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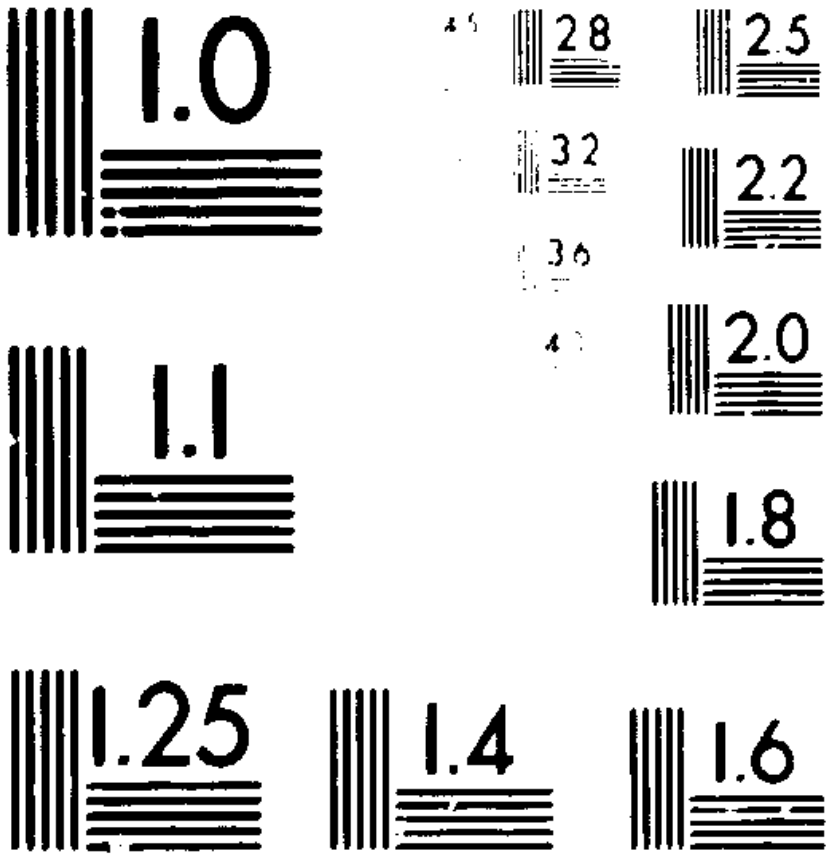

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THE INDUSTRIAL DEVELOPMENT DECADE FOR AFRICA: REVIEW OF PROGRESS, AND PROPOSALS ON WAYS AND MEANS TO ATTAIN ITS OBJECTIVES

Compendium of project proposals for the implementation phase (1985 - 1990) of the Industrial Development Decade for Africa */

Submitted by the secretariat of UNIDO

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C O N T E N T S

INTRODUCTORY NOTE

The profiles of the Project Proposals contained in this document have been prepared from requests received by UNIDO from African Governments and inter-governmental organizations as well as from concepts developed by the Secretariat based on experience acquired over the years in the provision of technical assistance to the developing countries in general and the African countries in particular. Since several of the requests received from individual governments are for technical assistance which are also applicable to other African countries, the Secretariat has expanded on the concepts contained in those requests and made provisions for other countries to benefit from similar assistance. This also has been the case with the concepts developed internally by the Secretariat.

In order to facilitate consideration, a list of the project proposals is presented at the beginning of the document along with their respective estimated costs and the pages in which they are contained in the document. A brief summary of each of these project proposals has been presented in the main document - Proposed Programme for the Implementation Phase (1985-1990) of the Industrial Development Decade for Africa (document ID/CONF.5/33). The projects which were adopted at each of the four subregional meetings on the promotion of intra-African industrial co-operation within the framework of the Decade and endorsed by the Seventh Conference of African Ministers of Industry which are contained in a separate document (document ID/CONF.5/CRP.1).

It should be emphasized that the project profiles and the modalities proposed for their implementation are open to review. Furthermore, the estimated costs are only indicative of the order of magnitude of funds required to implement the projects. It is envisaged that each of the project concepts would be developed in greater detail in consultation with the African countries and/or inter-governmental organizations concerned, taking into full account the views of any donor agency that might be interested in financing the project. At this juncture, the cost of implementing the project would also be defined in detail.

In the light of the above, the information contained in the project profiles should be regarded as a preliminary indication of the type of assistance to be provided and its estimated costs. It has been deemed useful to supply this information in order to stimulate the interest of potential donor and funding agencies in considering their financing. It is hoped that these agencies would examine each of the proposals and indicate those in which they would be interested to co-operate with the Secretariat and the relevant African countries or inter-governmental organizations concerned in their implementation.

LIST OF PROJECT TITLES AND ESTIMATED COSTS

PROFILES OF PROJECT PROPOSALS

No. 1

1. Title of project

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

2. Subregion/countries concerned

Project to be developed at a country level - see paragraph 7.

3. Objectives

The main objective is to design an industrial medium-term programme for the development of the national engineering industries (in particular the agricultural machinery industry) to meet the priority needs of the agricultural and rural sectors in terms of manufactured products (hand tools, agricultural machinery, storage facilities, first food processing equipment, equipment for irrigation, rural transportation, equipment for construction, energy, etc.), and of capabilities (repair and maintenance, design of adapted products, training, etc.).

The project will therefore help African countries to implement a practical industrial strategy and programme which will enable them not only to increase the national industrial output and technological development but will contribute to solve key socio-economic issues, like the food self-sufficiency, the creation of industries and jobs in rural areas, the modernization of traditional agriculture, the productivity of rural activities, the processing of agricultural products, the decrease of the rural/urban drift, all priorities stressed in the Lagos Plan of Action.

The experience drawn from the design and implementation of such integrated agriculture/industry strategy and programme in some selected African countries will benefit later to other countries. A basic function of such project will therefore be its catalytic role and multiplying effect.

4. Activities

A two-fold and complex activity should be carried out:

- The analysis of the real national needs for agricultural machinery, transportation equipment, local food-processing equipment, irrigation, storage, construction and all various rural equipment (metal engineering products used at the local rural level). Emphasis will be put on the equipment of traditional small and medium farming units and villages.

- The diagnosis of the existing manufacturing capacities, including for repair and maintenance, from the artisanal level to the large-scale industry. Appropriate methodologies will be used, covering the whole sector of capital goods and the industrial interlinkages.

The first phase would need a six months period. It would involve interactive work between national policy-makers and some high-level experts, under the guidance and co-ordination of UNIDO. Other organizations should be associated for certain aspects, like FAO (analysis of the needs and agricultural mechanization or food policies) or other development agencies (like EEC which is testing food policies in four African countries). The objective should be for UNIDO to have a catalytic role and co-ordinate various on-going actions at the national level. During the second phase (six months), alternative choices could be identified, proposed and discussed. A comprehensive industrial programme will be established in the frame of a global strategy chosen by the Government. This industrial programme will constitute a framework of reference for the national policy, for donor countries and for the potential partners from developed countries, for the aid organizations. Some of the projects identified will be implemented, if requested, in the frame of the UNIDO technical co-operation activities. UNIDO will monitor the implementation of the programme. The results will be analysed. The methodology and experiences will be diffused to other African countries (publications, seminars, ...).

5. Background/justification

African countries produce today less than 10% of the annual demand for agricultural machinery. Most of them are completely dependent on foreign technology, often not adapted, and 90% of African farmers are deprived of any use of any type of modern technology and use only hand tools. The inability of many African countries to produce enough adapted equipment for the priority agricultural and rural activities is one of the main bottlenecks in the dramatic fight of African populations to produce food, to get a minimal revenue, to improve the conditions of life and work at a minimum level, to attract young people to stay in villages, to modernize the rural economy. The problem is also to maintain and repair the more sophisticated imported equipment (tractors, pumps, motors, plant machinery) and manufacture necessary spare parts. Unfortunately, many African countries have not developed a minimal number of capital goods industries for meeting such needs; less than 1% of African manufacturing industry is active in agricultural machinery production when the total African population is made of more than 60% of farming populations.

An analysis of these problems has been made by UNIDO for the preparation of the First Regional Consultation on the Agricultural Machinery Industry in Africa (Addis Ababa, April 1982), based, inter alia, on 16 detailed case-studies. The innovative and thorough approach of UNIDO has been recognized by the participants of the Consultation, who adopted a comprehensive long-term regional Plan of Action (see paper 3, ID/WG.365/7). This Plan of Action was made of four proposed programmes, the first two being priority national programmes. A practical on-going follow-up is the preparation of a national plan of agricultural mechanization for the Republic of Cameroon to be implemented in 1984/85. Furthermore, three other main UNIDO actions are related to this basic UNIDO approach:

- A seminar held in Cairo, in October 1982, on the Design and Development of agricultural and rural equipment for African countries.

- A project for the promotion of the multi-purpose approach to the manufacture of agricultural machinery and other capital goods, including an expert group meeting in Beijing, in September 1984.

- The continuation of the research and the practical use of the methodology of Analysis of Technological Complexity (ATC) for capital goods.

The project concept proposed here is a synthesis of the programmes 1 and 2 recommended in Addis Ababa. Therefore, UNIDO has clearly the mandate, the background knowledge and information and the conceptual capacity to carry out such a project.

6. Estimated costs (Average cost per country)

Chief Technical Adviser, 10, m/m	$ 80,000
Short-term specialized experts, 9 m/m	56,000
UNIDO headquarters participation	10,000
Miscellaneous	4,000
TOTAL	$ 150,000

The cost of the national teams will be covered by the Government (about 2 man/year), as well as various costs involved for completing the work locally.

Total cost of the project for eight countries — $1.2 million

7. Workplan and countries to be considered for the period 1985 - 1990

- Each year, the project will be developed in three different African countries. The countries should have a clear policy in the field of agriculture and food self-sufficiency and the will to promote the national industries to meet the requirements of the agro-food and rural sectors. Basic conditions of real collaboration between the ministries of agriculture and of industry should be met. The EEC is presently testing national food strategies in some ACP African countries (Burundi, Kenya, Mali, United Republic of Tanzania). For the first year, some of these countries could be considered, since the basic information on the national priorities and strategies will exist.

- In each country, the project duration would be of about one year, with a very active and decisive participation of the national actors involved (policy-makers, industries, national centres and institutions concerned). A UNIDO Chief Technical Adviser will manage the project in co-operation with the national team and be assisted by specialized experts. The involvement of the UNIDO headquarters staff will not be only of an administration nature but also substantive. The possible sections to be involved are the Sectoral Studies Section in DIS, MEG Branch in PC, ENG and PLAN in DIO. An operational project team should be built in UNIDO to monitor the various national projects and the project as a whole.

No. 2

1. Title of project

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

2. Subregion/countries concerned

To be determined.

3. Objectives

Provision of supportive studies with policy guidance for the implementation of the programme for the IDDA. To contribute to enhanced and balanced industrial growth in individual countries in the medium and long term, through analysis of, and measures for, structural adjustment in the manufacturing sector and the establishment of new capacity, with a view to accelerating the implementation of the programme for the Decade.

4. Activities

(a) In each selected country, the experts will make a systematic diagnosis of current industrial production structures, (including such factor inputs as manpower, energy, technology and finance) and of the prospects and constraints faced by industry internally and externally;

(b) A programme containing a policy framework for industrial restructuring and development will be drawn up. Emphasis will be given to upgrading of products and production processes; accelerated local development of critical factor innuts; establishment of complementarity of production with other countries within respective subregions; sectoral integration, taking into account the increasing role of the informal sector in the industrial development process. The activities would be undertaken by teams of carefully selected national experts, UNIDO staff and internationally recruited high-level specialists, as appropriate. While the exercise is to be organized and monitored from UNIDO headquarters, the work would be carried out largely in the country concerned and, if desired, partly through relatively short-term missions to other countries in the subregion. Substantive responsibility for implementing the programme would rest with the Regional and Country Studies Branch, but close co-operation would be established with other relevant branches and sections in UNIDO.

5. Background/justification

The efforts launched in the context of the Industrial Development Decade for Africa provide a framework for programmed action of the nature described above. The current economic crisis has exposed various constraints and weaknesses in most African economies, pointing at the need for well-balanced and reinforced structures of the countries' manufacturing sectors to meet current challenges and fulfil prospects for accelerated industrial development. Particular emphasis will be laid on the rationalization and integration of established industries; the exploitation of expanded internal and subregional demand of the critical factor inputs, especially manpower, energy technology and finance.

6. Estimated costs

(a) The average cost per country is estimated to be:

Locally recruited experts, 12 m/m	$ 30,000
Short-term specialized international expert services at headquarters and field	48,000
UNIDO headquarters staff participation (including presentation and discussion of findings with policy-makers)	15,000
Administrative and research support	10,000
Miscellaneous	2,000
TOTAL per country	$ 105,000

(b) In addition, $30,000 per country study/project will be required during every second subsequent year for monitoring and follow-up workshops:

Locally recruited experts, 2 m/m	5,000
International specialized expert services at headquarters and field	18,000
Staff participation in field activity	7,000
TOTAL	$ 30,000

(c) Total costs:

1985: 2 countries	$ 210,000
1986: 2 new countries	210,000
1987: 2 new countries & 2 follow-up workshops	250,000
1988: 2 new countries & 2 follow-up workshops	250,000
1989: 2 new countries & 4 follow-up workshops	290,000
1990: 2 new countries & 4 follow-up workshops	290,000
TOTAL	$ 1,500,000

No. 3

1. Title of project

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

2. Subregion/countries concerned

Ten countries to be identified.

3. Objectives

(a) To assist the Government in reviewing its industrial strategy, industrial policy and institutional framework with a view to re-adjusting them in accordance with the prevailing needs of the country;

(b) to assist in strengthening the planning capacity of the Ministry of Industry and its relationship with parastatal organizations, as well as the preparation and appraisal of industrial projects; and

(c) to encourage a greater flow of investments in appropriate industrial subsectors, branches and areas.

4. Activities

The activities of the project, which will consist of the following, will be specified in the project document which will be prepared during the 6 m/m preparatory assistance phase:

(a) A quantitative and qualitative analysis will be made of the country's opportunities and potential problems for the establishment of a self-reliant and self-sustaining industrial strategy.

(b) Where possible, the impact of past and ongoing policies on the industrialization process will be reviewed and evaluated.

(c) The main procedural and institutional constraints to industrial development will be reviewed and assessed.

(d) Assistance will be provided to the Government in defining clear objectives for the contribution of the industrial sector to self-sustaining and self-reliant economic development.

