

112. Aluminium is widely used in the aircraft industry, electrical industry, construction industry and for household utensils.

113. Copper is a major input into the electrical industry and it is also used in brass in many other industries.

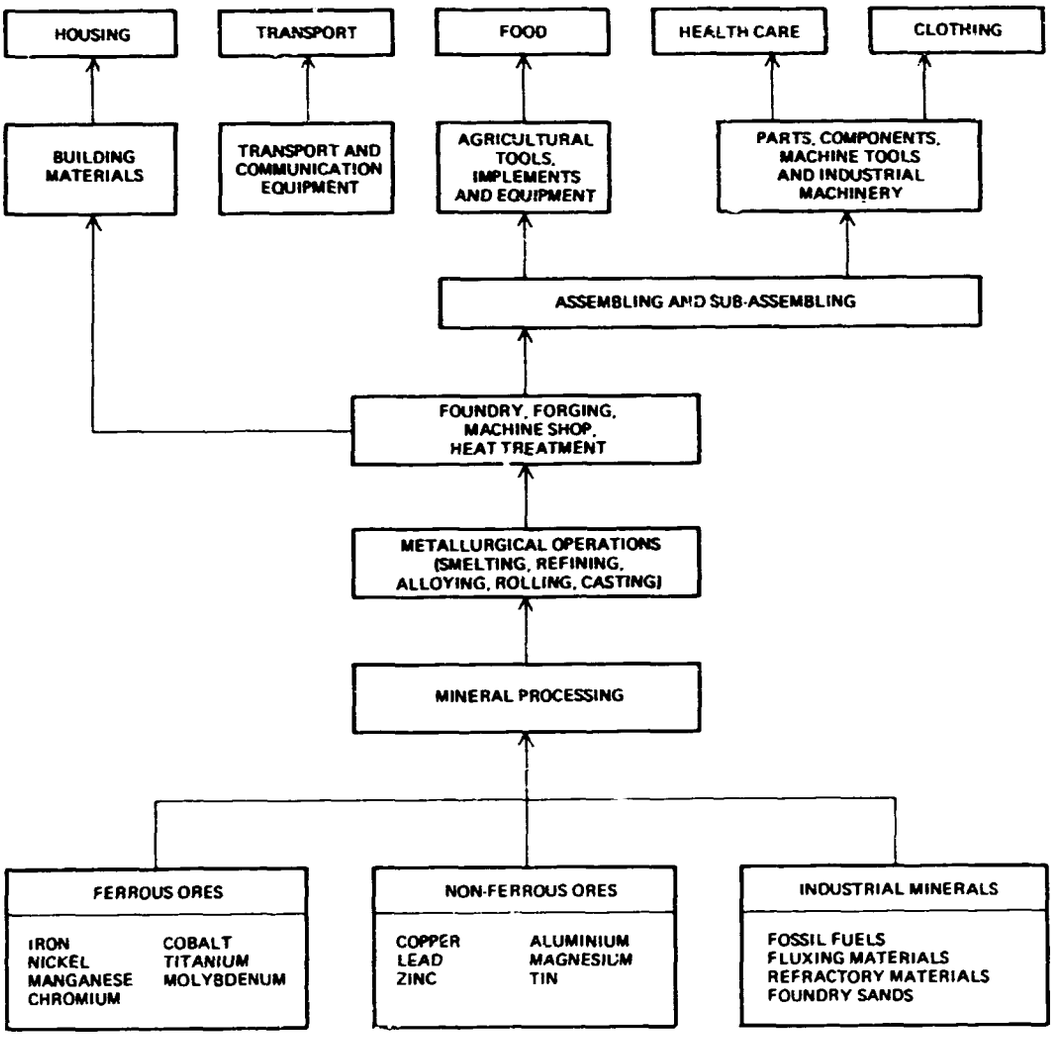


Figure I. Interlinkage between basic metals/engineering industries and basic needs

114. Tin and lead are mainly used as accessory metals in industrial production and as major components in bronze. Moreover, tin is essential to the development of the food preservation industry. Zinc is mostly used in die castings in the automobile industry and in brasses.

Major problems and constraints

115. The development of the metallurgical industry is a long-term investment activity whose duration spans several development plans of a country and whose benefits to the country extend far into the future.

116. Products of the metallurgical industry are numerous. As a result, the inputs to the industry vary in terms of quality and characteristics, leading to different processing routes determined by the raw material properties and thus involving difficult decisions as to the location of facilities and selection of

technology. The development of the industry also involves the exploitation of non-renewable resources which are often to be found in remote and isolated areas, thus necessitating heavy investment in infrastructural facilities.

117. The metallurgical industry is usually capital- and technology-intensive, making it virtually impossible for most countries with small national markets to establish an optimally sized plant. The lack of all basic raw materials within national boundaries, inadequate manpower capable of handling all aspects of a project from design to actual production, as well as inadequate infrastructure, energy and finance are among the major constraints. Other constraints include: difficulties in procuring modern technology and plant, inability to compete in the international markets for refined and fabricated products (this often depends on the cost of exploration and development, quality of the product and type of technology used) and the lack of political will to pool resources and establish multinational projects.

118. In addition, the structure and control of the metallurgical industry have over time become highly concentrated with extensive vertical integration from exploration through processing and fabrication to the marketing of final products. The industry is exposed to price fluctuations in the metals and mineral markets. This characteristic leads to a conflict of interests between those countries in which mineral resources are located and the users of such minerals, hence the need for equitable distribution of ownership and control of national, multinational or subregional metallurgical industries.

Priority multinational projects

119. The programme for the metallurgical industry during the Decade is expected to cover promotional activities aimed at encouraging the domestic supply of metals and alloys with a view to attaining self-reliance and self-sufficiency in these materials for use in the engineering industry. With this object in mind, the following projects have been identified as high priority areas.

Iron and steel industry

120. This programme is addressed to the need for self-reliance and self-sufficiency in carbon steels which are currently imported in large quantities (13.4 million tons in 1976). Carbon steels are required for infrastructural and industrial construction, as well as maintenance of existing industrial capacities.

121. The total iron ore resources in Africa are estimated at more than 20 billion tons of contained iron. Known, recoverable coal resources (excluding South Africa) are estimated at about 5 billion tons. Natural gas reserves are equally vast (about 6 billion cubic metres, about 10 per cent of the world's known (recoverable) reserves). Africa's reserves of steel-alloying elements

compared with world reserves are estimated as follows: 38 per cent chrome ore; 43 per cent cobalt; 50 per cent manganese; about 7 per cent fluorspar; and appreciable amounts of nickel, vanadium and tungsten.

122. It is quite clear that the resource base for iron and steel development exists in Africa, offering opportunities for large-scale industries serving the domestic requirements of the African region, based either on direct reduction/electric furnace or conventional blast furnace/oxygen steelmaking routes. The resource base also indicates that the ferro-alloying industry has great potential, considering the abundant energy resources available in Africa.

123. In order to promote the development of the iron and steel industry in Africa, the following production facilities related to the iron and steel industry should be considered integral parts of that industry: foundries, re-rolling mills currently based on imported billets, scrap-based electric furnace plants, continuous casting and rolling mills, integrated direct-reduction-based iron and steel plants and the conventional blast furnace steel plants.

124. The crude steel consumption in the African region by the year 2000 is estimated at 39 million tons per year (assuming a population of 780 million and an average 50 kg/capita crude steel consumption). According to projections (based on a trend scenario for direct, and a normative scenario for indirect, steel consumption), consumption would reach the 70 million ton level by the year 2000. It is expected that at least 50-60 per cent of this crude steel requirement will have to be produced locally. The conservative figure of 39 million tons will necessitate the construction of 20 conventional blast furnace/oxygen steel plants, each with a capacity of 1 million tons per year, involving an investment of $820 million (at 1979 prices) and 5,000 trained persons per plant. The corresponding figures for direct reduction/electric arc furnace are 40 plants, 500,000 tons per year, $185 million and 2,500 persons. The figures have been restricted solely to productive battery limits (which exclude cost of developing infrastructure) under African conditions.

Aluminium industry

125. Africa as a whole has about 43 per cent of the world's bauxite resources, but it produces only about 15 per cent of world bauxite output and transforms approximately 2.6 per cent of the world output into alumina and primary aluminium.

126. The aluminium industry is important to the attainment of the Lagos objectives, particularly in connection with the production and transmission of electrical energy. The present per capita consumption of aluminium in Africa is estimated at 0.02 kg compared with a world average of 13.5 kg and an average for Latin America of 0.4 kg.

127. Assuming a population of 780 million in the African region and an estimated per capita consumption of 1 kg by the year 2000, the demand for aluminium would be 780,000 tons per year with a conversion factor of 2 from

alumina to aluminium metal and 2.3 from bauxite to alumina. The total alumina processing capacity required by the year 2000 would be 3.6 million tons/year. Given an economic size of 1 million tons/year for an alumina plant, this means that four alumina plants would be needed. Each plant would require an investment of $650 million (in 1979 prices) and 1,250 trained workers.

128. In the case of the capacity requirements for aluminium metal, it is estimated that assuming an economic size of 150,000 tons/year for aluminium smelters, some five plants would be needed. Each plant would require an investment of $405 million (at 1979 prices), 1,670 trained workers and electric power of some 3 billion kW per year.

129. The programme for the development of the aluminium industry will necessitate the simultaneous development of electricity generation capacity based on hydro-power, coal and geothermal resources.

Copper industry

130. The copper resources of Africa are estimated at roughly 64 million tons of copper metal contained in ores with an average copper content of 2.36 per cent, about 13 per cent of the world's reserves. This means that a resource-base for the development of the copper industry exists in Africa.

131. The programme for the development of the copper industry during the Decade is aimed at promoting downstream processing in the industry with a view to ensuring the availability and supply of the metal to the electrical industry in Africa.

132. The consumption of copper is estimated at 780,000 tons per year (assuming a population of 780 million and 1 kg/capita for the year 2000). With an optimum economic size of 150,000 tons/year for a smelter, some five smelters would be required. Each smelter would call for an investment of $300 million (at 1979 prices) and 1,070 trained workers.

133. Some eight copper refineries would be needed on the basis of an optimum capacity of 100,000 tons/year for a copper refinery, while each refinery would need an investment of $50 million and 720 trained workers.

Lead and zinc industry

134. In formulating this programme for the Decade, recognition has been given to the fact that the demand for these metals will be determined by developments in the metal working and engineering industries. The main uses for zinc are: coating of steels, brass, and die casting. The Lagos Plan of Action implies the following derived demand for zinc: zinc-coated steel strip for car, truck, bus and rolling stock bodies; galvanized sheets for the construction industry; and die-cast components and parts for the transport industry.

135. The major outlet for lead is assumed to be lead batteries. Lead will therefore play an important part in connection with the production of transport equipment.

136. Identified resources of economically exploitable lead and zinc in Africa represent some 7 per cent of the world's total lead reserves and 11 per cent of the world's total zinc reserves.

137. The consumption of lead is estimated at 780,000 tons/year (assuming a population of 780 million and a consumption of 1 kg/capita in the year 2000 for the African region). This would require five lead smelters and refineries with an optimum economic size of 150,000 tons/year. Investments for each plant would amount to $105 million (at 1979 prices) and some 670 trained workers would be needed for each plant.

138. The demand for zinc is estimated at 468,000 tons/year (assuming a population of 780 million and a zinc consumption of 0.6 kg/capita for the year 2000 for the African region). This would require three zinc smelters of an optimum economic size of 150,000 tons/year. Each zinc smelter would require an investment of $240 million (at 1979 prices) and a labour force of 750 employees.

Tin industry

139. The largest single use for tin is coating on steels. Given the emphasis on food, the tinplate industry is assumed to be the sole determinant for tin during the Decade. It is expected that the rise in living standards and the consumption of canned foods resulting from urbanization and improved measures to preserve food will lead to increased consumption of tinplate, although competition with tin-free coating may be envisaged.

140. The consumption of tin is estimated at 16,000 tons/year (assuming a population of 780 million and a consumption of 0.02 kg/capita in the year 2000). Only one tin smelter would be required with a minimum economic size of 15,000 tons/year. Investments needed would be $120 million (at 1979 prices) and a labour force of some 750 trained workers would be needed.

Institutional framework

141. Although a number of separate autonomous institutions can be established to perform specific functions such as exploitation, development and processing of minerals and the utilization of energy, co-ordination of their respective activities would be facilitated if the functions required were carried out under the same organization at the national, subregional and regional levels. A combination of national metallurgical corporations and a multinational metallurgical corporation at the subregional level, the latter structured along the lines of transnational corporations, appears to be an option worth

examining. The corporations should be designed to undertake the following activities:

(a) Identifying, formulating and designing metallurgical projects;

(b) Promoting and implementing metallurgical projects;

(c) Commissioning and operating metallurgical plants;

(d) Marketing and distributing their products and raw materials with particular emphasis on intra-African trade;

(e) Training technical, managerial and administrative personnel;

(f) Conducting research and development;

(g) Co-operating with mining and other companies engaged in extracting raw materials;

(h) Mobilizing finance for investment.

142. It should be noted that the above corporations will, in certain cases, need to subcontract their activities to specialized institutions within Africa and without.

Chemical industry

143. The Lagos Plan of Action points to the need for the creation of an industrial base aimed, *inter alia*, at the satisfaction of the population's basic needs.[22] It is expected that during the decade 1980-1990, Governments will strive to achieve 1.4 per cent of world industrial production and attain self-sufficiency in the following subsectors: food, building materials, clothing and energy,[23] all of which, similar to all economic sectors, are direct or indirect users of chemical products. Other relevant paragraphs in the Lagos Plan of Action include those on laying the foundation for the phased development of basic industries including chemical industries and on subregional and regional co-operation;[24] on the preparation of subregional and regional plans for the creation of major industrial complexes;[25] and on giving high priority to multinational industries, including chemical industries.[26]

Characteristics of the chemical industry

144. When laying down policy for the development of the chemical industry, the following special characteristics of the industry must be taken into account:

(a) Alternative processes and alternative raw materials for the production of the same product;

---

[22] *Ibid.*, para. 56*(a)*.

[23] *Ibid.*, para. 66.

[24] *Ibid.*, para. 67*(b)*.

[25] *Ibid.*, para. 70*(a)*.

[26] *Ibid.*, para. 70*(c)*.

(b) Complex and sophisticated technology involving multi-stage processing;

(c) Capital-intensity, highly subject to the economies of scale;

(d) High energy requirements for certain products;

(e) Large proportion of highly qualified personnel required;

(f) Heterogeneity of products and viability dependent on integrated approach and economic outlets for co- and by-products;

(g) Effects on ecosystem, requiring incorporation of effluent treatment and safety measures;

(h) Close linkages with industry and other sectors of the economy.

145. The implications of the above characteristics are that, in order to be competitive, chemical plants at the basic and intermediate production levels should satisfy the economies of scale. Such sizes far exceed the demand of individual countries—hence the need to evolve workable modalities for co-operation among member States.

Linkage with, and impact on, other economic activities

146. The demand for chemicals increases at a faster rate than the general development of the economy. This means that the higher the stage of economic development attained, the more critical the role of the chemical subsector: this in turn implies an increasing degree of linkage with industry and other economic sectors (see Figure II).

147. It should be noted that a major part of the chemical industry output serves as an intermediate input into chemical processes and other industries and economic activities such as agriculture, construction and transport. Virtually no industrial product exists that does not incorporate chemicals in one form or another.

148. It is quite obvious that most chemical products are directly related to the satisfaction of basic needs, the most essential of which are food and health. During the last decade, slow growth in agricultural production in Africa led to an increasing amount of resources being diverted to food imports at extremely high prices, thereby reducing the amount of foreign exchange available for the import of capital and intermediate goods essential to the development of other sectors. The local production of essential chemicals based on domestic resources (natural gas, coal, phosphate rock, potash, salt, limestone, renewable biomass materials as well as electric energy) could stimulate the development of agriculture, industry and other sectors that would not otherwise be viable based on imported chemical inputs. In any event, particular attention should be paid to the environmental implications not only of the production of chemicals, but also of their application, as their long-term effects on the ecosystem should not be underestimated.

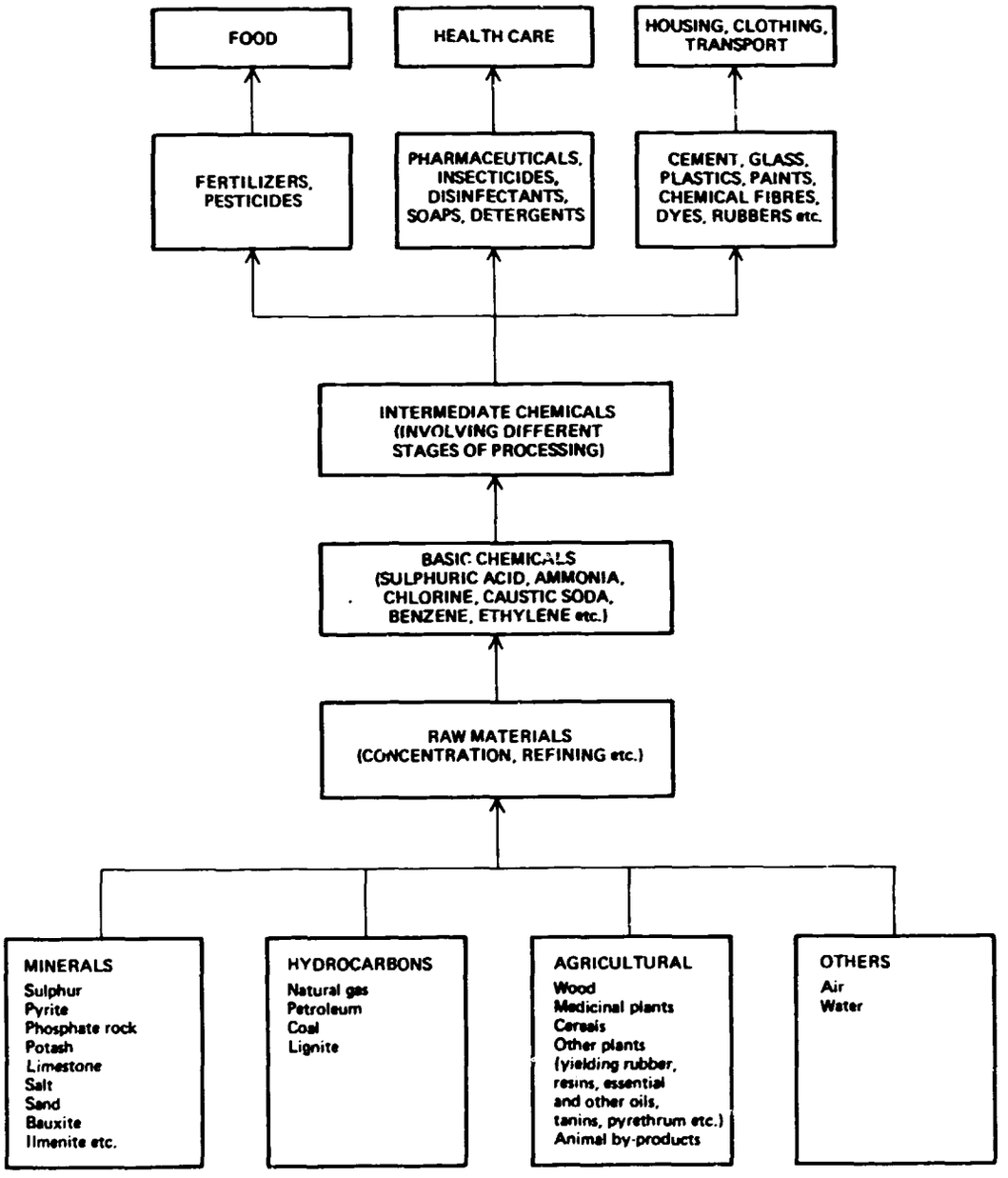


Figure II. Interlinkage of chemical process industries with basic needs

Identification of basic priority products

149. The chemical subsector is huge and highly diversified, comprising hundreds of thousands of chemical products. Many of the chemicals can be categorized into groups based on usage. In Africa, chemicals with outlets in agriculture and public health appear to be the most relevant, and import statistics support this conclusion. Fertilizers and pesticides are among these chemicals. In the case of the former, it appears that the trend is towards concentrated fertilizers, particularly urea, diammonium phosphate, triple

superphosphate and potassium chloride. As for the latter, conventional and broad spectrum pesticides such as dichlorodiphenyltrichloroethane (DDT) and benzene hexachloride (BHC), have been partially banned in some industrialized countries. However, their banning should not be automatically extended to African countries where conditions are entirely different. The pros and cons for the use of such pesticides in Africa should be carefully weighed before any decision is made on the type of pesticides to be produced in Africa.

150. With respect to pharmaceuticals, products for local manufacture should be selected from the 40 essential drugs and 10 vaccines and sera on the African Regional Organization (AFRO) List of Essential Drugs prepared by the World Health Organization (WHO) in consultation with African countries. At the same time, consideration should be given to the possible establishment of industries to produce oils and essences from aromatic plants in those countries which dispose of adequate raw materials.

151. In view of the importance of petrochemicals, attempts would be made, particularly by those countries with petroleum and natural gas resources to refine and process those resources into petrochemicals, especially plastics, synthetic fibres, rubber and detergents. Plastics, in particular polyvinyl chloride (PVC) and polyethylene, are among the chemical products that directly or indirectly influence agriculture (irrigation) and public health (water supply). In addition, they find many applications in construction and household goods.

Major problems and constraints

152. The diversified nature of the chemical industry makes it virtually impossible for any country with a small market to be self-sufficient in major products, since economies of scale and high investment are among the major constraints. Another impeding factor is the lack of adequate labour at all levels, from project inception to the operation of chemical plants, including project design and promotion, contract negotiations, operation and maintenance of the plants, with the consequently high cost of expatriate personnel. Other constraints include: inadequate infrastructure, energy, finance and institutional framework; the failure of Governments to appreciate the importance of the chemical subsector and formulate effective policies and programmes; lack of communication and exchange of information between government organizations and between Governments; exploitation by unscrupulous foreign companies and financial institutions; and inadequate experience in the maintenance of chemical plants.

Priority multinational projects

153. The programme of action for the chemical industry during the decade is expected to cover the promotion of activities aimed at the domestic production of chemical products directly related to the satisfaction of basic needs, particularly food and health. Therefore, the areas that can be identified as high priority are described below.

Agricultural chemicals

154. The food situation, and hence the self-sufficiency ratio in food in Africa, continues to deteriorate. For instance, regional (excluding South Africa) imports of cereals rose from 6.6 million tons in 1970 to 18.4 million tons in 1978. It should be noted that the latter figure coincides with the highest projection for 1990 in the Regional Food Plan for Africa. Fertilizers and pesticides are among the most expedient inputs in both the short and long term for increasing production and reducing food losses, respectively. Regional consumption of fertilizers is expected to increase from 2.7 million tons of nutrients in 1977 to 6.5 million tons in 1990. The corresponding values of pesticides will increase from $400 million to $1,000 million, respectively.

155. Activities related to agricultural chemicals as well as to the other chemicals should be directed towards promoting the development of the basic and intermediate production units that will provide inputs to processing and fabricating facilities which are, and will be, mainly at the national level.

Ammonia and nitrogenous fertilizers

156. Africa is endowed with raw materials and energy for making ammonia. These include natural gas (6,000 billion m^3), petroleum (8.2 billion tons) coal (4.4-9.0 billion tons), hydro-electric power (350,000 megawatts) and a huge potential for geothermal energy.

157. Projections based on consumption trends show that two or three (1,000 ton per day) ammonia units in Eastern and Southern Africa, four or five in West Africa and one in Central Africa, including the Nigerian and United Republic of Tanzania ammonia projects which are at advanced stages, will be needed during the period 1980-2000. A unit of this size would need a total investment of $200 million to $250 million at 1980 prices and a labour force of 300-500 persons. The corresponding figures for a urea unit designed to convert the ammonia output of one unit into urea fertilizers are $100 million and 100-200 persons, respectively.

Phosphoric acid and phosphate fertilizers

158. Africa with 47.2 billion tons of phosphate rock reserves accounts for 70 per cent of the world reserves. Unfortunately, the second important raw material, sulphur, is lacking in Africa. This would mean that many of the requirements will have to be imported unless the enormous hydro-electric potential (over 30 per cent of the world's potential) as well as geothermal energy are used to convert phosphate rock into phosphoric acid.

159. Projections similar to those for ammonia indicate that five or six (1,000 ton per day) phosphoric acid units in Eastern and Southern Africa and three or four in West and Central Africa will be required by the year 2000. While

existing facilities and projects in Senegal and Togo could cover demand in West and Central Africa for the 1980s, at least one unit for Eastern and Southern Africa needs to be established during this decade.

160. A phosphoric acid unit of the above size and a diammonium phosphate fertilizer facility designed to convert the output of the former into that of the latter would involve investment of $300 million and require a labour force of 800-1,000 persons.

Potash fertilizers

161. Workable potash deposits in Africa would appear to be limited. In fact, only two deposits of commercial interest have been located to date. One of them in the Congo, the exploitation of which was started, had to close down because of problems, mainly mine flooding, with the result that Africa is at present completely dependent on the import of potash fertilizers. The other deposit, already confirmed in a small part of the huge salt deposit in the Danakel depression in Ethiopia, contains about 100 million tons of K_2O. A market survey is currently being undertaken which is expected to lead to the establishment of a 600,000 or 1.2 million ton K_2O potash plant: the total investment and workforce required for the larger unit are $500 million and 1,000 persons, respectively.

Pesticides

162. The major raw materials and intermediates for making active pesticide substances include copper scrap, chlorine, benzine, methyl- and ethyl alcohol and pyrethrum. In this connection, it should be noted that inert materials (fillers, carriers and diluents) such as clay, talc, kaolin, silica, pumice, diatomaceous earth, corn cobs, groundnut shells, petroleum products and water, many of which can be found locally, constitute 75-99 per cent of the formulated pesticide products.

163. Except for a small DDT unit in Egypt and pyrethrum extraction in East and Central Africa, no production facility for the manufacture of active pesticide substances exists in developing Africa. The pesticides consumed are either imported in ready-to-use form or in bulk for domestic formulation.

164. On the basis of trend projections, the establishment during the period 1980-2000 of two or three large-scale pesticide plants would appear justified in Eastern and Southern Africa, with a similar number in West Africa and one in Central Africa.

165. Copper oxides, chlorinated insecticides and phosphorus-based pesticides are among the major pesticides used. Owing to the ban on certain broad-spectrum pesticides in developed countries, the continuing shift in the

requirements for different types of pesticides and world-wide research and development on new pesticides, great care should be given to the selection of pesticides for local manufacture.

Pharmaceuticals

166. In 1978 Africa (excluding South Africa) consumed $1,326 million worth of pharmaceuticals. Similar to pesticides, most of the pharmaceuticals were imported in the form of ready-to-use products or in bulk for local formulation. Some of the products, intravenous fluids in particular, contain up to 98-99 per cent inert materials, such as distilled water.

167. Assuming per capita consumption of $8 in 1990 and $12 in 2000 (at 1980 prices) as compared with a world average of $10 in 1975/76, the demand for pharmaceuticals in Africa is estimated at $5 billion in 1990 and $10 billion in 2000.

Pharmaceutical active ingredients

168. The major raw materials and intermediates for the production of certain pharmaceutical active substances include acetic acid, acetic anhydride, benzine, ammonia, aniline, sugar, corn steep liquor and starch. Some of these will be imported for some time to come.

169. Some of the active substances, the production of which could be justified, include antibiotics (penicillin, streptomycin, tetracycline, ampicillin) analgesics (aspirin), sulpha drugs (sulphatiazol, sulphadiazine, sulphadiamine) and antimalarials (chloroquine and primaquine). During the 1980s, at least one plant should be established in each subregion with their expansion and further development envisaged for the next decade.

170. An antibiotics plant with a capacity of 500-750 tons per year would require an investment of $100 million to $125 million and a labour force of about 500 persons.

Pharmaceuticals based on traditional medicinal plants

171. Africa is endowed with a variety of fauna and flora. Furthermore, successful introduction of fauna and flora from other regions in the past indicates potential for similar successes.

172. It is reported that in the United States, pharmaceuticals of vegetable origin account for 25 per cent of the prescriptions dispensed in public pharmacies. This suggests that this percentage could and should be higher in Africa. In other words, the potential in this field is virtually untapped insofar as modern uses are concerned.

173. At least 23 units conduct research into medicinal plants in Africa, including those located in Cameroon, Egypt, Ethiopia, Madagascar, Nigeria and the United Republic of Tanzania. Such and similar facilities should be encouraged to go into production and commercialization activities, and new production facilities should be established. Investment requirements are relatively low, of the order of $5 million to $10 million per production facility. Labour needs, including those for the cultivation and collection of medicinal plants, may reach 1,000 persons.

Biomass-based chemicals

174. Before the advent of petroleum, biomass together with coal served as raw materials for the organic chemical industry. With spiralling petroleum prices, the relative value of chemical feedstocks, and therefore of the chemical raw material mix, is changing. It appears that chemicals derived from the biomass conversion of renewable agricultural resources, such as starchy materials, molasses and sugar cane, will eventually compete with those from petroleum. Among the chemicals of interest under African conditions are ethyl alcohol, acetic acid and acetic anhydride, all of which serve as inputs into the pharmaceutical industry.

175. In addition to its use as motor fuel (blended with gasoline), ethyl alcohol can be converted into ethylene for making, *inter alia*, PVC and polyethylene, the two major plastics used in Africa. The manufacture of ethylene and its derivates from biomass are viable at much lower capacities compared with those based on petroleum. This would mean that, in African countries where economies of scale are crucial constraints upon industrialization, the biomass chemical route should be considered an alternative to that of petroleum when assessing petrochemical projects, particularly in petroleum-poor and land-locked countries.

176. An ethyl distillery with a capacity of 120,000 litres per day would require an investment of $10 million to $15 million and a labour force of 100 persons. Conversion of this alcohol to ethylene and then to PVC or polyethylene would involve investment of some $50 million to $60 million and a labour force of 100-200 persons.

Institutional framework

177. Although a number of separate autonomous institutions can be established to perform specific functions such as the exploitation, development and processing of chemical raw materials and the utilization of energy resources, co-ordination of their respective activities would be facilitated if the functions required were carried out under the same organization at the national, subregional and regional levels. A combination of national chemical corporations and a multinational chemical corporation at the subregional level, the latter structured along the lines of a transnational corporation, appears to

be an option worth examining. The corporations should be designed to undertake the following activities:

(a) Identifying, formulating and designing chemical projects;

(b) Promoting and implementing chemical projects;

(c) Commissioning and operating chemical plants;

(d) Marketing and distributing their products and raw materials, with particular emphasis on intra-African trade;

(e) Training technical, managerial and administrative personnel;

(f) Conducting research and development;

(g) Co-operating with mining and other companies engaged in extracting raw materials;

(h) Mobilizing finance for investment.

178. It should be noted that the above corporations will, in certain cases, need to subcontract their activities to specialized institutions within Africa and without.

Engineering industry

Importance of the engineering industry

179. As stated in the Lagos Plan of Action,[27] the industrialization of Africa requires the creation of an industrial base aimed at satisfying the basic needs of the people. Stress is also placed on the need to establish links between industry and other sectors, as well as between various industrial subsectors in order to promote interdependence among those subsectors and attain harmonized industrialization.[28] During the decade 1980-1990, Governments are expected to lay the foundation for the phased development of basic industries which are essential to self-reliance and self-sustained industrialization, since they produce inputs for other sectors.[29] The development of engineering industries, such as metal working, mechanical, electrical and electronics, provides an integrated and interlinked development for producing basic equipment and machine tools, as well as intermediate and capital goods for use in priority subsectors established by the Lagos Plan of Action (food and agro-industries, building materials, metallurgical, chemical and forest industries and energy). Intra-African industrial co-operation is also recommended as an instrument for self-reliance and the acceleration of industrial development, particularly the establishment of industrial complexes, whose costs and production capacity would exceed national financial and absorptive capacities.[30]

[27] *Ibid.*, para. 56*(a)*.

[28] *Ibid.*, para. 64.

[29] *Ibid.*, para. 67*(b)*.

[30] *Ibid.*, para. 70.

Current situation

180. During the colonial era, the development of the engineering subsector was never encouraged, as a result of which, after the African countries became independent, the problems of economic development were aggravated in the 1960s and 1970s. In order to meet most of the basic needs of its people, Africa has to import from the developed world almost all the engineering products required for manufacturing activities. The cost of these imports was approximately $6 billion (f.o.b.) in 1972, rising to $23 billion (f.o.b.) by 1977[31] and still increasing. A breakdown of imports by major groups is given below.

Group	*1972*	*1977*
	(billions of dollars)	
Machinery (non-electric)	2.0	7.0
Electric machinery	0.9	4.0
Transport equipment	3.2	11.3

The industrialization of Africa based on self-reliance and self-sustained development would therefore require that the engineering and allied metal working industries be developed as rapidly as possible, preferably during the decade 1980-1990.

Characteristics of the engineering and allied metal working industries

181. In formulating a policy and strategy for the development of the engineering and allied metal working industries, the following characteristics of the industry should be taken into account:

(a) Suppliers of a wide range of capital goods, products and spare parts to all industrial and other socio-economic activities;

(b) A high degree of interlinked engineering and technological manufacturing methods and processes, product standardization and precision;

(c) Diversity of machinery and equipment;

(d) Manufacturing technologies range from manual to transfer-line operations;

(e) Production levels vary from low-level batch sizes to high-level mass production and from simple to sophisticated machinery and equipment;

(f) Investment costs of plant and machinery depend on technology selected;

(g) Viability greatly depends on the availability of foundry, forging, heat treatment, machine shop, toolroom, repair and maintenance facilities within the factory or as a service facility;

(h) Dependence on ancillary industries and sub-contracting arrangements;

(i) Close linkages with basic metal industry and other sectors of the economy;

(j) Highly qualified and trained personnel required.

[31] ECE Bulletin of Statistics in World Trade in Engineering Products, 1972-1977.

The structure of the engineering and allied metal working industries

182. The structure of the engineering industry can be summarized as follows:

(a) Core engineering industries serving as an industrial base for the manufacture of basic engineering capital goods for the production of other capital goods, such as machine tools, metal working machinery and equipment for the peripheral engineering industries manufacturing agricultural machinery and equipment, machine tools for the manufacture of textile machinery, and woodworking machinery for the manufacture of hand tools;

(b) Peripheral engineering industries for the manufacture of engineering capital goods and services which are major inputs to industries manufacturing products to meet basic needs, such as agricultural machinery, motor cars and spare parts, marine engines and machinery, textile machinery, and generating equipment for energy.

183. These industries also manufacture spare parts, recondition capital goods and carry out a wide range of repair and maintenance activities. The basic manufacturing units supporting the core engineering industries are the foundry, forging shop, heat treatment, machine shop, toolroom, fabrication shop, metal-coating shop etc.

Interlinkage with other industrial and economic sectors

184. Within the engineering industry subsector, the peripheral engineering and allied metal working industries are interlinked with core industries producing goods and services, such as:

(a) Conventional and special-purpose machine tools and metal working equipment for the manufacture of specific parts and components;

(b) Shape castings from the foundry;

(c) Formed parts from the forging shop;

(d) Machining and heat treatment from the machine shops;

(e) Jigs, tools, fixtures, and cutting tools from the toolroom;

(f) Various fabricated welded parts from the fabrication shop;

(g) Nickel-chrome, phosphate, anodized and other metal-coated parts and components from the metal-coating shop;

(h) Reconditioning facilities for worn-out machinery and equipment from the heavy repair and maintenance shop.

185. The interlinkage between the peripheral engineering industries and the major economic sectors may be regarded as a *sine qua non* for the industrialization of Africa and the realization of the objectives spelt out in the Lagos Plan of Action. As a major source of input materials to the other

economic sectors, the peripheral engineering industries manufacture and supply machinery and equipment for:

(a) Food and agriculture: fertilizer and pesticide plants, water supply and irrigation equipment, food processing plants, and food storage facilities;

(b) Clothing: textile mills and clothing factories;

(c) Building and construction: steel re-rolling mills, cement mills, brick-making factories, ceramic factories, building and construction work, wood-based products;

(d) Transport and communications: transport equipment, as well as road, railway and telecommunications infrastructure;

(e) Energy: power generators, power transmission, solar energy production and utilization;

(f) Health: surgical instruments, pharmaceutical plants, and basic chemical plants;

(g) Education: paper mills, stationery manufacture, and audio-visual equipment.

The industries linked to priority sectors are dealt with below.

Core engineering industries

186. The major components of the core engineering industries in Africa should be directed towards the expansion and installation of basic engineering back-up service facilities (see Figure III). These services encompass the installation and expansion of:

(a) Foundry facilities (ferrous and non-ferrous) to manufacture shape castings prior to final machining;

(b) Forging facilities to manufacture formed shapes by external heat and force;

(c) Heat treatment facilities to harden and temper parts and components;

(d) Machine shop facilities to manufacture a wide range of parts and components, as batch jobs or mass production for assembly and sub-assembly purposes;

(e) Toolroom facilities to manufacture jigs, tools and fixtures for the mass production and repair and maintenance of tools;

(f) Fabrication facilities to protect surfaces of parts and components for longer life.

In Africa, the above components are mainly located in railway workshops, dockyards, large repair and maintenance workshops, and private and parastatal engineering industries.

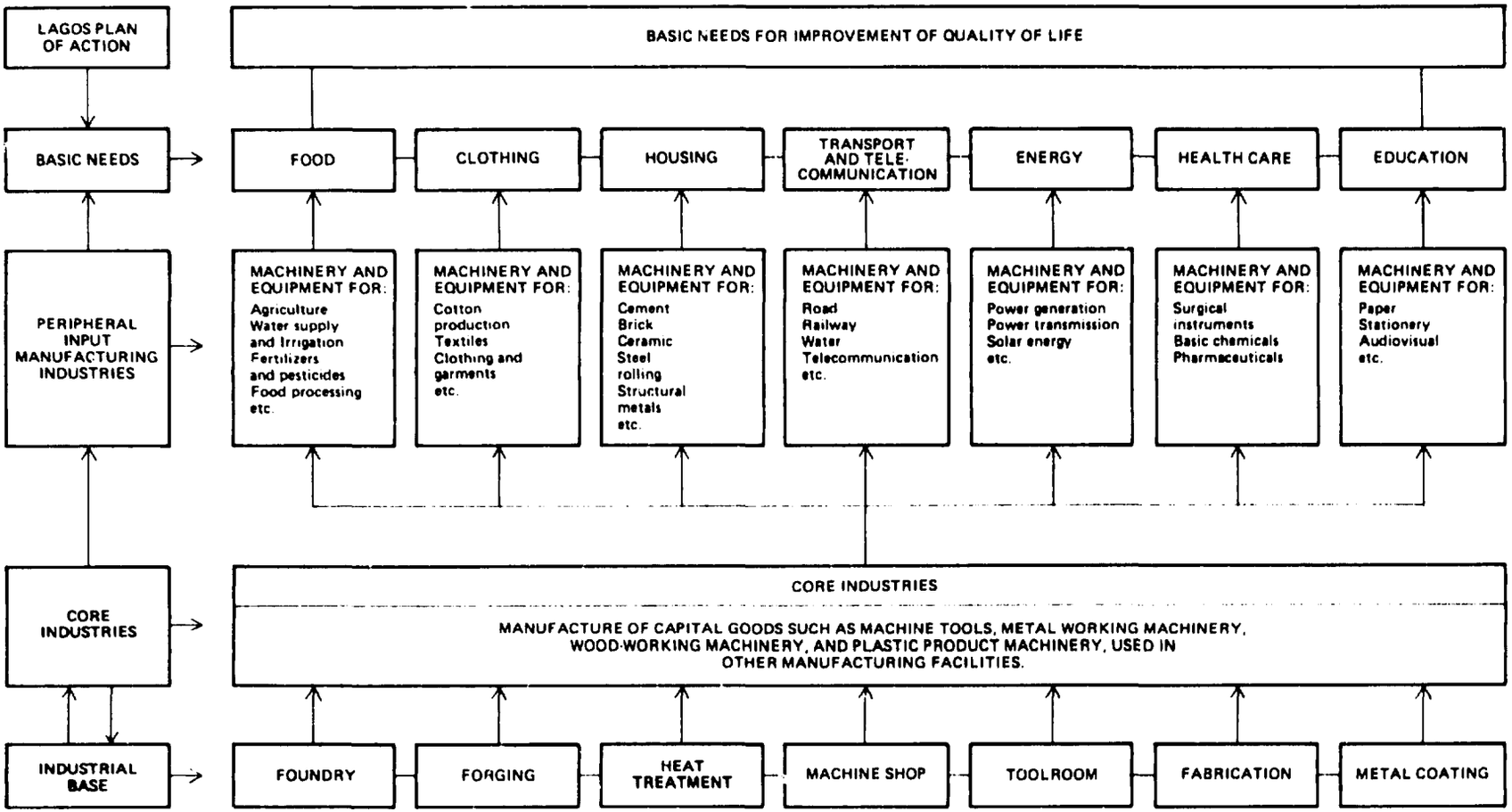


Figure III. Interlinked development of engineering and allied metal working industries to achieve the Lagos Plan of Action

187. The other important functions of the core industries are to supply capital goods to all economic activities. As a major manufacturer and supplier, the core industries are responible for:

(a) Producing conventional and special-purpose machine tools, metal working equipment, woodworking machinery etc.;

(b) Producing spare parts and reconditioning worn-out capital goods;

(c) Absorbing and supplying trained technical personnel, skilled machine operatives etc.

The role of core engineering industries

188. With the establishment of core engineering industries, natural resources, particularly basic metals, are increasingly utilized, capital formation accelerated, and the production of components, parts, machinery and equipment (import substitution) encouraged and promoted. Badly needed foreign exchange is conserved for other economic activities, and contributions made to the maintenance and productivity of agriculture and other industrial sectors. Core engineering industries also provide a basis for the development of science and technology, including research and development activities. As an incentive for investment in industrial activities, they contribute to the development of indigenous entrepreneurship and capabilities. They increase employment opportunities not only within their own subsectors, but also in other economic sectors, and they offer highly qualified and skilled labour which can be absorbed in all industrial activities. Core engineering industries promote and create modern infrastructural facilities. They are also necessary inputs for self-reliance and self-sustaining economic development, and promote the development of trade between developing countries.

Identification of priority products at core industry level

189. The engineering subsector includes a wide range of engineering products, of which capital goods, machinery and equipment for metal working and related industries play a significant role in the primary and secondary transformation[32] of parts and components. Therefore, the identification of priority products at the core industry level will be confined to: *(a)* the manufacture of selected machine tools, metal working machinery, woodworking machinery and related spare parts; and *(b)* foundry, forging, heat treatment, machine shop and toolroom facilities required for the primary and secondary transformation of parts and components to be manufactured at the country and inter-country level in the African region.

[12]Primary transformation covers the phase from liquid metal to shape castings for machining of parts, whereas secondary transformation extends from shape castings to the finished machining of parts.

190. It is anticipated that the following indigenous manufacture of machine tools and related machinery, equipment and accessories will play a crucial role in the industrialization process in African countries:

(a) Machine tools, machinery and equipment

(i) Conventional machine tools, up to 10 hp; metal and woodworking band saws; drilling machines; presses; bending machines etc.;

(ii) Power-operated portable hand tools, up to 1 hp; woodworking saws, grinders etc.;

(iii) Hand-operated equipment: benders, shapers, drills etc.;

(iv) Hand tools: shears, hammers, pliers, blacksmith tools, chisels etc.;

(v) Cutting tools: hacksaw blades, files, drills, taps, cutters etc.;

(vi) Measuring equipment and accessories.

(b) Capacities for casting and machining facilities

(i) Foundry complex for grey cast-iron, brass and aluminium castings capable of casting machine beds up to 5 tons;

(ii) Forging and heat treatment complex capable of forming parts up to 40 kg;

(iii) Machine shop complex for machining workshops: casting up to 5 tons and forging up to 40 cm diameter and 200 cm length;

(iv) Toolroom complex for the production of jigs, tools, and fixtures, repair of tools and manufacture of precison parts;

(v) Fabrication complex for the production of welded parts and components;

(vi) Metal-coating complex for nickel-chrome plating, phosphating etc.

191. The above listing of basic machinery and equipment is purely indicative. Egypt is the only country in Africa (excluding South Africa) which manufactures selected conventional machine tools and equipment. Algeria, Kenya and Nigeria will shortly commence the manufacture of selected conventional machine tools.

Major problems and constraints

192. The demand for machine tools and allied metal working and woodworking machinery and equipment is mostly met by imports. Domestic supplies are almost non-existent in most African countries. The major problems and constraints related to the development of core engineering industries are:

(a) Non-availability of essential raw materials, particularly pig iron, machinable rolled sections, alloy steels etc.

(b) Absence of policies and strategies for integrated industrialization;

(c) Inadequate indigenous capabilities for handling various aspects of projects, including their identification, planning, design, construction and implementation, as well as the procurement of finance and technology;

(d) Unwillingness on the part of the transnationals already established in Africa to set up core industries;

(e) Lack of political will to pool resources for the implementation of subregional and multinational core industry projects;

(f) Inadequate foundry, forging, machine shop, toolroom and ancillary facilities at the national level and the low utilization of installed plant capacity;

(g) Lack of research and development facilities and product standardization;

(h) Inadequate communication facilities and problems relating to the collection and dissemination of information among Governments in the field of core industry development.

In order to overcome the above problems and constraints, the African countries must consolidate their efforts to restructure existing facilities, including institutional arrangements for the integrated and interlinked development of the core engineering industries.

Priority projects and activities for the development of core industries

193. National and multinational activities related to the engineering industry development programme during the Decade are expected to cover promotional activities aimed at the development of core engineering industries in the manufacture of machine tools and allied metal working machinery, as well as equipment primarily devoted to the manufacture of input machinery to meet basic needs in African countries. The following areas have been identified as being of high priority:

(a) Development and manufacture of machine tools and allied metal working machinery

(i) Conventional machine tools up to 10 hp: one plant per subregion with an annual capacity of 300 to 400 (expandable to 1,200) units, manufacturing the range of products listed in paragraph 190*(a)*(i): each plant requiring an investment of $10 million to $15 million[33] and a labour force of 400 to 500 persons;

(ii) Power-operated portable hand tools up to 1 hp and hand operated equipment. At least two plants per subregion, each with an annual production of 100,000 power-operated hand tools listed in paragraph 190*(a)*(ii) and 10,000 units of the range listed in paragraph 190*(a)*(iii): each plant requiring an investment of $8 million to $10 million and a labour force of 250 to 350 persons;

(iii) Wide variety of mechanical hand tools: in any country with a population of over 4 million, one plant with an annual capacity of 5 million units of the range listed in paragraph 190*(a)*(iv): each plant requiring an investment of $3.5 million to $6 million and a labour force of 250 to 300 persons;

[33]These and other investment figures that follow exclude the cost of land and building, as well as parts and components made under subcontract.

(iv) Wide variety of cutting tools: one plant per MULPOC (sub-region) with an annual capacity of 1 million units of the range listed in paragraph 190*(a)*(v): each plant requiring an investment of $6 million to $8 million and a labour force of approximately 400 persons;

(v) Selected measuring equipment and accessories: one plant per MULPOC with an annual capacity of 100,000 units of the range listed in paragraph 190*(a)*(vi): each plant requiring an investment of $1.5 million to $3 million and a labour force of approximately 200 persons.

(b) Development of basic support industries

(i) Foundry complex at the national or inter-country level: in any country with a population of more than 3 million, one plant (based on the expansion and upgrading of existing foundries when applicable) with an annual capacity of 10,000 tons of liquid metal for conversion into high-duty grey iron, standard grade iron, steel and brass, and aluminium castings. Each plant requires an investment ranging from $10 million to $15 million and a labour force of 300 to 500 persons. Products include machine tool beds, column body, frame apron, tail stocks, spindle heads, guides, slides, pump-bodies, impellers, flanges, engine blocks, axle housing, crankcases, large cast-iron gear blanks and transmission parts with a maximum single piece weight of 2.3 tons;

(ii) Forging and heat treatment complex at the national or inter-country level: in any country with a population of more than 4 million, one plant with annual capacity of 2,000 tons of medium forged parts and 5,000 tons of small forged parts and corresponding heat treatment facilities: each plant requiring an investment of $4.5 million to $6 million and a labour force of 250 persons. Product sizes would range from 5-20 kg for the machine-tool, transport, and agricultural machinery industries;

(iii) Establishment of machine shops and fabrication shops as listed in paragraph 190*(b)*(iii) and (v);

(iv) Toolroom complex at the national or inter-country level: in any country with a population of more than 8 million, one plant with annual capacity of 1,000 jigs, tools and fixtures up to 50 kg weight, 5,000 tool regrinders and 200 moulds and dies: each plant requiring an investment of $5 million to $10 million and a labour force of about 200 highly skilled persons. The plant would be capable of training 100 persons per year;

(v) Metal coating plants at the national level: in any country with a population of more than 2 million, one plant incorporating nickel and chrome plating, galvanizing, phosphating, anodizing and enamelling facilities: each plant requiring an investment of around $2.5 million to $4 million and a labour force of 250 persons.

Engineering industries with linkages with priority sectors

194. As a means of ensuring self-sustaining development based on self-reliance, the section of the Lagos Plan of Action devoted to industry places special stress on the need to establish an industrial base which would ensure the integration of the whole economy[34] through effective mutual linkages between industry and other sectors[35] with a view to producing inputs for infrastructure[36] and other sectors, and meeting the basic needs of the mass of the population, most of whom live in rural areas. In addition to the specific high-priority sectors identified by the Ministers of Industry, such as food and agriculture and building materials,[37] the Heads of State and Government at their economic summit agreed to accord priority to the following sectors: food and agriculture, transport and communications, industry, energy, trade and finance. The linkage between the engineering sectors and these priority sectors have been shown earlier.

AGRICULTURE

195. The Regional Food Plan for Africa projects 13.8 million tons of wheat imports for the year 1990.[38] However, in 1978 cereal imports had already reached 13.4 million tons, indicating an alarming growth of demand. According to an FAO study,[39] in the year 2000, Africa will need 39 million more tons of rice and coarse grains than in 1980.

196. Consequently, cereal production has to be intensified urgently. This concern was voiced in the 1976 Freetown Declaration of Ministers of Agriculture and incorporated in the Regional Food Plan for Africa. The major areas of concern include food production, food losses, price policies and research, as well as extension and agricultural services.

197. Industry has a vital role to play in the development of agriculture, particularly since it provides industrial inputs into increasing production and reducing food losses. However, given the broad potential contribution of industry to agriculture and in view of the limited industrial capacity, coverage is highly selective: specific choices would depend on each country.

Project ideas

198. Among the priority industrial products and services identified in the Regional Food Plan, requisite inputs into food and agricultural production are:

Products and equipment for storage and processing;

[34] Lagos Plan of Action, paras. 52 and 56*(d)*.

[35] *Ibid.*, para. 64.

[36] *Ibid.*, para. 66*(e)*.

[37] *Ibid.*, paras 67 and 66*(d)*.

[38] Food and Agriculture Organization of the United Nations, *Regional Food Plan for Africa* (Rome, 1980).

[39] *Agriculture: towards 2000* . . ., table 10.3.

Transport equipment: trucks, pick-ups, animal-drawn carts, and wagons for moving food from the farms;

Construction and maintenance equipment for feeder roads, such as bulldozers, dumpers, and rollers;

General inputs: agricultural tools, implements and machinery, as well as industrial machinery and equipment used to manufacture irrigation equipment, fertilizers, pesticides and to process fuels;

Spare parts and components for all machinery and equipment and their maintenance.

199. The manufacture of simple hand tools is fairly well established in most African countries at the village blacksmith level and, in some countries, higher engineering levels have been achieved. However, in most African countries, the local manufacture of animal-drawn and power-operated implements is still virtually non-existent. The same situation exists in respect of such inputs as storage and processing equipment, and industrial machinery and equipment.

(a) Storage and processing equipment: according to the FAO study referred to above, an investment of $2 billion is required by the year 2000 for the purchase of processing equipment and machinery, such as oil crushers and mills;

(b) Transport equipment (see below);

(c) Construction and maintenance equipment for feeder roads: since these have a direct bearing on transport in general they are dealt with below;

(d) Agricultural tools: total imports of agricultural tools in the African region were of the order of 39,999 tons in 1976, and it is estimated that they will increase to 139,000 tons and 207,000 tons by 1990 and 2000, respectively. Current annual production capacity is about 18 million hand tools and 60,000 implements. By 1990, the Eastern and Southern African subregion will require over 7 million hand tools, thus calling for eight to 10 light engineering establishments, each involving an investment of approximately $2 million (at 1977 prices). The corresponding figures are over 10 million hand tools and 10-15 establishments for Western Africa, and 3 to 4 million hand tools and four or five establishments for North Africa. Each unit will employ about 100 persons. The Central African subregion will most likely be able to manage by upgrading existing and planned establishments;

(e) Hand-operated and animal-drawn implements: total demand for 1990 and 2000 is estimated at over 25,000 tons and 38,000 tons respectively. About 10 per cent of these requirements are for Central African countries and 30 per cent each for the three other subregions. With an annual production of 55,000 units per establishment, total requirements for Africa would be in the region of 25-30 establishments, each requiring an investment of $2 million by the year 2000 and a labour force of 130 persons per establishment;

(f) Power-operated agricultural implements and machinery: total regional requirements for these implements and machinery are estimated at 75,000 tons and 100,000 tons for the years 1990 and 2000, respectively. Their distribution would be similar to that for hand-operated and animal-drawn implements.

Very few African countries have manufacturing facilities for these implements and machinery, whereas about a dozen countries have facilities for assembling power-operated implements. For an annual production of 75,000 units (ploughs, harrows, tillers, threshers or winnowers), Africa would need six to 10 establishments involving investment costs of $3 million to $4 million per establishment and a labour force of about 150 for each unit;

(g) Agricultural tractors: in 1977, a total of 83,433 tons of agricultural tractors were imported into the region. It is estimated that this will increase to 687,000 tons in 1990 and 1,750,000 tons in 2000. Assuming a minimum economical manufacturing level of 10,000 tractors (of an average weight of 2 tons each) per annum, Africa should be able to support 25-30 manufacturing units by 1990, rising to 70 units by the year 2000. Each unit will require an investment of over $125 million (at 1977 prices) and a labour force of the order of 5,000;

(h) Irrigation equipment: in 1977, the region imported agricultural pumps to the value of $350 million. This demand is projected to increase to $1.09 billion in 1990, and more than $2 billion in 2000. Consequently, the region is well poised to develop its own manufacturing units. The estimated investment level would be about $1 billion in 1990 and an additional $1 billion in 2000. The corresponding labour requirements would be 50,000 persons for 1990 and an additional 50,000 persons for 2000. As regards tubes and pipes for agricultural purposes, it should be mentioned that the development proposed in the chemical sector could provide most of them in the form of PVC pipes and tubes;

(i) Spare parts and components and maintenance: the manufacture of the spare parts and components would be undertaken by the above units and through subcontracting to ancillary industries. Each manufacturing unit would have several ancillary industries requiring about 10 per cent of the investment and labour of the main manufacturing units. Furthermore, maintenance workshops would have to be established in those areas where none exist, and existing shops will have to be upgraded. Here again, some 10-15 per cent of the investment indicated for the main units will be required. Some of the mechanisms and activities that may contribute to the development of the food and agricultural inputs are indicated below.

Activities

200. The following are among the activities that need to be undertaken:

(a) The formulation of an agricultural modernization and phased mechanization policy and strategy based on self-reliance, taking into account the changes in the farmers' income levels, farm sizes, power requirements and energy needs as a basis for a farm input development programme;

(b) Design and formulation of an appropriate farm inputs development programme and identification of major changes in demand for inputs, including standardization, so as to extend the domestic market and develop maintenance services and the production of spare parts;

(c) Support for and upgrading of indigenous agricultural agents and rationalization of production;

(d) Preparation of manpower profiles for agricultural inputs and training plans as well as the organization of training schemes for farmers in the use of changing inputs;

(e) Preparation of fertilizer and pesticide programmes, including manpower profiles.

TRANSPORT AND COMMUNICATIONS

201. The implementation of the transport and communications plan in the Lagos Plan of Action on the basis of imported transport and communications equipment and spare parts is hardly conceivable with the current declining terms of trade facing most African countries, and rising debts. This is particularly true when it is recalled that the demand for imported transport and communications equipment is one of the most dynamic among the engineering products. Both the section in the Lagos Plan of Action devoted to transport and communications and the United Nations Transport and Communications Decade for Africa make an urgent plea for the promotion of an African industry in the field of transport and communications equipment.[40, 41] In the latter document, various road and road transport projects are identified amounting to $3,925 million for the first phase (1980-1983). Numerous pre-feasibility, feasibility and engineering design studies are under way which will lead to construction projects in phase II. Similarly, the programme envisages the "development of telecommunications and electronics industry in Africa."[42]

202. Import of transport equipment (amounting to over $11 billion in 1977) accounts for about 40 per cent of the total imports of the African developing countries. Estimated projections for the year 1990 and 2000 indicate that imports will reach about $25 billion and $45 billion respectively. The corresponding figures for communications equipment are $2.3 billion and $5.4 billion.

Project ideas

203. The major components of the section in the Lagos Plan of Action devoted to transport and communications include: roads and road transport, maritime transport, railway and rail transport, ports, air transport, inland water transport, and multi-modal transport. The communications part of the plan covers telecommunications, communications by satellite, broadcasting (radio and television), postal services and manpower development and training.

---

[40] Lagos Plan of Action, para. 207*(f)*.

[41] *Transport and Communications Decade for Africa 1978-1980*, vol. I (E/CN.14/726), para 13*(f)*.

[42] *Ibid.*, para. 109*(a)*.

204. The following product lines are identified as being among the major inputs[43] in the development of the transport and communications subsectors:

Railway tracks and rolling stock;

Trucks, buses, passenger cars, bicycles and carts;

Telecommunications equipment, including radio and television;

Boats;

Road construction equipment, including tractors and earthmoving equipment;

Spare parts and components for the above equipment.