5. Background/justification

The establishment of self-reliant and self-sustaining development calls for re-adjustment and restructuring of the industrialization process in order to exploit national resources and satisfy the needs of the population and the economy. Governments will play a key role in the management and support of this re-orientation process. First, Governments need to identify new opportunities and assess the main constraints upon self-sustaining and self-sufficient industrialization; then they should review and revise the industrial policy environment in order to support the promotion and efficiency of industrial investment in priority branches, including the promotion of an integrated network of small scale industries; finally the Governments will have to re-organize

the supporting institutional arrangements to ensure efficient and appropriate management and support for industrial development.

Lesotho, for example, is a small country and is very much dependent upon her highly industrialized neighbour, the Republic of South Africa, which employs 50 per cent of Lesotho's male labour force and provides more than 90 per cent of the imports, mostly consumer goods. In order to achieve the objectives of its Third National Development Plan (1981 - 1985) the Government's policy is to attract foreign investors and to support local entrepreneurs in establishing export oriented and import substitution industries.

There is at present no assessment of the results so far achieved in the implementation of the Development Plan. However, recent trends indicate that the Government is not achieving its objectives, as there has been much less employment creation than expected. Almost all industrial developments have been concentrated in Maseru, the capital city, and Mapetsoe. There are few linkages between the modern industrial sector and the rest of the economy. The Government has therefore decided that adjustments in the industrial strategy, policies and incentive measures are needed and that a more elaborate and better monitored industrial planning process is required in order to achieve the stated objectives. The following are the main weaknesses:

- There is a lack of co-ordination between Government Ministries and bodies which are supporting the industrialization process.

- The Ministry of Industry is understaffed, not well organized and lacks the capacities to formulate and monitor the industrial strategy, policies and development programmes of key industrial sectors.

- Criteria used to evaluate projects submitted to the Industrial Licencing Board and the Pioneer Industries Board are inadequate.

- There is a lack of an overall industrial information management system to assess and monitor the development of the industrial sector

- The Co-ordination mechanisms between the Ministry of Industry and the two parastatals Lesotho National Development Corporation and Basotho Enterprises Development Corporation are ill-defined and do not enable the Ministry to guide and monitor these two key development institutions in an efficient manner.

6. Estimated costs (per country)

A team of international consultants:	
1 Industrial economist	8 m/m
1 Marketing economist	3 m/m
1 Technologist	3 m/m
1 Specialist in industrial policies	3 m/m
1 Specialist in the promotion of small-scale industries	3 m/m
1 Specialist in institutional development	3 m/m
	23 m/m ——— $ 184,000

Headquarters mission to review and present to the Government the recommendations proposed by the team of international consultants	10,000
Administrative support	4,000
Miscellaneous	2,000
TOTAL per country	$ 200,000
Total cost for ten countries	$2,000,000

No. 4

1. Title of project

Assistance in the revision of subregional industrial promotion programmes and policies.

2. Subregion/countries concerned

North, West, Central, Eastern and Southern subregions of Africa

3. Objectives

To assist the subregional organizations in reviewing and updating their industrial policies with a view to intensifying subregional industrial co-operation and integration.

4. Activities

(a) Where possible, the impact of past and ongoing subregional policies on the promotion of subregional industrial co-operation will be reviewed and evaluated.

(b) Recommendations will be prepared for the adjustment of the subregional industrial policies in the trade, investment, technology, manpower and energy sectors in order to intensify the promotion of subregional industrial co-operation.

5. Background/justification

The Lagos Plan of Action and the programme of the Decade outline a far-reaching regional approach to economic development based on the concepts of self-reliance and self-sustaining development. Both documents emphasize the integrated socio-economic development of the region, principally through the establishment of a sound industrial base designed to meet the interests of each country and strengthened by complementarities at the subregional and regional levels. In 1983 and 1984, UNIDO, in co-operation with ECA and OAU, organized four subregional meetings on the promotion of intra-African industrial co-operation within the framework of the IDDA. At those meetings, an integrated industrial promotion programme was prepared for each subregion.

This project aims at assisting subregional organizations in the establishment of a coherent policy environment to contribute to subregional industrial co-operation and in particular to the implementation of the above-mentioned subregional integrated industrial programmes.

6. Estimated costs (per subregion)

1 Industrial economist,	6 m/m	
Specialist consultants in trade, investment, technology, manpower and energy,	9 m/m	
Sub-total	15 m/m	$ 120,000
Headquarters missions to review and present the policy recommendations of the team of consultants		20,000
Administration support		4,000
Travel costs within the subregion		4,000
Miscellaneous		2,000
TOTAL		$ 150,000
Total cost for the four subregions		$ 600,000

No. 5

1. Title of project

Strategy for the development of the pharmaceutical industry.

2. Subregion/countries concerned

Five countries to be selected, including Angola.

3. Objectives

(a) To contribute to the improvement of the country's social health sector and promote self-sufficiency in the manufacture of commonly-used essential drugs.

(b) To promote the development of a pharmaceutical industry based on the utilization of local raw materials, employment of local manpower and development of technical skills.

(c) To assess the viability and benefits of establishing local pharmaceutical production and devise a long range strategy for the development of the pharmaceutical industry in Angola by carrying out a detailed techno-economic study of the available capacities, raw materials, technical manpower and the national market for pharmaceuticals.

(d) To determine the technical assistance to be provided for installation and running of pharmaceutical plants, including a formulation unit and a unit for basic production based on the utilization of medicinal plants.

4. Activities

(a) The general situation in the field of pharmaceutical production will be evaluated to give an estimate of existing production and quality control facilities.

(b) An assessment will be made of raw materials and national resources relevant to the pharmaceutical industry, e.g. botanical resources, abattoir wastes, basic chemicals, packaging and auxiliary materials.

(c) Assistance will be provided, in co-operation with the Ministry of Health, concerned departments of the Government and representatives of the World Health Organization (WHO) in Angola, to draw up a list of essential drugs.

(d) Based on the list, efforts will be made to identify the different types of pharmaceuticals in current and future demand which could be easily and economically manufactured locally.

(e) A corresponding production programme will be worked out, including production of ready-made essential drugs and extracts produced from medicinal plants, drugs and products derived from abattoir wastes.

(f) In co-operation with Government authorities concerned, a strategy will be prepared for the production of essential drugs in new and existing facilities, in order to attain self-sufficiency.

(g) An evaluation of available buildings will be made to identify the best location for new facilities.

(h) Specifications for purchase of equipment and machinery for both production and quality control will be drawn up.

(i) Taking into account current and projected demand, an assessment will be made of the quality and quantity of intravenous fluids used in Angola and demand for solutions and packs for each type of product.

(j) In co-operation with the Government authorities concerned, an examination will be made of the possibilities for local production of intravenous fluids, taking into account production capacity and types of intravenous fluids to be manufactured.

5. Background/justification

Bearing in mind the growing importance of health care as an integral aspect of economic development, the Government of Angola has expressed keen interest in developing its pharmaceutical industries sector many other African countries are developing a social security system unique in this region and by which the Government would be responsible for the supply of drugs for the people. At present, requirements for pharmaceuticals in most African countries are met through imports with a very high value which, for Angola, amounted to more than $30 million. Modern facilities for the manufacture of essential drugs therefore need to be established in the countries to save increasing amounts of foreign exchange.

An integral part of the project will comprise preparatory assistance for the establishment of intravenous fluids plants. Due to the non-availability of intravenous fluids, the infant mortality rate has been rather high. Such plants will help to improve overall health care, reduce the infant mortality rate and, simultaneously, save considerable amounts of foreign exchange.

In connection with this project, the Government of Angola has requested UNIDO, as follow-up to previous assistance, to assist in preparing a detailed strategy as Phase I of the project, based on the statistics and data available in the country, and to plan the establishment of the pharmaceutical industry for the country as Phase II, including the setting up of an intravenous fluids plant at Malange.

6. Estimated costs

Expert services, 12 m/m	$ 90,000
UNIDO technical and administrative support	20,000
Training	100,000
Subcontracts	100,000
Equipment	50,000
Miscellaneous, including production of report and operation and maintenance of equipment	40,000
TOTAL cost per country	$ 400,000
Total cost for five countries	$2 million

No. 6

1. Title of project

National workshops on the Industrial Development Decade for Africa.

2. Subregion/countries concerned

To be identified; (about 4 countries per year over five years).

3. Objectives

(a) To sensitize well-defined target groups (decision-makers in government, industrial leaders, relevant institutions such as Chambers of Commerce and Industry, universities, development financial institutions) on the objectives, strategy, and programme of the Decade;

(b) To assist the Government in assessing its national industrial objectives and priorities in the light of the Lagos Plan of Action and the Decade programme;

(c) To assist the Government in identifying measures for re-adjusting or reformulating their industrialization strategies and policies in accordance with (b) above, taking into account the need for subregional co-operation, and especially in the development of strategic core industries;

(d) To lay the ground work for the preparation of an industrial master plan which will provide the framework of the implementation of the Government's industrialization programme;

(e) To identify ways and means of ensuring more effective co-ordination and contribution of the existing institutions in the industrialization process.

4. Activities

The main activity of the project will comprise a one/two week workshop attended by decision-makers in Government, industry and other concerned institutions. At the workshop, the participants will be presented with the objectives, strategy and programme of the Decade. On the basis of a background document, prepared by a consultant, on the country's industrialization process (existing situation, opportunities and constraints, Government objectives and policies, relevant substitutions) the participants will then review and, eventually, modify the objectives for the industrial sector, the priority industrial sub-sectors, the supporting industrial policies and institutional framework. Finally, they will propose guidelines for the preparation of an industrial master plan which will provide the framework to achieve the revised industrial strategy.

5. Background/justification

The re-adjustment of the industrialization process of African countries called for in the programme of the Decade requires Governments to undertake an in-depth re-examination of their current industrialization strategy, policy and programmes in order to realign them with the priorities and objectives of the Decade within the framework of the Lagos Plan of Action. The support and active co-operation of high level decision makers in the concerned ministries, industries (public and private sectors) and institutions (promotion offices, banks, etc.) is also important.

6. Estimated costs (per national workshop)

Industrial economist 4 m/m	$ 32,000
Administrative support	5,000
Headquarters mission to prepare and participate in the workshop	10,000
Miscellaneous including preparation of documentation and reports	3,000
TOTAL cost per country	$ 50,000
Total cost for two countries	$1,000,000

No. 7

1. Title of project

Rehabilitation programme - direct assistance to industry.

2. Subregion/countries concerned

To be identified.

3. Objectives

The objective of this project is to improve plant operations, productivity and efficiency through the identification of problems and prescription of remedial measures in specific industrial plants facing operational problems. The points to be considered in such a programme would include technical and management problems related particularly to capital and resource planning; purchasing and material control; operations scheduling and control; capacity and manpower planning; production and quality control; maintenance; organization, financial management; and marketing.

4. Activities

The activities to be carried out in the course of the project include the following:

(a) Diagnostic analysis of existing situation and capabilities in selected industrial sectors

This will consist of the collection and analysis of information and operational and breakdown of major equipment and efficiency of production processes; specific causes of equipment failures, plant shutdowns and operational problems; problems encountered in implementing corrective measures such as organization of production, spare parts availability, resource constraints, etc. On the basis of the information collected and the analysis made, a recommended rehabilitation programme will be proposed related, in particular, to the technical, production, management, financial and manpower aspects. The programme will also suggest suitable measures for its implementation including, where possible, the use of local industrial consultancy organizations.

(b) Operational and institutional building phase

Pending the introduction of the rehabilitation programme, direct short-term assistance would be provided to the plant to solve immediate problems related to the: introduction of appropriate management and organizational schemes; intensified production improvement including organization, rehabilitation of equipment and re-tooling programmes; development of appropriate MIS, particularly in financial accounting areas (taking into account the application and use of minicomputers); organization of intensive training programmes for local experts, plant personnel and production engineers; improvement of design or re-design of products in accordance with market and production possibilities; organization of supply and distribution schemes, taking into account such aspects as stocking, packaging, transport, etc; development and introduction of maintenance programmes, and the improvement of energy consumption.

5. Background/justification

The problem of industrial rehabilitation is increasingly being recognized as one requiring special attention. Recent studies and field inspections of industrial facilities show that the most common causes of industrial performance problems in developing countries consist, among others, of management, technical, productive and the non-existence of organized approaches towards maintenance, and lack of experience by plant personnel in this field are, for example, two major obstacles which can be overcome through technical assistance programmes. Improvements in plant level management and maintenance have a direct impact on capacity utilization of the plant and hence on its financial performance.

Besides the problems of maintenance and repair, a number of other areas also have to be tackled. These areas concern those issues related to financial and economical aspects as well as to technological and technical areas. In most of the plants the accounting and budgeting systems have to be strengthened by introducing cost accounting and improving cost accountancy and control practices. With regard to technical and technological aspects, technological alternatives should be reconsidered. Similar considerations concern organization of production, renovation of equipment, re-tooling of equipment, marketing, etc. Another area to be tackled is the supply of necessary inputs such as spare parts, energy, raw materials, etc., as well as the distribution of finished products. As far as the products are concerned, design up-dating or possibly an adaptation of design in accordance with market and production possibilities has to be considered.

6. Estimated costs

Chief technical adviser/industrial maintenance management expert,	12 m/m	
Industrial engineer, specialized in production,	8 m/m	
Industrial economist, specialized in organizational and marketing,	8 m/m	
Maintenance systems specialist,	4 m/m	
Short-term consultants specialized in food processing, metalworking and other subsectors,	18 m/m	
Sub-total	50 m/m	$ 500,000
UNIDO technical and administrative support		30,000
Training, including in-country group training, seminars and workshops; fellowships and study tours abroad		30,000
Equipment		50,000
Miscellaneous, including reproduction, translation, etc.		40,000
TOTAL cost per country (or group of countries)		$ 650,000
Total cost of project for ten countries (or groups of countries		$6,500,000

No. 8

1. Title of project

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

2. Subregion/countries concerned

Two to four selected African countries.

3. Objectives

To demonstrate the possibility of practical implementation of a programme for integrated development of the leather industry through co-operation between African countries and medium- and small-scale enterprises and co-operatives in one or two industrialized countries. A successful demonstration would convince other countries, both developing and industrialized, of the practicability of this approach.

4. Activities

Phase I

On the basis of sectoral studies already undertaken,[1/] a small number of African countries would be selected for an in-depth study of existing resources and constraints, in order to draw up an integrated development programme of the sector. This study would have to take into account, inter alia the following elements:

- Requirements for the improvement of raw hides and skins;
- Necessary inputs for improving the utilization of existing capacity in tanning and leather products;
- Possibilities for the use of locally produced tanning chemicals;
- Technical, management, training and marketing requirements;
- Investment and working capital requirements for the overall plan;
- Possible bilateral arrangements with enterprises in other countries;
- Assessment of potential economic benefit from sectoral development;
- Assessment of advantages of graduate development from semi-processed leather to finished goods. (The possibility of opting for production of manufactured goods without proceeding through all intermediate stages should be given particular consideration.