205. Of the product lines identified above, the following products and product groups are deemed to be most deserving for follow-up during the Decade:

(a) Railway equipment:[44] in 1977, railway equipment to the value of $767 million was imported into the region. This demand is estimated to rise to $2,000 million and $3,400 million by 1990 and 2000 respectively, of which 50 per cent will be for locomotives and powered vehicles. The respective investment and manpower necessary for achieving the required production would be of the order of $3 million and 250,000 persons in 1990, and an additional $2 million and 150,000 persons respectively for the year 2000. About 10 manufacturing units would be required in 1990, increasing to 17 by 2000. Each manufacturing unit would specialize in the production of specific items, such as bogies and wheels, diesel locomotives (the engine being supplied by the engine manufacturing unit serving the truck and tractor units), electric locomotives, passenger coaches and freight cars. Large foundries and forging shops will be required to cater for the above;

(b) Road vehicles: in 1977, road vehicles to the value of almost $5.5 billion were imported into the region. The most conservative projections for 1990 and 2000[45] indicate a market value of $18 billion and $29.5 billion respectively (passenger cars $4 billion and $8 billion; buses $4 billion and $6.5 billion; lorries and trucks $10 billion and $15 billion for 1990 and 2000 respectively). These figures justify the development of manufacturing units. It is suggested that the manufacturing activities be placed under the umbrella of a multinational corporation, preferably encompassing all OAU member States. This corporation would control the manufacturing and assembling units detailed below. It would also look after such matters as research and development, training, sales, and procurement of raw materials. Numerous ancillary units are envisaged which would be independant, but linked to or integrated with the manufacturing units, passenger cars, lorries, trucks and buses and supply them with ancillary parts such as starters, headlamps, coils, and sparking plugs;

(i) *Passenger cars:* the projections cited above for 1990 and 2000 indicate a corresponding demand for 800,000 and 1,600,000 vehicles respectively. The manufacture of 800,000 cars would support two assembly plants, five to 10 manufacturing units

[43] *Ibid.*, paras. 157, 158, 172, 226, 227, 403.

[44] In this and subsequent sections, the base year is 1977, investment figures are at 1977 prices and projections are based on the past trends.

[45] One passeneger car per 500 inhabitants in the year 2000.

making engines, gearboxes, wheels, and tyres; three to five foundries, and three to five toolshops. Total investment would be of the order of $6 billion by 1990 and another $5 billion by 2000, with manpower requirements of 150,000 persons by 1990 and another 100,000 persons by 2000;

(ii) *Buses:* in the light of the above projections, the region will be able to support four or five manufacturing units in 1990 increasing to six to eight units in 2000. Total investment for the former would be about $3 billion and an additional $2 billion for the latter. The corresponding manpower requirements would be 200,000 persons and an additional 150,000 persons;

(iii) *Lorries and trucks:* the projections mentioned above indicate that four manufacturing units will be required by 1990 and two more by 2000, involving total investment of $5 billion and $3 billion respectively. The corresponding manpower requirements would be 300,000 persons and 150,000 persons. The models envisaged range from light pick-ups to large 30-ton trucks and above, each production unit specializing in a particular model;

(iv) *Motor cycles, low-cost vehicles and bicycles:* in 1977 the region imported bicycles and motor cycles to the value of $376 million. The figures projected for 1990 and 2000 are $1.4 billion and $2.3 billion, respectively. Assuming that half of the above was spent on low-cost vehicles, the projected figures would increase to over $2 billion and $3.4 billion, respectively. The technology involved is rather simple and does not require substantial investment: consequently their manufacture should be encouraged as a first step towards more complex technologies. Numerous specialized units will be required to produce forged parts, wheels, hubs, connecting rods, pistons etc. The total investment will be of the order of $700 million by 1990 and an additional $600 million by 2000. The corresponding manpower requirements would be 150,000 persons by 1990 and an additional 120,000 by 2000;

(v) *Road construction equipment:* the demand for road construction equipment is directly related to road building activities in a given country. In 1977, developing countries in Africa imported 273,304 metric tons of road construction machinery. It is estimated that in 1990 and 2000 they will need over 320,000 and 600,000 metric tons of such machinery (excluding extra requirements generated by the Transport and Communications Decade). These needs will entail investments of nearly $5 billion and $8 billion respectively in the two decades. However if the tractor manufacturing units envisaged above are developed, tractor units with 4-wheel drive can be obtained from the tractor plant and converted into road-building equipment. Similarly, the manufacture of dumpers and similar items can be linked to truck plants. (It has already been assumed that provision will be made for these items on the assembly lines);

(c) Ships and boats: demand for 1990 is conservatively estimated at $2.8 billion and reaching $6.6 billion by the year 2000. The technology used in the construction of ships and boats (and partially of the engines) is relatively simple, comparable to carpentry. The value-added is quite low, investment is low, and labour requirements are high. Investment is estimated at less than $1 billion for 1990 plus $2 billion for 2000. Engines must be tentatively considered for local production. Many ancillary industries are involved in ship and boat building, such as woodwork, electrical equipment, air-conditioning equipment, plastics and instruments, all of which have to be developed concurrently. In this connection, consideration might also be given to the production of fishing boats made from materials other than wood, such as ferro-cement and fibre-glass, with an appropriate source of power. Production could be launched in a coastal or lake country and the experience acquired subsequently transferred to other countries in the subregion or region;

(d) Spare parts and accessories: these would be manufactured in the appropriate ancillary manufacturing units (cars, buses, trucks, low-cost vehicles etc.) and their manufacture has already been taken into account above;

(e) Telecommunications equipment, including radio and television receivers: in 1977, the African countries imported over 5 million radio and television sets and 27,412 tons of telephone equipment. By 1990 these figures are expected to rise to almost 20 million sets and over 86,000 tons, and by 2000 to almost 40 million sets and more than 210,000 tons. By 1990, Africa will be able to support over 100 radio and television manufacturing units as well as more than 10 telephone equipment manufacturing units. The total investment for radio and television manufacture will be of the order of $250 million and for telephone equipment $500 million. The labour requirements will be 10,000 to 15,000 for the former and 20,000 to 30,000 for the latter. Promotion of the electrical and electronic industries is thus not only of importance to the assembly of radios, televisions and telephones, but it also serves as a supplier of essential spare parts to other sectors. Its products, such as simple switches, cables, fuses, wire, insulators and meters, ranging to generators and switch gear, have a significant role to play in the development of a country.

Activities

206. In order to implement the integrated development and local production of the above-mentioned equipment, the following activities are recommended:

(a) Formulation of transport and communications equipment development and production programmes at the national and subregional levels, taking into account the projected and planned development of other sectors, especially food and agriculture, distribution of population, consistency with domestic resources, level of rural incomes, the need for mass transportation, rising costs of imported energy, new sources of energy, and the Transport and Communications Decade;

(b) Upgrading of indigenous repair and maintenance workshops located in urban and rural areas, through the supply of technical support, such as quality control, standardization, loans to acquire new equipment, bulk supply

of their raw material inputs at reasonable prices, marketing of their products, if necessary, and possibly the establishment of specialized industrial estates;

(c) Preparation of labour profiles to facilitate the planning and development of the manpower required for this subsector;

(d) Upgrading of railway and other workshops to produce a wide range of products for railways and other needs, including the assessment of possibilities for upgrading the workshops into fully fledged subsidiary companies and the organization of inter-African study tours to share relevant experiences;

(e) Reduction and standardization of the number and variety of key transport equipment and vehicles, including trucks and passenger cars, in order to facilitate the emergence of national expertise through concentrated national efforts and the production of key components, such as engines, gearboxes and tyres, as well as spare parts and components;

(f) Training of labour required by the industries.

NATURAL RESOURCES

207. Industry provides inputs needed in the exploration, mining and processing of mineral resources. By providing locally made inputs, the African countries will be able to increase the value added and thus exercise effective control and sovereignty over their natural resources. This is in accordance with the Lagos Plan of Action in which it is envisaged that measures will be taken to increase the integration of mineral industries into national economies as one of the necessary structural changes aimed at increasing the linkage between industry and mineral resources.

208. The role of industry during the Decade should include the generation of skills and technology and the production of capital goods and supplies for mineral exploration, mining and processing. Skills and technology are largely determined by the organization of production, covering the whole spectrum of interlinked and sequenced operations related to primary resource extraction, transportation and conversion, product transportation, secondary conversion, supply and end-use. As for capital goods and supplies, the industry needs to be developed with a view to making the following industrial inputs available to mineral exploration, mining and processing:

Equipment for geological investigations and mineral exploration;

Mining equipment and machinery;

Mineral processing equipment, machinery and plant;

Service ancillary industries, such as foundries, forge shops, and maintenance and repair facilities;

Supplies, tools, spare parts and components for the above.

Activities and projects

209. Activities of the Decade related to exploration, mining and processing of mineral resources will depend upon activities and projects related to the development of those industries providing the inputs particularly the engineering industry. National and multinational activities and projects with respect to the latter include:

(a) Assessment of procedures and experience in the organization and management of manufacturing enterprises for the production of supplies, tools, spare parts, components, equipment, machinery and plant for the exploration, mining and processing of minerals;

(b) Identification of essential engineering products that should be selected for standardization and production in the African region;

(c) Preparation of an inventory of existing, and assessment of the required, capacity and capabilities for intra-African production of industrial inputs needed in the exploration, mining and processing of minerals;

(d) Promotion of the establishment of enterprises for the production and marketing of mining equipment, chemicals, and supplies;

(e) Preparation of manpower profiles to be used for manpower planning and training for industries related to the production of supplies, equipment, plant and machinery for the mining and mineral processing sectors.

Institutional framework for the engineering industry

210. In order to implement all the above activities, it will be necessary to strengthen existing national institutions and commercial enterprises dealing with production and marketing. The Ministry of Industry in collaboration with other related ministries can play a leading role in establishing these industries. It is proposed that a machinery and allied engineering industries design and development centre be established in each subregion. This will be the real base for the development of core industries. Such a centre will be in a position to offer the following institutional services:

(a) Project identification, preparation and management services for the preparation of feasibility studies, project evaluation, technical training and management consultancy;

(b) Product development and design services, including product adaptation and design, standardization and prototype design. These activities can be carried out in collaboration with the African Regional Centre for Engineering Design and Manufacturing at Ibadan, Nigeria;

(c) Procurement, finance and marketing services for machinery and raw materials, including financing through a loan facilities scheme;

(d) Technological advisory services related to plant layout, process planning, production methods, machinery and equipment selection, production techniques, design (for jigs, tools, and fixtures), production and material control, quality control and inspection;

(e) Common technological services to be obtained in part from the centre indicated above and in part from the industrial establishments themselves;

(f) Common engineering services for both the public and private sector including foundry for ferrous and non-ferrous shape castings, forging and heat treatment plants, toolrooms, galvanizing and electroplating plants, ancillary industries manufacturing gears, clutches, motors, belts, hardware, cutting tools, pneumatic equipment, plastic parts, and electrical equipment.

211. In addition, the following institutional arrangements would contribute to the development of the engineering industry;

(a) Establishment of some key engineering corporations to spearhead national and multinational efforts directed towards the development of the relevant engineering industry (agriculture, transport and communications, natural resources) based on a limited set of priority products, the promotion of domestic design capacity in collaboration with the design and development centre mentioned above, as well as through feedback and the provision of subcontracts to indigenous small-scale enterprises in the relevant fields;

(b) Effective organization of the market and marketing of relevant products both domestically and in other African countries;

(c) Creation of standardization units within the framework of the African Regional Organization for Standardization,[46] to promote the standardization of tools, implements, equipment and machinery in priority fields;

(d) Establishment of training centres to train manpower required for both the manufacturing industries and end users;

(e) Information services on market trends and developments in such fields as product design and manufacturing technologies;

(f) Elimination of tariff and non-tariff barriers among member States.

Small-scale industries

212. In the Lagos Plan of Action, strong support is expressed for the creation of a network of small- and medium-scale industries at the national level and Governments are urged to take effective measures and provide incentives for the development of small- and medium-scale industries.[47] In order to create self-reliant and self-sustaining industrial development, national subregional industrial policies and strategies should aim at establishing a sound industrial base,[48] with emphasis on the development of capacities and capabilities which contribute to the promotion of resource-based industries, such as agro-based, basic engineering, capital goods, chemical, metallurgical and light industries, through the provision of inputs or utilization of outputs. Small-scale industries could contribute to the establishment of this base and the promotion and expansion of such industries could help meet the 2 per cent industrial production target set for the African region by the year 2000.[49]

[46] Located at Nairobi, Kenya.

[47] Lagos Plan of Action, para. 69*(i)* and *(j)*.

[48] *Ibid.*, para. 66*(a)* and *(h)*.

[49] *Ibid.*, para. 62.

Small-scale industries as vehicles for modernizing the economy, particularly in rural areas

213. The promotion of small-scale industries would contribute immensely to industrial development. Usually, small-scale industries are labour-intensive and account for more jobs per unit of capital invested. Their establishment would thus generate employment and income and help to check rural-urban migration. The location of small-scale industries in rural areas is likely to encourage the use of new, renewable and alternative sources of energy, which are invariably cheaper to produce, thereby reducing the use of imported energy and other factors and conserving foreign exchange. These industries are also centres for the development of semi-skilled manpower and indigenous entrepreneurial capabilities badly needed for industrialization. Their establishment also encourages the development of integrated and interlinked industrial development by subcontracting. Small-scale industries geared towards the production of components or spare parts also stimulate the growth of other sectors, such as food and agro-based industries, building industries, transport and communications, and energy. The promotion and expansion of small-scale industrial activities in those production sectors could help meet the goals and objectives of rapid and integrated development, with emphasis being placed on the satisfaction of basic needs and the use of local resources.

214. During the last decade, countries in Africa have established policies and programmes for the development of small-scale industries. In some countries, the Government established industrial estates in urban and rural areas to promote and encourage the development of small-scale industries, while other countries have not yet used industrial estates for the development of small-scale industries.

Major problems and constraints

215. Most African countries have not incorporated specific national policies on small-scale industry development in their national development plans and no clear-cut definition exists of what small-scale industries are; consequently, no integrated programme exists for the development of small-scale industries. Another major constraint is the lack of adequate capacities to collect information on the type of goods that can 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, as well as shortcomings in the areas of marketing and distribution. As far as financial facilities are concerned, a number of African countries have their own financial institutions, in the private, state or semi-state sectors. These facilities can be drawn into the process of providing more flexible, simplified credit schemes to small-scale enterprises. However, it is also characteristic and understandable that the failure to promote small-scale industry activities is due not only to the lack of finance, but also (and mostly) to the lack of a guarantee system for loans granted by local financial institutions. The African Governments should create facilities whereby small-scale entrepreneurs could secure long-term loans,

thus promoting small-scale, rural and cottage industries. In setting up these special financial schemes for small-scale industry, attention should also be given to promoting those indigenous enterprises with potential for medium- and large-scale production.

216. The contribution of small-scale industries to the implementation of the Decade programme will be greatly enhanced once the scope of their activities has been determined, appropriate capacities and capabilities developed, and basic information on their production made available.

Activities and projects

217. The following activities and projects should be considered:

At the national level

(a) Formulating policies, strategies and a coherent and integrated development programme for the development of small-scale industries within the framework of industrial development and rural development, taking into account possibilities for inter-sectoral and interlinked project activities;

(b) Assessing manpower and managerial capabilities, and establishing a programme for their upgrading, involving country-wide identification and registration of entrepreneurs (including potential entrepreneurs), and the organization of national small-scale and rural industry associations;

(c) Facilitating the marketing of final products and procurement of raw materials and intermediate inputs etc. at stable prices, through specially designed national marketing corporations for small-scale enterprises;

(d) Designing training programmes for upgrading extension services and developing national capabilities in project identification; promotion, design, analysis and implementation for the development of small-scale and rural industries;

(e) Undertaking action-oriented research on the possibility of establishing for the procurement of equipment for small-scale and rural industries, and establishing effective linkages with the development of local engineering design and production capacities, including standardization and quality control, as well as advisory and institutional support;

(f) Formulating arrangements for subcontracting between small- and large-scale enterprises;

(g) Studying the most efficient means of providing physical facilities for small-scale industrial projects, including water, power, electricity, and buildings (especially in rural areas) and investigating possibilities for rural co-operatives through the provision of infrastructure, such as industrial estates and workshops;

(h) Reorienting and mobilizing decentralized industrial services and institutions (including product and technology development), to serve, on a priority basis, rural-based industry with particular regard to intermediate goods

for agriculture, consumer goods in the basic needs category, and linkages with urban industry and markets;

At the subregional and regional level

(i) Preparing a directory of project profiles for the whole of Africa, covering techno-economic information and including products to be manufactured, process descriptions, capacity and specification of plant and machinery, raw materials and other inputs, financial requirements in the form of fixed and working capital, marketing and product distribution, and a programme of action to assist and advise small-scale industrial entrepreneurs in their manufacturing activities;

(j) Encouraging new forms of multinational co-operation through national focal points, responsible for small-scale industries and integrated rural development, aimed at broadening the scope, nature, feasibility, implementation and development of small-scale and rural industrial programmes and projects;

(k) Formulating and implementing a technical co-operation programme among the African countries, as well as with other developing countries (on the basis of TCDC), to include study tours, in-plant training, workshops, seminars and training courses involving officials, trainees, experts and small-scale industrial entrepreneurs;

(l) Studying appropriate support institutions and policy measures to promote self-help in small-scale industry undertakings, including special funds and agencies to provide financial assistance in the form of risk capital; customs and tax exemptions; loans for specific projects; technical repair and maintenance brigades to provide service at a fee; consultancy services; internal and external market promotion; marketing and procurement; and training of workers, managers, foremen and entrepreneurs.

Institutional framework

218. The following institutional arrangements might be considered:

(a) The establishment of national institutions to design training programmes for upgrading extension services, provide information, consultation and extension services, and foster capabilities in the development of small-scale and rural industries;

(b) The establishment of appropriate support institutions and mechanisms to: promote self-help in small-scale industrial activities; mobilize funds for the development of these industries; procure raw materials, intermediate inputs, etc; and market products;

(c) The creation of multinational associations of small-scale enterprises through national focal points aimed at broadening the scope, nature, feasibility and implementation of small-scale industrial projects.

Packaging industry

Need for packaging materials

219. It is a recognized fact that manufacturing and processing industries cannot be established without a parallel packaging industry. Achievement of self-sufficiency in food production, which is the main objective of Africa as indicated in the Lagos Plan of Action, depends not only on the production of food, but also on its safe delivery to the consumer. Most fresh food products in Africa are moved in bulk or using artisanal packaging methods which lead to serious losses and wastage of no less than 35 per cent. These losses could be reduced to a large extent by the use of appropriate economic packaging methods.

220. The perishable nature of most food products makes it necessary to ensure their appropriate protection against any climatic and mechanical causes of premature deterioration. This necessity is heightened by the additional stresses and hazards normally encountered during handling, transport, storage and distribution. Fresh and processed foods need to be packaged whenever wide distribution is envisaged. Protection is the fundamental function of packaging, which represents an indispensable tool for the easy and economic operation of the transport, storage and marketing systems. The use of convenient 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, including pharmaceuticals. The development of the processing and manufacturing industry and an increase in the marketing of food and industrial products bring about an increased demand for retail packaging.

Packaging materials and their linkage with other industries

221. The many different types and forms of packaging materials include:

(a) Wooden boxes, cases, crates, barrels and pallets;

(b) Natural fibres: bags, nets, cords and fabrics;

(c) Wrapping paper, cardboard containers and moulded pulp;

(d) Glass (including ceramic) containers;

(e) Metal tins, cans, aluminium foil, boxes and drums;

(f) Plastic (including rubber) containers, bags, sacks, nets, cords, wrapping film and sheets;

(g) Containerization—use of permanent packaging units, usually made from metals.

222. The same degree of diversity is to be seen among the basic raw materials used in the packaging industry. These include wood, waxes, sand, clay, iron and tin ores, bauxite, petroleum and natural gas, salt, sulphur and a host of chemicals, such as soda ash, as well as such related materials as adhesives and

bitumen. It is clear that the packaging industry uses the same basic inputs as the forest, agricultural, metallurgical and chemical industries. The packaging industry is dependent upon these industries, and its development ensues in tandem with that of those basic industries which provide it with its inputs. Conversely, by providing an outlet for intermediates, by-products and wastes, it promotes the vertical and horizontal integration of those industries which were accorded high priority by the Lagos Plan of Action.

223. It thus follows that the local production of packaging materials contributes to the mobilization of available indigenous raw and intermediate materials and manpower, as well as to the generation of opportunities for the development of many small- to medium-scale industries.

224. Packaging materials have to meet certain requirements, particularly those related to hygiene. These requirements are particularly stringent in respect of plastic materials, such as PVC, where plastic components can contaminate the foodstuffs in the container. Such requirements are of particular significance to the packaging of goods for export where the packaged goods have to compete internationally.

Prospects for the development of packaging materials

225. Demand for packaging is a function of economic development. In the course of a country's development, as urbanization increases and consumption patterns and eating habits change, more and more foodstuffs will undergo some form of processing that requires increasingly sophisticated packaging. This, to some extent, applies to other products, particularly those of the processing industries. In short, it is likely that the demand for packaging materials will increase at rates higher than those of the economy as a whole—thus the need arises to provide inputs for the packaging industry when planning and developing processing industries, particularly in the forest-based, agricultural, metallurgical and chemical subsectors.

226. In developing countries, packaging materials are generally used more than once—be it for the same or different purposes. Given this situation and the likely trend towards returnable containers in industrialized countries —because of the increasingly high cost of energy—African countries would do well to consider developing their packaging industry based on the manufacture of returnable containers whenever practical.

Activities

227. In the light of the above, efforts should be urgently made to promote and provide technical support to the development of the packaging industry to meet the requirements that arise in connection with the transportation, storage

and distribution of food, as well as other agricultural and industrial goods. The following activities should be undertaken:

(a) A survey of the main packaging and related materials imported by the African countries;

(b) A survey and evaluation of the main types of packaging materials used in African countries;

(c) A study of alternative and complementary types of packaging materials for use in the African region and the promotion of their standardization;

(d) An appraisal of indigenous raw materials and by-products in the African region which could be used for the manufacture of the packaging materials required;

(e) A study and development of appropriate technologies for the conversion of indigenous raw materials and by-products into the packaging materials required;

(f) The design and manufacture of prototypes of tools and mechanical aids for the manufacture of the packaging materials referred to above;

(g) The development of models and promotion of plants for the manufacture of the packaging materials;

(h) The development of the requisite skills;

(i) Collection and dissemination of information relating to the packaging industry.

Institutional framework

228. The following institutional arrangements might be considered:

(a) At the national level, it is recommended that an appropriate machinery be set up for the development of the packaging industry whose activities would include those outlined above as well as standardization, testing and quality control;

(b) At the subregional and regional levels, it would be desirable to:

(i) Strengthen or establish new regional packaging development centres to assist and advise African countries by providing information, training, and research and development services related to the packaging industry;

(ii) Establish an African packaging federation or council which would provide a forum for discussing and adopting appropriate measures for the development of the packaging industry in Africa, promote the establishment of national packaging institutions as well as intra-African co-operation, and provide policy guidance to the above proposed African packaging development centres.

3. Major factor and related inputs

229. The major project ideas identified in the previous sections need to be developed, promoted and implemented; they have to pass through the project cycle. Furthermore, the resulting production facilities should be operated efficiently and their outputs marketed and distributed.

230. Undertaking the above activities, including those implied, requires capabilities and capacities for, *inter alia*: carrying out pre-investment studies, bidding, contracting and negotiating, as well as erecting and operating plants. All these involve a varied number of factor inputs. Under the present and probable future conditions in the world and within the framework of the objectives of self-reliant and self-sustaining industrialization set out in the Lagos Plan of Action, the availability of natural resources becomes the basic pre-requisite for decision-making at the initial stage of project identification and preparation. Whereas all the raw materials and energy needed may not be available within the national boundaries, the region as a whole is endowed with almost all of the natural resources required for the proposed projects. All that is needed is for the States concerned to co-ordinate their efforts in the exploitation of, and trade in, these resources.

231. Once the availability of natural resources and their economic exploitation have been established, the other factor inputs come into the picture. These may be categorized into those related to capabilities and capacities for:

(a) Development of projects (pre-investment studies, specifications, bids and contracts);

(b) Construction of production facilities (procurement, contractors, supervision and commissioning);

(c) Plant operation;

(d) Marketing and distribution;

(e) Monitoring and evaluation.

232. These categories require enterpreneurs and skilled manpower, an institutional framework and financing, all of which are treated below.

Natural resources

233. One of the most important requirements for accelerating the industrial development of the African region, as called for in the Lagos Plan of Action, is the rapid acquisition by the African countries of knowledge of the natural resource endowment of the countries in the region, i.e. those natural resources that constitute inputs into the industrial project arising out of the Lagos Plan of Action. At present, most of the mineral, agricultural, forest and marine resources of the region are exported unprocessed. Some are processed into mineral concentrates or plant extracts with a view to reducing transport costs. However, the resultant value added is small, if not negligible.

234. In the metallurgical and chemical industries, two basic industries providing inputs to other industries and economic activities, the processing of resources for local use has been rather limited. Africa imports metals, chemicals and products which are derived from the resources it exports in unprocessed form. Worse still is the fact that virtually no trade in raw or semi-processed materials is carried out between African countries. A number of national projects were considered unfeasible because one or more of the physical inputs were not available within the country, even though such inputs, including electric energy, could have been obtained from neighbouring countries.

235. The present knowledge of natural resource endowment of the African region is both inaccurate and scanty. Its inaccurancy stems from the fact that it has been mainly derived from foreign multinational corporations whose criteria for assessing the resources differ from those which would be applied by indigenous institutions intending to use natural resources for socio-economic activities within the African region. Its scant nature is due to large areas of the continent still being unexplored.

236. A detailed evaluation of certain natural resources could be undertaken by a number of African countries using their own existing institutions. However, in certain instances, such as natural resources, the exploration of which is expensive, or resources extending to two or more countries, evaluation could exceed the financial and technical capabilities of many African countries. Moreover, at this stage of natural resource development (especially for minerals) investment is risky in the sense that although millions of dollars may be directed towards the evaluation of a single area, it may not be certain that deposits will produce the natural raw material in quantities enough to cover the cost of exploration.

237. If the countries of the African region are to exercise full sovereignty over their natural resources and have these resources promote a regionally self-sustaining socio-economic development process, they have to generate a large proportion of the capital to finance new natural resource development projects in the region. Few countries in Africa, with the possible exception of the major oil-producers and those with a large industrial sector, have the internal financial capacity to support large-scale development projects in this field.

IMMEDIATE FOLLOW-UP MEASURES TO REMOVE OBSTACLES TO THE EXPLOITATION OF NATURAL RESOURCES

Activities and projects

238. The following activities and projects should be considered:

(a) At the national level, an urgent re-examination and evaluation should be made of the past records of all natural resource exploration surveys. Should some of these records still be held by former colonial powers and foreign multinational corporations, African Governments should devise means of retrieving the information;

(b) As a preliminary step towards the systematic exploration of the vast unexplored areas in the region and probably the best and quickest way of acquiring some basic knowledge of the natural resource endowment of those areas, the rural population could be employed to prospect for natural resources. Thus, simple courses in natural resource prospecting, simple portable tools, technical assistance, and other incentives to unsophisticated labour combined with the utilization of local knowledge could provide Governments with valuable clues for subsequent in-depth investigations and the location of natural resources essential to development;

(c) The information gathered from past records and the employment of rural unsophisticated labour in prospecting for natural resources as suggested above might not, in some cases, be a sufficient basis for planning natural resource development at the national level. Detailed assessments and evaluations of such factors as quantities, qualities, recovery techniques and end-uses of the resources would have to be made so as to establish an inventory of the country's natural resources; information that can be easily understood by national development planners;

(d) National institutions in many African countries could concentrate their efforts on the detailed evaluation of small- to medium-scale natural resource evaluation projects, while African multinational natural resource exploration and evaluation corporations could be formed to undertake such work in respect of those projects that are beyond the capabilities of many individual countries;

(e) Closely related to the above is the need at the national level to evaluate current natural resource development activities in each African country so that the countries might decide on possible restructuring in response to the requirements of the Lagos Plan of Action: for example, by deciding which projects could continue as national projects and which could be upgraded to subregional or regional projects;

(f) At the national level, the information on natural resource endowment gathered by national institutions—including information on on-going projects—should not only be used for national projects, but also made available to existing and future subregional and regional socio-economic development institutions. Similarly, the information acquired by African multinational natural resource exploration and evaluation corporations should be supplied to the relevant national Governments and the subregional and regional socio-economic development institutions. The subregional and regional socio-economic development institutions should then collate the national inputs in the form of studies with proposals for subregional and regional natural resource development projects for consideration by member States. These studies would, for example indicate natural resource complementarities and raw material availability in different countries and include proposals for promoting intra-African trade in such raw materials;

(g) At the national level, inputs into the natural resource development sector must be identified in consultation with suppliers (national, subregional or regional), so that these inputs are available when the project is implemented. Likewise, consultations with potential consumers (national, subregional or regional) have to be held at the planning stage so that markets are available

when production commences. Subregional and regional sources of inputs to national natural resource development projects, and subregional or regional markets for such national projects will then be determined, *inter alia*, by the lack of national inputs or restricted national markets;

(h) It is proposed that most African countries should devote considerable attention to national natural resource development projects which are small- to medium-scale in nature, labour-intensive, situated in rural areas and use simple technology so that the countries can implement the projects relatively easily through their own internal efforts. As for large-scale projects, these should be considered on a subregional and regional basis so that finance and other inputs can be provided by the participating countries through mutually agreed mechanisms;

(i) Both at national and subregional and regional levels, African Governments will need to co-ordinate protection of the environment which could be disturbed through the exploitation of natural resources, pollution, deforestation, over-utilization of renewable natural resources etc.;

(j) The African countries can learn from the experience of other developing countries, such as Brazil, Chile, India and Peru. Study tours to those countries by Africans responsible for natural resource development should be encouraged;

(k) With regard to securing external resources for the development of African natural resources, Governments should ensure that such resources are principally directed towards natural resource development projects which promote and sustain co-operative arrangements among the African countries, thus enabling the region to obtain the fullest possible development benefit accruing from regional linkages. These co-operative arrangements should also help to build up indigenous inputs relevant to natural resource or raw material exploration, evaluation, management, extraction, and intra-African trade between basic core industries.

Institutional framework

239. The following institutional arrangements should be considered:

(a) It is suggested that special priority be given to financing both national and subregional and regional natural resource development projects through local commercial and specialized bank credits, and local consumer advances. This will require the establishment of specialized subregional and regional natural resource finance institutions. Moreover, local consumers may have to refrain from purchasing their products outside the African region. Foreign investment in natural resource development may be encouraged by African Governments, yet they should avoid competing against one another for such capital;

(b) In the field of manpower development and utilization for natural resource development activities in the African region, African countries will need to consider a number of measures to improve the present situation, including: the reorientation of training so as to respond to natural resource

endowments and the production of goods and services from such natural resources; increased use of subregional and regional training institutions; secondment of existing skilled labour from relatively well endowed countries to countries with relative scarcities; and the pooling of skilled labour from different countries for subregional and regional projects;

(c) As regards research and development, African Governments might need to consider the advantages to be derived from subregional and regional institutions for the natural resource-based industries of the African region;

(d) The role of the United Nations system in assisting African countries in the development of their natural resources will be largely catalytic, whether in the conduct of studies, implementation of projects, or monitoring of projects. All of this will have to be undertaken upon request and together with representatives of African Governments so that the studies become their property and not that of the United Nations. Similarly, the projects and the responsibility for their success or failure should rest with the Governments and not with the United Nations;

(e) So that subregional or regional projects (in natural resource development, for example) may be effectively promoted and sustained, it is suggested that each African Government establish national organs directly responsible for subregional and regional institutions and projects. Such national organs could be separate ministries (e.g. Ministry of Regional Co-operation), given the emphasis placed in the Lagos Plan of Action on African regional co-operation in socio-economic development.

Agricultural and forest resources

240. The economies of most African countries are based on agriculture. On an average, more than 50 per cent of the population earn their livelihood directly or indirectly from agriculture. In short, agriculture forms the basic pre-requisite for any sustained future development in Africa.

241. During the past two decades, Africa has experienced a severe food crisis, due in the main to the lack of policies and programmes to boost agricultural production. Food production has consistently failed to keep up with population growth. Per capita food production has declined at a rate of 1 per cent, while food imports have increased steadily with serious consequences for the balance of payments in many countries. In the Lagos Plan of Action, a radical transformation of rural development policies is thus envisaged.

242. In the light of past experience, the shortage of agricultural raw material supplies may well prove to be a constraint upon the rapid development of food and other industries processing agricultural raw materials. In many cases, agricultural processing facilities have had to work below capacity or even close down for lack of inputs in adequate quantities and qualities at the right time and place. This implies the need for integrating agricultural production and processing (the concept of agro-industrialization).

243. Africa, however, has a huge potential: it could raise agricultural production and, with a proper mix of policies, reverse past trends. This is supported by the fact that it has large reserves of land that have not been utilized or have been underutilized owing to the lack of investment in infrastructural facilities as well as to human and animal diseases (such as trypanosomiasis and other diseases). The fact that it straddles the equator offers scope for introducing non-indigenous flora and fauna. In this connection, it should be noted that in 1975 only 51.5 per cent of the total arable land of Africa was cultivated (see table 6).

TABLE 6. LAND USE IN AFRICA, 1975

(In millions of hectares)

Subregion	*Arable land*	*Crop area*	*Major food crop area*[a]	*Other crop area*[b]	*Crop area as percentage of arable land*
North Africa	39.2	25.6	17.7	7.9	65.3
Sahel	43.4	13.6	13.0	0.6	31.3
Western Africa	69.4	39.0	28.9	10.1	56.2
Central Africa	19.2	7.3	4.9	2.4	38.0
Eastern and Southern Africa	59.1	33.1	25.1	8.0	56.0
Regional total	230.3	118.6	89.6	29.0	51.5

Source: Food and Agriculture Organization of the United Nations, *Africa Regional Food Plan* (Rome, July 1978).

[a]Cereals, root crops, pulses and groundnuts.

[b]Industrial crops and other food crops.

244. As regards fishery, the fish resources of Africa are immense. This has attracted fishing vessels from many parts of the world to African coastal waters. The major coastal states have now extended their jurisdiction over fisheries to 200 miles and limited the amount of fishing by non-coastal states, in accordance with recommendations by the United Nations Law of the Sea Conference.

245. In respect of forest resources, the 714 million hectares of tropical hardwood forests in Africa (see table 7) represented about 27 per cent of the

TABLE 7. ESTIMATES OF GROSS AND COMMERCIALLY USEFUL FOREST AREAS BY MULPOC, BY TYPE OF FOREST

	All forest		*Closed forest*		*Plantations*	
	Area (10⁶ ha)	*Africa (per cent)*	*Area (10⁶ ha)*	*Africa (per cent)*	*Area (10⁶ ha)*	*Africa (per cent)*
Tangiers	49.9	7.0	20.3	8.4	1.0	29.9
Niamey	139.5	19.5	22.4	9.3	0.2	6.0
Yaounde	96.7	13.5	52.8	21.6	0.05	1.5
Gisyeni	129.6	18.2	122.7	50.7	0.1	3.0
Lusaka	294.3	41.2	23.4	9.7	0.9	26.9
S. Africa	4.0	0.6	0.3	0.1	1.1	32.8
Africa	714.0	100.0	241.9	100.0	3.35	100.0

Source: FAO/World Bank Investment Centre.

world's tropical forests in 1975. By the year 2000, closed tropical forests in Africa are expected to be reduced drastically to 187 million hectares. This state of affairs should be migitated through planned exploitation, afforestation and reforestation. For those areas that do not have forest resources, yet produce certain agricultural products (such as sugar cane), particle-board and fibre-board could be produced from ligno-cellulosic agricultural residues.

246. The important agricultural and forest resources of Africa include:

(a) Foodstuffs: cereals, roots, tubers, sugar, edible oils, fruit and vegetables, fish and animal products, including hides and skins;

(b) Natural fibres: cotton, wool and sisal etc.;

(c) Beverages: tea, coffee and cocoa;

(d) Medicinal plants and plants yielding essential oils;

(e) Forest products: wood, natural resins and rubber.

247. Africa exports a number of the above raw materials to developed countries, only to re-import them in processed form at much higher prices. Intra-African trade in these materials has been low owing to the lack of transportation between African countries, the shortage of storage facilities, as well as tariff and non-tariff barriers.

Activities and projects

248. The following activities and projects should be considered:

(a) Agricultural raw materials

(i) Identification and classification of agricultural land (land-use and soil surveys) and preparation of appropriate maps;

(ii) Improvement and development of irrigation facilities;

(iii) Provision of appropriate inputs;

(iv) Provision of adequate marketing facilities and price incentives;

(v) Eradication of diseases such as trypanosomiasis and onchocerciasis;

(vi) Provision of an adequate transportation network and storage facilities;

(vii) Integration of agricultural and forest production with processing.

(b) Forestry products

(i) Identification and inventory of forest resources by type and species of timber;

(ii) Forest conservation and regeneration with emphasis, whenever applicable, on village or community wood lots or agro-forestry;

(iii) Reduction and, eventually, elimination of log exports.

(c) Fisheries

(i) Subregional co-operation to improve off-shore fishing and landing facilities;

(ii) Improvement of marketing facilities;

(iii) Renegotation of fishing rights in the light of the new Law of the Sea.

(d) Meat processing

(i) Improvement and development of breeding and stock-raising;

(ii) Provision of adequate slaughterhouse and processing facilities;

(iii) Improvement of distribution and marketing.

Institutional framework

249. The following institutional arrangements might be considered:

(a) Research and training institutions;

(b) Rural finance institutions;

(c) Marketing and price stabilization schemes (institutions);

(d) Public and private firms to produce and market agricultural and forest raw materials and fish;

(e) Mechanisms for subregional co-operation in such areas as training and research;

(f) Strengthening extension facilities (institutions).

Metallic mineral resources

250. The Lagos Plan of Action has recognized the crucial role played by indigenous natural resources in the development of local industry in the African region and in the promotion of self-reliant and self-sustaining socio-economic development of the African countries.[50]

251. Given the overriding priorities (food and agriculture, industry, transport and communications, energy, trade and finance) a framework now exists for identifying the major raw materials required for the development of the priority sectors identified in the Lagos Plan of Action.

252. In determining the needs for metallic mineral resource development, the final demand in the priority sectors identified in the Lagos Plan of Action will be used as basic determinants of the size and scale of development. The most important considerations will be the need and demand for metals used in the:

Steel industry: iron ores, nickel, manganese and chrome;

Electrical industry: copper and aluminium;

Other engineering industries: lead, zinc and tin.

---

[50] *Ibid.*, paras. 56, 66 and 70.

253. As an indication of the level of demand for major metallic mineral raw materials the foliowing quantities have been estimated, based on an assumed population figure of 780 million and 50 per cent self-reliance by the year 2000: 50 million tonnes/year run of mine iron ores; 2 billion tonnes/year copper ores (at 0.5 per cent Cu); 9 billion tonnes/year bauxite (50 per cent Al_2O_3).

254. The end-use patterns of steel, copper, aluminium, zinc and lead in the engineering industry based on the example of Hungary in 1977 are illustrated in table 8, which shows a strong emphasis on agricultural machinery. The figures may not be taken as being typical for the structure of the consumption of metals, but merely as an illustrative example.

TABLE 8. INDICATIVE REQUIREMENTS OF BASIC METALLIC MATERIALS FOR THE ENGINEERING INDUSTRY (1977)

	Types of material required in production (per cent)				
Product group	*Steel products*	*Copper products*	*Aluminium products*	*Zinc products*	*Lead products*
Agricultural machinery including tractors	45.0	1.9	44.6	—	4.1
Metal working industries	7.9	1.0	2.0	—	0.5
Electrical industry	9.1	33.3	11.5	1.1	—
Transport equipment	38.0	63.8	41.9	98.9	95.4
Total	100.0	100.0	100.0	100.0	100.0

Source: Economic Commission for Europe, "Measures for saving minerals in engineering industries: Statistical annex for Chapter I: economic and technical factors influencing the structure of the consumption of basic traditional and new types of minerals" (ENGIN/AC.R.3/Add.5/Annex, 28 May 1980), derived from table I, based on the case of Hungary.

Problems and constraints

255. Exploration for minerals and mining development in the African region depends on international mining companies as well as foreign initiative and investment. International mining companies now claim that owing to political changes, the rapid escalation of capital and operating costs during the 1970s, slow industrial growth and structural changes within their own countries, they are no longer willing to open up new mining developments in the developing countries of Africa. The conclusion to be drawn from this argument is that the African region can no longer depend on foreign initiative and finance alone.

256. Another constraint arises from the domination and control of the mineral sector by large multinational companies. These have dominated the market outlets for mineral commodities. In addition, they have ensured that African countries depend on them for finance, technology and manpower. As a result, the African region does not possess the capacity to manufacture locally the inputs essential to the mineral sector. Africa is now importing exploration, mining and mineral processing equipment and machinery valued at $371 million, equivalent to 16 per cent of world trade in prospecting, mining and mineral processing machinery. This situation has contributed to the importation of packaged technology which has proved to be capital-intensive and consumes almost all the foreign exchange generated by the sector.

257. Production of mineral raw materials in the African region has been dictated by external markets and interests. This has led to the following major problems with regard to production:

(a) Long development cycle from broad geological surveys through exploration to mining development and exploitation;

(b) High capital investment and the lack of risk capital required for mineral exploration and mining development;

(c) Historic dominance and control of the mineral resources sector by multinational corporations leading to African countries being denied access to markets, finance and technology;

(d) Limited indigenous capabilities for project preparation and development;

(e) Constraints imposed on the size and scale of operations owing to small national markets, and obstacles to access to markets in neighbouring countries;

(f) Shortage of indigenous skilled manpower and the lack of indigenous corporate management expertise;

(g) Remoteness of mineral raw materials deposits, necessitating the creation of physical infrastructure prior to exploitation, as well as the provision of transportation facilities;

(h) Need for supporting ancillary and complementary raw materials.

Activities and projects

258. The challenge facing the mineral sector during the Decade is to ensure that production in the mineral sector is governed by the needs of the African region. This will necessitate the complementarity of resources; pooling of manpower, expertise and experience; development of scales of production and technologies suited to the needs of the region, including the promotion of backward, forward and lateral linkages.

259. The following activities and projects are aimed at facilitating the supply of mineral inputs to industry, as well as ensuring that mineral development activities correspond to the new development perspective and thus the restructuring of the mineral sector to meet the new needs arising from the Lagos Plan of Action:

(a) Preparation of an inventory of mineral resources for the steel, electrical and other engineering industries;

(b) Establishment of a common methodology for assessing information on mineral occurrences in the region and the subsequent application of this methodology at the national level with a view to acquiring a regional picture for inventories of priority mineral resources;

(c) Updating and improving inventories of priority minerals;

(d) Identification of basic types of equipment and industrial products for mineral exploration, development and processing with a view to manufacturing them within the region;

(e) Assessment of the manufacturing capabilities (including labour profiles) for production of and trade in exploration, mining, and mineral-processing equipment and supplies;

(f) Continuous assessment and projection of demand for basic mineral commodities with a view to integrating exploration, mining development and processing with the expansion of new industries.

Institutional framework

260. An institutional framework is required for improving the existing mineral sector and facilitating its orientation in line with the aspirations of the Decade programme. The most important national and multinational institutional needs for the Decade include:

(a) Strengthened geological and mining development units as part of a basic infrastructure for building up technical knowledge of the resource base at the national and subregional levels;

(b) Enterprises for exploration, mining development, mineral processing and marketing;

(c) Financing institutions for exploration, mining development and mineral processing operations;

(d) Equipment and machinery manufacturing enterprises for the mineral sectors;

(e) Strengthening and expanding the scope of the East African Mineral Development Centre as well as those planned to be established in the other subregions to cover training, documentation facilities and dissemination of information.

Chemical raw materials

261. Self-reliant and self-sustaining economic development, the basic objective of the Lagos Plan of Action, implies domestic natural resource-based industrialization. In fact, the need for the utilization of domestic natural resources to the maximum extent possible is emphasized in the Plan.[51]

262. Directly or indirectly, the chemical industry provides for basic needs. It provides fertilizers and pesticides, thus increasing agricultural productivity and reducing losses in crops and animals. It produces pharmaceuticals as well as sanitary chemicals to protect and cure man and livestock from disease. It provides cement, glass and paints for the building of shelter, paper and ink for

[51] *Ibid.*, paras. 56*(b)*, 60*(c)*, 66*(f)*, 69*(l)* and 70*(b)*.

education, fuels and tyres for transport, chemicals for purifying water etc. In short, basic needs are the major determinants for the majority of chemicals and hence for their demand.

263. Unlike other subsectors, the chemical industry uses diversified raw materials, including metals and non-metals and their ores, agricultural materials (plants and animals), air and water. The major raw materials for the production of some of the priority chemicals (fertilizers, pesticides and pharmaceuticals) as well as their basic and intermediate products are shown in table 9, in which alternative raw materials are separated by slashes.

264. One of the most important characteristics of the industry is that many of the basic chemicals can be produced from different raw materials. This is particularly true of the organic chemicals originating from vegetable matter, petroleum, natural gas and coal. Owing to the spiralling costs of petroleum and natural gas, vegetable-based chemicals, such as ethyl alcohol, acetic acid, ethylene, PVC and polyethylene, which lost ground during the advent of petroleum and natural gas-based industries, are likely to prove competitive in the near future. This trend should be taken into account when selecting raw material or process combinations for chemical projects. In addition to using renewable resources, the scale of operation of vegetable-based chemicals is relatively low and within the reach of many developing countries.

TABLE 9. MAJOR RAW MATERIALS FOR PRIORITY CHEMICAL PRODUCTS

Raw materials	*Basic and intermediate products*	*Priority chemical products*
Petroleum products/natural gas/ coal/lignite, air, water	Ammonia, nitric acid	
Phosphate rock	Phosphoric acid	Fertilizers
Sulphur/pyrites/smelter waste/ gas/hydrogen sulphide	Sulphuric acid	
Sylvite/carnallite	Potassium chloride	
Petroleum products/coal/gas and tar	Benzene, toluene, phenols	
Sulphur/pyrites/smelter waste/ gas/hydrogen sulphide	Colloidal sulphur, thiocompounds, sulphuric acid	
Phosphate rock	Phosphorus, phosphorous oxides	Pesticides
Copper ore	Copper, copper scrap	
Salt	Chlorine, hydrochloric acid, caustic soda	
Molasses/starch	Ethyl alcohol	
Petroleum products/coal/gas and tar	Benzol, phenol, salicylic acid, methyl alcohol	
Sulphur/pyrites/smelter waste/ gas/hydrogen sulphide	Sulphuric acid, chlorsulphuric acid	
Salt	Chlorine, caustic soda	Pharmaceuticals
Starch materials, soybean, groundnuts, etc.	Cornsteep liquor, flour, oils	
Sugar	Sorbitol, glucose	
Molasses/starch	Ethyl alcohol, acetaldehyde	
Medicinal plants	Extracts	
Animal by-products	Extracts	

265. Although not evenly distributed, the major chemical raw materials (except sulphur) are available in the region. However, inadequate information is available on quality and quantity that would justify exploitation, particularly data on currently unutilized deposits. There is, therefore, a need to undertake an inventory of deposits and determine accurately their qualities and exploitable reserves. In this connection, it should be noted that when designing the chemical process to be used, due account must be taken of the properties of the deposit or raw material.

266. Other problems relating to the utilization of chemical raw materials include inadequate and expensive infrastructure, inaccessible deposits, lack of adequate water for ore beneficiation and process steam generation in some areas, high cost of electric energy for electric-intensive chemicals, uneconomic scale of mining for captive use and high capital intensity for mining.

Activities and projects

267. The following activities or projects should be considered:

(a) Preparation of an inventory of chemical raw materials already being worked as well as those with potential for exploitation;

(b) Undertaking field work to ascertain the commercial viability of chemical raw materials for which adequate information is not available as well as for those known to occur in the region;

(c) Performance of processing trials on chemical raw materials with a view to finding out the best processing techniques in existing and new research and development centres;

(d) Promotion of joint chemical raw material prospecting, exploration and exploitation, particularly among neighbouring countries;

(e) Promotion of trade in chemical raw materials among African countries, especially through long-term purchase agreements;

(f) Promotion of joint workforce development and training in chemical raw material exploration, development and mining.

Institutional framework

268. The following institutional arrangements should be considered:

(a) Setting up and strengthening national and multinational mining companies to prepare inventories on chemical raw materials, to undertake prospecting, mining and trading, as well as to train labour;

(b) Setting up and strengthening research and development institutions to carry out testing of, and process trials on, chemical raw materials.

Energy

269. The Lagos Plan of Action aims at satisfying the energy needs of the African region by developing and utilizing different forms of energy.[52] The lack of skills and limited finance have been recognized as constraints in the Lagos Plan of Action, which calls for long-term energy programmes that are integrated in national development in terms of policies for energy development, production, supply and consumption.

270. The energy programme for the Decade, particularly for the industrial sector, is approached from the following viewpoints:

(a) Energy needs implied by the scale and intensity of industrialization in the Lagos Plan of Action;

(b) The serious impact of rising costs of imported petroleum fuels on the industries of African countries;

(c) Measures to ensure availability and supply of all necessary forms of energy to existing and future industries in Africa;

(d) The contribution of industry to the energy sector in the supply of equipment and machinery for the production, transmission and utilization of fuels and energy.

271. Energy has a special significance by virtue of its nature in facilitating the supply of direct heat, illumination, industrial power and transportation. The overall expected growth of African economies resulting from the Lagos Plan of Action, population growth and urbanization are envisaged to lead to an increased demand for energy.

272. The Lagos Plan of Action underscores the need for energy-conservation actions, measures aimed at ensuring availability and supply of energy, lessening dependence on imported fossil fuels, development of renewable sources of energy (solar, wind, geothermal, and organic), and fuller utilization of the hydro-electric potential.

273. The development of new and renewable sources of energy will necessitate the simultaneous development of adequate and cost-effective energy storage systems as a requirement for commercial success and industrial applicability. However, within the current limitations set by the technology of energy conversion, handling, storage, and transport systems, it is envisaged that the switch from non-renewable to renewable energy sources is a long-term objective. This notwithstanding, the promotion of new and renewable sources of energy should not be limited to the development of small-scale industries alone, but should be considered in a broader perspective so as to benefit the whole gamut of industrialization.

274. The consumption patterns for renewable and non-renewable energy will be influenced by the ratio of urban to rural population in a country. In cases where the rural population is engaged in commercial agricultural production.

[52] *Ibid.*, para. 66.

renewable energy can be considered feasible. In general, urban energy requirements should be met from conventional sources of energy, including those based on fossil fuels and hydro-power as well as geothermal. It is assumed that renewable energy sources are more cost-effective in rural than urban areas.

275. Indications of end-uses of commercially produced energy are summarized in table 10, from which it can be concluded that industry is the most important single end-user of energy.

TABLE 10. END-USES OF COMMERCIAL ENERGY IN SELECTED COUNTRIES[a]

(Percentage)

	India (1970/71)	*Mexico (1972)*	*United States (1972)*	*Federal Republic of Germany (1972)*
Transport	32	39	35	20[b]
Industry	39[c]	43	29	36
Agriculture[d]	5	1	4	5
Commerce[e]	6[f]	3	9	11
Residential	18	14	23	28
Total end-uses	100	100	100	100

Source: UNCTAD "Energy supplies for developing countries: issues in transfer and development of technology" (TD/B/C.6/31, 13 October 1971), table 2, p. 10.

[a]Excludes non-energy use.

[b]Includes bunkering.

[c]Includes mining.

[d]Includes mining and construction for all except India.

[e]Includes public uses.

[f]Includes construction.

276. Africa is endowed with both renewable and non-renewable forms of energy (including over 30 per cent of the world's hydro-electric potential). However, it does not yet have the technological and industrial capacity to exploit this resource.

277. In order to ensure a better utilization of hydro-energy as well as reduce consumption of oil and coal used in thermal power stations, high voltage networks should be interconnected at the national, subregional and ultimately regional levels. This would serve the urban requirements as well as give a boost to railway electrification. The rural sector would best be served by mini hydro-stations working autonomously.

278. The population of Africa is expected to rise to over 780 million by the year 2000. Assuming a conservative per capita consumption of 1200 kWh[53] at

[53]In 1976, the average per capita consumption in Europe was 3,892 kWh, whereas the corresponding figure for Africa was 200 kWh.

the turn of the century and a utilization factor of 50 per cent, the installed electric power required would amount to about 216,000 MW. Assuming that 16,000 MW[54] are already installed, the additional megawattage needed is of the order of 200,000 MW. Based on the 1977 unit price of $300 per kW, the additional investment requirement comes to $60 billion for 200 generating stations, each with installed capacity of 950 MW and 10,000 mini stations of 1 MW each for the rural sector. This investment increases to $84 billion when the usual provisions of 13 per cent and 27 per cent of the cost of the installed capacity are made for transmission and distribution respectively.

279. The implications of the above huge investment is that it would be justified to establish a number of engineering production units to manufacture turbines, generators, transformers, switch gear, transmission and distribution cables, and pylons.

Activities

280. Energy-related activities should, *inter alia,* include promotional measures aimed at the development and efficient utilization of sources of energy at national and multinational levels, such as:

(a) Implementation of comprehensive energy programmes at the national, subregional and regional levels to support the whole industrialization process in Africa;

(b) Intensification of research and development activities related to developing alternative new and renewable sources of energy at the national, subregional and regional levels;

(c) An analysis of current uses of sources of energy with a view to ascertaining the efficiency of energy uses as well as the potential and possibilities for conservation;

(d) An assessment of energy, machinery and equipment needed for energy generation, transmission etc., within the industrialization framework of the Lagos Plan of Action, taking into account existing and future requirements;

(e) An assessment of the cost-effectiveness of the various available types of energy sources, end-uses of energy and energy conversion systems, with a view to selecting the most effective energy source and system for particular end-uses;

(f) Preparation of labour profiles for the energy sector;

(g) Intergovernmental consultations on policies for energy development, within the industrialization framework of the Lagos Plan of Action.

---

[54] In 1976, the per capita consumption of electricity in Africa was 200 kWh, thus giving an installed capacity of 16,000 MW (at a utilization factor of 50 per cent) for a population of 410 million.

Institutional framework

281. The following specific national and multinational institutions should be promoted:

(a) Energy study groups to advise Governments on national energy needs, supply-policies, conservation measures and energy research and development efforts required to ensure the development and application of technology in the energy sector;

(b) Enterprises for the development, production and marketing of energy resources;

(c) Research, development and training centres with emphasis on non-conventional energy;

(d) Enterprises for the manufacture and marketing of energy conversion, generation, storage, transport, transmission and utilization equipment and devices;

(e) Subregional and regional energy boards grouping the national energy boards for integration and interconnection of energy networks, as well as standardization of energy equipment.

282. The promotion of these institutions should, however, be seen in conjunction with the proposal to set up an African Energy Commission and an African Energy Development Fund within the context of the Lagos Plan of Action.

Environment

Industrial infrastructure

283. Badly planned industrialization can bring about complex environmental pollution problems. The amount and type of industrial pollution depends very much on the type and design of the production machinery being used. It has been common practice that, while many investment companies use processing machines and equipment with minimum environmental pollution in their own countries, they prefer to use cheap, poorly designed and environmentally unsound industrial technologies in the developing countries. To worsen the situation, no preventive measures are built into production design so as to reduce environmental degradation of the physical or human environment. To avoid these hazards or reduce them to tolerable levels, the following measures might be taken:

(a) Environmental legislation and conventions should be initiated, at national and multinational levels, to agree on the levels of tolerable industrial pollution, the monitoring of natural resource depletion, and exchange of environmental information for intra-African co-operation so that:

(i) Environmental management regulations are obeyed by all national and multinational industrial investors;

(ii) A common framework exists between countries in areas with common environmental problems of an industrial nature, and

this framework should provide for access by members of the national environmental secretariats to carry out an assessment of the environmental impact of industrial operations;

(iii) Within each industrial complex capable of emitting toxic materials, equipment is installed to check levels of toxicity and adequate steps are taken to control this;

(iv) Environmental health standards are observed for every installation.

(b) Environmental standards should be set by the countries involved for the type of processing equipment to be used in the different sectors of industrial production outlined in the programme document.

Food processing

284. The main areas here include measures to avoid food poisoning and to control the conservation of the nutritional value of foods. Assessments must therefore be carried out and standards met for:

(a) Levels of tolerable toxicity of food processing chemicals, and machine-waste components;

(b) Toxicity of preservatives;

(c) Types of storage containers.

Forest-based industries

285. Environmental hazards here are manifold; deforestation, soil erosion, tailings or dumps, air pollution from saw mills and related environmental pollution. Needed measures include:

(a) Co-operation with agriculture and forest departments to handle reforestation and afforestation activities;

(b) Research into recycling of mill wastes for use elsewhere;

(c) Pollution control for saw mill operations.

Metals

286. The metal (minerals) industry has areas where utilization of wastes could enhance other sectors of development, for instance, the use of slag-silt to produce cheaper building materials with cement, porcelain, and other materials for low-cost housing and construction that will not be subject to high tonnage strain. Furthermore, there are serious polluting metals that need careful environmental management in physical, human and aquatic environments:

(a) Need to control the amount and pollutant levels of metal such as lead, zinc, copper, tin and wastes from the aluminium industries;

(b) Standards to be incorporated in machine installations.

Chemicals

287. The environmental impact of fertilizers and pesticides must be an integra' component of such industries Fertilizers encourage the growth not only of food crops but also of poisonous weeds—including aquatic algae—that endanger both human and animal life as well as aquatic fauna. Measures should therefore include control of:

(a) Chemical nature of fertilizers and pesticides;

(b) Toxicity of chemicals;

(c) Production in the pharmaceutical industry.

Institutional framework

288. The following institutional arrangements should be considered:

(a) Environmental co-ordinating committees should be strengthened or established at the national, subregional and regional levels, including lake and river-basin commissions. The day-to-day work of these committees should be delegated to the national environmental secretariats;

(b) As appropriate, sub-committees should be established in specific industry-related areas, such as the chemical, agro-industrial and metallurgical subsectors, which should work in close co-operation with the African Regional Centre for Technology, The African Regional Organization for Standardization, and the African Regional Centre for Engineering Design and Manufacturing.