Phase II

On the basis of the survey in Phase I, a part of the leather system which could be regarded as a sub-system amenable to an integrated approach would be identified (for cost reasons, as indicated below). A plan for integrated development covering this part of the sector would be drawn up.

Phase III

When the plan has been approved by national authorities concerned, it would be negotiated and implemented in full co-operation with national and international authorities, enterprises, financial institutions, etc.

The programme should be fully comprehensive and not, a priori, exclude any form of international co-operation. Private investment, public investment, aid, technical assistance, commercial financing (notably, programme lending) should be combined in a suitable package to achieve the development goal of the programme in the most efficient way. The main activity of the project is to assemble this package.

The administration of the programme must be entrusted to a "supra-divisional" Task Force, following the model of the UNIDO IV Task Force rather than that of a usual "inter-divisional" Task Force.

5. Background/justification

The validity of an integrated programme approach as a relevant framework for international co-operation for the development of the full potential of the raw hides and skins and leather and leather products industry was recognized by the Third Consultation on the Leather and Leather Products Industry (Innsbruck, Austria, 1984). The appraisal of the validity of an integrated approach was based on the studies already undertaken on the sector.[2/] The need to mobilize small- and medium-scale enterprises and co-operatives in industrialized countries has been repeatedly stressed in UNIDO studies and meetings. There is, however, no national or international organization with the authority or the incentive to design and implement such a programme. If this could be done, even on a very limited scale, it would attract the interest of other developing countries and of more high-powered donors, investors and financing agencies. It would obviously be preferably to take the complete leather sector as a target for the programme but, for cost reasons, this is not possible. A part of the sector must therefore be selected.

6. Estimated costs (per country)

Phase I	Preparation of case studies: Consisting of 4 m/m of expert service and UNIDO headquarters staff participation in field work ----------	$ 40,000
Phase II	Design of plan, 4 m/m ----------	30,000
Phase II - III	Negotiations, discussions, agreements and preparations to reach the implementation stage ----------	30,000
	TOTAL cost per country	$ 100,000
	Total cost for ten countries	$1,000,000

1/ The "leather and leather products industry: Trends, prospects and strategies for development" (UNIDO/IS.442); "Strategies for increasing the production of tanning chemicals in developing countries" (UNIDO/IS.448).

2/ Ibid.

No. 9

1. Title of project

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

2. Subregion/countries concerned

Each of the four subregions.

3. Objectives

Contribution, through supportive studies, to national and interregional co-operation strategies for the integration of external and domestic inputs to industrialization.

To contribute to enhanced and effective use of external inputs to the manufacturing sector by assessing their existing nature and magnitude and formulating recommendations for their mobilization and application, with special reference to the possibilities for substitution of external inputs through extended domestic inputs and regional co-operation.

4. Activities

(a) In respect of all the countries of the region, a detailed study will be made of current external inputs to the manufacturing sector. Special attention will be paid to the flows of official development assistance (ODA) to the manufacturing sector; in general, the inputs to be examined will include finance (both official and private), technology and human resource development (training from external sources), raw materials and other intermediate inputs in the form of imports, and primary inputs in the form of skilled and other labour. The information to be collected and analysed will therefore be broad enough in scope to indicate the full dimensions and character of the external inputs to the manufacturing sector in Africa.

(b) Proceeding from the above assessment, the second phase would include the drawing up of a series of recommendations covering how external inputs should be changed or re-directed for most effective use, and how domestic resource mobilization and regional co-operation schemes could accelerate the industrialization process by substituting identified complementarities, for external inputs as far as possible. Particular attention would be given to the need to "unpack" donor packages, so that partial substitution of external inputs could still take place even when national or regional resources were not fully adequate for the project in question.

The activities would be carried out largely by UNIDO staff, with research assistance and two outside consultants specialists in international trade and resource flows. Occasional staff travel would be necessary for consultation with major donor groupings in developed countries, but the work would be carried out at UNIDO headquarters, with the Regional and Country Studies Branch assuming substantive responsibility for implementation in close co-operation with other relevant branches and sections of UNIDO.

5. Background/justification

About one-third of all official development assistance (ODA) goes to Africa and in many cases the role of ODA in African economies is very important. The extent, however, to which ODA and other external finance is contributing to industrialization in Africa is a question that needs detailed examination in the context of the need for greatly increased mobilization of resources to achieve the objectives of the Decade. Other external inputs to the sector are also critical: these include both official and private flows of technology and training. Again, the importance of imports of capital and intermediate goods is such that present constraints on these have led to wide spread under-utilization of capacity and the erosion of the industrial base. An overall assessment of all these external inputs to the sector would enable the preliminary identification of areas in which critical gaps existed or in which change was needed. Recommendations could then be made on such subjects as the altered patterns and nature of ODA, in order to ensure utilization of indigenous inputs whenever possible and to direct scarce external resources towards essential areas of the manufacturing sector. Other forms of industrial financing which will be examined in this context include: enhanced domestic capacity for an improved and more structured absorption of external inputs; and co-operation schemes for African regions for the increased utilization of existing regional resources through exchange of commodity, financial, technological, and human resources. The study will thus provide a basis for detailed country-by-country analysis of programmes for external input use in the context of restructuring African economies for accelerated industrialization, and for parallel analysis of subregional co-operation schemes.

6. Estimated costs (per subregion)

1 Project co-ordinator(12 m/m)	$ 96,000
4 Industrial economist (12 m/m)	96,000
Short-term experts (10 m/m)	80,000
Administrative and Research assistance	10,000
UNIDO Technical Support services	15,000
Miscellaneous including computer time	3,000
TOTAL	$ 300,000

Total cost for all four subregions $1,200,000

No. 10

1. Title of project

Assistance in the formulation and implementation of national industrial master plans.

2. Subregion/countries concerned

About five countries to be selected.

3. Objectives

To prepare an industrial master plan which will serve as a framework for public and private investments and for the establishment of an integrated industrial structure based on the exploitation of national resources and the satisfaction of the needs of the population and economy.

4. Activities

(a) Techno-economic studies will be carried out to assess the present status, opportunities and constraints of industrial development, at both sectoral and subsectoral levels.

(b) Key industrial subsectors and processing chains which will contribute to a self-sustaining and self-reliant economic development will be identified.

(c) An industrial master plan will be formulated, setting objectives, targets and integrated programmes for the development of the identified key industrial subsectors and processing chains.

(d) Measures and plans of action will be formulated to support the implementation of the industrial master plan in areas such as trade, investment promotion, technology, manpower, energy, supply of raw materials, infrastructure, etc.

(e) Recommendations will be provided for improvements in the organization and management of the industrial planning process, including effective co-operation between the ministries and institutions involved in the preparation and implementation of the plan.

(f) A training workshop in the preparation and implementation of an industrial master plan will be held.

5. Background/justification

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.

6. Estimated costs (per country)

Team of international personnel

1 Industrial economist/Chief Technical Adviser,	24 m/m	
Sectoral specialists,	24 m/m	
1 Specialist in institutional infrastructure,	6 m/m	
1 Specialist in technology,	6 m/m	
1 Specialist in industrial financing,	6 m/m	
1 Specialist in manpower development,	6 m/m	
Sub-total	29 m/m --	$ 576,500
Headquarters technical supervision, monitoring and evaluation of the project		15,000
Administrative support		15,000
Project car and other equipment		10,000
Miscellaneous		4,000
TOTAL cost per country		$ 620,000
Total cost for five countries		$3,100,000

No. 11

1. Title of project

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

2. Subregion/countries concerned

Each of the four subregions.

3. Objectives

To improve the overall industrial infrastructure of Africa by assisting the development of railways. Specifically, the project will have the following objectives:

(a) To survey existing steel-making facilities in Africa and determine the increase in capacity and range of production needed to meet the demand for plain carbon and special steel rails, pressed steel sleepers, and metallurgical products required for the development of the railways.

(b) To formulate and, as a second phase, provide the technical assistance programmes required to increase the technological and metallurgical capability to produce locally the full range of steels required for the railways throughout Africa.

4. Activities

Phase I

In close co-operation with the Union of African Railways, a consultant study will be made of steel production and rolling facilities to produce the steel rails, pressed sleepers and other metallurgical products required by railways in Africa. A master plan will be drawn up by the consultants, taking into account the status of, and known plans for, the national development of steel making and medium-section mill rolling facilities, as well as the future demands for rails, pressed sleepers and other steel finished products required for the expansion of the African Railways. Particular attention will be paid to the technological capability of the steel plants in Africa to produce high wear-resistant steel for heavy duty rails (52 - 54 kg/m), currently not produced in Africa, and also rails with good weldability, both of which are needed to transport the vast quantities of minerals in certain parts of the continent.

Phase II

This would entail the provision of the required know-how to produce and fabricate the various carbon and alloy steels and roll the special steel rails which will be needed for the development of the railways. Only very provisional cost estimates can be made at this stage. Actual expert inputs will be elaborated in the consultant study in Phase I.

5. Background/justification

Assistance to the African railway engineering sector is one of the most urgent priorities of the Decade, due to its direct relationship to the overall economic and social problems confronting African countries. The density of the African railway network is very low: in an area of 29 million km^2, Africa has only 80,706 km of track - an average density of 2,63 km per 1,000 km^2. Europe, which has other highly developed modes of transport, has over 60 km of track per 1,000 km^2. In the African continent, 11 countries have no national railway or section of an international railway (Burundi, Chad, Central African Republic, Equatorial Guinea, Gambia, Guinea-Bissau, Niger, Lesotho, Libyan Arab Jamahiriya, Rwanda, Somalia).

The African railway network is made up of a series of secondary networks, most of which are national in character and often independent, with varying technical characteristics. The European gauge is used in North Africa from Morocco to Egypt. The standard African track gauge is used on the South African countries' network and in Ghana, Nigeria, Sudan and Zaire. The metric track gauge is used by the railways of West Africa and East Africa. The adoption of 1,067 m as the standard gauge for the entire continent would facilitate the interconnection of the networks, and the unification, development and improvement of railway services and facilities for the production and maintenance of railway equipment.

6. Estimated costs

In view of the prior involvement and availability of the required know-how and expertise, special consideration might be given to utilizing partly contributions made by the Government of the Arab Republic of Egypt for Phase I of the project.

More precise cost estimates for Phase II will be available at the end of Phase I.

Phase I

	1985
International expert services, 20 m/m -	$ 160,000
Local experts	20,000
UNIDO technical and administrative support	15,000
Miscellaneous	5,000
Sub-total	$ 200,000

Phase II

	1986
International expert services, 60 m/m -	$ 480,000
Local experts	100,000
Training	100,000

UNIDO technical and administrative support	40,000
Miscellaneous	30,000
Equipment (e.g. for testing and quality control at the factory level)	50,000
	$ 800,000
Total cost per subregion for phases I and II	$1,000,000
Total cost for all four subregions	$4,000,000

No. 12

1. Title of project

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

2. Subregion/countries concerned

OMVS member countries (Mali, Mauritania and Senegal).

3. Objectives

To prepare a master plan outlining the industrialization strategy to be adopted by the Member States of OMVS.

4. Activities

The proposed master plan is intended to:

(a) Determine the industrial specialization of each member country with regard to agro-industry possibilities in the basin.

(b) To identify multinational projects for the OMVS countries which will give a positive impact on the accelerated economic development of the region.

(c) To prepare pre-feasibility studies for projects to be implemented in the short run.

(d) To assist the OMVS Secretariat in designing financing plans for the mobilization of investment funds required for the setting up of the industries.

(e) To assist the OMVS Secretariat in evaluating the engineering studies in providing the necessary technical assistance.

5. Background/justification

During a first phase of assistance to OMVS in 1970, under project SI/RAF/75/035, UNIDO provided a team composed of an industrial economist, a mechanical engineer, an agro-industry engineer, and a building materials engineer for a period of five months to conduct industrial surveys in specific fields of competence. The report of the team was approved by the OMVS Council of Ministers in July 1977, and the OMVS Secretariat was given a mandate to continue the necessary programme of studies to enable the council to take, as quickly as possible, appropriate decisions leading to the implementation of selected subregional industrial projects. It seems likely that priority will be given to industry projects such as production of cement, irrigation pipes, irrigation pumps, agricultural machinery and processing of agricultural products.

6. **Estimated costs**

Personnel costs	$ 670,000
Follow-up mission	20,000
Training	100,000
Subcontracts	150,000
Equipment	40,000
Miscellaneous	20,000
TOTAL	$ 1,000,000

No. 13

1. Title of project

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

2. Subregion/countries concerned

Ten countries to be determined.

3. Objectives

Provision of supportive studies with policy and guidance for the implementation of the programme for the Industrial Development Decade for Africa.

(a) To explore the present state and prospects of the food-processing sector in order to identify production, technological and economic constraints and to elaborate recommendations concerning ways and means of overcoming them for each individual country under consideration.

(b) To evaluate the present contribution of small- and medium-scale enterprises and co-operatives with the total output of this sector and to ascertain the adequate measures for increasing the efficiency and productivity of these actors.

4. Activities

Firstly, a study on the food-processing sector in each selected country will be elaborated. It will consist of four main parts. The first one will include a comprehensive but concise analysis of the present performance of the food-processing sector according to major economic indicators, its nature, availability of indigenous raw material, existing links between agriculture and processing, marketing, involvement of foodstuffs in international trade. The identification of major constraints affecting the development of the sector will be considered in the second part of the study, while the third part will embrace the proposals for necessary actions to be implemented in order to increase the capacity utilization level and promote this industry in African countries. Special consideration will be devoted in the fourth part to the largest group of food producers, namely small- and medium-scale enterprises and co-operatives. Emphasis will be given to enumerating all indispensable measures which should be adopted to revitalize and increase the productivity of these actors.

Secondly, the recommended actions, listed in priority order in the studies, should serve as a basis for launching the next phase of the project, namely the assistance needed in carrying out the specific projects connected with the improvement of performance by the food-processing industry.

The activities would be undertaken by teams of carefully selected national experts, UNIDO staff and internationally recruited high-level specialists, as appropriate. While the project will be organized and monitored from the UNIDO headquarters, the work will be largely carried

out in the country concerned and partly through short-term missions to other countries in the subregion, if so desired. The substantive responsibility for implementing the programme would rest with the Negotiations Branch but close co-operation would be established with other relevant branches/sections in UNIDO (Sectoral Studies Branch, Agro-Industries Branch).