Capabilities and capacities

Improvement of national, subregional and regional capabilities

BROAD ISSUES

289. The scope and structure of activities required for accelerated industrialization towards self-sustainment in Africa are made virtually impossible by the lack of adequate labour at all levels, from project inception to the operation of industrial plants, including project identification, preparation, design, appraisal and promotion, procurement of machinery, plant and other materials and supplies, contract negotiations, operation and maintenance of industrial plant—resulting in dependency on high-cost expatriate personnel. Other constraints include inadequate knowledge of natural resources; inadequate infastructure, energy, finance and institutional framework; the failure of Governments to appreciate complementarities of industrial activities among themselves and with activities of other socio-economic sectors; lack of communication and exchange of information among government organizations as well as among Governments; and exploitation by unscrupulous foreign companies and financial institutions.

PROPOSALS FOR ACTION

Governmental and intergovernmental machinery[55]

290. There is a need to evaluate the efficiency of Governments as bodies allocating resources and regulating the agents of industrial production and to appraise the efficiency with which their activities are carried out.

291. It is impossible to continue indefinitely with an incomplete knowledge of the African resource base. Governments, through properly organized mechanisms, both at the national and subregional levels should, therefore, take steps to improve their knowledge of the national economy and of the factors impeding national, subregional and regional efforts to industrialize.

Public sector enterprises

292. There is a need to set up a co-ordination body, such as a bureau of public enterprises, in order to evolve a common policy and approach to similar problems facing various state enterprises, although they may belong to different ministries.

Improvement of capabilities for local private entrepreneurs

293. Governments could develop a portfolio of projects, keeping in view the resources and needs of the country. This portfolio should contain project profiles and provide details such as the broad technical and financial parameters of the projects, including approximate capital costs, return on investment, availability of raw material, and size of market. Sometimes, pre-feasibility or feasibility studies could be made available at a subsidized rate or free of charge.

Support measures for foreign investors

294. Governments must improve industrialization legislation directives to cope with the new patterns and objectives of industrial investment and information systems should be promoted which would encourage investors to conform with national industrial development objectives while offering them the necessary guarantees.

Support measures for joint ventures

295. Assistance should be provided for local partners in selecting suitable joint venture partners, and mutually advantageous joint venture arragements should be introduced which are in harmony with the strategy of the country.

---

[55]See chapter III, Modalities for the implementation of the programme, paras. 21-22 for further details of some of these proposals.

Development of capabilities for small-scale entrepreneurs

296. It will be necessary to collect reliable information on indigenous small-scale businesses and prospective small-industrial entrepreneurs who genuinely need the assistance and support of the Government. A small-scale enterprise promotion centre could be created for the purpose.

297. In order to enhance the capabilities of Governments and the various agents of production and distribution as indicated above as well as those of the supporting institutions and services, it is important that the key skills required be locally developed. Skills are required for corporate planning and implementation, ranging from project analysis to production control in both the private and public sectors.

298. There is also a need to develop domestic capabilities in the engineering design of products, equipment, tools and processes, if countries are to make real progress towards self-reliance and self-sustainment within the industry sector in particular, and all economic sectors in general. In this connection, the member States have established the African Regional Centre for Engineering Design and Manufacturing, located at Ibadan, Nigeria, whose objective it is to assist African countries, directly and through their own national institutions, in developing their national design and manufacturing capabilities. The Centre's programme for the period 1982-1986 is expected to cover the following areas:

(a) Identification of priority machinery and implements;

(b) Adaptation of foreign designs for priority machines and implements, and arrangement of basic documentation;

(c) Development of indigenous designs for the machines and implements identified, progressing from the development of one product to the other;

(d) Training and re-training of designers, manufacturing and testing engineers and trainers;

(e) Co-operation with national design and research centres, polytechnics, universities and industrial establishments;

(f) Co-operation with other regional and national centres and institutions for standardization in the reduction of the variety of components and machines;

(g) Promotion of entrepreneurship through prototype production, group discussions and group study tours;

(h) Assistance to Governments in establishing maintenance workshops and manufacturing units;

(i) Organization of design and technical documents and archives, and the dissemination of information and documentation.

Institution building

299. The full scope of institutional support for the Decade programme at the national, subregional and regional levels will need to be reiterated, as also will its inseparability from the problem of human resource development. A particularly significant, yet underestimated, aspect of institution building is the large and growing outlay of foreign exchange for imported institutional services. Any effort to implement the Lagos Plan of Action in general or the Decade programme in particular will increase this drain to such an extent as to affect seriously the financing of the Plan or programme as a whole.

300. Institutions of crucial importance to the Decade programme were listed in chapter I. Some of these institutions exist at the national level but rarely suffice to cover all the critical functions essential to a major forward thrust related to the core of the programme. Consequently, after determining the national plan and its core, the first essential step is to review existing national institutions of the kind listed in chapter I for the purpose of determining those:

(a) Which require fuller expansion (since many of these institutions may exist only in a rudimentary form), improvement (in terms of the range of competence) or orientation (towards innovative and promotional activities);

(b) Which can be considered to serve multinational development needs.

301. It is not unreasonable to distinguish between those institutions with primary responsibility for such activities as the organization of raw material supplies, including energy (state mineral exploration and mining companies and public utilities), the development of factor inputs, or production and marketing, and those institutions which carry out supplementary services, particularly in support of entrepreneurial action, such as information, banking and insurance, material and product testing, and project preparation.

302. The significant role which the public sector must inevitably play in the early stages of the design and implementation of national plans and programmes makes it essential that the fullest use be made of the expertise they command at present. Special and imaginative measures must be employed to improve their managerial and technical qualities, such as study tours, attachment of staff to similar and more sophisticated enterprises elsewhere, intensive courses for improvement of managerial and technical expertise, and the redefinition of functions, roles and areas of relatively independent initiatives. At the multinational level, mechanisms for promoting consultation and collaboration between state enterprises and public utilities in critical sectors should be established at an early date and the fullest use made of their combined expertise in designing production, labour development, research and development, and marketing plans, and in assisting in their implementation. The principle should be to make the maximum use of indigenous institutions already in business.

303. With regard to other multinational institutions, especially those charged with the improvement of geographical areas such as river and lake basins, a

first step would be to review their present constitutions, orientation and competence in the field of industrial development with a view to their being changed and restricted for operational purposes.

304. It should be recognized and accepted that many regional institutions are inevitably temporary structures reflecting the exigencies of the economies of scale until national or multinational replacements can be built up. In their absence, the often critical services they provide can only be obtained by increasing the outward flow of foreign exchange from the region. In the case of each existing and new regional institution, it should be obligatory to calculate the net foreign exchange drain implied by its non-establishment. Steps should also be taken to ensure the effective dissemination of information on assistance available from the United Nations organizations and other international bodies. This information could be channelled as appropriate, through such bodies as the African Intellectual Property Organization, the Industrial Property Organization for English-speaking Africa, the African Regional Organization for Standardization, the African Regional Centre for Technology, the African Regional Centre for Engineering Design and Manufacturing, and the African Institute for Higher Technical Training and Research.

Human resource development for industrialization[56]

305. One of the most striking issues raised by the Lagos Plan of Action is that of developing the relevant indigenous factors of production, of which human resources are the most important. The term relevant in this context is intended deliberately to emphasize the poor correlation between the pattern of output of the conventional formal education system in Africa on the one hand, and the exploitable natural resource and raw material base and pattern of end-products aimed at in national development plans on the other. For expository purposes, priorities in the development of human resources may be stated as entrepreneurial resources and associated support services; manpower for the exploration, evaluation and extraction of raw materials (such as minerals and metals, hydrocarbons, forest products, fibres, rubbers, ceramic raw materials and abrasives) and their trade; labour for management (finance, personnel, materials, production, technology and maintenance); labour for production related to the priority sectors in the Lagos Plan of Action (food, textiles, building materials, energy, metals, chemicals, engineering, and forest products, and research and development); and labour for the development of institutional and physical infrastructure (banking, insurance, marketing, transport, training etc.). It is not difficult to show that the formal educational system fails to produce the requisite range of specialized graduates (geologists, mining engineers, textiles technologists, food technologists, foundry technologists, forest products technologists, production engineers, cost and works accountants, specialists in business management and finance, design engineers,

[56]This section is to be read in conjunction with the corresponding paragraphs in the previous chapter, as well as with ECA/IDD-I/INR/BD/5, ECA/CM1.6/INR/BD/5, Joint UNIDO/OAU Draft Study on the Development of Industrial and Technological Manpower in the African Countries: A Proposed Framework of Action.

specialists in materials, system analysts etc.), while their numbers and qualifications (in terms of immediately usable skills) are not suited to the requirements of the Lagos Plan of Action. In some cases the facilities exist here and there in the region but require co-operative action for improvement and expansion. In other cases, they do not exist at all. In both cases, it must be obvious that the technical process of improving and expanding existing institutions or establishing new ones will take several years, to which should be added the preceding period of defining needs, preparing feasibility studies and carrying through multinational negotiations. Clearly, indigenous methods will have to be discovered and applied to reduce the time and cost involved in human resource development processes, particularly when the dominance of the rural sector and the potential of women are taken into account.

306. Perhaps the most significant constraints will be the supply of teachers and trainers and the supply of teaching material. A minimum programme at the national level would include:

(a) Compilation of labour or skill profiles—possibly as part of a regional information system—mainly in respect of project areas falling within the main core of the Decade programme, which would be available to Governments or corporate planners with the minimum of delay;

(b) Development of national machinery to analyse, review and project the labour required, particularly for core projects and for consultations on their development;

(c) Compilation and continuous review of new or cheaper techniques for accelerated human resource development, based on widespread surveys, for the information and guidance of industrial labour planners and education and training institutions; this could be organized as a readily accessible regional information system;

(d) Evaluation of the relationship of the pattern of labour output of national institutions to defined requirements;

(e) Review and application of measures for optimizing the use of national and multinational resources for the development of special types of labour;

(f) Review of the role of technical assistance in human resource development for industry;

(g) Possible establishment of teaching companies, national or multinational centres combining industrial production (of selected key products), teaching and learning, adaptive research and experimental development, demonstration and extension, and marketing as well as the adoption of specific policy measures for the development of indigenous consultancy services;

(h) Evaluation of the needs of entrepreneurs in the public and private sector for support services, and review of the state of such services in order to bring about their early improvement and expansion. With regard to expansion, special cognizance should be taken of the dominance of the rural sector and of rural industrialization, and hence of the need for consultancy and support services (including mobile clinics) in rural areas.

307. Important qualitative changes in teaching and learning processes and their organization will be necessary. In particular, the sterility of urban education will have to be overcome and prevented from undermining the practical and inventive traits imparted by traditional education in the rural areas. To assist in all this, research into cognitive processes in Africa will probably have to be intensified and co-ordinated, and the intervals between establishing valid research results and their widespread adoption considerably shortened.

308. Engineering and other curricula will almost inevitably require extensive changes to provide for new areas of specialization appropriate to African needs (such as applied natural resource economics and management, environmental sciences, integrated development of arid areas, labour-intensive technologies, cross-disciplinary studies for constituting project feasibility teams or manning project study centres) or to include new aspects, such as project evaluation techniques, technological economics, and systems analyses.

Financing the Decade programme

309. A significant part of the challenge in implementing the Lagos Plan of Action in general and the Industrial Development Decade in particular lies in the fact that the bulk of factor inputs relevant to exploring for, evaluating and extracting industrial raw materials and converting them into semi-finished and finished products have to be purchased with foreign exchange from outside the region. Therefore, the rate at which the effects of the foreign exchange constraints can be reduced depends on the rate at which relevant indigenous factor inputs are created and domestic industrial raw materials extracted and traded. In this connection, two considerations deserve special attention: the proportions of foreign exchange and domestic real resources devoted to the development of indigenous factor inputs and to the extraction of and trade in raw materials, as well as the adoption of new methods of accelerating the development of indigenous factor inputs and the supply of raw materials.

310. The cost of imported factor inputs has been rising enormously, outstripping the cost of exports. It must be noted that without the indigenous development of relevant factor inputs and raw materials, domestic financial savings have little operational meaning since, by definition, they can only be used to buy factor inputs and raw materials which should have been produced locally.

311. In addition the following lines of action should be given priority attention:

(a) Measures for reducing capital wastage through improved and widely encouraged maintenance (particularly preventive maintenance) and repair policies and practices;

(b) Adequate measures to reduce, where desirable, under-utilization of fixed capital assets;

(c) Adoption of policies and encouragement of widespread adoption of arrangements for bulk procurement of machines, spares and materials (associated with measures promoting standardization);

(d) Efforts to improve national capacities in equipment selection and installation;

(e) Use of barter arrangements, particularly with regard to intra-African trade in industrial raw materials and energy which generally constitute a substantial component of the cost of industrial production;

(f) Establishment of an intra-African investment system to finance basic and strategic industries;

(g) The preparation of a general directory indicating sources of finance and ways and means of mobilizing financial resources at the national and subregional levels;

(h) Measures for increasing the flow of external finance for industrialization in Africa through established and new mechanisms, including the proposed International Bank for Industrial Development.

312. Governments need to give urgent attention to the South-North flow of foreign exchange from the African region to pay for imported services which include consultancy for feasibility studies; project design and planning; site development; equipment selection, importation and installation; project management; trouble shooting, especially with regard to civil engineering, energy, mining and manufacturing projects; banking; shipping; insurance; advertising; entertainment; education and training; information; trademarks and technologies. For example, an ECA field mission report on the establishment of an African Regional Centre for Consulting Engineering and Management estimates that Africa will be using 4000 work-years of consultancy services annually, 90 per cent of which is imported.[57]

313. The rate of foreign exchange outflow can be reduced by evolving suitable policies and strategies, at the national, multinational and regional levels, for improving and expanding indigenous consultancy services, for the substitution of indigenous capabilities and for evaluating and negotiating projects. In this connection, the strengthening and establishing of the appropriate institutions for developing the work force and delivering advisory services should be accorded high priority.

314. This drain is not only substantial but also likely to grow at an explosive rate as vigorous attempts are made to implement the Lagos Plan of Action in general and the Decade programme in particular, and it will frustrate these efforts.

315. At the regional level, it has become imperative to give attention to the establishment of an intra-African investment system for mobilization and redeployment of financial resources for developing and establishing multi-

[57] Page 103, 25 July 1981, presented to the Ad Hoc Meeting of Intergovernmental Experts on African Regional Centre for Industrial Consultancy and Management Services, Addis Ababa, 14-18 September 1981.

national strategic industries. This hardly needs amplification since the African Development Bank, the African Trust Fund, the African Industrial Development Fund and a number of multinational banks are already important examples of such mobilization and redeployment and some Governments are already moving towards intra-regional investment through bilateral arrangements. However, there is room for expansion, and the African Development Bank should allocate a percentage of its resources to financing industrial projects. Institutional devices geared towards such objectives can be found in Australia, Japan and the Middle East. For example, the Arab Petroleum Investment Corporation (APICORP) specializes in financing petroleum and petroleum-related projects which are helping to build a regionally integrated Arab petroleum sector of international standing. The Industrial Bank of Japan specializes in financing the chemical industry of that country. The Arab Mining Corporation specializes in the mobilization and channelling of funds for the expansion of the mineral mining sector, which is considered an essential base for heavy industrial development in the Economic Commission for Western Asia (ECWA) region.

316. At the national level, critical assessments will have to be made to align the policies and practices of domestic savings and investment institutions with national priorities in the integrated industrial development plan.

III. Modalities for the implementation of the Decade programme

1. Introduction

1. An overall framework for the preparation and implementation of the Decade programme was presented in chapter I. In chapter II, guidelines were suggested for the adoption of strategies for major industrial subsectors and areas, while in chapter IV proposals are made for measures which should be adopted at the national, subregional, regional and global levels for monitoring and reporting on the implementation of the Decade programme. With the adoption of the proposals in these three chapters, the African countries and the international community, especially the relevant international organizations, will have to take the necessary action for their effective implementation. It has therefore been considered useful to suggest, in this chapter, a number of measures which the various parties concerned with the implementation of the Decade programme should take.

2. As recognized in the Lagos Plan of Action and reinforced in previous chapters, the responsibility for the development and implementation of the Decade programme lies largely with the African countries themselves: the most critical action is at the national level; hence, emphasis has been placed in this chapter on the modalities to be adopted at the national level. Action at this level needs to be reinforced by collective action, at the subregional and regional levels, based largely on the harmonization of the national efforts in each country.

3. Since the success of the Decade requires the support of the entire international community, this chapter also proposes a number of modalities which could help to intensify the assistance provided by the international community to the African countries, as well as to enhance co-operation at the bilateral, multilaterial and global levels in favour of the African countries. Even at this level, the responsible initiative still has to come from the African countries themselves, with the co-ordinating organizations (ECA, OAU and UNIDO) providing the necessary support, as requested.

4. The implementation of the Decade programme calls for short-term measures to be undertaken during the preparatory phase of the programme (1982-1984) and medium- and long-term measures to be undertaken during the implementation phase of the programme (1985-1990). The modalities proposed in this chapter have therefore been presented accordingly. This refinement is considered essential as it will enable member States to decide on the measures

which they should take, particularly in the period immediately after the Sixth Conference of African Ministers of Industry, in order to maintain the momentum and interest generated by the meeting for the success of the Decade.

5. Similar to the proposals presented in previous chapters, the suggestions presented below are by no means exhaustive. They are not intended to provide a solution in all African countries. They are, however, intended to urge the authorities concerned with the formulation and implementation of the Decade programme to initiate immediate action for its launching.

6. It is to be observed that emphasis has been placed on actions at the national level which are to be taken during the preparatory phase of the programme. This emphasis is intended since it is at the national level that the foundations for the success of the Decade are laid, while actions at the subregional, regional and global levels serve simply to reinforce their impact. Action during the preparatory phase of the programme is most essential as it prepares the basis for the implementation of the programme in the subsequent phase.

Key points of the industry chapter of the Lagos Plan of Action

7. In the Lagos Plan of Action, it is emphasized that the integrated socio-economic development of the region, as well as its liberation from under-development and economic dependence, hinge upon the establishment of an industrial base designed to meet the interests of the countries and strengthened by complementarities at the subregional and regional levels. This contributes to the satisfaction of the basic needs of the population, makes maximum use of local natural resources, generates employment, establishes a base for, and promotes the development of, other economic sectors, stimulates the development of technology, and makes for the modernization of society.

8. Conscious of the need to accelerate the self-reliant and self-sustained industrialization of Africa, the African countries reiterated in the Lagos Plan of Action their support for the Industrial Development Decade for Africa and expressed their determination "to take all necessary steps to ensure that this Decade is fully successful".[1] Long-term objectives are set for the region whereby Africa shall achieve a share of at least 2 per cent in world industrial production by the year 2000, the corresponding shares being 1.4 per cent by the end of the Decade and 1 per cent by 1985. African countries will do everything in their power to achieve self-sufficiency by 1990 in the food, building materials, clothing and energy sectors, while during the first half of the Decade the foundation will be laid for the phased development of the following basic industries essential to the achievement of self-reliance: food and agro-

[1] Lagos Plan of Action, para. 58.

industries, building industries, metallurgical industries, mechanical industries, electrical and electronic industries, chemical industries, forest industries, and energy industry.

9. The requirements for the achievement of these objectives are spelt out in the Plan. At the national level, they include the designing of national industrialization policies, the development of human resources, the development of technological capabilities, the establishment of appropriate industrial institutions (including financial and technological), the determination of the role of private, semi-public as well as public enterprises as instruments for the implementation of the Lagos Plan of Action, and the effective development of small- and medium-scale industries based on local resources, labour and technologies.

10. Particular weight is attached to the intensification of intra-African industrial co-operation as an instrument for self-reliance and accelerated industrial development. To this end, at the subregional and regional level, emphasis is placed on the preparation of appropriate plans for the establishment of industrial complexes whose cost and production capacity exceed the financial and absorptive capacities of single countries yet are suited to subregional development, as well as the creation of multinational production units supported by the appropriate institutional framework. Particular importance is also attached to increased trade in manufactures between countries in the region and the creation of industrial co-operation areas without customs and trade barriers. Particular significance is attached to the exchange of essential goods, while ensuring that no undue advantage is taken of the liberalization process.

11. Co-operation with other regions of the world is seen to be essential to the attainment of the industrial development objectives of Africa. This co-operation should be mutually advantageous and based on respect for the fundamental interests of the continent and, in particular, the sovereignty of each country over its natural resources. With respect to other developing regions, the African countries will, for example, promote the exchange of industrial technology, implement joint training programmes, and conclude trade and other agreements. In their relations with the developed countries, co-operation should lead to effecting a massive transfer of financial resources, acquiring technology and know-how at lowest costs, curbing the activities of the multinational corporations, redeploying industrial capacities in keeping with the objectives of the Lima Declaration and Plan of Action, and providing free access to developed country markets for manufactures from the region.

12. In addition to the above, the international agencies should adjust their programmes to the needs of the region and receive financial resources commensurate with these tasks so that they can play an effective role in the industrial development of Africa, particular emphasis being placed on the least developed of the developing countries.

2. Proposals for action at the national level

Actions during the preparatory phase (1982-1984)

Formation of National Co-ordinating Committees

13. Immediately after the adoption of the framework for the Decade programme by the Sixth Conference of African Ministers of Industry, each Government should set up a National Co-ordinating Committee for the Decade. The Committee would provide overall direction and guidance for the translation of the framework into a national programme for the formulation, promotion, implementation and monitoring of the Decade at the national level.

14. The first task of the Committee would be to bring about an understanding of the country's structure and identify core projects of major importance to industrial development in each country, since their identification would enable the Committee to set long-term objectives in perspective. These objectives will be to:

(a) Prepare and update integrated industrial development plans comprising a diagnosis of the existing industrial structure policies and incentives from the viewpoint of the priority given to self-reliance; conduct a survey of the country's natural resources; identify priority industrial sectors; establish sectoral development strategies and instruments; formulate multi-sectoral medium- and long-term development projections; and identify industrial projects;

(b) Prepare a relevant international co-operation strategy and an appropriate consultation and negotiation framework;

(c) Establish a relevant long-term national programme for the industrial labour force and introduce training programmes, policies and incentives geared to the needs of industry;

(d) Develop programmes, establish or strengthen projects and centres, and introduce policies at the national level in the areas of industrial development, technology, project financing, energy development, and industrial and technological information.

15. The second task would be to familiarize various governmental departments and the people of the country, in particular the decision-makers, with the purpose, goals, objectives and implications of the Decade. This promotional exercise could include the organization of national seminars and brain-storming sessions on the Decade's objectives, as well as full and effective utilization of the mass media.

16. The National Co-ordinating Committees should be made up of high-level experts and influential people drawn from industry and other relevant sectors, including:

(a) Ministries of Industry, Planning, Agriculture, Natural Resources, Energy, Finance, Transport and Communications, Education, and Trade and Commerce;

(b) Parastatal organizations involved with industrial development, such as those dealing with investment, finance, trade and marketing, energy, water development, food, and consultancy services;

(c) Major public and private sector enterprises;

(d) Small-scale industrial units;

(e) Educational and research institutions;

(f) Private consultancy organizations;

(g) Major political parties and other relevant bodies.

Incorporation of the concepts and ideas of the Decade programme in national development goals and objectives

17. The implementation of the programme for the Industrial Development Decade should begin with the incorporation, as appropriate, of its concepts and ideas into the framework of national perspectives and long- and medium-term development goals. In this connection, an important point of departure will be the identification of the indigenous productive capacities which, if created, would enable individual African countries to meet gradually, from within, their changing domestic basic needs and key development requirements. It should be understood that the Decade programme is aimed at creating a foundation for the achievement of self-reliance and self-sustainment in accordance with the Lagos Plan of Action.

18. Many countries and economic groupings would need to modify existing plans, programmes and policies so as to facilitate the introduction of new national and multinational strategies and the establishment of structures required to develop and implement appropriate priority programmes in relation to priority needs. To this end, knowledge about the national economy and other practical factors that impede national industrialization efforts would need to be expanded (see chapter II for further details).

Review and adjustment of governmental machinery for industrial development

19. An evaluation should be made of the efficiency of the governmental machinery for allocating resources to and regulating the agents of industrial production. In this connection, the activities of the ministries that exercise regulatory functions pertaining to industry, their extension services and location policies need to be critically examined with a view to fashioning an efficient instrument for the attainment of the objectives of the Decade. In a similar manner, attention should also centre on the mutual feedback between the Ministry of Industry and the ministries and government institutions responsible for such areas as agriculture, trade and commerce, mines and mining, power, transport and communications, monetary and fiscal policies, statistical services and industrial research.

20. At the sectoral level, it is important that the Ministry of Industry, industrial parastatals and other institutions be organized and staffed so as to permit specialization and ensure complementarity. The Ministry of Industry should thus pursue a policy of harmonious operational relationships with other ministries and governmental organs, and account must be taken of the complementarities of their mutually supportive and feedback activities. A focal point must be established within the Ministry to act as secretariat to the National Co-ordinating Committee: it would handle the day-to-day work related to the Decade and liaise with the co-ordinating organizations (ECA, OAU and UNIDO) and other bodies set up at the regional and subregional levels for the Decade.

Activating the agents of production and distribution

21. The implementation of the programme will largely depend on the goals, behaviour and capacities of the agents of industrial production and distribution (which in the region comprise indigenous private, state and foreign investors), and the incentives offered to them. Hence, depending on domestic conditions, and utilizing the relevant experience of other third world countries, it is recommended that measures be taken to enable state and private enterprises to manufacture the products enumerated in the previous chapter. Public utilities must also be involved in this orientation. It therefore follows that in the preparatory phase a policy framework should be established and implemented so as to ensure that the interests and activities of those agents are in conformity with national industrialization policies.

(a) *Public sector enterprises*

(i) A co-ordinative body—such as a Bureau of Public Enterprises—should be set up to evolve a common policy and approach to similar problems encountered in various state enterprises, although they may belong to different ministries;

(ii) National consultations should be promoted among public enterprises on the role they could play in adopting and implementing the Decade programme in the context of national resources and prevailing conditions;

(iii) Study tours should be organized to public enterprises in different sectors in such countries as Brazil, India and Mexico so that African countries could learn from successful public enterprises in other developing countries;

(iv) National consultations could be held subsequent to the study tours proposed above to consider such issues as technical assistance from the enterprises visited or joint ventures on the basis of technical co-operation among developing countries (TCDC);

(v) A national academy or a similar arrangement might be introduced for managers in enterprises to provide training at various managerial levels;

(vi) A permanent national machinery should be established for consultations among public enterprises on the status and prospects of the national economy and the role of public enterprises therein, as well as on performance improvements and performance indicators;

(vii) National associations of state enterprises operating within the same sector or subsector should be established with a view to promoting multinational industrial co-operation and joint ventures.

(b) *Private sector enterprises*

In view of the importance of securing the active involvement of the private sector as appropriate in a production programme geared to the needs of the Decade, a forum for discussion with the production sector, including the private sector, would be needed in order to make that sector aware of the essential need for achieving the aims and objectives of the Decade as well as to ascertain the types of assistance that Government could provide to the production sector. To this end:

(i) A portfolio of projects should be prepared by the Government, containing project profiles with the broad technical and financial parameters, including such data as approximate capital cost, return on investment, availability of raw materials, size of market, and sometimes pre-feasibility or feasibility studies could be made available at a subsidized rate or free of charge;

(ii) The development of local management and engineering consultancy skills should be promoted;

(iii) Institutions should be set up by the Government to help potential entrepreneurs select projects of their choice, and a portfolio of projects of national interest could be made available for this purpose. An investment centre should be set up at the national level to provide the requisite information and facilities to potential investors;

(iv) Governmental guidelines and consultancy support should be provided for entrepreneurs entering into collaborative arrangements with, and technology acquisition from, foreign sources so that mutually beneficial and fair industrial collaboration contracts can be negotiated.

(c) *Foreign investors*

(i) African Governments should promote information systems which would encourage investors to conform with national industrial development objectives, while according them the necessary guarantees;

(ii) Governments should improve industrial legislation in order to cope with new trends in the pattern and objectives of industrial investment, and to minimize the contradictions between the objectives of the foreign entrepreneurs and those of the host country;

(iii) A package of incentives, such as tax relief and repatriation of profits to attract foreign investment, should be so designed that the basic developmental objectives of the country are not jeopardized;

(iv) Ready access should be provided to information on investment opportunities, economic climate, resource endowment and other data which potential foreign investors require: appropriate project portfolios would also be of assistance;

(v) The investment centre mentioned above could also provide information and facilities to potential foreign investors: branch offices would need to be established abroad—possibly on a joint basis with other African countries—or at least a representative at their respective embassies.

(d) *Joint ventures*

(i) Assistance should be given to local partners so as to facilitate the choice of suitable joint venture partners and to ensure mutually advantageous joint venture arrangements in harmony with national strategy;

(ii) Support services should be provided to local entrepreneurs —public or private—during the process of negotiation;

(iii) A separate body of division with expertise and experience in the negotiation of joint ventures would have to be set up within the investment centre mentioned above.

(e) *Small-scale entrepreneurs*

Since a well-structured small-scale industry sector can contribute significantly to meeting the needs of the people, activity in that sector is a fundamental element in the Lagos Plan of Action. This is a major area for the development of indigenous private and co-operative entrepreneurship.