5. Background/justification

The selection of the project stems directly from the recommendations adopted at the First Consultation on the Food-Processing Industry.

The food-processing sector, being the leading industrial sector in practically all African countries, contributes largely to their national income. However, its development is far from satisfactory due to various internal and external obstacles even though large potentials exist within the African region to remedy the situation. As a consequence, the imports of foodstuffs to African countries, industry food aid, is often an imperative necessity.

In order to achieve self-sufficiency in food and self-sustained development of the food-processing sector as called for in the Lagos Plan of Action and the Programme for the Industrial Development Decade in Africa, comprehensive remedial actions are needed. As a first step, the examination of the existing performance of the sector, identification of the critical points in such performance and the enumeration of necessary measures should be elaborated in the form of sector studies for selected African countries.

6. Estimated costs

The average cost per country study/project is estimated to be:

Phase I

Locally recruited experts, 8 m/m	$ 16,000
Short-term specialized expert services at headquarters and field, 4 m/m	30,000
UNIDO headquarters staff participation, including presentation and discussion of funding with policy-makers	10,000
Research assistance/GS temporary assistance at headquarters, 2 m/m	4,000
Sub-total	$ 60,000

Phase II

For implementation of the specific projects resulting from the recommendations included in the studies, the same amount of $60,000 should be envisaged.

Total cost of phases I and II	$120,000
Total cost for ten countries	$1,200,000

No. 14

1. Title of project

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

2. Subregion/countries concerned

Each of the subregions.

3. Objectives

Provision of a phased integrated package containing technical assistance-linked training:

(a) in industrial extension services directed towards the small enterprise level;

(b) in specialist activities of the intermediate channels of finance at the national level (i.e. development finance institutions, banks, etc.), which link small enterprises to external sources of finance.

To assist in putting into place systematic and effective programmes necessary for a thriving small enterprise sector with a view to accelerating the implementation of the programme for the IDDA.

4. Activities

(a) For each of the subregions, a 12-week training workshop for industrial extension officers will be organized in order to ensure competence in the provision of such commercial skills as book-keeping, budgeting, marketing, etc., to small enterprises and small entrepreneurs in the industrial sector. Concurrent with this, two UNIDO experts, one skilled in industrial engineering, the other in cost and works accounting, will be appointed for one year to assist in the implementation of effective schemes of industrial extension and will participate in these training workshops, although the operation of each training workshop will be the responsibility of an external specialized teaching institution (e.g. Delft University, Bradford University, Manchester Business School, Trinity College, Dublin, etc., which have specialist expertise), together with appropriate UNIDO staff (responsibility of the Training and the Institutional Infrastructure Branches), and will be based in an appropriate national institution.

(b) A sharply focused fellowship programme directed towards senior staff of domestic industrial finance institutions with the objective of providing external training in budgetary control internal to finance institutions and in loan supervision. These external fellowships will last for eight weeks, and 25 participants will be drawn from the countries in the subregion. Teaching will be based in a training or finance institution in the region twinned with an appropriate external teaching institution (responsibility of the Training Branch and the Feasibility Studies Section).

(c) A manual will be prepared containing information on the procedures of external finance agencies (bilateral, export credit, etc., of developed and developing countries) to be followed by borrowers in the use of lines of credit extended by these agencies, such as collateral and other loan security, record and reporting procedures, commitment and disbursement procedures, etc. This manual, which will be updated periodically, will provide the basic source material for a biennial fellowship programme based in a training or finance institution in the region (twinned with an appropriate external teaching institution) which will provide for fellowships in groups of 20 for a period of eight weeks (responsibility of the Feasibility Studies Section, the Negotiations Branch and the Training Branch).

(d) A phased investment promotion programme will be conducted to acquaint external finance agencies of the type mentioned in paragraph (c) above with the technical assistance and training efforts undertaken in individual African countries with regard to the effectiveness and efficiency in their use of external finance for small-scale industry development, as developed above in paragraphs (a) and (b), with the objective of promoting flows of finance from these agencies via domestic finance institutions to small-scale enterprises and entrepreneurs in individual African countries. In this regard, projects will be identified, prepared and promoted among these and other potential investors.

For the eastern and southern subregional programme, the special needs of Comoros, which has requested UNIDO for assistance to its Development Bank, will be considered.

6. Background/justification

In the Lagos Declaration and Plan of Action there is wide recognition inter alia of the important place of small-scale industrial enterprises in the industrial development of Africa. A similar recognition has been expressed in recent statements by the Heads of various multilateral finance agencies as well as by senior officials of the European Economic Commission. One necessary though not sufficient pre-condition in assisting the small-scale sector is the provision of industrial extension skills to such agencies as national industrial development corporations. Skills are required to assist the domestic entrepreneur, be that entrepreneur in the privatae sector, the State sector or the co-operative sector. Different skills are required in domestic finance agencies, in loan appraisal, monitoring, loan supervision, etc. A third set of skills is required in understanding and applying the procedures required of borrowers by external lenders; these procedures differ from lender to lender. It is recognized that such small-scale sector activities are expensive in terms of staff time and resources of institutions serving the sector. This integrated project can make an important contribution in initiating programmes at the national, subregional and regional levels for training in an economic and effective way in the areas identified. In the design of training programmes and the provision of technical assistance, account will be taken of the project related to a programme of economic advisory services for African industrial restructuring and development at the country level (project profile No. 2) and the complementary activities recently started jointly by UNIDO with the African Development Bank.

6. Estimated costs

The average costs for elements of the annual programme are as follows:

(a) Industrial extension programme	
Expert in industrial training, 12 m/s	$ 96,000
Experts in the organization of setting up extension services, 24 m/s	192,000
Training workshop at subregional level for about 20 participants	60,000
UNIDO headquarters technical and administrative support	40,000
Miscellaneous	12,000
Sub-total	$400,000
(b) Fellowship programme on budgetary control and loan supervision	
25 fellowships, duration eight weeks, estimated costs	$100,000
Expert services to assist in programme preparation	70,000
UNIDO staff participation	10,000
Sub-total	$180,000
(c) Fellowship programme on procedures required by external finance agencies	
25 fellowships, duration eight weeks, estimated costs	$100,000
Expert services to assist in programme preparation	70,000
UNIDO staff participation	10,000
Sub-total	$180,000
(d) Investment symposium (duration: 1 week)	
Travel and per diem (for 20 participants)	$ 45,000
UNIDO staff preparation, participation and administrative support	20,000
Miscellaneous	10,000
Sub-total	$ 75,000
Total for components a, b, c and d	$835,000
Total for entire programme covering all four subregions	$3,340,000

No. 15

1. Title of project

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

2. Subregion/countries concerned

Four countries to be selected, including Mali.

3. Objectives

(a) To improve, by refining simple appropriate technologies, the processing of agricultural products in rural zones and in this way promote better storage and marketing of these products whilst, at the same time, alleviating the work of rural women.

(b) To design and produce pilot processing for the commercialization of selected appropriate traditional technologies.

4. Activities

(a) A preparatory mission will be carried out in close co-operation with the African Regional Centre for Engineering Design and Manufacturing and the African Regional Centre for Technology to synthesize studies existing in the country, review documents and discuss selections with the authorities concerned in the areas to be investigated, to analyse products to be studied and the type of villages in which studies will be carried out.

(b) A mixed team of international, ARCT, ARCEDEM and local experts will be sent to two or three selected villages. General information will be collected and video recordings made of the different transformation processes. A preliminary report on information obtained will be made and discussions held with the authorities concerned.

(c) A study will be made of information obtained and a definition formulated of the transformation procedures to be adapted to the know-how encountered. Reasons will be provided for the proposed solutions. Depending on the results of the study, one or two processing lines will be set up according to the products selected.

(d) One of these production lines will be set up in a selected village. Trials will be carried out to assess materials which could be fabricated in the country.

5. Backgroumd/justification

It is well known that in rural communities certain traditional agricultural products such as karite, gombo, datou, etc, are pre-processed before consumption. Methods employed are often rudimentary with the main aim of allowing limited storage of the products. These methods are traditionally performed by women and children and often take up an important amount of labour-time. Any increase in the yield of

certain products, especially cereals, would result in increased losses since the rural technology system cannot absorb the surplus. It is thus important to solve this problem, not by transferring technology, but simply by improving that which exists and at the same time integrating up-to-date knowledge of the product, i.e. elementary hygiene, nutritional aspects and quality of consumptibles.

For the above-mentioned reasons, it is proposed that two or three typical villages be selected and certain essential products for identification and analysis of know-how and methods employed so that a two-prong strategy may be applied:

- Improving the processing and such as mixed flour (maize, sorghum, etc, etc.).
- Pre-industrialization of these methods and construction of small-scale machinery to carry out different functions.

This will result in the perfection of a totally endogenous technology, in improving working conditions especially for women, and the introduction of new types of consumption linked to existing production.

6. Estimated costs

Agro-industrial engineer, 12 m/m	$ 96,000
Mechanical engineer (rural technologies), 6 m/m	48,000
Sociologist, 3 m/m	24,000
ARCT and ARCEDEM participation	20,000
Locally recruited experts, 8 m/m	20,000
Equipment	160,000
UNIDO headquarters technical supervision and follow-up	20,000
Miscellaneous	12,000
TOTAL cost per country	$ 400,000
Total cost for four countries	$1,600,000

No. 16

1. Title of project

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

2. Subregion/countries concerned

African, Asian, including China, and Latin American countries.

3. Objectives

The objective of the project is to promote and intensify co-operation between African countries and organizations and those in Latin America and Asia, including China. This will involve the identification of areas of co-operation and, possibly, projects for joint implementation.

4. Activities

The activities of the project will include:

(a) identification of areas in which greater industrial co-operation could be promoted between African and Asian countries (including China) and organizations, and initiation of specific programmes and joint projects of co-operation for greater contribution by the Asian countries and organizations in the implementation of the programme for the IDDA;

(b) organization of two inter-regional meetings in India and China to review and agree on the areas, programmes and projects indicated in (a) above as well as periodic meetings to review and adjust, not only the programmes to be adopted in India and China, but also the one adopted in Rio de Janeiro;

(c) follow-up with African, Latin American and Asian countries and organizations for the preparation of joint projects, including the mobilization of financial resources for their implementation.

5. Background/justification

In 1983, the First Latin America/Africa Symposium was held in Rio de Janeiro, Brazil and in view of the positive results of the meeting and the Resolutions adopted by the Conference of African Ministers of Industry and the eighteenth session of the Industrial Development Board, similar programmes were considered for the Asian countries and China. It has also been considered necessary to take measures for the implementation of the above-mentioned programmes and to hold periodic meetings to review their implementation and to adjust them in accordance with the current requirements of the African countries.

6. Estimated costs

Organization of inter-regional meetings	$ 300,000
Identification, preparation and promotion of joint projects	450,000
UNIDO headquarters technical and administrative support	40,000
Miscellaneous	10,000
	$1,000,000

No. 17

1. Title of project

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

2. Subregion/countries concerned

3. The nine SADCC member countries (Angola, Botswana, Lesotho, Malawi, Mozambique, Swaziland, United Republic of Tanzania, Zambia, Zimbabwe).

4. Objectives

To contribute to accelerated and self-sustaining industrial growth in individual countries, as well as in the SADCC subregion, in the medium and long term, through the encouragement of industrial co-operation. This would permit maximum utilization of local resources in the manufacture of goods for local and export markets, with a view to achieving self-reliance and economic independence.

4. Activities

(a) Studies will be made on specific subjects or issues which are crucial to industrial co-operation and intra-SADCC trade in manufactures, (e.g. industrial financing, common external tariff, settlement of trade accounts, etc,) as follow-up of the study entitled "Industrial Co-operation through SADCC" (UNIDO/IS..) prepared by the Regional and Country Studies Branch.

(b) Specialists from each country will prepare country papers outlining their experiences.

(c) A workshop will be organized for senior policy makers, industrial strategists, financiers and promoters from the SADCC countries, and representatives of interested multilateral and intergovernmental donors or agencies. The workshop is to discuss and make recommendations on such strategies, policies, measures and programmes as would facilitate and foster industrial co-operation and intra-SADCC trade in order to promote industrialization in the subregion during the Decade.

(d) Investment projects will be identified, prepared and promoted among potential investors.

5. Background/justification

The efforts launched in the context of the Industrial Development Decade for Africa provide a framework for programmed action of the nature described above. The findings, conclusions and recommendations of the preliminary study "Industrial Co-operation through SADCC" call for follow-up action.

Among the constraints on industrialization in SADCC countries is the inadequacy of individual national markets. Particular emphasis will, therefore, be laid on: the formulation and implementation of programmes and measures for promoting a subregional market to support the establishment of certain types of manufacturing facilities, which would otherwise not be possible or feasible; the exploitation of expanded internal and subregional demand and higher value added in local production; the development of critical factor inputs, especially manpower, energy, technology and finance, as well as their maximum utilization in local manufacturing.

6. Estimated costs

12 m/m of locally recruited experts	$ 30,000
15 m/m of short-term specialized expert services at headquarters and field	120,000
Travel and per diems of about 20 participants to workshop	25,000
UNIDO headquarters staff participation, including attendance of meeting	15,000
Administrative support staff	5,000
Miscellaneous	5,000
TOTAL	$ 200,000

No. 18

1. Title of project

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

2. Subregion/countries concerned

Non-governmental organizations from all African countries will be considered for participation in the project.

3. Objectives

(a) To identify active national, regional and international non-governmental organizations (NGOs) and develop ways and means to incorporate them into the industrialization process of Africa.

(b) To inform leading NGOs of the objectives and the overall programme of the Decade and to mobilize a co-ordinated effort for a greater flow of technical and financial assistance from both African and non-African NGOs in order to support the activities of the Decade.

(c) To identify specific projects/programmes within the Decade in which African and other NGOs could co-operate with UNIDO and the concerned parties from Africa.

4. Activities

Phase I

(a) Two surveys will be conducted (one each for English- and for French-speaking countries) on active NGOs and appropriate business and industrial institutions in Africa and their present activities in the fields of industrial development; based on these surveys, a background paper on potential areas for co-operation between these NGOs will be prepared. The surveys will identify the activities of the NGOs, main industrial sectors, specific projects, and potential for co-operation between these organizations, UNIDO and African states in implementing projects in priority subsectors within the framework of the IDDA. The terms of reference for the above surveys will be formulated at a later stage.

(b) Backgroumd material on the Decade which provides the objectives and major aspects of the Decade Programme, indicates the strategies for major industrial subsectors and areas, and emphasizes the activities of UNIDO in support of the Decade, including specific programmes and projects being undertaken, will be circulated.