(i) A small-scale enterprise promotion centre should be created to collect reliable information on indigenous small-scale businesses and prospective entrepreneurs in this sector who genuinely need the assistance and support of the Government;

(ii) Policy measures should be introduced such as the reservation of a number of items for manufacture solely in the small-scale sector, provision of incentives to large-scale industries to develop ancillary small-scale units as subcontractors and appropriate protection by Government from unfair competition;

(iii) Physical support systems should be introduced, thus providing physical infrastructure such as fully serviced industrial estates, raw materials (especially those in short supply), machinery and equipment, prototype centres (where small-scale industrial units can experiment with new products and processes), common testing facilities and quality-control methods;

(iv) Financial support should be assured, and special financial corporations set up for the purpose of providing subsidized interest rates on loans, transport subsidies, and price supports;

(v) A small-scale industry promotion centre should be set up to provide consultancy services, including: project design and detailed engineering; choice of production technology; selection of machinery and equipment; supervision of project construction; management consulting and problem-solving; and legal advice;

(vi) Marketing support should be ensured through the establishment of a special institution to act as the marketing agency for the products of small-scale entrepreneurs;

(vii) Standardization and quality control should be practised, and support given to training and labour development;

(viii) Appropriate technological inputs should be provided, as should the requisite institutional infrastructure and procedural support so that the small entrepreneurs are not hindered by a multiplicity of procedures;

(ix) TCDC activities in the field of entrepreneurial development, managerial development and consultancy should be promoted.

22. It must be kept in mind that most small-scale entrepreneurs are unaware of the need for these services.

Strengthening or establishment of a national technological machinery

23. When foreign investment dominates industry as has been the case in Africa, the choice of technology and its cost have always been determined by foreign management according to their whims and caprices. In order to change this situation, it is important to formulate national technological plans and programmes as an integral part and supporting feature of development plans. In addition, depending on the expected growth of indigenous enterprises, Governments should create or strengthen appropriate national machinery to locate, evaluate, and negotiate the purchase of technology licences and equipment on behalf of its clients—mainly indigenous private, co-operative and state enterprises; and, depending on the potential domestic demand, establish one or two development corporations to commercialize indigenous technologies and new products, as well as prototypes for carefully selected products. This subject is also discussed in chapters I and II.

Assessment of training requirements

24. A joint committee, with representatives from the manufacturing and related sectors and the Ministries of Industry, Labour, Planning, Education and Finance, might be appointed to examine existing arrangements for industrial training, assess existing resources, and identify current shortages and future requirements for the achievement of the objectives of the Decade in both the public and private sectors.

Mobilizing financial resources for the Decade programme

25. Governments should, individually or collectively, take steps to establish industrial funds in order to finance projects of social significance that would supplement industrial development programmes, and pursue a policy for the long-term financing of growth in priority industries. Government expenditure constitutes a significant portion of all expenditure in any economy. This purchasing power can be, and has been, used to stimulate the growth of specific branches of industry. It is thus recommended that Governments should effect a certain share of their purchases solely in the small- and medium-scale sectors and enact procurement laws favouring those industries. Such measures may need to be supplemented by a rationalization programme aimed at upgrading equipment, financial support, standardization, and quality control, as well as the efficient organization of marketing, possibly through a small-scale industrial development and marketing corporation.

26. The implementation of national and multinational plans, and the resultant major industrial projects will require a considerable increase in investment capital. Given the financial requirements of the national development plans, it is unlikely that individual countries can finance from their own national budget their share of the capital needed for major enterprises. It is, therefore, imperative that effective subregional and regional mechanisms for mobilizing investment funds be established, if large national and multinational projects are to be established. In this connection, the African Industrial Development Fund located in the African Development Bank, should be given practical support. The UNIDO proposal for the establishment of an International Bank for Industrial Development (IBID) as well as the proposal to set up an African Solidarity Fund for Industry should be likewise supported so that the African countries can mobilize the necessary finances and other resources both from within the region and without (particularly involving partners from other developing countries, such as the oil-exporting countries).

27. Self-reliance requires that a country's investment-output ratio be increased. Thus, Governments might wish to establish the amount of output saved and invested in the productive sectors, particularly in the industrial sector, and review the policies and instruments with the object of increasing the share of output invested. This may require the reform of monetary and fiscal policy, as well as of the instruments used for its implementation.

Preparation of a national programme for the Decade

28. On the basis of the actions suggested above, a national programme should be prepared for the Decade. It is necessary to emphasize that this programme will consist of major structural core projects, precise measures for strengthening national machinery for industrial development and relevant programmes in the field of manpower and technology development, as well as the mobilization of financial resources (see chapters I and II).

Actions during the implementation phase (1985-1990)

29. The actions to be taken during the implementation phase of the programme would be largely aimed at strengthening the modalities adopted during the preparatory phase and adopting new measures, especially for the implementation of the national programme for the Decade. Important aspects of the modalities to be adopted during this phase of the programme will, therefore, relate to developing the requisite manpower and technical skills as well as to strengthening or establishing national institutions.

Training and work force development

30. In order to enhance the capabilities of Governments and the various agents of production and distribution as indicated above as well as those of supporting institutions and services, it is important that the key skills be developed locally. Skills are required for corporate planning and implementation, ranging from project analysis to production control, in both the private and public sectors.

31. In this connection, countries should, individually or collectively, establish institutions for promoting the development of new and anticipated managerial and operational skills, through such mechanisms as training institutes and teaching companies. African universities and other existing institutes, including the Institute for Economic Development and Planning (IDEP), should develop programmes consistent with these needs. Institutes providing training in the preparation of feasibility studies have also to be set up, while other methods of labour development could be developed through fellowships, workshops, seminars and study tours.

Improvement of skills related to factor inputs

32. Failure to increase the proportion of locally developed inputs means failure to diversify industrial production and skills. The same problem has distorted import-substitution policies, creating high-cost industries and weakening the potential comparative advantages of the African region.

33. Measures should be taken to start the process of developing locally the supply of factor inputs. This entails revising syllabuses, particularly at the secondary and tertiary levels, strengthening existing research and development institutions, intensifying on-the-job training, using informal arrangements, and creating new institutions such as African multinational industrial and mining corporations. It also includes intensifying natural resource exploration and exploitation, promoting the spirit of entrepreneurship, and developing indigenous technology and technological capabilities. Furthermore, expatriates should be used sparingly and rationally, with as large an admixture of local staff as possible.

34. The main alternative to on-the-job training—apprenticeship training—should be encouraged in such technical subsectors of industry as the manufacture of machine tools and the construction industry. Every industrial activity must include a training component. The mass media—television and cinema, in particular—should be mobilized so as to provide persons such as small-scale entrepreneurs, who are otherwise outside the educational system, with simple technical skills and knowledge.

Research and development, including the collection and interpretation of information

35. The role of information in implementing industrial plans is not limited to its dissemination alone. It also encompasses the development of capabilities to generate, collect, analyse and interpret information. Ill-managed information or information in the hands of incapable personnel fails to yield results.

36. The role of universities and other institutions of higher learning as well as public or private industrial research institutes is most important in the area of research and development. Some of the information available through these sources could be of great use to the implementation of the Decade programme. Information will be required on such matters as production techniques, product specifications, input sources and conditions of their supply. It should be made available to indigenous entrepreneurs, especially in small-scale, medium-sized and rural industries.

37. In this connection, African countries will need to develop on a large scale the capacity to absorb and adapt technologies developed elsewhere. Presumably this ability to unpackage technology systems would have to be acquired first within the context of regional co-operation. The role of the African Regional Centre for Technology (located at Dakar, Senegal) and the African Institute for Higher Technical Training and Research (located at Nairobi, Kenya) will be important factors in this respect.

38. Other specific research projects will need to focus on meeting the basic needs[1] of the masses of the African population, such as:

(a) Indigenous foods: research into their production, processing, storage and preservation so as to overcome hunger and malnutrition;

(b) Forest products: research into their processing with a view to reducing imports of such products as pulp for paper mills, plastics, synthetic fibres, adhesives and chemical by-products derived from charcoal;

(c) Low-cost housing: research into construction and building materials available in Africa and other developing countries and their possible transfer and adaptation to local conditions and environment;

(d) Alternative energy technologies: research into the production of energy from non-conventional sources to supplement work on the exploration,

[1] See also chapter II.

appraisal and development of existing conventional energy resources in the region;

(e) Medicinal plants and biomass chemicals: major research effort is needed to determine the properties of locally available raw materials and upgrading their quality for industrial processing in the pharmaceutical and other chemical industries;

(f) Genetic engineering: a regional research centre for experimentation and training in biotechnology could help to build up a nucleus of local researchers who could explore ways of solving problems of critical relevance to Africa, such as growing better crops or producing vaccines and medicines for malaria, cholera, hepatitis etc.;

(g) Engineering design, fabrication and production: research in this area is the weakest link in the industrial sector in Africa,[3] and thus full support should be given by industry to the African Regional Centre for Engineering Design and Manufacturing, located at Ibadan, Nigeria.

National industrial institutional machinery

39. As part of the institutional infrastructure needed to promote industrial development and co-operation and their follow-up, it will be necessary to reinforce or introduce the following specialized institutions:

(a) Market and marketing: national institutions, co-ordinated at the multinational level, to develop co-operative arrangements with respect to market size and structure, diversity of product lines and product mix, distribution and marketing of products, and joint pricing policies;

(b) Raw materials: co-ordinated national institutions for the multinational pooling and procurement of resources and the organization of production in subsidiary companies so as to provide complementary natural resource inputs required by both the national plants and multinational heavy industries, thus ensuring fuller utilization of locally available raw materials;

(c) Semi-finished and intermediate goods: institutions to solve problems relating to excess capacity by promoting complementarity and specialization in intermediates, as well as components and accessories for industrial plants, bulk purchase and procurement of supplies, and overcoming technical constraints imposed by the scale of operations, and exploiting economies of scale through subcontracting, co-contracting and co-production;

(d) Financing: institutions designed to increase the ability of member States to raise the capital needed for investment, including the organization of investment finance, joint loan guarantees and contracting, intercountry purchase agreements and buy-back arrangements;

---

[3] Including also maintenance, repair and manufacture of parts, components, machine tools etc.

(e) Work force training: institutions for promoting development of new and anticipated managerial and operational skills, involving training institutes and teaching companies, the rational accumulation of new expertise and local labour, and the creation of capabilities and opportunities for new careers in industry (mainly in the formulation, design, preparation and implementation of industrial projects; negotiating skills; feasibility studies and evaluation);

(f) Technology: institutions to strengthen technological capabilities for "unpackaging" and adapting imported technology, including the development of indigenous expertise to solve local technological problems; improve design capabilities, standardization and quality control; identify technologies and by-products on the basis of raw material properties; undertake research and development according to basic needs and equipment requirements; organize joint negotiations to acquire technology and equipment and external research and development finding, as well as commercialize indigenous research and development results;

(g) Information: institutional machinery to promote the flow of information to (and its exchange between) those engaged in the industrial development process in Africa, in a pre-investment, planning, decision-making or operational capacity. This increased flow of information would permit a more appropriate choice among technological alternatives, and make for more efficient management methods and the profitable operation of industrial enterprises. Full use should be made of the experience of African countries whose resources should be pooled with a view to establishing industrial contacts and partnerships among the countries of the region;

(h) Consultancy organizations: in order to reinforce the activities of the above-mentioned institutions, indigenous national consultancy organizations should be created to perform the following services:

(i) Preparation of pre-investment studies, specifications, bids and contracts;

(ii) Appraisal of feasibility studies and industrial bids and contracts;

(iii) Procurement of raw materials and equipment, and inspection before delivery;

(iv) Organization of local procurement of raw materials through competitive bidding;

(v) Overall monitoring and assessment, on behalf of the Government, of all project activities, including scheduling, supervising and synchronizing their implementation at both the national and multinational level;

(vi) Co-operation with other African countries in the organization, exchange and subcontracting of consultancy and other industrial services.

The question of the development of an appropriate institutional machinery for industrial development is elaborated on in chapters I and II.

3. Proposals for action at the subregional and regional levels

Actions during the preparatory phase (1982-1984)

Subregional and regional organizations

40. At the subregional level, every effort should be made to:

(a) Prepare sectoral policies and programmes within strategic industrial branches;

(b) Identify major industrial projects of interest to the countries in the subregion;

(c) Strengthen or establish institutions in the subregions aimed at promoting subregional industrial integration.

Furthermore, new activities to facilitate the achievement of the objective of intra-African industrial co-operation and integration, including promotional and popularization activities for the Decade, should be launched, while at the regional level steps should be taken towards identifying and formulating common strategies for the development of priority heavy industries, such as capital goods, necessary for the region as a whole, and to establish a mechanism of consultations and negotiations.

41. The secretariats of the intergovernmental organizations should convene expert working groups to elaborate precise proposals on the priority subregional programmes involving the Governments concerned. Participants in these working groups should be well informed about the work of the National Co-ordinating Committees and their inputs. The same sort of preparatory work outlined at the national level should also be undertaken at the subregional levels. The subregional working groups will determine the terms of reference for assistance to be provided by ECA, OAU and UNIDO for the Decade programme. It is important that the regional and subregional financial institutions participate in these working groups.

42. The modalities of industrial co-operation should be governed primarily by the Final Act of Lagos. In this connection, the principal framework will consist of intergovernmental (subregional and regional) organizations and MULPOCs, where no viable economic grouping exists. However, a mechanism must be provided to facilitate multinational co-operation between two or more countries from different subregions, especially in cases of potential complementarities in resources and capabilities.

Institutional instruments of action

43. In certain cases, secretariats of intergovernmental organizations and MULPOCs could take the initiative by promoting the establishment of multinational industrial enterprises. It is well known, however, that in the past

intergovernmental organization secretariats have not always succeeded in this respect. It is, therefore, pertinent to adopt a number of approaches, which could be introduced as instruments of action in key sectors, in order to speed up the development of multinational industrial enterprises. National industrial corporations created in the same (priority) sectors[4] should be the links between a given country and the regional or subregional arrangements. The same framework could, in fact, be enhanced to promote TCDC activities on both a bilateral and multilateral basis. Mechanisms for the exchange of information would facilitate Governments' efforts in recognizing potentialities for co-operation in particular industries, including production, markets and marketing and the corresponding industrial services and capacities.

Multinational co-operation arrangements

44. On the basis of national industrial corporations and other establishments, links could be formed between multinational industrial corporations and the corresponding corporations at the national level and vice versa. Established inter-country projects such as the African Regional Centre for Engineering Design and Manufacturing, African Regional Centre for Technology, African Industrial Development Fund, African Institute for Higher Technical Training and Research, African Institute of Economic Development and Planning, and African Development Bank should also propose programmes in keeping with the Decade. The basic machinery and arrangements for implementing intra-African co-operation should be clearly defined and translated into operational terms at the national level. In this connection, each country should set up a special focal point in the form of an administrative unit within the Government, preferably in the Ministry of Industry, to liaise with subsectoral enterprises and other national industrial instruments, with a view to monitoring and co-ordinating at the national level activities and inputs for the implementation of priority areas of co-operation. The same focal point, in its capacity as secretariat to the National Co-ordinating Committee, will also monitor the implementation of the Decade at the national level. Furthermore, each participating country should incorporate in its legal system provisions designed to facilitate the negotiation of agreements that will bring about and sustain effective multinational co-operation.

Intergovernmental agreements

45. Whereas intergovernmental agreements constitute the legal basis for many forms of intergovernmental industrial co-operation, they generally cover only the broad economic pre-requisites for activity at the enterprise level. The details of industrial co-operation at that level are regulated in contracts between enterprises or with the State and private organizations.

[4]See chapter II regarding sectoral programmes and project ideas.

46. In the paragraphs which follow, examples are given of arrangements that serve to reinforce co-operation in the field of multinational industrial development.

(a) *Bilateral intergovernmental agreements:*

(i) *General intergovernmental agreements on economic, scientific and technical co-operation*

These agreements cover both the establishment of long-term co-operation programmes and the intergovernmental institutional machinery for the development of co-operation. The latter generally consists of joint commissions which, *inter alia*, decide on the area in which industrial co-operation is useful. Further to periodically reviewing progress, these commissions consider the further development of economic, scientific and technical co-operation, as well as any other questions which occur during the execution of agreements;

(ii) *Intra-African co-operation on specific projects*

Agreements of this nature which may, for example, relate to specific large-scale projects, such as the establishment of a steel plant or a research and development project, generally include machinery in the form of joint intergovernmental committees for the execution and review of the agreement, as well as a legal framework;

(iii) *Protocols*

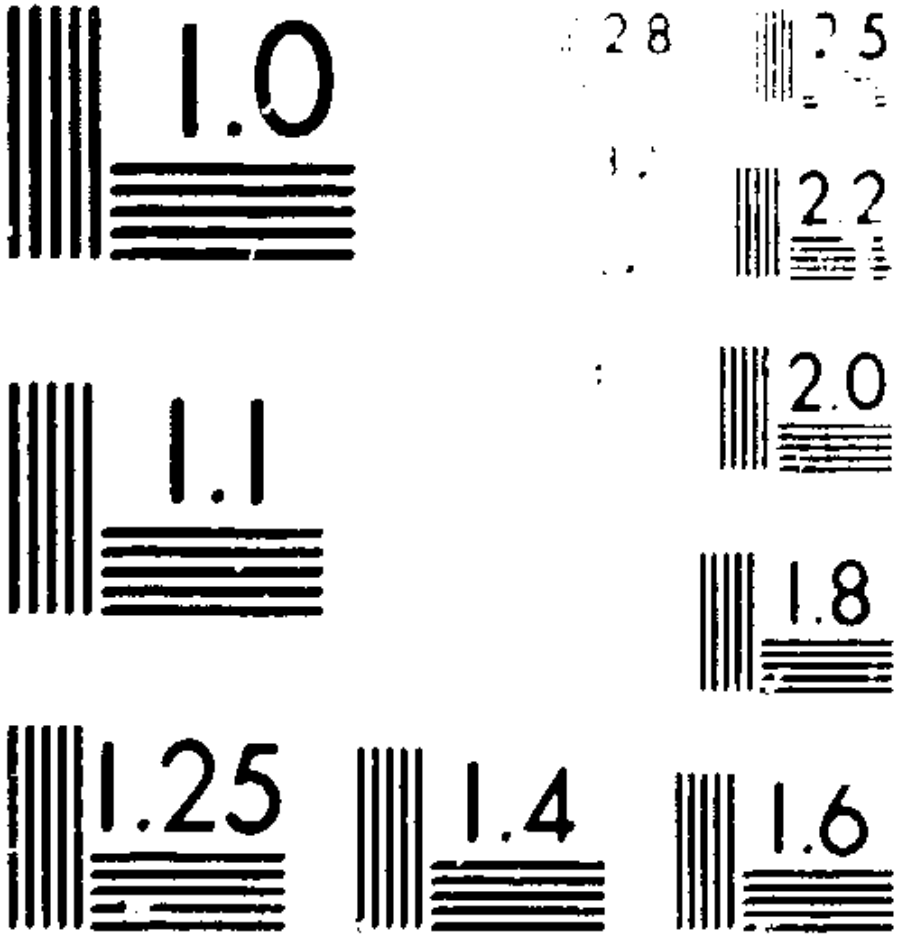
Protocols are signed at the level of governmental bodies in connection with intergovernmental economic and industrial co-operation agreements. They supplement the latter by spelling out the specific details. In certain cases, certain co-operation treaties or agreements have a series of protocols pertaining to co-operation in specific industrial sectors;

(b) *Multilateral intergovernmental agreements:*

Specific co-operation agreements supplemented by protocols are also concluded multilaterally, *inter alia*, in the context of industrial co-operation within regional economic groupings. Similar to bilateral agreements, multilateral agreements on industrial co-operation may also be concluded on the basis of a TCDC framework;

(c) *Industrial co-operation at the enterprise level:*

Agreements at the enterprise level can be of a very diversified nature. Their content must, however, be in conformity with the laws pertaining to the operation of enterprises in the countries concerned. Moreover, industrial co-operation arrangements at the enterprise level should invariably require that the participating domestic firms should not be wholly owned or controlled by foreign investors. Agreements on buy-back arrangements can also facilitate collective action at the enterprise level.


2.8
2.5
1.0
2.2
2.0
1.1
1.8
1.25
1.4
1.6

Preparation of a subregional or regional programme for the Decade

47. On the basis of the actions to be undertaken during the preparatory phase as described above, a programme should be prepared for the Decade at the subregional or regional level. The programme should consist of a set of activities or projects organized within a subregional or regional context to serve the whole subregion, region or some countries thereof. These activities would include training and manpower development, multinational enterprises, natural resource development, technology, research and development, institution building, mobilization of financial resources and promotion and popularization of the Decade.

48. Of course, such a programme cannot be comprehensive, since most of the actions will be determined by the manner in which the programme has been defined and translated into operational terms at the national level. Furthermore, collective action cannot and should not be rigidly confined to pre-determined subregional boundaries.

49. Since little is known in most African countries of the region's natural resources, the distribution and location of industrial production facilities, technical skills, levels of technology and other factor inputs for industrialization, an industrial map of Africa should be drawn up providing information on these factor inputs, thus facilitating the implementation of the Decade programme.

Actions during the implementation phase (1985-1990)

50. The modalities to be adopted during the implementation phase of the programme would largely depend upon the programme itself and the manner in which the issues have been defined and translated into operational terms at the national level. Actions would include strengthening the modalities adopted during the preparatory phase of the programme, as well as adopting new modalities envolved in the course of implementation on the basis of experience acquired. Important aspects would include strengthening the capabilities of existing regional and subregional organizations and specialized institutions as well as establishing institutions. Working in a complementary manner, all these could ensure the effective execution and monitoring of the Decade programme, the national component being of crucial importance to success.

Ratification of industrial protocols

51. The framework for these actions is already provided in the Final Act of Lagos. An important modality for the implementation of the Decade programmes at the subregional and regional levels would be the preparation, negotiation and ratification of protocols, in the industrial field, in the context of the treaty to be signed for the establishment of the African Economic Community or within the framework of on-going and future actions for the establishment of subregional groupings, economic communities or preferential

trade areas. These protocols would help spell out in greater detail the nature, scope and details of the modalities for industrial co-operation arrangements. Other forms of intergovernmental agreement are described in the section above. it is proposed that the establishment of multinational industrial enterprises should receive particular attention during the Decade in order to facilitate funcional co-operation rather than co-operation based on protocols *per se*.

The role of the co-ordinating organizations (ECA, OAU and UNIDO)

52. The main co-ordinating organs for the regional and subregional programmes of the Decade will be ECA, OAU and UNIDO. They will carry out their task within the terms of reference of the Joint Committee established by the three secretariats for the implementation of the programme for the Industrial Development Decade for Africa. These organizations would also assist Governments in:

(a) Initiating ideas and proposals on regional projects and submitting them to the member States concerned for approval before undertaking final actions;

(b) Harmonizing and consolidating the proposals originating from Governments for consideration by the Conference of African Ministers of Industry;

(c) Preparing feasibility studies on the regional projects for submission to member countries for approval;

(d) Identifying short-term consultants to assist in setting up the National Co-ordinating Committees;

(e) Organizing seminars, workshops, conferences, missions, study tours and other promotional and popularization activities in relation to the Decade programme.

4. Proposals for action at the global (inter-regional) level

Actions during the preparatory phase (1982-1984)

Technical co-operation among developing countries (TCDC)

53. An important modality for the implementation of the Decade programme during the preparatory phase is the mechanism of technical co-operation among developing countries. New developments in the South-South relations are giving rise to a certain pattern in inter-regional co-operation. An increasing number of States are arranging technical co-operation arrangements with other third world countries in such fields as investment finance, technology, work force and skills development, consultancy services, joint ventures and natural resource development. This approach or pattern should be developed further to facilitate industrial development in Africa.

54. In connection with the above, the organization of solidarity meetings in selected developing countries for the purpose of obtaining the assistance of other developing countries, through specific well-prepared projects, is particularly relevant. This modality has been found useful in the countries where such meetings have been organized, while other resources for industrial development could be forthcoming from financial institutions within the Afro-Arab context. Consequently, the African countries need to ensure that the industrial sector is given priority in Afro-Arab co-operation arrangements and in the relevant institutions, such as the Arab Bank for Economic Development in Africa (ABEDA). In addition, consortia of companies from developing countries could be organized to join forces with African companies in African investment projects.

55. Other arrangements, especially those initiated by the African countries themselves, need to be identified, studied, improved and extended, due consideration being given to national developmental objectives. The three co-ordinating agencies should actively assist Governments in these activities. In order to further industrial development, measures should be taken to prevent unfair exploitation of such co-operation arrangements between third world countries by branches of multinational corporations in those countries. Various mechanisms, such as a system of industrial consultations, could serve to ensure that the interests of the third world countries are protected and South-South co-operation promoted.

North-South co-operation

56. Since some of the inputs of critical importance to industrialization in Africa, particularly finance, technology and specialized skills, will for some time continue to come or be channelled from the industrialized countries owing to the advantageous initial position they had acquired in Africa, North-South co-operation deserves careful attention in the implementation of the Decade programme. During the preparatory phase, attention should be paid to industrial negotiations, both within the context of the envisaged global negotiations in the General Assembly as well as within the UNIDO System of Consultations.

57. In this regard, the African countries are urged to adopt a common position when participating in these negotiations, thus ensuring that Africa's interests, as reflected in the framework of the Decade programme, are fully accommodated. The African countries need to set up permanent machinery, at both the national and regional level, so as to follow, with vigilance, all developments in these international industrial negotiations and ensure their consistent participation at an appropriate policy and technical level. Such preparations should also ensure that North-South co-operation does not lead to the dilution of or divergence from the main objectives of the Decade programme.

58. For their part, the developed countries are called upon to approach these industrial negotiations with greater conviction and commitment to the cause of genuine international industrial co-operation which, in the long term, will be mutually beneficial to all parties. While Africa adheres fully to the solidarity of the Group of 77, it would like both developed and other developing countries to devote special attention in these negotiations to measures which would enhance and support the industrialization efforts of the African countries. This is particularly important in view of the low level of industrial development in the region—a fact which has been fully recognized by the entire international community in its proclaiming the 1980s as the Industrial Development Decade for Africa.

Bilateral and multilateral economic co-operation agreements

59. In the past, economic co-operation agreements signed by the African countries with bilateral and multilateral aid or funding agencies have not accorded much importance to industrial matters. During the preparatory phase of the Decade programme, it is recommended that each African Government review its existing economic co-operation agreements and readjust them to accommodate industrial issues more fully. The framework of the Decade programme provides a useful background to reinforcing the industrial aspects of these co-operation agreements.

60. The bilateral and multilateral agencies are all called upon to adopt the framework of the Decade programme as a basis for readjusting their policies and programmes in Africa. In this connection, African Governments expect their bilateral and multilateral partners to recognize the aspirations embodied in the objective of self-reliant industrial development. Adjustments should encompass government policies, and through them, the policies of multinational corporations and other investors involved in the industrialization process in Africa. Action should also be taken by the developed countries to bring about a more positive attitude towards African industrial development efforts and to promote and popularize the Decade among financial institutions, mining corporations, and government decision-makers, thus facilitating their industrial co-operation with the African countries. There may be a need to create special investment promotion centres to facilitate the flow of investment from their countries to Africa.

Actions during the implementation phase (1985-1990)

61. The Actions to be undertaken, at the global level, during the implementation phase of the programme would largely be a reinforcement of the measures and modalities initiated during the preparatory phase. They will include:

(a) Identification and negotiation of investment projects;

(b) Implementation of TCDC projects and programmes identified during the preparatory phase;

(c) Increased participation in industrial consultations leading to the negotiation and implementation of joint ventures;

(d) Intensification of international co-operation in the development of industrial and technological capabilities specially directed towards the large-scale absorption of resources and technologies.

5. Role of the international agencies

Actions during the preparatory phase (1982-1984)

Reorienting the policies and programmes of the agencies towards the framework for the Decade programme

62. As called for in the various resolutions pertaining to the Decade, the United Nations agencies, in particular ECA, UNDP and UNIDO, would be expected to redesign and intensify their programmes of technical assistance, in the industrial field, to the African countries. An important step to be taken during the preparatory phase of the programme is the need for each of these organizations to undertake a critical examination of their policies, programmes and activities in Africa with a view to reorienting them in accord with the framework of the Decade programme. The organizations should seriously consider setting aside a portion of their resources for the implementation of special programmes of assistance to the African countries in the implementation of the Decade programme. Periodic (initially annual) reports on the status of implementation of their Decade-related programmes should be prepared and submitted to the Joint Committee. All other international agencies and organizations should effectively reorient their activities with a view to ensuring their maximum contribution to the Decade programme.

63. In order to ensure that this is done, the African countries need to intensify their representation and participation at the policy and technical meetings of these organizations in order to ensure that the organizations' programmes related to industry in Africa are in accordance with the framework of the Decade programme. In the case of certain international organizations, such as UNDP and UNIDO, this would also help to ensure that increasingly high priority is accorded to industrial activities in Africa. In this regard, the African countries also need to ensure that the industrial sector is assured higher priority in the UNDP country and regional programmes. This requires a permanent system of communication between all parties, whereby the National Co-ordinating Committees could play an extremely important role.