(c) Specific projects and/or concepts will be prepared. Branches and sections of UNIDO will be asked to prepare specific projects which could be organized and implemented jointly with the participating NGOs. The package of projects will be presented at a meeting (see (d) below) and will be the basis for the initiation of specific co-operation among the NGOs themselves, and between them and UNIDO.

The projects will also be the basis for follow-up activities to the meeting.

(d) A four-day NGO Forum will be organized between selected NGOs from within and outside Africa. The meeting will be held in an African country. In that connection, African locations possessing good meeting and interpretation facilities, such as Nairobi (Kenya) and Addir Ababa (Ethiopia) and which are willing to host the meeting, will be considered.

(e) A directory of active African NGOs and of NGOs from outside Africa interested in establishing co-operation with African countries, will be prepared.

Phase II

Specific projects identified during Phase I will be implemented (detailed projects will be prepared between the concerned countries, UNIDO and co-operating NGOs).

UNIDO is expected to get involved in many of the activities resulting from the NGO Forum, i.e. in the further promotion of resulting projects/agreements for co-operation and in supporting and ultimately cost-sharing some of the activities identified during and after the NGO Forum. Also, as a follow-up to the meeting, the final report will be distributed to all participating NGOs and other parties.

5. Background/justification

To support Africa's industrialization efforts, national, regional and international resources should be mobilized, co-ordinated and efficiently channelled to African countries. In view of the declining financial resources available for new programmes and projects, it is imperative that NGOs, business and related institutions be approached as a way of attracting additional resources to carry out activities in support of the Decade.

In this context, the present project should play an important role, as resources available to NGOs and related organizations could assist the African countries in areas such as investment and joint-ventures; transfer of technology; subcontracting; development and upgrading of industrial institutional infrastruture; design and development of industrial products; standardization and quality control; manpower training; promotion of exports within and outside Africa; upgrading of research and development institutes and universities. Consequently, NGOs working in Africa and international NGOs should be made aware of the importance of the objectives of the Decade and given practical guidelines on how to participate in its activities.

6. Estimated costs

Phase I (To be implemented in 1984/85)

Short-term experts for preparation of surveys (including specific programmes/projects) regarding African and non-African NGOs (one in French, one in English), 3 m/m each	$ 24,000
(Note: in order to reduce consulting costs, it is expected that consultants will be hired from international NGOs, which could make expertise available at nominal cost)	

Travel and per diem for 30 representatives of African NGOs to participate in the NGO Forum to be organized in Africa, including interpretation and other conference services	50,000
UNIDO headquarters technical and administrative support	20,000
Miscellaneous, including translation and printing of a final report of the meeting	6,000
Sub-total	$100,000

Phase II

Implementation of selected and identified projects (resulting from Phase I) during the period 1985 - 1988.	
Estimated UNIDO contribution	$100,000
Total cost of project for phases I and II	$200,000

No. 19

1. Title of project

Preparation of films, video cassettes and other promotional programmes for the Decade.

2. Subregion/countries concerned

All African countries.

3. Objectives

The development objectives of the project are to promote and popularize the Industrial Development Decade for Africa (IDDA) through the maximum involvement of the mass media - radio, television and press - as well as the national publicity machinery. This would help to create greater awareness inside and outside Africa of the priorities, specific programmes and requirements of the IDDA thus ensuring a greater commitment towards the fulfilment of the objectives of the Lagos Plan of Action and the Programme for the IDDA.

4. Activities

The activities of the project will include the following:

(a) Publication of a UNIDO bulletin on the Decade

The objective of the bulletin is to reach decision-makers, educators, labour leaders, industrialists, investors, national co-ordinating committees, national committees for UNIDO and NGOs with a view to keeping them informed on new developments, projects, technologies and opportunities in Africa. It will have a circulation of 25,000 in each language, rising to some 50,000 by 1990.

(b) Preparation of a series of movies and video cassettes on the IDDA

A series of movies on general and specific aspects of the IDDA will be prepared and widely circulated to the mass media, the business community and educational institutions in Africa and other interested countries. In addition to the movie currently under preparation on the launching of the IDDA, subjects being considered for the production of other include:

One Point Four Per Cent

Africa has set itself the target of 1.4 per cent as its share of world industrial production by the year 1990. Measures being taken or to be taken for increasing their industrial production would be highlighted. The 45-minute film will show what is being done and what still remains to be done to achieve this target and its implications on the economic development of Africa.

Industrialization in Africa by 1990

A rapid review of the measures taken, including the work of UNIDO towards the implementation of the Programme for the IDDA. The 30-minute film would show the variety of problems the African countries are facing and will have to face in the years to come and identify measures to be taken, including a pooling together of the knowledge and skills available in Africa for the achievement of the ideals of the IDDA.

African Women in Industrial Development

The 30-minute film would portray various aspects of the evolution of African women and the role they now occupy in their countries' development efforts and highlight their increased participation, growing responsibilities, and their vital contribution to the industrialization process in Africa.

Africa and new technological breakthroughs

A 30-minute film would be produced highlighting the possible impact of new technologies such as genetic engineering, biotechnology and micro-electronics in the industrialization of Africa. It will also highlight the implications of these technologies on the manpower and other technology capacity developments in the African countries.

Video cassettes

In addition to the films, video cassettes will also be produced on various aspects of the IDDA. A major concern in Africa is maintenance, rehabilitation and revitalization of the manufacturing industry. A series of video programmes in the priority industrial subsectors and areas would assist African countries in tackling one of their most serious problems. This entails technical, financial and technological inputs.

The objective of these video cassettes would be to help develop technical capabilities in African countries and to identify measures aimed at tackling the problems involved. The subjects to be selected for the production of the video cassettes will include the following: project design, evaluation and financing; factory establishment and management; manufacture and maintenance of simple food-processing equipment; agricultural tools and implements, water pumps, energy appliances; testing and quality control in selected industries; mini iron and steel fertilizer plants and hydropower generation plants; and techniques and methods of packaging, welding, forging, casting, industrial design, etc.

(c) Radio and TV programmes in Africa on the activities of the IDDA

A series of 5 - 15 minute radio and/or TV programmes will be prepared for wide circulation among national radio and TV networks in African countries for use in publicizing the IDDA.

(d) Use of national and selected international journals

Contacts will be established and maintained on a regular basis to ensure the involvement of national and international journalists to publish articles on the IDDA. The use of the UN Development Forum will be continued on a continuous basis.

(e) Organization of competitions

Competitions and quiz programmes will be organized at the national and subregional levels, among schools, universities and other institutions of higher learning, on IDDA-related subjects.

(f) Publicity and circulation of brochures and posters on the IDDA

A series of brochures and posters will be printed and widely circulated, especially in the African countries, for publicizing the IDDA. These will cover both general and specific aspects of the IDDA. In this connection, a campaign will be carried out for a wider circulation of the technical publications of UNIDO with a view to ensuring their more effective utilization by those who really need these documents in Africa.

(g) Conference of national directors of information in Africa

A conference of African national directors of information will be organized to brief them on the programme for the IDDA and to develop a plan and programme for use at national and international levels for publicizing the IDDA.

5. Background/justification

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". Long-term objectives were set for the region whereby Africa could 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 would 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-industries, building industries, metallurgical industries, mechanical industries, electrical and electronic industries, chemical industries, forest industries, and energy industry.

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.

Particular weight was attached to the promotion and popularization of the Decade. The seventh meeting of African Ministers of Industry, at their meeting in Addis Ababa (Ethiopia) in March 1984, reiterated the need for a comprehensive programme to promote and popularize the Decade. It called for the expansion and intensification of the programme for the popularization of the Decade. In September 1982, Africa media experts recommended that UNIDO undertake the task of publicizing the Decade on its behalf and of the other two organizations. This was endorsed by African Ministers at their Conference in Kigali (Rwanda) in March 1983.

6. Estimated costs (for a period of six years)

(a)	Publicity of a quarterly bulletin	$ 400,000
(b)	Production of a series of movies	450,000
(c)	Production of a series of programmes on video cassettes	280,000
(d)	Production and circulation of radio and TV programmes	100,000
(e)	Use of national and selected international journals and the UN Development Forum	100,000
(f)	Organization of competitions	200,000
(g)	Publicity and circulation of brochures, posters and technical publications	100,000
(h)	Conference of national directors of information in Africa	150,000
(i)	UNIDO technical and administrative support	50,000
(j)	Equipment	70,000
(k)	Training of national information officers	70,000
(l)	Miscellaneous	30,000
	TOTAL	$ 2,000,000

No. 20

1. Title of project

Assistance in the management of the national industrialization planning process.

2. Subregion/countries concerned

To be identified; e.g. five countries per year.

3. Objectives

The cojectives of the project are to:

(a) establish an appropriate and efficient institutional system to support the industrialization process;

(b) ensure the effective participation of all economic operators concerned with the formulation and implementation of industrial strategies, policies and plans;

(c) improve the co-ordination mechanisms between the Ministry of Industry and the other ministries and institutions involved in the industrialization process; and to

(d) train national officers in the management and monitoring of the implementation of industrial strategies, policies and plans.

4. Activities

(a) A diagnosis will be made of the efficiency and effectiveness of the existing institutional system supporting the industrialization process.

(b) An efficient industrial information system for the formulation and monitoring of the implementation of industrial strategies, policies and plans will be designed.

(c) Proposals will be drawn up for an appropriate decision-making system which will ensure the participation of all concerned economic operators in the formulation and implementation of industrial strategies, policies and plans.

(d) Proposals will be made for effective mechanisms to provide co-ordination between the Ministry of Industry and the other ministries and institutions involved in the industrialization process.

(e) An effective and efficient system to monitor the industrial strategy, policies and plans will be designed.

(f) Simplified and clear procedures for co-ordinating and monitoring the identification, preparation and evaluation of industrial projects will be devised.

(g) Training will be provided for national officers in the management and monitoring of the industrialization process.

5. Background/justification

One of the major constraints upon the establishment of an effective and efficient industrial planning process in African countries is the lack of a well-organized and managed institutional system to support it. There is little participation of the population and of the private sector in the formulation of strategy, policies and plans; several ministries are involved in promoting and supporting the industrial sector without adequate co-ordination between their decisions and activities. There is often a lack of an effective industrial information system to support the formulation and monitoring of the industrial strategy, policies and plans. The procedures to evaluate industrial projects to be promoted within the framework of the strategy, policies and plans are often cumbersome and inadequate.

6. Estimated costs (per country)

A team of consultants		
Specialist in industrial planning systems,	12 m/m	
Short-term experts in specialized fields,	11 m/m	
Sub-total	23 m/m	$ 184,000
Administrative support		3,000
Headquarters mission to monitor the project activities and present the recommendations of the consultants to the Government		10,000
Miscellaneous		3,000
TOTAL cost per country		$ 200,000
Total cost for 5 countries		$1,000,000

No. 21

1. Title of project

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

2. Subregion/countries concerned

Six countries to be determined, including Cameroon, Ivory Coast, Madagascar, Malawi and Togo.

3. Objectives

To assist the countries in improving the quality, safety and reliability of manufactured goods and products with the aim of increasing exports, promoting self-reliance, making optimum use of national resources, rationalizing production, increasing industrial productivity, protecting consumers, and raising living standards.

Activities

(a) A survey will be made of institutions, organizations, laboratories, government departments, universities, etc. which are active in the fields of quality control, standardization and metrology.

(b) The NQCS will be established, to link the abovementioned institutions and form an integrated system to promote the development and management of quality control.

(c) Where required, physical facilities (e.g. testing laboratories, equipment etc.) will be provided.

(d) The necessary legal, institutional and technical documentation for the NQCS will be drawn up, together with a national certification marking scheme.

(e) At least 30 - 50 standards related to product quality and performance will be formulated.

(f) Training programmes will be organized, both locally and abroad, to upgrade the skills of national staff at various levels, in the fields of quality control, quality assurance, standardization, certification marking, testing and metrology.

5. Background/justification

The development and improvement of the quality, safety and reliability of manufactured products for export or local consumption has been recognized as a top priority in the industrial development process. In order to achieve this end two elements are essential: the availability of standards and specifications, and the availability of precise and accurate measuring instruments and systems used in industrial production processes and in testing laboratories. Measuring instruments have to be maintained repaired and calibrated in order to ensure a high degree of precision and measurement reliability. Hence the need for a well-organized and operating national metrology system.

It has been shown that the most efficient way to maximize the contribution of quality control, standardization and metrology to industrial development lies in promoting the integration (or at least the full co-operation) of institutions involved in these activities. This has led to increasing adoption of the necessary legal, technical and institutional infrastructure measures for the establishment of national quality control, standardization and metrology systems (NQCS), which usually include and are managed by a national board or council. (National systems ensure the optimum use of the national human, technical and institutional resources, and should include the public and private sectors.

Estimated costs (per country)

Quality control/standardization expert, 18 m/m	$ 144,000
Certification marking expert, 6 m/m	48,000
Testing laboratories expert, 6 m/m	48,000
Training expert in quality control/standardization, 6 m/m	48,000
Metrology expert, 3 m/m	24,000
Short-term consultants, 6 m/m	48,000
Study tours for senior staff, 2 m/m	10,000
International fellowships, 6 m/m	15,000
Local group and in-plant training	10,000
Laboratory equipment	80,000
UNIDO technical and administrative support	15,000
Miscellaneous	10,000
TOTAL cost per country	$1,000,000
Total cost for six countries	$3,000,000

No. 22

1. Title of project

Assistance in the determination and creation of industrial zones and estates.

2. Subregion/countries concerned

Ten countries to be selected, including the Central African Republic.

3. Objectives

To create new poles of development and set up appropriate infrastructures for the establishment of industry.

4. Activities

An expert team, preferably provided by an engineering consultancy office, will comprise a civil engineer, a systems engineer or an industrial economist. In co-operation with the Government agency concerned, the team will:

(a) Identify zones suitable for establishment of industrial estates.

(b) Collate data on existing physical infrastructure which exists or must be set up for the sites in question.

(c) Work out the cost of setting up the infrastructure taking account of the number, size and type of enterprise to be set up.

(d) Identify the industries to be established.

(e) Pinpoint the markets and the raw materials which could be used by processing plants.

(f) Carry out an investigation on small-scale industry to determine real needs with regard to industrial estates.

(g) Carry out a pre-feasibility study for each selected site on the basis of available data, this study should encompass investments, exploitation costs and annual disbursements, forecast profits, a financial plan and financial evaluation.