Assistance in popularizing and promoting the Decade

64. On the basis of appropriate policies and programmes for the Decade, the agencies could, through the Pan-African News Agency, the Joint Committee or independently, assist the African countries to produce a series of films to

highlight the important contribution of industrial development to the development of the region, particularly in the rural areas.[5] These films or film strips should be widely circulated throughout Africa and arrangements made to have them shown in commercial cinemas or on television. Radio programmes could also be broadcast on national networks as well as by the United Nations and international networks. Furthermore, an information bulletin, such as "Industry Africa", "Investment Africa" or other magazines, periodicals, posters and calendars, could be published and widely circulated both within Africa and without. In order to ensure the effectiveness of any popularization programmes, it will be essential to identify specific target groups in the countries for special promotional measures.

65. Demonstrations are among the most effective means of publicity. The promotional programme for the Decade at the national, subregional and regional levels should, therefore, include a series of seminars, study tours, industrial fairs, mobile industrial demonstration units, and the organization of displays of indigenous industrial products etc. These activities, which should be organized for various sectors of the population, would contribute to the exchange of experience, thereby helping to create new African initiatives in industry. They would bring about a greater awareness of the contribution that all members of society can make to industrial development, and highlight the contribution of industry to economic development in general.

66. The international organizations will play an extremely important role in popularizing the Decade, not only within Africa but also throughout the international community. They could arrange for the more effective distribution of their publications to industrial enterprises, universities and public libraries, and organize seminars publicizing industry. Some of these activities will have to be consolidated and improved for more effective application beyond the preparatory phase, as they become a permanent feature of cultural indoctrination and contribute to the continuous activation of the indigenous agents of production and distribution.

Preparatory high-level field missions to intensify technical assistance

67. An extremely important activity to be taken up during the preparatory phase of the Decade programme would be the fielding of high-level missions to assist member States, upon request, in the preparation of their national, subregional and regional programmes for the Decade. The field activities to be undertaken by these missions include:

(a) Preparation of integrated national industrial development plans based on the principles, objectives and targets of the Lagos Plan of Action and in accordance with national industrial and economic development strategy and goals. Their preparation would include the identification of those projects that could be better implemented at the multinational level;

[5] See also chapters I and II.

(b) Identification of the major structures essential to accelerated industrial development. Since the mission team will not have time to prepare a complete plan, this identification will constitute the main contribution to planning, involving an evaluation of existing national industrial structure, its strengths and weaknesses regarding intra-sectoral and intersectoral relationships, rationalization and development of key subsectors and major national industrial branches; and an assessment of the country's natural resources, including nature and scope of their complementarities, and of its market structure and size. On the basis of the above, core projects to be implemented at the national level and those to be referred to multinational co-operation can be identified;

(c) Further evaluation and implementation of critical national projects of specific interest to the country;

(d) Evaluation of the state and national mechanisms for dealing with industrial policy-making, planning and programming projects, including their implementation and monitoring;

(e) Preparation of a comprehensive programme for the promotion and popularization of the Decade in general and specific terms.

68. In order to ensure the success of these missions, a number of pre-mission activities need to be undertaken by the co-ordinating organizations. These include the:

(a) Preparation of a brief country study on the state of industrialization in each country as briefing material for the missions;

(b) Identification of African experts and consultancy organizations who could participate in the initial ECA/OAU/UNIDO assistance to Governments in drawing up their national programmes;

(c) Preparation of terms of reference and guidelines for the missions;

(d) Intensive briefing sessions for the mission members on the Decade programme;

(e) Provision by the National Co-ordinating Committees to the mission of counterpart experts and all the requisite information and their experts as counterparts.

69. At the regional and subregional levels, the high-level missions will, in co-operation with experts from the subregion or region, assist the regional or subregional organizations to:

(a) Examine existing industrial and economic co-operation arrangements in order to determine those which can best be used for implementing the Decade programme, taking into account the structural arrangements and the minimum technical and economic requirements;

(b) Assess the natural resource endowments of the countries and the capacities available for exploiting and developing those resources so that appropriate courses of action can be proposed. In this connection, an assessment should also be made of existing production units which could be used to meet certain requirements, such as those for spare parts or farm implements.

(c) Review intergovernmental structures at the regional and subregional level with a view to establishing or improving such structures;

(d) Propose ways of strengthening the intergovernmental secretariats and their instruments of action in order to enhance their competence with regard to multinational arrangements for industrial co-operation and integration;

(e) Suggest ways and means of promoting TCDC within the subregion or region whereby the stronger countries could assist the weaker ones in specific areas;

(f) Prepare master plans for the Decade programme, including basic industries, and elaborate promotional and popularization activities. The multisectoral and interdisciplinary approach recommended for the national level should also be adopted at the subregional or regional level.

Actions during the implementation phase (1985-1990)

70. Having formulated concrete programmes, the international organizations would be in a position to execute those programmes and thus provide real substantive support to the African countries in the implementation of their individual (national) and collective (regional and subregional and multinational) programmes. ECA, OAU and UNIDO, in collaboration with other technical assistance agencies and Governments of Africa, will continue to organize consultation and negotiation meetings, study tours and industrial fairs, with a view to assisting the participating African countries in the implementation of their national and multinational industrial projects. These activities will involve financial institutions and government officials as well as agents of production and distribution from both the public and private sectors.

71. It is expected that the proportion of UNDP resources allocated to the industrial sector in its national and regional programmes in Africa will have increased appreciably, thus facilitating the implementation of the Decade programme. Activities to be undertaken during the implementation phase would include assistance to the countries of the region in:

(a) Conducting pre-feasibility studies for multinational projects in order to ascertain their viability and analyse the economic benefit accruing to the countries participating in such projects;

(b) Organizing consultations and negotiations among the countries concerned in order to reach agreement on the terms and conditions to be offered to countries participating in the establishment of multinational industrial enterprises;

(c) Elaborating appropriate statutes for each multinational enterprise, determining the modalities of operation, raw materials supplies, trading of finished goods, and distribution of profit;

(d) Organizing bids for newly-created multinational corporations;

(e) Elaborating agreements with subregional development banks and other African and non-African financial institutions on the financing of industry through the mobilization of investment funds;

(f) Supporting multinational corporations in such areas as the evaluation of technical studies, supervision of construction, and planning work force and budgetary requirements.

6. Conclusion

72. It is worth pointing out once again that the success of the Decade lies in the hands of the African countries themselves. Only the African countries can save their economies from excessive dependence on external assistance and intervention, thus clearing the way for self-reliant and self-sustaining industrial development in the region.

73. Despite major efforts by the African countries, an urgent need remains for external support by the international community, especially the United Nations organizations. African countries belong to these organizations and contribute financially to their welfare. They must, therefore, make the maximum use of their services, capabilities and facilities. No African country should hesitate to seek either to influence these programmes in favour of the African countries or to request the assistance of the international organizations.

74. The co-ordinating organizations (ECA, OAU and UNIDO) for the Decade programme stand prepared to assist the member States, individually or collectively, in improving and extending inter-regional arrangements with other developing countries and global co-operation with the entire international community, for the promotion of industrial development in Africa, through the implementation of the Decade programme.

IV. Monitoring and reporting on the implementation of the Decade programme

1. In chapter XIII of the Lagos Plan of Action, attention is focused on development planning. It is pointed out that "what is lacking the most is the implementation part of the plan which usually consists of: manpower requirements; technological requirements; more clearly defined financial implications; a time frame; a monitoring system; and harmonization with economic development plans of neighbouring countries, as well as at the subregional and regional levels. The absence of such an implementation plan has rendered the economic development plans in most African countries not only most susceptible to political and world economic changes, but also unattainable".[1]

2. It is further stated that the "successful elaboration and implementation of an economic development plan depend, to a large extent, on maximum involvement of national technical capabilities. A national institutional and economic development infrastructure therefore needs to be well articulated in order to provide an appropriate framework for involvement of the entire population, particularly the technical expertise, in the entire spectrum of economic development endeavours".[2]

3. In the light of the above, it is suggested in the Plan that "in accordance with national priorities, appropriate ministries, delegations, directorates, organizations, technical committees and professional associations would need to be established within such an economic development institutional infrastructure. In this connection, it may be noted that the governmental institutional machinery which has been set up in most Member States is for administrative purposes and not for economic development".[3]

4. In the Lagos Plan of Action, the Heads of State and Government consider that "the industrialization of Africa in general, and of each individual Member State in particular, constitute a fundamental option in the total range of activities aimed at freeing Africa from underdevelopment and economic dependence. The integrated economic and social development of Africa demands the creation, in each Member State, of an industrial base designed to meet the interests of that country and strengthened by complementary activities at the subregional and regional levels".[4] "By harmonizing development

[1] Lagos Plan of Action, para. 326.

[2] *Ibid.*, para. 327.

[3] *Ibid.*, para. 328.

[4] *Ibid.*, para. 56.

activities through ensuring that optimum use is made of the limited resources of the various Member States, industrial co-operation creates conditions conducive to regional and subregional collective self-reliance, while at the same time provides the framework for strengthening the effort of each country."[5]

5. Conscious of the above situation and of the need to strive to translate development targets into programmes of action, the Heads of State and Government expressed, in the Lagos Plan of Action, their support for the recommendation that the 1980s be proclaimed as the Industrial Development Decade for Africa. In so doing, they expressed their full awareness that "such a proclamation will confer certain obligations on those who work for it and thus undertake to make an appropriate contribution to the efforts required to ensure its success". They also expressed their determination to "take all necessary steps to ensure that this Decade is fully successful".[6]

6. In the resolution on the Lagos Plan of Action, the Heads of State and Government requested the OAU Secretary-General to take all appropriate measures to prepare and convene the appropriate commissions of the OAU, and to prepare and submit periodic progress reports on the implementation of the Plan of Action by Member States to the Assembly of Heads of State and Government. The co-ordination and monitoring of the implementation of the programme for the Industrial Development Decade for Africa was to be undertaken within this framework, and in harmony with similar actions for co-ordinating and monitoring the implementation of the Lagos Plan of Action and the Final Act of Lagos.

Co-ordinating and monitoring the implementation of the Decade programme

7. No development plan, including programmes and projects for the industrial sector, however well formulated in terms of consistency, realism and comprehensiveness, can make a positive impact on overall economic development, unless it is effectively implemented. A pre-requisite for effectively implementing such programmes and projects is the development of an efficient organizational and administrative structure that permits: continuous monitoring of the programmes and projects; performance evaluation; and identification of problems with proposals for remedial actions, where necessary. This presupposes that:

(a) The objectives of the programme or project are clearly defined in both qualitative and quantitative terms;

(b) Basic data and information (in particular baseline data) are regularly collected, analysed, recorded and made available to policy-makers;

(c) Evaluation reports are periodically prepared and duly acted upon before they become obsolete and the situation deteriorates beyond remedy.

---

[5] *Ibid.*, para. 57.

[6] *Ibid.*, para. 58.

The purpose of monitoring

8. The purpose of monitoring the programme and projects is to enable policy-makers, programme managers and project officers to review and appraise the implementation thereof. An exercise of this kind would, *inter alia*, provide information on the progress made as well as on the obstacles encountered in implementing the programme. This would contribute to the adoption of corrective measures and to the development of a feed-back mechanism linked to the planning exercise for the next plan period. Since changing conditions make deviations from original targets inevitable, progress must be reviewed and assessed in relation to prevailing conditions so that potential (or existing) bottlenecks can be identified as soon as possible, their causes determined and an evaluation made of the extent to which deviations jeopardize the attainment of set objectives. Measures for overcoming these problems can be prepared and steps taken to act appropriately in good time.

Definition of programme and project objectives

9. Effective monitoring is contingent upon a clear statement of the quantitative and qualitative of the programme and projects. Furthermore, a series of benchmarks has to be set up against which progress can be measured. A distinction should be made between physical and financial targets, since investment (financial flows) and growth and development (the output goods and services to meet the needs of the mass of people) are often confused. Objectives should also be phased in both preparatory and implementation stages, and the project results anticipated for each stage should likewise be clearly stated.

Basic data and information

10. An important input to programme and project monitoring is the collection, analysis and interpretation of data for use before, during and after the execution of the programme or project. Baseline data are particularly essential since they permit the subsequent measurement of project results. They should be collected early, before operations begin, and a continuous project record should be maintained thereafter.

11. Data and information can be collected in various ways, such as through studies and questionnaires, through visits to similar projects (in similar situations) or by engaging the services of experienced consultants. The generation, collection, interpretation and dissemination of information involve various categories of people, and people interested in or affected by the programme or project should be involved.[7] Consequently special programmes should be developed and implemented to train policy-makers, programme managers, project officers and others involved in programme and project monitoring.

[7] UNESCO—Evaluating Development Projects.

12. On the basis of the data and information gathered, periodic reports should be prepared, comparing general programme and project performance against the agreed objectives. Periodic reports should cover and evaluate aspects of the programme or project, such as equipment, personnel, training, financial arrangements, public awareness and actual operations, and appraise the results. In the light of difficulties encountered, the work plan might be reformulated. In this connection, special attention should be given to monitoring the major factors inducing structural changes in relation to the attainment of the objectives of self-reliance and self-sustainment.

Methods of co-ordinating and monitoring the implementation of the Decade programme

13. The success of the Industrial Development Decade for Africa depends on the proper programming of activities and the monitoring of their implementation not only at the national, but also at the subregional, regional and global levels. It is therefore expected that soon after the adoption of the Framework of a Programme for the Decade, far-reaching steps will be taken at the various levels to elaborate a more comprehensive programme for the Decade, including appropriate machinery for co-ordinating and monitoring the implementation of the programme. The suggestions presented below might be considered.

Action at the national level

14. In many African countries, growing emphasis is being placed on the process of economic planning and the preparation of development plans. Central planning machinery is invariably established in each country for this purpose. However, in general, less importance is attached to the implementation of these plans, programmes and projects (including their monitoring, review and evaluation), and this task is often left to different government departments. Whereas attempts are made during the planning process to accommodate the sectoral implications of a programme or project, similar efforts are not made during their implementation. This has led to the ineffective co-ordination of follow-up activities and a failure to adjust for want of periodic reviews and evaluation. To the extent that all programmes and projects have cross-sectoral implications, particularly in terms of essential inputs into their implementation, the monitoring (including review and evaluation) of the programme and projects for the Industrial Development Decade should be performed by a well-defined unit. This function would be only a part of the overall monitoring of general economic performance defined in the Lagos Plan of Action.

15. Focal points for co-ordinating and monitoring the implementation of the programme, projects and activities of the Decade would have to be designated. These could be the ministry, commission, department, or directorate responsible

for industrial development activities in the country, whose main function would include:

(a) Monitoring the implementation of activities related to the Decade in the country;

(b) Co-ordinating the work of those ministries and departments whose activities have implications for industrialization, and in particular the implementation of industrial projects;

(c) Developing appropriate strategies for raising the necessary funds from both national and external sources;

(d) Launching a nation-wide campaign so as to involve the entire population in the implementation of the activities of the Decade;

(e) Organizing national workshops, seminars and training programmes in order to increase public awareness of the need for accelerated industrial development and secure their involvement;

(f) Liaising with other countries, the OAU and the international community, especially the relevant international organizations, so as to harmonize endeavours throughout the continent.

16. The focal point should work closely with the central planning office or the ministry of national planning. It should enjoy the same status and support from all sectors, public and private.

17. Since the multisectoral activities of the Industrial Development Decade involve other ministries, especially those in charge of finance, agriculture, transport and communications, energy, education, science and technology, and public information, each country should consider setting up a national co-ordinating committee for the Decade. This committee should consist, *inter alia*, of senior executives from the relevant ministries, public and private sectors, chambers of commerce and industry, universities, financial and research institutions, as well as professional associations. The committee would, in particular, provide overall direction and guidance in the formulation, implementation and monitoring of the Decade programme. Each member State should set up an interministerial committee and other technical committees to advise and assist the national focal point and the national co-ordinating committee in programming and monitoring the implementation of the Decade programmes, projects and activities. However, it is important to emphasize that the institutional arrangements for implementing, continuously evaluating and monitoring the programme and projects should be clearly specified in order to avoid undue duplication. The same degree of importance attached by many African countries to improving public administration must now be accorded to improving and making appropriate budgetary provision for the control and administration of development sectors, programmes and projects.[8]

18. As indicated above, the effective co-ordination and monitoring of the implementation of the Decade programme, projects and activities depend, to a large extent, on the availability of information and statistical data, as well as on

[8] *Public Administration for Development* ST/ESA/SER.E/1.

the availability of competent staff. National institutional machinery should be set up, including an information bank for the collection, appraisal, storage, and retrieval of the entire range of industrial and technological information and relevant economic development statistical data and their dissemination to the various authorities involved with the co-ordination and monitoring of the Decade programme. It would also be necessary to launch training programmes so as to ensure the continuous upgrading of the skills needed for monitoring the implementation of the programme, including those persons involved in the information sector. Depending upon the level, volume and diversity of the information required, it may be necessary to utilize a computerized system linked to international systems such as the UNIDO Industrial and Technological Information Bank and the ECA Pan African Documentation and Information System.

19. In many African countries, public enterprises constitute an important channel for planning and implementing industrial programmes and projects. Their use is likely to gain momentum as countries proceed with the implementation of the Lagos Plan of Action, especially in the industrial sector. However, some undesirable effects might come about with the spread of these enterprises if their activities deviate from the mainstream of national development. Consequently, it is essential to co-ordinate and monitor the activities of those enterprises on a central basis, using public accountability procedures.

20. Involvement of the private sector presents difficulties owing to the small size of the indigenous private industrial sector in all African countries. In nearly all African countries, early attempts at industrialization failed to achieve the declared policy objectives, however loosely formulated (import substitution or local processing), despite the enormous incentives offered to foreign investors. In the case of import-substitution industries, the goods produced were more expensive than imports and the plants operated below full capacity, culminating in a call for more stringent import restrictions which Governments invariably obeyed. Although most of these plans are still operating, no consistent attempt has been made to monitor their progress against the set objectives.

21. In most African countries the private sector was initiated by foreign companies. If monitoring the implementation of the Decade programme is to be effective, the private sector will have to be involved in the process of setting programme and project objectives and targets, as well as the benchmarks against which progress can be assessed. A continuous and harmonious communication system should be established and maintained between the private sector and the national focal points. Industrial agreements or certificates issued to foreign or indigenous private industrial enterprises should specify the conditions pertaining to effective implementation, such as progress reports, information on all aspects of the operation and suggestions for adjustment. These reports would serve as a useful basis for evaluating the performance of the enterprises.

Monitoring action at the subregional and regional levels

22. Subregional and regional industrial co-operation is accorded special significance in the Lagos Plan of Action. The objective is to formulate industrial development programmes and projects on a multinational basis in order to maximize industrial complementarities, ensure judicious use of scarce resources, and bring about the full exploitation of regional and subregional markets.

23. If national capabilities for project formulation and execution (including the monitoring, review and evaluation thereof) are not enhanced, multinational projects have little chance of success since the problems they face are even greater.

24. The methods used to monitor the implementation of regional and subregional industrial projects would comprise:

(a) Setting up or strengthening inter-governmental co-ordination machinery which, on the basis of periodic reports on the implementation of the projects, would review and evaluate project implementation, agree on the required adjustments and map out the future course of action. Such a body would be within the general framework for co-ordinating and monitoring regional and subregional economic development programmes, and should be linked to equivalent national bodies. A close relationship should be maintained with the specialized regional and subregional institutions which could provide certain support services, data and information. As in the case of national bodies, appropriate training should be provided as the need arises;

(b) Organizing series of periodic review missions and workshops which would, *inter alia*, assess the impact of the programme on the overall economic development, taking into account socio-economic and other effects;

(c) Providing overall guidance on all matters relating to the implen tion of the Decade programme at the regional level, through the Conferen... African Ministers of Industry, its Follow-up Committee on Industrialization, and similar bodies. The annual meetings of the Ministerial Follow-up Committee on Industrialization in Africa and the biennial Conference of African Ministers of Industry would continue as scheduled, with appropriate modifications as may be required. As in the past, preparation for the meetings will be the joint responsibility of the ECA, OAU, and UNIDO, within the framework of the Joint ECA/OAU/UNIDO Inter-Secretariat Committee for the Decade. It is suggested that the preparatory phase of the Decade programme be reviewed in 1984, with a mid-term review of the ongoing programme being undertaken in 1987 and a terminal review in 1991;

(d) Establishing machinery for industrial consultation (and arbitration), as this could lead to joint industrial agreements and to the introduction of a common investment code.

Contributions from international organizations

25. International organizations can make, and indeed have made, a substantial contribution to the development efforts of the African countries. They have provided assistance in project identification, formulation and execution at the national, subregional and regional levels. International organizations offer a particular advantage in that they have a wealth of experience of similar conditions in other regions or countries, and they dispose of extensive information on a broad range of technical matters pertinent to industrial projects.

26. With regard to monitoring the implementation of the Decade programme, international organizations, especially ECA, OAU and UNIDO, should provide information derived from studies of projects in conditions similar to those in Africa. They should assist in organizing workshops on certain aspects of implementing the Decade programmes, as well as in organizing and participating in review missions related to multinational projects.

27. As for monitoring the implementation of the programme within the United Nations system UNIDO, in accordance with its central co-ordinating role in the field of industry, will initiate and co-ordinate activities and inputs within that system, including technical and financial assistance so as to support both the national and regional programmes. Such assistance would also include the provision of training to the bodies concerned with monitoring implementation at those levels.

28. In order to maximize the contribution of other organizations in the United Nations system to the development and implementation of the Decade programme and related activities, an appropriate *ad hoc* co-ordinative mechanism should be set up to advise ECA and UNIDO and assist in co-ordinating and monitoring inputs from the United Nations system. It is expected that United Nations assistance, in particular that of the ECA and UNIDO, would include strengthening the various national, subregional and regional machineries identified above that would be needed to monitor the implementation of the Decade programme and projects.

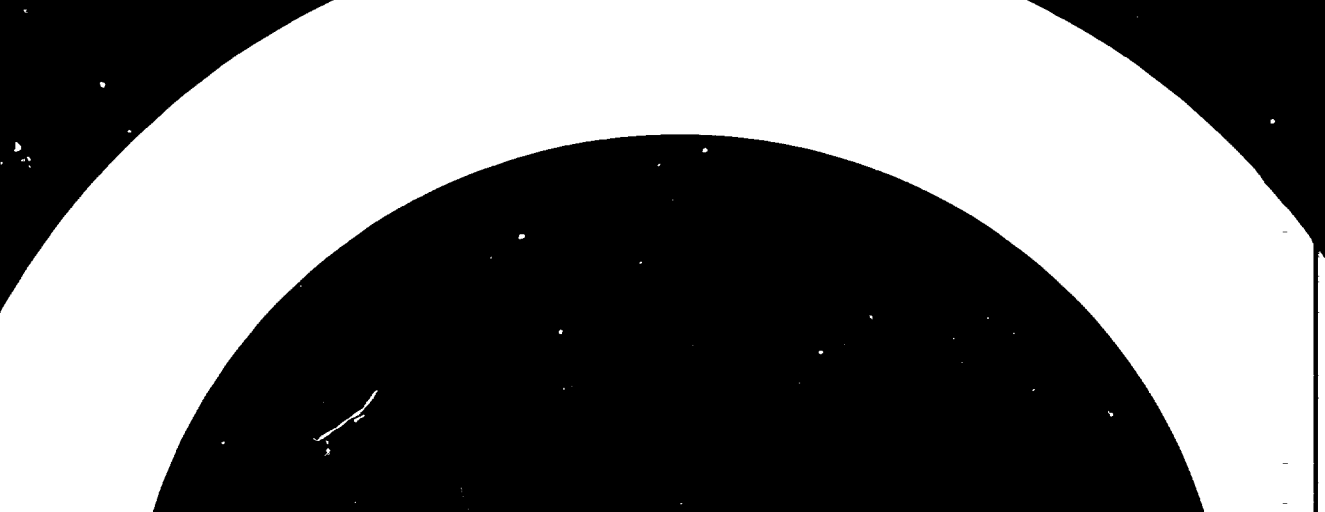
Conclusion

29. The proposals made above are by no means exhaustive, nor do they attempt to provide a definitive solution for each country, subregional or regional organization. They should be examined in the context of the situation in each country, subregion or region. ECA, OAU, and UNIDO are ready to assist any country, subregional or regional organization, if so requested, in carrying out a review of its situation with a view to improving or introducing machinery specifically suited to prevailing conditions and requirements.

30. As acknowledged by the Heads of State and Government in the preamble of the Lagos Plan of Action, the success of the Decade will require of all African peoples, the same determination, sacrifices, commitment and resources that have virtually rid the continent of political domination.

31. The proclamation of decades in respect of specific issues is becoming increasingly customary in the United Nations. However, it is essential that the same fervour shown for the proclamation of decade-related programmes should be displayed for their implementation. Furthermore, African countries have adopted economic planning as an approach to their economic transformation. However, not in every instance has the same degree of seriousness, devotion and financial commitment been shown to implementation as has been shown to the preparation of economic development plans. Planning is unnecessary if countries are unable or unwilling to implement. This becomes all the more relevant when it is recalled that in operative paragraph 5 of the resolution adopted by the OAU Council of Ministers on Industrial Development in Africa at its thirty-seventh ordinary session, all OAU member States were requested "to take, with the assistance of the UNIDO and the UNDP, the necessary measures to draw up and implement specific programmes in the context of the Decade at the national, regional and subregional levels".[9] (See annex II).

[9]CM/Res.886 (XXXVII).



V. Conclusion

1. In paragraph 1 of the Preamble to the Lagos Plan of Action, the OAU Heads of State and Government declared that "the effect of unfulfilled promises of global development strategies has been more sharply felt in Africa than in the other continents of the world. Indeed, rather than result in an improvement in the economic situation of the continent, successive strategies have made it stagnate and become more susceptible than other regions to the economic and social crises suffered by the industrialized countries. Thus, Africa is unable to point to any significant growth rate or satisfactory index of general well-being in the past 20 years. Faced with this situation and determined to undertake measures for the basic restructuring of the economic base of our continent, we resolved to adopt a far-reaching regional approach based primarily on collective self-reliance". In adopting the Monrovia Declaration of Commitment, they also recognized "the need to take urgent action to provide the political support necessary for the success of the measures to achieve the goals of rapid self-reliance and self-sustaining development and economic growth". They accordingly adopted the Lagos Plan of Action and the Final Act of Lagos which provide the policy guidelines and the political framework for accelerated economic development of the continent.

2. In recognition of the pivotal role which industrialization will play in the economic development of the African countries, the Heads of State and Government, when elaborating the African strategy for the Third United Nations Development Decade, ranked industrialization second among their priorities, first priority being accorded to self-sufficiency in food production. This high priority accorded to industrial development is fully reflected in the Lagos Plan of Action. Thus, paragraph 56 of the Plan asserts that "the industrialization of Africa in general, and of each individual Member State in particular, constitutes a fundamental option in the total range of activities aimed at freeing Africa from underdevelopment and economic dependence. The integrated economic and social development of Africa demands the creation, in each Member State, of an industrial base designed to meet the interests of that country and strengthened by complementary activities at the subregional and regional levels". Furthermore, in the Final Act of Lagos, industry was selected as one of the priority sectors for continental integration during the 1980s.

3. The decisions of the OAU Heads of State and Government reflected in the Lagos Plan of Action and the Final Act of Lagos are filled with wisdom since experience in other parts of the world has clearly shown that, in order to achieve fast economic growth, the African countries must necessarily change the structure of their economies by increasing substantially the share of manufacturing in national output and by introducing corresponding changes within the structure of manufacturing industry itself.

4. Recent international developments and changes in perception by certain assistance agencies have tended to erode the decision by the African Heads of State and Government to accord high priority to industrialization in their economic development. In the Lagos Plan of Action, emphasis is placed on developing, diversifying and processing the region's natural resources for export so as to acquire the required basic products, such as machinery and equipment for economic growth. Self-sufficiency in food production and other economic sectors without the establishment of a viable industrial base will not only become an unattainable goal, but will also perpetuate the external domination of the African economy and the continued external exploitation of the natural resources of the continent.

5. All the African countries are therefore urged to counter these negative trends and undue external interference in the sovereign rights of the African countries to determine the strategy and destiny of their economic development. The entire international community is once more called upon to respect fully and faithfully the strategy and priorities adopted by the OAU Heads of State and Government, as reflected in the Lagos Plan of Action and the Final Act of Lagos, for the economic development of the continent and to redesign their technical co-operation activities with the African countries accordingly.

6. As recognized in the Lagos Plan of Action, the implementation of the Decade programme lies largely in the hands of the African countries themselves. Thus, in paragraph 58 of the Plan, the Heads of State and Government, in endorsing the proclamation of the Decade, also expressed their full awareness that "such a proclamation will confer certain obligations on those who work for it and thus undertake to make an appropriate contribution to the efforts required to ensure its success" and further expressed their determination to "take all necessary steps to ensure that this Decade is fully successful".

7. In the light of the above and in accordance with operative paragraph 5 of resolution CM/RES.886 (XXXVII) (see annex II) adopted by the thirty-seventh ordinary session of the OAU Council of Ministers held at Nairobi, Kenya, 15-16 June 1981, all African countries are urged to take the necessary measures to draw up and implement specific programmes in the context of the Decade at the national, subregional and regional levels. These programmes may consist of a selection of priority industrial branches and projects in accordance with the Lagos Plan of Action, due account being taken of the related labour, technological and financial implications, both quantitative and qualitative, as well as promotional and popularization activities. The Decade programme thus comprises the various programmes adopted at the national, subregional and regional levels, the overall implementation of which will be periodically reviewed and monitored by the Conference of African Ministers of Industry.