5. Background/justification

Up to the present time the Central African Republic has seen the concentration of industrial enterprises and their offshoots in the capital city, Bangui. This situation hinders the development of other areas which show economic promise. Moreover, it encourages migration of rural people towards the capital in search of employment. To overcome this the Government, considering the physical infrastructure already present or required (e.g. road network, energy supply, water supply, drainage system, availability of raw materials for industrial plants, market opportunities for manufacturers), would like to identify new development sites and undertake pre-feasibility studies for the

establishment of industrial estates. The Government also hopes that such estates would help to promote certain other of its projects and that it would encourage industrial development elsewhere.

6. Estimated costs

Consultants (engineering consultancy office), comprising an architect, an industrial engineer and industrial economist, 12 m/m (possibly by subcontract)	$ 96,000
Training (to allow for participation of national experts in the finalization of the study)	7,000
UNIDO technical support and follow-up	10,000
Miscellaneous	2,000
TOTAL	$ 115,000
Total for ten countries	$1,115,000

No. 23

1. Title of project

Assistance in trade and investment promotion.

2. Subregion/countries concerned

Six countries to be selected, including Botswana.

3. Objectives

To assist in developing the institutional framework and strengthening the staff capacity of national trade and investment promotion centres in the identification, preparation, evaluation and effective promotion of sound investment projects.

4. Activities

The detailed activities of the project will fall under four broad categories. These relate to (a) studies on methodology and institutional co-ordination, (b) pre-investment studies, (c) investment follow up and promotion and (d) training.

(a) Methodology and institutional co-ordination

The international expert, together with national experts, will:

- Advise on methodology and criteria to be applied for project identification within the framework of socio-economic development plans and priorities;
- Survey, analyse and recommend appropriate institutional set-ups, procedures and practices to be applied by TIPA and used for the preparation of investment projects;
- Examine alternative methodologies and approaches used for preparation and screening of investment projects;
- Formulate recommendations on approaches for project design and preparation;
- Elaborate mechanisms for mobilizing and co-ordinating the efforts of various public and private institutions in generating and following up on investment project proposals;
- Prepare national standards and guidelines for the design, preparation and evaluation of investment projects;
- Study alternative ways of effectively monitoring investment projects.

(b) Pre-investment studies

The international expert, in co-operation with national experts, will undertake investment project identification, project preparation and evaluation. The Computer Model for Feasibility Analysis and Reporting (COMFAR) will be installed at the initial stage of project implementation and will be used for project preparation and evaluation.

(c) Investment follow-up and promotion

- TIPA staff, with the advice of international experts, will establish portfolios of investment proposals, so as to facilitate investment follow up actions, and prepare investment policy and guidelines, e.g. a code of conduct for foreign investors;

- The international expert will provide:

  Advice and recommendations on legal aspects of contracts for different forms of industrial co-operation with foreign partners (e.g. joint ventures, supply of know-how and technology, management, training contracts, etc.).
  Necessary procedures for contracts planning and negotiations, criteria for performance guarantees, conflicts settlement, etc.
  Legal advice as may be required on the legal set-ups of different corporate structures and on overall industrial legislation in order to create a conclusive environment for industrial development.
- Representatives of the national centre will undertake a contact mission to the UNIDO Investment Promotion Services (IPS) in Brussels, Cologne, Zurich, New York, Vienna, Paris, Tokyo and Warsaw in order to establish an operational network with these services.
- Representatives of the national centre will regularly visit the IPS's for specific promotional activities; seminars at each IPS, discussions with specific joint venture projects, etc.

(d) Training

The international expert will undertake:

- Training of national personnel in project identification, preparation and evaluation through on-the-job training, training seminars, fellowships and study tours.
- Training using COMFAR in selection of investment projects on the basis of comprehensive financial and economic analysis.
- Preparation of brochures and teaching materials regarding techniques, in particular for conducting economic, financial and technological appraisals of investment projects and for investment promotion activities.

5. Background/justification

It is recognized that the promotion of private foreign investment is an extremely complex operation, with many countries vying for investment in a highly competitive market. In order to achieve a major breakthrough in attracting private foreign investment in carefully chosen priority sectors, it is necessary to streamline the organization of national institutions in dealing with private foreign investment.

Furthermore, it has been pointed out that the successful induction of foreign capital and technology require not only active investment promotion activities overseas, but also sound identification and preparation of viable projects as an effective input to a series of investment promotion activities. For instance, pre-investment studies including evaluation of locally available raw materials and many other factors related to technical and economical aspects of industrial projects have to be carefully conducted. The strengthening of national institutional and staff capacities will result in multiplier effects for promoting investment projects.

6. Estimated costs

Project duration		3 years
Industrial economist (team leader), 18 m/m	$	144,000
Financial analyst (team leader), 18 m/m		144,000
Short-term consultants, 12 m/m		96,000
UNIDO technical and administrative support		20,000
Training costs		60,000
Equipment costs		25,000
Miscellaneous		11,000
TOTAL cost per country	$	500,000
Total cost for six countries		$3,000,000

No. 24

1. Title of project

Establishment of an industrial information service.

2. Subregion/countries concerned

Selected countries.

3. Objectives

The project aims to improve the industrial development of the country by ensuring an appropriate collection, storage, retrieval and dissemination of industrial information to all potential end users, in particular the small- and medium-sized industrial enterprises. The kind of information referred to above will cover, in particular, the choice of appropriate technologies, patents and licences, industrial promotion and management, industrial machinery and equipment.

The immediate objective of the project is the establishment of an Industrial Information Service with the Ministry of Industry to collect, store, process, retrieve and disseminate information to all potential users in the country.

There is at present no organized system of industrial information in the country. Since industrial information is an important instrument to promote industrialization, it is felt that an adequate information system should be set up to enable:

- industrial planners and programmers in the country to obtain the necessary data; and
- the industrial enterprises, especially the medium- and small-size industries, to obtain the necessary information to improve their operations, in particular their methods of production and management.

4. Activities

(a) Setting up of an Industrial Information Service with the Ministry of Industry, comprising a library and documentation service specially oriented towards dissemination of information to all potential users.
(b) Elaboration and implementation of a comprehensive and practical programme of work and plan of action.
(c) Organization of a training programme for national staff in the field of industrial information.
(d) Assessment of the information needs of potential users of the Industrial Information Service and identification of the information sources existing in the country.
(e) In-depth discussion of the above with the responsible officials of the Ministry of Industry and any other Government agencies concerned.
(f) Preparation of a master plan for the organization, structure and operations of the planned Industrial Information Service, including organization chart, staff and equipment needed, etc.
(g) Setting up the various units constituting the Industrial Information Service, in particular a Questions and Answers Unit, a Selective Dissemination of Information Unit and a Promotional Publications Unit.

(h) Establishing an exchange of information through co-operation agreements with other information sources in and outside the country. In this connection special consideration will be given to establish the appropriate linkages with all relevant international organizations providing industrial information, in particular the UNIDO Industrial and Technological Information Bank (INTIB).
(i) Carrying out on-the-job training of local personnel by UNIDO experts.
(j) Organization of training courses and/or lectures for local personnel.

The preparatory assistance mission by an expert will be undertaken to carry out the above three project activities (d), (e) and (f), and to prepare the project workplan.

6. Estimated costs

Inputs and budget per country

The Government inputs will be:

Assignment of national counterparts for the international experts, secretarial assistance, driver, necessary office space, office equipment and supplies for the installation of the Industrial Information Service and remuneration of the fellows during their training abroad.

UNIDO inputs will be:

Project personnel, including short-term consultant (2 m/m) for the preparatory mission, industrial information (project co-ordinator) for 18 m/m (split missions), short-term consultants (18 m/m) in highly specialized fields to be determined during the project execution, training for individual fellowships (a total of $40,000) in specialized technical information centres abroad; delivery of appropriate equipment (books, periodicals, reprographic equipment at an approximate cost of $100,000) needed for the project; UNIDO technical and administrative support ($35,000); miscellaneous ($21,000). The total project budget is $500,000 for one country, bringing it to $3,000,000 for six countries.

No. 25

1. Title of project

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

2. Subregion/countries concerned

Niger and Nigeria.

3. Objectives

Promotion of inter-country projects and programmes leading to the development of the resources of the member States.

4. Activities

To assist the Commission in the:

(a) identification, preparation, evaluation and implementation of industrial projects; and the
(b) training of the staff of the commission for its functioning.

5. Background/justification

After its creation in March 1971, the Commission has been actively occupied with the following matters:

(a) The industrial sector such as the exploitation of mineral deposits, the construction materials industry, the mechanical industry and the plastics industry.
(b) The agro-industrial and agricultural sector such as the cereal industry, meat and milk, vegetable oils, animal feeds, and underground waters.
(c) The transport and communications sector.

In April 1977, the Secretary General of the Commission presented an official request to UNDP, for technical assistance for the execution of studies in order to promote industrial projects. Consequently a project (RAF/77/020) was approved by UNDP and executed by UNIDO in association with FAO, from June 1979 to June 1982. Under this project, studies were undertaken on the Komodougou River Basin, and on industrial milling of millet and sorghum. This project is to provide assistance in implementing the results of the studies.

6. Estimated costs

Expert services, 60 m/m	$ 720,000
UNIDO technical and local administrative support	30.000
Training	30,000
Subcontracts	200,000
Equipment	10,000
Miscellaneous	10,000
TOTAL	$1,000,000

No. 26

1. Title of project

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

2. Countries concerned

To be determined.

3. Objectives

To promote the technological self-reliance of the rural population through the design, manufacture and promotion of a small-scale technically viable and commercially profitable garr (a traditional fermented food) making plant. To simultaneously investigate possible additives or use modern methods of biotechnology/genetic engineering that would improve the nutritional value of garri with increased protein content and vitamin B-12. Garri is a poor man's food based on cheap Cassava.

4. Activities

(a) A survey of work already done in the field of improved garri processing, notably by the Federal Institute of Industrial Research, Oshodi (Nigeria) and Project Development Agency (PRODA), Emugu (Nigeria) and others where Garri's food is being produced already on a pilot plant scale;
(b) Identify a most suitable, single or mixture, of micro-organisms in traditional garri food making and make genetic improvements to produce fermented foods with improved nutritional value;
(c) Produce and supply a standardized low cost small package of such micro-organisms for home use and small-scale production of improved fermented foods;
(d) Set up a pilot/proving plant for production/demonstration/training with improvements in the supply of standard quality raw material and improvements in process control of fermentation;
(e) Test and conduct socio-economic analysi;
(f) Assist in pilo* fabrication and extension;
(g) Develop rural small-scale entrepreneurship.

5. Background and justification

One of the most important by-products from the cassava root (known as manioc in some parts) is garri, a fermented, gelatinous, granulous flour which is the staple food for most of West and Central Africa. In some areas garri contributes as much as 60% of the total calory intake of the population. Cassava (Manihot utilization), from which garri is made, is easy to grow since it can do well even in poor quality soil. Propagation by vegetative means from cuttings can be carried out throughout the year, and it can be harvested after 9 - 12 months. For many households with small land holdings, it is the only crop grown since it finds several other usages besides garri processing.

The standard method for garri production involves harvesting the cassava roots, washing and peeling, grating the peeled roots to obtain a fine mash, fermentation of the mash in hessian fibre sacks for 4 - 5 days, dehydration under heavy weights which squeeze out excess moisture in the mash, granulating and sifting, and finally, frying over a hot fire in an open cast iron pan using palm oil, with continuous stirring to keep the particles separate. Every single one of the above steps is carried out manually. It is a long, tedious and uneconomic process. Cassava roots not used within 48 hours after harvesting are not suitable for processing due to biodeterioration. This has to be checked. Garri food has only less than 1% protein. It is possible to increase the protein and vitamin contents of the food through improved essential micro-organisms and fermentation processes, for example, in Indonesian Tape. Ketella fermented, the protein content of cassava is increased 2-4 times.

As it is, garri food is being produced on a pilot plant scale. Improvements are however needed:

(a) to select and generate improvement of essential micro-organisms for increased protein, vitamin contents and nutritional value;
(b) to produce such micro-organisms and supply in standard packages, both for home use and small and medium scale production;
(c) to improve process control for PH, temperative, humidity, oxygen, etc., and
(d) to demonstrate techno economic viability, marketability and profitability of the process.

A modern small-scale, low-cost garri processing equipment and standard quality package of essential micro-organisms would cut down losses, improve the nutritional value of food and permit decentralized production in cottage, small and medium scale sectors. This is an ideal candidate for upgrading traditional technology through technological advances; making use of local resources and feeding with traditionally accepted food but with improved nutritional value.

6. Estimated costs

6 m/m consultant/expert services	$ 45,000
Training	45,000
Subcontract	90,000
Equipment	100,000
Headquarters technical backstopping	10,000
Miscellaneous	10,000
TOTAL	$300,000

No. 27

1. Title of project

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

2. Subregion/countries concerned

CEAO countries (Ivory Coast, Mali, Mauritania, Niger, Senegal, Upper Volta).

3. Objectives

To process locally-available agricultural raw materials in order to cut down imports.

4. Activities

(a) Establishment of a pilot plant for processing cereals and roots by extrusion.
(b) Introduction of extrusion technology to stimulate construction of similar plants in other subregions.
(c) Introduction of a new type of locally-produced food.
(d) Promotion of the commercial application of the developed extrusion cooking technology in other subregions.

5. Background/justification

Under the project UC/RAF/77/037, a detailed industrial scheme is being elaborated for the establishment of one pilot plant for extrusion cooking in the CEAO countries. In this project, UNIDO and the Food and Agriculture Organization of the United Nations (FAO) are co-operating with the aim of assisting African countries in attaining self-sufficiency in cereals and eliminating imports through locally produced cereals and roots. By means of extrusion cooking, these products can be transformed into nutritious foods at low cost.

The installation of a pilot plant (as follow-up action) is considered essential to demonstrate the above-mentioned results which will be applied in countries located in other subregions.

6. Estimated costs

Experts' services for start-up operations, 6 m/m	$ 45,000
Training	20,000
UNIDO headquarters technical support	5,000
Equipment	450,000
Miscellaneous	5,000
TOTAL	$525,000

No. 28

1. Title of project

Development of the coconut processing industry.

2. Subregion/countries concerned

United Republic of Tanzania and eventual attention to other countries.

3. Objectives

To assist in introducing better copra drying and solvent extraction methods, to train personnel in management and to promote the clove processing industry for the optimum utilization of the island's clove potential.

4. Activities

With regard to the legal establishment and organization of the Zanzibar Coconut Authority, the following are to be undertaken in close co-operation with the Government authorities:

(a) review the prevailing situation in Zanzibar's coconut production (and processing) sector and define the structural key elements;
(b) in connection with the coconut production and processing situation, review the administrative structure of the various authorities presently involved or partly involved in it;
(c) outline the organizational and administrative requirements of the coconut production and processing sector in relation with the existing responsibilities of the present administration in view of appropriate development action to be taken;
(d) review the constitution of the Zanzibar Coconut Authority and outline its functions and responsibilities;
(e) make the Zanzibar Coconut Authority effective as the counterpart to UNIDO in this project and the responsible Coconut Authority in Zanzibar. In case the final legal act should take more time, ensure that the Coconut Authority fully exercises its responsibility on a provisional basis until finally and legally created.