8. In keeping with the recent resolutions (see annexes III, IV and V) adopted by the General Assembly, the ECA Conference of Ministers and the Industrial Development Board, the secretariats, of ECA, OAU and UNIDO stand ready to assist each African country, subregional and regional organization in this great endeavour, which marks an historic attempt to achieve the best possible conditions of life for the peoples of Africa and secure their economic well-being for generations to come.

Annex I

General Assembly resolution 35/66. Industrial development co-operation

A. Third General Conference of the United Nations Industrial Development Organization

The General Assembly,

Recalling its resolutions 3201 (S-VI) and 3202 (S-VI) of 1 May 1974, containing the Declaration and the Programme of Action on the Establishment of a New International Economic Order, 3281 (XXIX) of 12 December 1974, containing the Charter of Economic Rights and Duties of States, and 3362 (S-VII) of 16 September 1975 on development and international economic co-operation,

Recalling also the Lima Declaration and Plan of Action on Industrial Development and Co-operation,[1] adopted at the Second General Conference of the United Nations Industrial Development Organization, which laid down the main measures and principles for industrial development and co-operation within the framework of the establishment of the new international economic order,

Taking note of the New Delhi Declaration and Plan of Action on Industrialization of Developing Countries and International Co-operation for their Industrial Development,[2] adopted at the Third General Conference of the United Nations Industrial Development Organization, which spelt out a strategy for the further industrialization of developing countries for the 1980s and beyond, as well as a plan of action for the restructuring of world industry within the framework of the establishment of the new international economic order,

Emphasizing the role of the redeployment of industrial capacities in the context of international industrial co-operation, including resources and technology transfers aimed at establishing and strengthening the productive capacities of developing countries with a view to stimulating their economies, and taking into account their potential to develop their national resources in conformity with the overall national objectives and priorities and the need to increase correspondingly their share in world industrial production,

Conscious of the role of the United Nations Industrial Development Organization as the central co-ordinating organ within the United Nations system for the promotion of industrial development co-operation and for the fulfilment of the agreed measures and the attainment of the agreed targets in both the Lima Declaration and Plan of Action on Industrial Development and Co-operation and the New Delhi Declaration and Plan of Action on Industrialization of Developing Countries and International Co-operation for their Industrial Development,

Having examined the reports of the Industrial Development Board on its first special session, held from 12-16 November 1979,[3] and on its fourteenth session, held from 12-19 May 1980,[4]

---

[1] See A/10112, chap. IV.

[2] See ID/CONF.4/22, chap. VI.

[3] *Official Records of the General Assembly, Thirty-fifth Session, Supplement No. 16* (A/35/16), vol. I.

[4] *Ibid.*, vol. II.

Noting Economic and Social Council resolution 1980/61 of 24 July 1980 on industrial development co-operation,

Bearing in mind the decisions adopted by the Industrial Development Board at its second special session, held on 17 October 1980,[5]

1. *Takes note* of the report of the Third General Conference of the United Nations Industrial Development Organization, held at New Delhi from 21 January to 9 February 1980;[6]

2. *Endorses* the programme priorities adopted by the Industrial Development Board at its fourteenth session[7] on the follow-up of the decisions and recommendations of the Third General Conference of the United Nations Industrial Development Organization;

3. *Endorses* the decisions made by the Industrial Development Board at its fourteenth session with regard to the System of Consultations,[8] notably its decision to establish on a permanent basis that System, which should be an instrument through which the United Nations Industrial Development Oganization would serve as a forum for developed and developing countries in their contacts and consultations directed towards the industrialization of developing countries and would also permit negotiations among interested parties at their request at the same time as, or after, consultations;[9]

4. *Urges* the international community to consider concrete measures, where appropriate, for restructuring world industrial production through positive strategies, thus establishing a more effective international division of labour which would, *inter alia*, facilitate the redeployment of industry, expand and strengthen the industrial capacities of developing countries and promote the domestic industrial processing of the natural resources of developing countries;

5. *Emphasizes* the need to facilitate the restructuring of world industrial production through, *inter alia:*

(a) Support for increased industrial production in developing countries;

(b) Special and differential treatment in favour of developing countries, where feasible and appropriate, in the context of a general effort to liberalize world trade, in particular in their favour;

(c) Trade liberalization in relation to increased market access;

6. *Reiterates* the decision of the Industrial Development Board at its second special session[10], and decides to ensure the provision of adequate resources to enable the United Nations Industrial Development Organization to implement its mandate, particularly as regards the follow-up of the Third General Conference as agreed upon by the Board at its fourteenth session, taking into account the budgetary restraints under which the United Nations regular budget has to operate;

7. *Further reiterates*, bearing in mind paragraph 75 of the report of the Permanent Committee of the Industrial Development Board on the work of its fourteenth session,[11]

---

[5] *Ibid.*, vol. III, chap. II.

[6] ID/CONF.4/22.

[7] *Official Records of the General Assembly, Thirty-fifth Session, Supplement No. 16* (A/35/16), vol. II, para. 54.

[8] *Ibid.*, chap. XI.

[9] *Ibid.*, para. 151.

[10] *Ibid.*, vol. III, para. 15.

[11] *Ibid.*, vol. III, annex II.

that proper measures should be taken for all agreed priority areas, as agreed to by the Board at its fourteenth regular session and its second special session, including the development of human resources and industrial production, which were not specifically reflected in the proposals of the Secretary-General as contained in the revised work programme of the United Nations Industrial Development Organization for 1981 and the current programme budget;[12]

8. *Requests* the secretariat of the United Nations Industrial Development Organization to take immediate measures within its competence for the early and full implementation of the Comprehensive New Programme of Action for the Least Developed Countries, adopted by the United Nations Conference on Trade and Development in its resolution 122 (V) of 3 June 1979,[13] and the relevant resolutions and decisions of the General Assembly, and to submit annual reports to the Industrial Development Board on the progress of industrialization of the least developed countries;

9. *Appreciates* the steps already taken to ensure the co-ordination of activities with other United Nations bodies in the field of industrial development and stresses the need for continuing full co-operation and work to ensure optimal follow-up to the decisions, recommendations and results of the Third General Conference of the United Nations Industrial Development Organization from the programming to the implementation stage, particularly in such areas as consultation meetings, energy and operational activities, as agreed upon by the Industrial Development Board at its fourteenth regular session and at its second special session;

10. *Requests* the Industrial Development Board at its fifteenth session to consider further proposals by the secretariat of the United Nations Industrial Development Organization for the promotion of industrialization of developing countries and to decide on further action;

11. *Appeals once again* to all Governments that have not yet done so to sign and ratify, accept or approve the new Constitution of the United Nations Industrial Development Organization[14] as early as possible, preferably no later than mid-1981;

12. *Urges* all States, in particular the developed countries, to contribute to the United Nations Industrial Development Fund or to raise their contributions, taking into account the need for maximum flexibility, with a view to reaching the agreed desirable funding level of $50 million annually;

13. *Decides* to review at its thirty-seventh session, the follow-up of the Third General Conference of the United Nations Industrial Development Organization.

83rd plenary meeting
5 December 1980

B. Industrial Development Decade for Africa

The General Assembly,

Recalling resolution 51 (XIV) adopted by the Industrial Development Board at its fourteenth session on 19 May 1980,

---

[12]See ID/B/C.3/99 and Add.1.

[13]See TD/268, part one, sect. A. For the printed text, see *Proceedings of the United Nations Conference on Trade and Development, Fifth Session*, vol. I, *Report and Annexes* (United Nations publication, Sales No. E.79.II.D.14), part one, sect. A.

[14]A/CONF. 90/19.

Noting Economic and Social Council resolution 1980/46 of 23 July 1980 on the Transport and Communications Decade in Africa,

Noting also the decisions adopted by the Assembly of Heads of State and Government of the Organization of African Unity at its second extraordinary session held at Lagos on 28 and 29 April 1980,[15] and by the Council of Ministers of that organization at its thirty-fifth ordinary session, held at Freetown from 18 to 28 June 1980,[16] to take appropriate measures to implement the Monrovia Strategy for the Economic Development of Africa,[17]

1. *Proclaims* the 1980s as the Industrial Development Decade for Africa;

2. *Calls upon* the United Nations Industrial Development Organization and the Economic Commission for Africa, in close co-operation with the Organization of African Unity, to formulate proposals to implement the programme for the Industrial Development Decade for Africa and to monitor its progress;

3. *Supports* the establishment of a co-ordination unit or group within the United Nations Industrial Development Organization for the Industrial Development Decade for Africa and requests the Secretary-General to provide appropriate resources to enable that organization to perform its role in the preparation and implementation of the activities of the Decade;

4. *Requests* the Executive Director of the United Nations Industrial Development Organization and the Executive Secretary of the Economic Commission for Africa to initiate appropriate contacts with the organs, organizations and bodies of the United Nations system in order to contribute to the success of the Industrial Development Decade for Africa and to report on the action taken, through the Industrial Development Board, at its fifteenth session, and the Economic and Social Council, at its second regular session of 1981, to the General Assembly at its thirty-sixth session.

83rd plenary meeting
5 December 1980

[15] See A/S-11/14.

[16] See A/35/463 and Corr.1, annex I.

[17] See A/34/552, annex I, resolution CM/Res.722 (XXXIII).

Annex II

OAU resolution CM/Res.886 (XXXVII) Industrial Development in Africa

The Council of Ministers of the Organization of African Unity meeting in its thirty-seventh ordinary session in Nairobi, Kenya, from 15 to 26 June 1981:

Having considered the report of the Secretary-General on the Industrial Development Decade for Africa (Document CM/1135 (XXXVII)),

Recalling the commitment and determination of all Member States, as expressed in the Lagos Plan of Action and the Final Act of Lagos, to accord a major role to industrialization in their national development plans and for continental sectoral integration,

Recalling further the decision of the Second Extra-ordinary Assembly of Heads of State and Government, as embodied in the Lagos Plan of Action, to declare the years 1980 to 1990 as the Industrial Development Decade for Africa,

Taking note of resolution 35/66B of the United Nations General Assembly and of the resolution adopted by the Fifteenth Session of UNIDO Industrial Development Board on the Industrial Development Decade for Africa,

Recalling OAU Resolution CM/Res.736 (XXXIII) on the signature and ratification of the Constitution of UNIDO as a Specialized Agency of the United Nations,

1. *Takes note* of the progress report of the Secretary-General on the Industrial Development Decade in Africa, contained in Document CM/1135 (XXXVII);

2. *Welcomes* the proclamation of the 1980s as the Industrial Development Decade for Africa by the United Nations General Assembly resolution and the resolution adopted by the Fifteenth Session of the UNIDO Industrial Development Board which, *inter alia*, declares the Industrial Development Decade for Africa as one of the most important programmes of the UNIDO;

3. *Appeals* to developed countries and multilateral financing institutions to provide the necessary resources for the implementation of the Programme of the Decade;

4. *Reiterates* the call by the UN General Assembly to the Secretary-General of the UN to provide appropriate resources for the successful launching of the Decade as well as for the preparation and implementation of the Decade Programme;

5. *Requests* all OAU Member States to take, with assistance from the UNIDO and the UNDP, the necessary measures to draw up and implement specific programmes in the context of the Decade at national, regional and subregional levels;

6. *Invites* the Conference of African Ministers of Industry scheduled for November 1981 in Kampala, Uganda, to provide a common African policy guidance and adopt a framework for the programme of the Decade as an important step towards the implementation of the Lagos Plan of Action in the field of industry;

7. *Urges* all relevant international organizations, especially the UNDP in the context of the programming of its national and regional funds for Africa, to increase, in accordance with the UN General Assembly Resolution 35/66B, their technical and financial assistance to the African countries at the national, regional and subregional levels for the preparation and implementation of the Decade Programme;

8. *Expresses its profound gratitude* to the UNIDO for its sustained and growing technical assistance given to African countries and consequently *strongly supports* the measures recently taken by this organization to reorient its policy in favour of developing countries.

9. *Urges* all Member States, which have not done so, to ratify, as a matter of urgency, the Constitution of UNIDO to ensure the early transformation of the Organization as a UN Specialized Agency to enable it to more effectively fulfil its mandate which is of particular relevance to the achievement of African economic development objectives as reflected in the Lagos Plan of Action and the Final Act of Lagos;

10. *Requests* the Secretary General to:

(a) Take, in co-operation with the Executive Director of UNIDO and the Executive Secretary of the ECA, all necessary measures for effective monitoring of all activities related to the implementation of the Decade Programme and to present progress reports to the Council of Ministers on a regular basis,

(b) Convey the contents of this resolution to the Secretary-General of the UN and the Administrator of the UNDP.

Annex III

General Assembly resolution 36/182. Industrial development co-operation

The General Assembly,

Recalling its resolutions 3201 (S-VI) and 3202 (S-VI) of 1 May 1974, containing the Declaration and the Programme of Action on the Establishment of a New International Economic Order, 3281 (XXIX) of 12 December 1974, containing the Charter of Economic Rights and Duties of States, and 3362 (S-VII) of 16 September 1975 on development and international economic co-operation,

Recalling also its resolution 35/56 of 5 December 1980, containing the International Development Strategy for the Third United Nations Development Decade, in which, *inter alia*, it stressed the importance of industrialization in the development of developing countries,

Recalling further the Lima Declaration and Plan of Action on Industrial Development and Co-operation,[1] adopted at the Second General Conference of the United Nations Industrial Development Organization, in which were laid down the main measures and principles for industrial development and co-operation within the framework of the establishment of the new international economic order,

Recalling also the New Delhi Declaration and Plan of Action on Industrialization of Developing Countries and International Co-operation for their Industrial Development,[2] adopted at the Third General Conference of the United Nations Industrial Development Organization, in which a strategy was spelt out for the further industrialization of developing countries for the 1980s and beyond, as well as a plan of action for the restructuring of world industry within the framework of the establishment of the new international economic order,

Endorsing the consensus reached at the fourteenth session of the Industrial Development Board on the follow-up to the Third General Conference of the United Nations Industrial Development Organization,

Recalling further General Assembly resolution 35/66 of 5 December 1980 and Economic and Social Council resolution 1981/75 of 24 July 1981 on industrial development co-operation,

Bearing in mind the Lagos Plan of Action for the Implementation of the Monrovia Strategy for the Economic Development of Africa,[3]

Conscious of the role of the United Nations Industrial Development Organization as the central co-ordinating organ within the United Nations system for the promotion of industrial development co-operation and for the fulfilment of the agreed measures and the attainment of the agreed targets in both the Lima Declaration and Plan of Action and the New Delhi Declaration and Plan of Action,

---

[1] See A/10112, chap. IV.

[2] ID/CONF.4/22 and Corr. 1, chap. VI.

[3] A/S-11/14, annex I.

Bearing in mind that, within the framework of the new international economic order, far-reaching changes in the structure of the world economy involve the restructuring of world industry, taking fully into account the capacities and potential of the developing countries,

Reiterating the need for a substantially increased transfer of financial and technical resources to developing countries for their accelerated industrialization,

Welcoming the efforts made by the United Nations Industrial Development Organization in the field of technical assistance and stressing the need for a further increase in the flow of such assistance to developing countries,

Having considered the report of the Industrial Development Board on its fifteenth session,[4]

A. Report of the Industrial Development Board at its fifteenth session

1. *Takes note* of the report of the Industrial Development Board on its fifteenth session;[4]

2. *Urges* the early implementation of all the decisions contained in Economic and Social Council resolution 1981/75 on industrial development co-operation;

3. *Reiterates* the importance of redeployment, as described in paragraph 73 of the annex to General Assembly resolution 35/56, and considers that the secretariat of the United Nations Industrial Development Organization should undertake to continue studies in this field;

4. *Requests* the secretariat of the United Nations Industrial Development Organization to continue to improve and further develop its programme on industrial redeployment along the lines approved by the Industrial Development Board at its thirteenth and fifteenth sessions, as well as by the General Assembly in resolution 34/98 of 15 December 1979, entitled "Industrial development co-operation and Third General Conference of the United Nations Industrial Development Organization", and in resolutions 35/56 on the International Development Strategy for the Third United Nations Development Decade and 35/66 on industrial development co-operation;

5. *Strongly supports* the strengthening of the system of consultations, in the light of experience gained and of the relevant decisions of the Industrial Development Board,[5] giving particular attention to measures which could increase the industrial capacities of developing countries, and requests the Board to consider, at its sixteenth session, the possibility of including consultation meetings in the biennium 1982-1983 in addition to those listed in paragraph 171 of the report of the Board on the work of its fifteenth session;

6. *Urges further* all States that have not yet done so to ratify the new Constitution of the United Nations Industrial Development Organization as soon as possible in order to allow the conversion of the organization into a new specialized agency in 1982;

7. *Reiterates also* the importance of facilitating the restructuring of world industrial production through, *inter alia*, the implementation of its resolution 35/66, and of resolution 131 (V) of 3 June 1979 of the United Nations Conference on Trade and Development;[6]

---

[4] *Official Records of the General Assembly, Thirty-sixth Session, Supplement No. 16* (A/36/16).

[5] See, in particular, *ibid.*

[6] See *Proceedings of the United Nations Conference on Trade and Development, Fifth Session*, vol. I, *Report and Annexes* (United Nations publication, Sales No. E.79.II.D.14), part one, sect. A.

8. *Decides* to ensure that adequate resources are made available to the United Nations Industrial Development Organization for priority activities on the basis of the consensus reflected in recent sessions of the Permanent Committee of the Industrial Development Board and of the Board itself;

9. *Also urges* all States, in particular the developed countries, to contribute to the United Nations Industrial Development Fund or to raise their contributions taking into account the need for maximum flexibility, with a view to reaching the agreed desirable funding level of $50 million annually;

10. *Requests* the Industrial Development Board at its sixteenth session to continue to consider carefully the proposal of the Executive Director for an international bank for industrial development with a view to taking a decision on it, and requests the Executive Director to continue his efforts on the subject in accordance with the relevant decision of the Permanent Committee at its sixteenth session ;

11. *Requests* the Executive Director of the United Nations Industrial Development Organization, at the request of the developing countries, to increase technical co-operation and programmes and projects in energy-related industrial technology on the basis, *inter alia*, of agreements reached at the United Nations Conference on New and Renewable Sources of Energy, held at Nairobi from 10 to 21 August 1981;

12. *Also requests* the Executive Director of the United Nations Industrial Development Organization to increase technical co-operation and the programmes and projects for the least developed countries on the basis of their requests and as envisaged in the Substantial New Programme of Action for the 1980s for the Least Developed Countries;[7]

13. *Decides* to ensure that adequate resources are made available to the United Nations Industrial Development Organization to assist developing countries in the preparation of the industrial programmes and projects referred to in paragraphs 11 and 12 above;

14. *Requests* the Industrial Development Board, at its sixteenth session in May 1982, to begin functioning as the Preparatory Committee for the Fourth General Conference of the United Nations Industrial Development Organization, to be convened in 1984, and accordingly formulate an agenda and other proposals and submit those recommendations to the General Assembly at its thirty-seventh session;

15. *Welcomes* the offer of the Government of Kenya to host the Fourth General Conference of the United Nations Industrial Development Organization.

B. Industrial Development Decade for Africa

1. *Takes note* of the note by the Secretary-General dated 5 October 1981,[8] on the implementation of the Industrial Development Decade for Africa;

2. *Declares* the Industrial Development Decade for Africa to be one of the most important programmes of the United Nations Industrial Development Organization;

---

[7]See "Report of the United Nations Conference on the Least Developed Countries", Paris, 1-14 September 1981 (A/CONF.104/22).

[8]A/36/466.

3. *Requests* the Executive Director of the United Nations Industrial Development Organization to provide adequate resources, including human resources, for the co-ordination unit for the Industrial Development Decade for Africa;

4. *Decides* to allocate adequate financial resources to assist in the rapid industrialization of Africa within the time-frame and scope of the Lagos Plan of Action,[9] with particular reference to the least developed countries, as from the 1982-1983 biennium;

5. *Also requests* the Executive Director of the United Nations Industrial Development Organization and the Executive Secretary of the Economic Commission for Africa to continue and intensify contacts with the organs, organizations and bodies of the United Nations system in order to contribute to the success of the Industrial Development Decade for Africa and to submit a comprehensive report on the Industrial Development Decade for Africa to the General Assembly at its thirty-seventh session, through the Industrial Development Board at its sixteenth session and the Economic and Social Council at its second regular session of 1982.

[9] A/S-11/14, annex I.

Annex IV

ECA resolution 442 (XVII) Formulation and implementation of a programme for the Industrial Development Decade for Africa

The Conference of Ministers

Bearing in mind the decision of the Heads of State and Government of the Organization of African Unity on accelerated industrialization in Africa as contained in the Monrovia Declaration, the Lagos Plan of Action and the Final Act of Lagos,

Guided by and *committed to* the implementation of the Lagos Plan of Action which stresses the importance of the industrialization of the African region in general and of each individual African country in particular as a fundamental option in the total range of activities aimed at freeing Africa from under-development and economic dependence,

Recognizing that the effective implementation of the Lagos Plan of Action will, to a large extent, hinge on the accelerated development of the industrial sector, as a supplier of essential inputs both to itself as well as to the other priority sectors in the Lagos Plan, namely agriculture, transport and communications, energy, trade and finance, and as a user of the outputs from these sectors,

Convinced of the vital significance for African countries of United Nations General Assembly resolutions 35/66B of 15 December 1980 proclaiming the 1980s as the Industrial Development Decade for Africa and 36/182 part II of 17 December 1981 stressing the importance of the Decade for Africa.

Recalling resolution CM/Res.886 (XXXVII) of June 1981 adopted by the Organization of African Unity which, *inter alia,*

(a) Welcomes the proclamation by the General Assembly of the 1980s as the Industrial Development Decade for Africa;

(b) Requests all States members of the Organization of African Unity to take the necessary measures to draw up and implement specific programmes in the context of the Decade at the national, subregional and regional levels; and

(c) Urges all relevant international organizations, especially the United Nations Development Programme, to increase, in accordance with United Nations General Assembly resolution 35/66B of 15 December 1980, their technical and financial assistance to African countries for the preparation and implementation of the Decade Programme;

Recalling further resolution 1 (vi) of 25 November 1981 of the sixth meeting of the Conference of African Ministers of Industry on the adoption of proposals for the formulation and implementation of a programme for the Industrial Development Decade for Africa,

1. *Endorses* resolution 1 (vi) of the sixth meeting of the Conference of African Ministers of Industry and the establishment of the Joint Intersecretariat Committee on the Decade comprising the Commission, the Organization of African Unity and the United Nations Industrial Development Organization;

2. *Calls upon* all member countries individually and collectively to take steps as a matter of urgency, including the establishment of national co-ordinating committees and focal points and the organization of national workshops with the participation of all the relevant sectors and institutions to examine and adjust their development plans with a view to incorporating, as appropriate, the concepts, guiding principles and objectives of the Industrial Development Decade Programme in their national economic perspective and development plans;

3. *Further calls upon* each member country, as a matter of urgency, to identify the group of strategic and core industrial projects at both the national and the multinational levels which by virtue of their interrelations, promote each other's growth and development and which, through technical and economic linkages and complementarities, especially with priority sectors set out in the Lagos Plan of Action, would accelerate industrial and general economic development and growth;

4. *Urges* member countries to identify, assess and determine their industrial capacities and capabilities, *inter alia*, for

(a) The preparation and implementation of projects;

(b) The preparation, evaluation and negotiation of specifications, bids and contracts;

(c) The procurement of technology, plant, and management and consultancy services;

(d) Research and development and training;

(e) Production, marketing and distribution, which should be up-graded and integrated, to enable them individually and collectively gradually to meet their changing domestic needs for key consumer, intermediate and capital goods in accordance with the concepts, guiding principles and objectives of the Industrial Development Decade for Africa;

5. *Recommends* the adoption of a multinational approach and intra-African co-operation, as the most viable option in the African context, in the development of strategic and basic industries, particularly the metallurgical, chemical and engineering industries, which by virtue of their requirements for large markets and their role in providing key inputs for all economic activities are crucial for self-reliant and self-sustaining development and economic growth;

6. *Calls upon* member countries to strengthen consultations among themselves with a view to facilitating collective action including consultations and negotiations with third parties and to establishing eventually an African mechanism for industrial consultations, negotiations and arbitration;

7. *Calls upon* member countries to provide information on arrangements for their national industrial workshops as called for in operative paragraph 2 above to enable the secretariat of the Commission, the Organization of African Unity and the United Nations Industrial Development Organization to programme their technical support/assistance in response to any request from countries;

8. *Recommends* that the closest relationship among appropriate organs of government, including those dealing with external relationships, should be established at the national level with a view to ensuring that international industrial negotiations and co-operation truly reflect the imperatives of the Decade as set out in the proposals for the Decade Programme.

9. *Calls upon* the Executive Secretary to take, in collaboration with the Secretary-General of the Organization of African Unity, the Executive Director of the United Nations Industrial Development Organization and the Secretary-General of the United Nations Conference on Trade and Development, vigorous steps to promote intra-African trade in industrial raw materials, intermediate and finished products in recognition of the crucial role of industrial trade in facilitating the implementation at the national and multinational levels, of programmes and projects for the Industrial Development Decade for Africa;

10. *Requests* the Executive Secretary, the Executive Director of the United Nations Industrial Development Organization and the Secretary-General of the Organization of African Unity and the executive heads of other international and African organizations to adjust their work programmes with a view to providing greater support to the member countries in their efforts to implement the Industrial Development Decade Programme and, in particular to:

(a) Assist member countries in undertaking appropriate realignment of their national development plans in the light of the Decade Programme, by providing guidelines organizing national, subregional and regional workshops, assessing natural resources and national capacities and capabilities, and identifying core projects as provided in paragraph 3 above, that can be implemented at the national and/or multinational level;

(b) Assist Governments in strengthening existing, and developing new, capacities and capabilities in areas including those identified in paragraph 4 above for self-reliant and self-sustaining industrialization;

11. *Urges* the Administrator of the United Nations Development Programme to increase, in accordance with the resolutions adopted by the General Assembly and the Organization of African Unity on the Decade, the amount of funds allocated to the industrial sector in its national and regional programme for Africa with a view to expanding the scope and volume of its assistance in the programming and implementation of the Decade programme at the national, subregional and regional levels;

12. *Requests* the Secretary-General of the United Nations to make available, in accordance with the relevant resolutions on the Decade, the necessary resources required to strengthen the secretariats of the Commission and the United Nations Industrial Development Organization and thus enable them to play their expected roles in assisting member countries to implement the Industrial Development Decade for Africa;

13. *Calls upon* the Executive Secretary to report regularly, in consultation with the Secretary-General of the Organization of African Unity and the Executive Director of the United Nations Industrial Development Organization to the meetings of the Commission through the Conference of African Ministers of Industry on the progress achieved in the implementation of the Industrial Development Decade for Africa.

Annex V

IDB resolution 55 (XVI) Industrial Development Decade for Africa

The Industrial Development Board,

Recalling General Assembly resolutions 35/66B of 5 December 1980, and 36/182, section II, of 17 December 1981 on the Industrial Development Decade for Africa, and noting with interest resolution 1 (vi) adopted by the African Ministers of Industry at their sixth conference,[1]

Recalling further resolution 54 (XV) adopted by the Industrial Development Board at its fifteenth session on 30 May 1981, which, *inter alia*, declared the Industrial Development Decade for Africa to be one of the most important programmes of the United Nations Industrial Development Organization,

Noting the endorsement of the programme for the Industrial Development Decade for Africa in resolution 442 (XVII) adopted by the Conference of Ministers of the Economic Commission for Africa at its eighth meeting on 30 April 1982,

1. *Takes note* of the progress report on the Industrial Development Decade for Africa submitted by the Executive Director of the United Nations Industrial Development Organization and the Executive Secretary of the Economic Commission for Africa;[2]

2. *Takes note* of the proposals contained in resolution 1 (vi) adopted by the African Ministers of Industry at their sixth conference on the formulation and implementation of a programme for the Industrial Development Decade for Africa;

3. *Requests* the Executive Director of the United Nations Industrial Development Organization to adjust the work programme of the United Nations Industrial Development Organization so as to take fully into account the requirements of the Industrial Development Decade for Africa;

4. *Appeals* to the donor countries and institutions to increase their contributions to African industrial development within the framework of the programmes and projects formulated by the African Governments themselves with a view to achieving the target set by them for the African region of a share of 1.4 per cent in world industrial production during the Decade. In this regard contributions to the United Nations Industrial Development Fund for the financing of the programme for the Decade are strongly recommended;

5. *Requests* the United Nations Development Programme to consider increasing its support to the African Industrial Development Decade by allocating adequate financial resources to the programme for the Decade;

---

[1] ID/B/274/Add.1; E/ECA/CM.8/2.

[2] ID/B/274.

6. *Further requests* the relevant United Nations agencies to undertake necessary adjustments in their programmes with a view to contributing effectively to the implementation of the Industrial Development Decade for Africa as called for in General Assembly resolution 35/66B;

7. *Requests* the General Assembly to allocate adequate staff and financial resources so as to ensure the effective co-ordination and implementation of the activities of the United Nations Industrial Development Organization and the Economic Commission for Africa related to the Industrial Development Decade for Africa.

323rd meeting
28 May 1982