With regard to the improvement of the coconut harvesting and copra production sector, the following work is to be carried out:

(a) review the coconut harvesting and copra drying methods presently practised, evaluate the situation and define relevant detailed improvement action;
(b) design one or more copra drying devices suitable for operation in Zanzibar;
(c) manufacture and establish the minimum of three suitable copra driers in selected areas and operate them as model and demonstration units;
(d) train the local personnel in appropriate copra drying methods and hold seminars and on-the-spot training courses in order to make coconut producers familiar with the copra production requirements;
(e) in co-operation with the Coconut Authority, install more copra drying units to replace inefficient existing ones and provide guidance and advice to all concerned;

(f) in co-operation with the Coconut Authority, review the economic and financial situation arising from improved copra production methods and elaborate relevant organizational/financial measures that may be required to make appropriate copra production methods an essential and viable part of the overall coconut industry in Zanzibar.

With regard to the technical evaluation up-dating of the "Oil Complex No. 8", the following work is to be carried out:

(a) Review the technology applied and the equipment used and specify the detailed itemized technical improvement to be taken.
(b) Review the copra raw material supply situation, the transport and storage facilities and specify the technical and organizational improvement action to be taken.

With regard to the introduction and operation of a copra and copra product quality control systems, the following work is to be carried out:

(a) in co-operation with the Coconut Authority, select the most appropriate location for the establishment of a product quality control laboratory;
(b) elaborate detailed plans for the establishment and function of the quality control laboratory with special attention paid to the existing situation in Zanzibar;
(c) elaborate an organizational and management plan covering the overall product quality control activities with regard to copra and all copra products in order to ensure efficient and effective quality control operations;
(d) in co-operation with the Coconut Authority, take all necessary action for the setting-up of the quality control laboratory and the initiation of its continuous operations;
(e) introduce and practice relevant analytical quality control methods and train the laboratory staff by individual instructions and demonstrations as well as by organizing relevant courses and seminars.

With regard to making the solvent extraction plant and the connected production units a future viable factory, the following work is to be carried out:

(a) Make a detailed inventory of the solvent extraction plant and its related production units and specify the equipment and/or equipment units - if any - that have to be produced in addition to the existing ones in order to make the plant fully operational and estimate the investment costs involved.

5. Background/justification

Coconuts are, next to cloves, Zanzibar's most important agricultural raw material potential. The coconut production, harvesting and processing sector is, however, still on an unsatisfactory level of development and leaves room for considerable improvement. The main reason for the rather low level of development is primarily based on the lack of an effective coconut administration that is in a position to supervise and co-ordinate all aspects of the coconut production, processing and marketing sector.

Following the examples of other developing countries with a coconut potential, the Government has decided to establish the Zanzibar Coconut Authority and make it responsible for all coconut development issues in Zanzibar. UNIDO, within the framework of this project, is to assist the Government in the legal establishment, organization and operations of the Zanzibar Coconut Authority, the effective function of which is considered a pre-condition for any improvement action to follow. The Zanzibar Coconut Authority will act as the UNIDO counterpart for all activities that are to be undertaken within the framework of this project and is, therefore, an essential element of it. The Authority will be based on the existing Copra Board which is still functioning. The Constitution of the Copra Board actually covers most of the activities of the proposed Authority, and needs to be strengthened so as to make it more responsible to the needs.

The primary coconut processing activities, namely harvesting, defibration, cracking and copra production (drying) are carried out at the village scale by farmers. While the defibration and cracking of the coconuts are manually made as is normally done in all coconut producing countries, the copra production is remarkably less efficient. The copra dryer designs are over-simplified and have a low degree of efficiency. The copra produced has an impermissable high moisture content and is not normally suitable for the production of coconut oil without considerable additional drying. This fact appears to be known to the Ministry of Agriculture recommending that the drying process be completed at the oil mills which, however, is not normally done and can also not be considered an oil mill activity.

The second stop in the improvement of the coconut industry is, therefore, the controlled production of copra and the introduction and practising of quality control measures under the supervision of the Zanzibar Coconut Authority with UNIDO expert assistance.

About nineteen small- and medium-capacity copra processing oil mills exist in Zanzibar and Pamba. Most of the production units are technically out-dated and the available equipment will have to be replaced in the not too distant future.

None of the existing oil mills exercises appropriate preparation technologies. The copra is cut and milled but not heated prior to entering the expellers. None of the oil mills operates a steam boiler. The unsuitable preparation results in a very high residual oil content in the cake (20 per cent or more) and in a low quality oil. Because of cold pressing of copra, the protein is not coagulated and partly enters the coconut oil which apparently has a high content of undesirable substances.

The copra milling industry requires urgent technical improvement. As it is not possible to install steam boilers at each of the existing very small and technically out-dated oil mills, the most appropriate one will have to be selected for effective technical improvement action with regard to all aspects, technically, economically and otherwise. The Government wishes to make the "Oil Complex No. 8" the one factory that is to be brought up to full techno-economic efficiency. The "Oil Complex No. 8" consists of equipment supplied by foreign companies and is in comparatively good condition.

Within the framework of the "Industrial Estate", a solvent extraction plant is presently being installed. The complete equipment has years ago been imported from India. In the light of the present situation, justified doubts exist about the solvent extraction plant's industrial viability. It is, therefore, essential that a detailed evaluation study be carried out in order to define the conditions that have to be created in view of making the solvent extraction plant an efficient part of the Zanzibar coconut industry and a techno-economically viable factory.

A further important element in all the envisaged development action is the effective control of the coconut products quality. Facilities have to be created to this effect and operated.

6. Estimated costs

Expertise, 50 m/m	$400,000
Follow-up missions	30,000
Training	45,000
Equipment	120,000
Miscellaneous	5,000
TOTAL	$600,000

No. 29

1. Title of project

Pilot plant for dry-salted fish.

2. Subregion/countries concerned

Three selected countries, including Senegal.

3. Objectives

To process locally available natural resources and satisfy basic needs.

4. Activities

(a) Equipment and technical assistance will be provided to set up and manage a pilot plant for dry-salted fish in the country.

(b) Local staff will be trained in the management of the plant.

5. Background/justification

Fishing is a very important activity in many African countries, especially in rural and coastal areas. UNIDO has already provided some equipment for processing plants built by the Government for fishing co-operatives in some African countries such as Senegal in the area of Joal under the supervision of the Institut de Technologie Alimentaire. As demonstrated by the case in Senegal when construction of the main plant is completed, there is often a need for additional equipment, mainly for generation and deep-freezing, as well as for training of local staff in their effective use and maintenance.

6. Estimated costs

Expert, 12 m/m	$ 90,000
Training	20,000
UNIDO headquarters technical support	10,000
Equipment	180,000
Consumable materials	130,000
TOTAL cost for one country	$ 430,000
Total cost for three countries	$1,290,000

No. 30

1. Title of project

Managing and programming integrated development of the fish processing industry.

2. Countries concerned

Five countries to be determined, including Mauritania, Mozambique and Cameroon.

3. Objectives

To increase the capacity of the countries to manage their fisheries industries making use of large amounts of available natural resources; to evaluate the contribution that fisheries can make to national, economic, social and nutritional goals of the countries; to elaborate the basis of a programme for the development of the fisheries industries sector for a base period of 5 years; to establish operative mechanisms for the continuous programming and management of the fisheries system.

5. Activities

(a) For each one of the two countries an assessment of the present situation and structure of the fisheries industries will be performed, using technical and socio-economic criteria. The assessment will cover all components of the fisheries system (hydrobiological resources, industrial inputs, capital goods requirements, marketing, consumption, trade, etc.). The information collected on the different components will be fed into a simulation model system to perform the following activities: quantification of the flows of the system, analysis of alternative technical, economic and marketing options, simulation of economic and industrial policies and evaluation of their impact on the system. The model system is already available and has been tested in other sectors and regions of the world fpr similar purposes, although modifications will have to be introduced in the course of the work. Through the project, the model itself will be made available to the selected countries and the technology necessary for its use will be transferred in the form of operating manuals, computer hard and software. Personnel will be trained to operate the model.

(b) On the basis of results obtained in (a) above, design of a proposal for the integrated programming of the system that will include production goals for the different components, economic and technological policies, activities and projects required, investment and financing programmes.

(c) Establishment and start-up of the institutional organization required for collecting and handling the information necessary for supervising the execution of the programme designed under (b).

(d) Training of the necessary personnel for managing and programming the development of the fisheries industries.

5. Background/justification

Fundamental changes that have recently taken place in the world's fisheries create new opportunities for coastal states with large fisheries resources to develop their own industries. The programming of the development of the fisheries industries is complex. There is not a unique model for fisheries development and there is a wide range of alternative objectives for development. Moreover, conditions under which fisheries operate are highly dynamic, requiring periodic evaluation of the validity of objectives using reliable and timely data for a large number of components of the system. Countries like Mauritania and Mozambique have large fisheries resources, but have not structured integrated fisheries policies. Such policies should permit the optimum management and utilization of these resources to serve local and international markets and to set up a basis for negotiating with potential partners the means for the most adequate exploitation of the resources. Through the project, a technology for programming and managing the fisheries and other industrial systems will be transferred. Trained personnel to do the planning and follow-up of the development of the system will become available to the countries. An actual proposal for planning the sector will be made and the necessary institutional framework to manage the system will be put in place.

6. Estimated costs

The cost involved for each country is estimated to be :

Locally recruited experts, 6 m/m	$ 15,000
Senior fisheries specialists and travel, 3 m/m	22,500
Senior economists and analysts, 8 m/m	60,000
UNIDO Headquarters staff support	10,000
Microcomputer and software	10,000
Miscellaneous	2,500
TOTAL cost per country	$120,000
Total cost for five countries	$600,000

No. 31

1. Title of project

Development of the meat processing industry.

2. Subregion/countries concerned

Six countries to be selected, including Ethiopia.

3. Objectives

To assess and evaluate the slaughterhouse industry operations with regard to varieties, quantity and quality of by-products and residues produced and their present and potential utilization in the food-processing industry, as well as in other industries, for quality products for local consumption and export.

4. Activities

With regard to existing slaughterhouse operations, experts will :

- carry out a detailed assessment of the present situation in the slaughterhouse industry and specify the type, quantity and quality of by-products produced;
- review the quality of available by-products and outline feasible ways and means for improvement of operations to obtain optimum quality by-products;
- specify the type of slaughterhouse by-products that remain unutilized at present, estimate the quantity and comment on their quality;
- specify the type of slaughterhouse by-products that are currently being processed by utilization plants inside and outside slaughterhouse operations, and covering the food and non-food production sector;
- review the slaughterhouse operations from the view-point of obtaining the optimum varieties and quantities of by-products for further processing;
- specify the items of equipment and utilities required and technological revisions to be made on existing operations to obtain the optimum of varieties and quantities of by-products that can beneficially be utilized for the production of food and non-food products in demand of the domestic and export market, if applicable;
- estimate the investment costs involved, determine the production cost factors derived therefrom and carry out a cost/price analysis;
- Assess and evaluate the short and long-term market for the products presently produced from slaughterhouse by-products and those that may be produced from so far unutilized by-product by relevant utilization plants in the food and non-food production sector. Estimate the likely market price structure for each of such products in the domestic market and outline world market prices for export consideration;
- It is expected that the counterpart organization will, prior to the fielding of the experts, carry out to the extent possible the activities described under a, c, d and h above.

With regard to by-product utilization industries:

- Review and evaluate from the techno-economic view-point existing slaughterhouse operations in the food and non-food production sector;
- Outline feasible ways of improvement of such operations and the quality of the products produced. Specify the items of equipment and utilities required and technological revisions to be made in view of the most beneficial utilization of the by-products processed for the production of marketable products;
- Estimate the investment costs involved, determine the production cost factors derived therefrom and carry out a cost price analysis;
- Outline feasible utilization schemes for those slaughterhouse by-products that have so far not been obtained from slaughterhouse operations or remain unutilized. Specify the products to be produced therefrom and comment on their marketability;
- Specify technology to be applied in such new by-product utilization plants, itemwise specify the required equipment and support installation, estimate the water and energy consumption, labour requirements and management system. Prepare a relevant plant layout and present a detailed, technical factory project;
- Estimate the investment costs involved, estimate the production cost factors and prepare all techno-economic data required for a detailed and comprehensive industrial feasibility study to be carried out upon the principle approval by the authorities of the factory(ies) proposed to be established.

General:

- Based on the results of the study and evaluation work as mentioned under the paras. 4a and b above, prepare a detailed and comprehensive work programme and time schedule for short and long-term action to be taken for the improvement and/or setting up in Ethiopia of a feasible slaughterhouse by-product utilization industry;
- The work programme is to be supported by a comprehensive study report outlining all the assessments, evaluations and conclusions arrived at along with relevant justification.

5. Background/justification

The economic profitability of meat industry may be improved by adequate utilization of slaughterhouse by-products (animal by-product). Their utilization and processing, including dead or condemned animals, is also important in order to maintain the overall hygienic conditions and to avoid the discharge of putrefactive waste in such a way that it may create pollution problems. Modern meat industry is able to utilize practically all by-products either directly or they may be supplied in a raw or semi-processed form to other industries involved in the manufacture of a variety of products. Some by-products are used in the manufacture of edible products; some are sued in the production of animal feed, or for a number of other products, such as fertilizer, leather, glue, photographic gelatine, neatsfoot oil, textile sizing and dye setting albumen, various pharmaceuticals, etc. Under the conditicns prevailing in many developing countries, like Ethiopia, it is important that the by-products and waste materials are somehow used and not discarded or used to a limited extent only. The choice, therefore, is to be decided on the basis of all relevant factors.

In spite of the drought, there exists an intensive livestock production in many African countries, including Ethiopia which has one of the largest livestock herds in Africa with some 70 million cattle, sheep, goats, equines and camels as well as some pigs and poultry. However, most of the meat in the African countries is distributed and sold as red meat and is not of a very good quality because of a prolonged growing-up age of animals, limited fattening practice, long transport from far-away grazing areas, limited or non-availability of animal feed mixtures, etc. Originally, some plants had facilities for by-products treatment. The main problems of the meat industry in the African countries which have been identified some years back have still not been solved. These include more efficient and economic utilization and processing of animal by-products.

At this stage, the collection, utilization, pre-processing and processing within the existing meat industry will be considered only. Their further use and processing into other products within other sectors of industry, such as food, leather, textile, wood, pharmaceutical, photographic, etc., may be considered as a follow-up. This will depend on the capacity of these industries to utilize or further process them in the country as well as on the domestic and export market requirements.

6. Estimated costs

Subcontracts	$105,000
UNIDO Headquarters Technical and Administrative support	10,000
Miscellaneous	5,000
TOTAL cost per country	$120,000
Total cost for six countries	$720,000

No. 32

1. Title of project

Promotion of the textile industry.

2. Country/region concerned

Ten selected countries, including the Central African Republic.

3. Objectives

To ensure production of textiles based on locally produced cotton to satisfy the increasing internal demand for high turnover products up to the end of the century.

4. Activities

(a) On-site studies will be made of the market, the site, type and availability of resources and textile product costs in the country;

(b) a report will be prepared, synthesizing the results obtained;

(c) a technical study will be made for the rehabilitation of existing industries and the establishment of a fully integrated weaving, finishing and printing based on local raw materials; and

(d) investment projects will be identified, along with their financial and economic analyses, and promoted among potential investors.

5. Background/justification

Many African countries are net exporters of cotton to Europe. However, they import textile products. Since several of these countries are land-locked, transport costs are high. Moreover, existing textile manufacturing plants possess outdated, dilapidated machinery. The Governments hope to set up a modern complex comprising a vertical production chain, spinning, weaving, finishing and printing which will use locally available cotton to produce sufficient high-quality textiles, as set out in line with a competent market study.

In 1982, UNIDO carried out a number of studies, including one under Project DP/CAF/78/008, which called for the setting up of a textile complex in the Central African Republic to include:

(a) Spinning 16,000 spools
(b) Weaving looms 420 units
(c) Finishing and printing complete production line according to the articles to be produced.

6. Estimated costs

Specialists in textiles, 4 m/m	$ 32,000
Industrial economist (market analysis, costing), 3 m/m	24,000
Specialist in financial analysis, 2 m/m	16,000
UNIDO headquarters technical and and administrative support	15,000
Training	210,000
Miscellaneous	3,000
TOTAL cost per country	$ 100,000
Total cost for ten countries	$1,000,000

No. 33

1. Title of project

Pilot project: establishment of small garment manufacturing units.

2. Countries concerned

Five countries to be selected, including Lesotho and Zambia.

3. Objectives

- To create income earning opportunities for women in rural areas and meet local and regional market demands;
- to establish garment production units that will enable women to generate income through the application and upgrading of traditional skills.

4. Activities

First Phase

Marketing (taking in al lkinds of uniforms besides these from schools, like hospitals, police, other public authorities, etc.); raw material purchase (fabrics, accessories like linings, buttons, zippers, threads, etc.); cutting in layers according to standardized patterns; distribution to the individual seamstresses; collecting of sewn garments; quality control; labelling and packing; distribution.

The actual sewing (assembling of cut parts of garments) would be done either in the individual homes of the seamstresses or in groups (co-operatives) in the surrounding villages. The equipment of these seamstresses could vary from privately owned hand- and/or foot treadle machines to electric industrial sewing machines, either owned by the individuals, leased from or owned by the Centre.

Second Phase

Some advanced sewing operations could be carried out by the Centre, improving the efficiency and quality of the production, for a group of 20 - 30 individual seamstresses, leaving the main, simple (straight) sewing processes still with the individual seamstresses in their homes and/or villages.

Third Phase

At this ultimate stage, most of the manufacturing process would be carried out at the Centre, representing a complete small-scale ready-made garment factory.

5. Background/justification

The wearing of uniforms in schools and in certain professions (hospitals, police, etc.) is a "must". There is a continuous demand for such articles even in remote rural areas. During the African Regional Workshop on the Integration of Women in the Industrial Planning and Development Process (RP/RAF/84/024) in Harare, Zimbabwe, April 1984, Lesotho and Zambia requested the setting up of small pilot garment manufacturing units.

These can be produced in small-scale production units which must be competitive to medium - or large scale manufacturers and enable women to generate income and apply their skills. This can be achieved through the establishment of centres for the cutting and distribution of work to home workers who have their own sewing machines and their subsequent collection quality control, packaging and distribution. A phased approach is proposed starting with a centre with some 14 women at the centre servicing some 30 homeworkers. In a later phase a garment factory will be established at the centre which however does not rule out the continuation of home work.

The advantages of such a centre are:

- low investment is necessary for this stage;
- the envisaged operation is independent from a sophisticated infrastructure;
- the utilization of quite common, widespread skills available almost everywhere;
- the opportunity to improve production methods with relatively low technologies;
- garment manufacture is, compared with other industries, quite labour intensive;
- still remaining a close attachment of the seamstresses to their family environment;
- personal contacts to local schools, hospitals, authorities, etc., are mostly existing and would help in marketing the products.

6. Estimated costs

Government

Operation of the Centre (staffing and initial operation costs until the centre becomes self-supporting).

UNIDO

1 expert in garment-making, 6 m/m plus 2 follow-up missions of two months each, 10 m/m ----	$ 80,000
2 volunteers, 10 m/m ----------	30,000
Technical and administrative support ----------	25,000
Miscellaneous ----------	5,000
TOTAL cost per country	$ 220,000
Total cost for five countries ----------	$1,100,000

If successful, such pilot projects can be established in other African countries.

No. 34

1. Title of project

Establishment of national textile quality control centres.

2. Subregion/countries concerned

Sudan and one other country to be selected.

3. Objectives

To establish a fully equipped textile quality control centre with the capability of ensuring the quality standards of cotton textile products and becoming the official national agency for quality certification of textiles exported from the Sudan.

4. Activities

Assistance will be provided for the national textile quality control centre through the provision of expert services, laboratory and testing equipment and the training of local staff, to enable it to more effectively carry out the following activities:

- Establishing quality standards for the Sudanese textile products;
- ensuring that all textile products exported from the Sudan fully meet the required quality standards;
- assisting in adopting process control systems necessary for achieving and maintaining the required quality levels;
- testing and certifying textile products for export;
- training mill personnel in quality control.

A twinning arrangement will be made with a more advanced textile institute in another developing or developed country.

5. Background/justification

The textile industry is one of the most important areas for development in Sudan, with annual production of cotton at 200,000 tons. The Government of Sudan intends to attain self-sufficiency in popular fabrics and export part of the cotton crop as yarn rather than as raw cotton. To this end, there are ongoing investment projects in both the public and private sectors of the textile industry.

Export orientation of the textile industry is very much emphasised by the Government to improve the balance of payments situation, which has been adversely affected over recent years by heavy commitments of foreign reserves for the importation of machinery and equipment for development projects.

The Sudanese cotton textile industry comprises 24 mills, either operational or under construction. When the ongoing projects are completed, the industry will provide employment for over 25,000 people.

The installed weaving capacity is already sufficient, in principle, to satisfy requirements and the spinning capacity will be sufficient when the ongoing projects are completed.

Some of the new factories are geared specifically to export, and yarn samples have been well received by potential custombers in Europe. The export market demands that sufficient safeguards exist to ensure that quality levels will be consistently maintained and that the Sudanese textile industry is exporting products of a certified quality. It is for this reason that the establishment of an impartial textile quality control centre was requested by the Ministry of Industry. At the request of the Government of Sudan, a UNIDO consultant specialist in textile quality control and testing, drafted the project proposal.

6. Estimated costs

International staff, 68 m/m	$ 540,000
Project support staff, 126 m/m and other personnel costs	69,000
Experts internal travel	9,000
Fellowships training, 33 m/m	82,000
Subcontract	100,000
Equipment (laboratory + testing)	770,000
Miscellaneous costs	30,000
TOTAL per country	$1,600,000
TOTAL for two countries	$3,200,000

No. 35

1. Title of project

Assistance in the establishment of textile training centres.

2. Subregion/countries concerned

Initially in Sudan with eventual extension of similar assistance to other countries.

3. Objectives

The project's immediate objectives are as follows:

(a) The establishment of a training capacity and capability by:

- a nucleus textile training centre;
- the training of counterparts as instructors/trainers, who will then train in-plant instructors/trainers for the in-plant training, particularly of operatives and fitters. The individual mills will then be able to fully utilize their existing training cells/units.

(b) The training of higher level technical (supervisory) personnel in the industry will be conducted by the counterparts, with the assistance of the UNIDO experts.

(c) To develop a comprehensive national and mill-by-mill in-plant training oriented plan.

4. Activities

The activities of the project will include the formulation of a programme for the work of the centre with emphasis on its operational modalities, industrial advisory services, training not only of the staff of the centre but also of experts and technicians from industry, testing and quality control. A programme will also be established linking the centre to a more advanced one in another developing or industrialized country.

A detailed workplan will be prepared by the UNIDO chief technical adviser, within one month of his arrival. It will show an outline and proposed timetable of activities for achieving the objectives of the project.

5. Background/justification

The actual performance of the textile industry has shown rather low production figures than envisaged in the Government's plan. The efficiency of both spinning and weaving mills is much below the planned figures.

One of the main causes of this condition is the acute shortage and lack of skilled personnel. This fact is jeopardizing the efficient utilization of the existing capacity, planned extensions, and the new projected capacities of the textile industry. It has also delayed the attainment of the projected output of the already existing capacities.

The present training activities in the textile industry are limited only to the training of workers and fitters. These activities are neither systematic nor consistent, and do not lead to the desired results. The main drawbacks are the absence of analytical methods of training and qualified instructors.

It is envisaged, therefore, that developing the technical skills of the personnel through training is an urgent requirement of the textile industry.

6. Estimated costs

Project manager, 42 m/m	$ 336,000
Weaving expert, 33 m/m	264,000
Spinning expert, 33 m/m	264,000
Training expert, 6 m/m	48,000
Training	80,000
UNIDO headquarters technical and administrative support	50,000
Subcontracts	180,000
Equipment	350,000
Miscellaneous (reports etc.)	28,000
TOTAL	$1,600,000

No. 36

1. Title of project

Assistance in the rehabilitation of the paper industry.

2. Subregion/countries concerned

Three countries to be selected, including Mozambique.

3. Objectives

To modernize and increase the production of the existing paper mills to their former capacities and establish training programmes for training engineers, technicians, and operators for the national pulp and paper industry.

4. Activities

(a) A mission will be sent to assist the government in diagnosing the factory, identifying its problems and to prepare a rehabilitation programme.

(b) Modern and efficient production techniques to increase the production of the paper mill to its designed capacity will be demonstrated.

(c) A training programme will be established.

(d) In-plant training courses for up to 150 technicians and operators will be held. Three university graduates and 15 engineers will be placed at universities abroad where they can be trained in bagasse pulp and paper-making technology for the new bagasse pulp/paper mill.

5. Background/justification

In several African countries there are very promising conditions for the establishment of new pulp and paper mills to produce newsprint using locally available raw materials such as sugar cane bagasse. The Governments are anxious to create a national cadre of pulp and paper production including engineers, technicians and operators to run existing and new paper mills.

6. Estimated costs (for a period of three years)

Expert services, 90 m/m	$ 720,000
UNIDO technical and administrative support	30,000
Training	80,000
Subcontract	150,000
Equipment	100,000
Miscellaneous	20,000
Total cost per country	$1,100,000
Total cost for three countries	$3,300,000

No. 37

1. Title of project

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

2. Subregion/countries concerned

Four selected countries, including Sudan.

3. Objectives

To contribute towards increasing the operating efficiency of the major concentration of furniture and joinery plants in the country.

To contribute towards achieving improved productivity by the adoption of streamlined production methods - thus promoting the capability of the industry to produce low-cost furniture for the requirements of low and medium population groups.

The overall immediate objective of the project is to assist the Forest Administration in Khartoum in establishing a Service Centre, within their existing furniture workshop, to cater for selected and immediate needs of the furniture/joinery industries. States more explicitely the immediate objectives are a) to provide small entrepreneurs in the "three cities" areas with tool maintenance services on a regular basis and at nominal cost, and b) to manufacture wooden dowels for distribution at nominal charges.

4. Activities

Expert in maintenance of woodworking tools (24 m/m): This activity is concerned with the establishment and actual operation of the servicing activities envisaged under the project, aiming at introducing sound tool maintenance practice for extending the working life of cutting tools and at contributing towards producing wood products of improved quality. The following tasks will be performed:

- Installation, within the existing workshop facilities, of tool maintenance and dowel-making equipment provided under the project;
- bringing existing tool maintenance machinery to full operating conditions as required, as well as modifying the geometry of cutting tools according to the requirements of timber species used in industry;
- practical on-the-job training for servicing personnel on tool room techniques and preventive maintenance of wood-working equipment provided by the project;
- preparation of manual on servicing costing for both tool maintenance and dowel-making for the purpose of establishing servicing charges;
- trial and regular servicing work for the industry.

Kiln drying; wood seasoning expert (6 m/m): The activity is concerned with the setting-up of a dry kiln unit within the Servicing Centre to be established under the project. Its aim is to provide dry stock for the production of dowels as a service to the industry and an experimental ground for the utilization of the dehumidification type of wood seasoning.

Further tasks included are a) the installation of a prefabricated kiln chamber, b) the testing of drying schedules, c) practical on-the-job training of kiln operators and d) the trial run and regular operation of kiln.

5. Background/justification

The furniture manufacturing sector in many African countries is still at its early stage of development both in terms of size and industrial technology. In Suda for example, there is a total of 157 furniture workshops in the country with 94 of them concentrated in the "three cities" area (Khartoum, Khartoum North and Omdurman) where the largest production units are located. The major problems faced by the industry in the African countries concerns maintenance of cutting tools, machinery, production methods and the supply of spares. There is nearly complete absence of appropriate equipment for the maintenance of cutting tools. For example, circular saw blades are in most cases roughly sharpened by hand filing or free-hand on standard bench grinders, resulting in uneven tooth pattern and tooth profile. Similar problems occur in the maintenance of other cutting tools. Planer knives, for example, are sharpened free hand, which results in crooked cutting edges and uneven sharpening angle.

The problem is aggravated by continued serious difficulties in obtaining foreign currency for import of cutting tools replacements and machinery spares; lack of know-how in the selection of appropriate and efficient cutting tools of modern design.

The introduction of the modern steamlined technique of dowel-jointing would radically simplify the production process - and greatly minimize capital investment in equipment as well as cost of cutting tools - to the point that it could be easily adopted even by the smallest entrepreneurs by utilizing inexpensive dowelling jigs and standard power drills.

6. Estimated costs (for an estimated period of two years)

Expert in maintenance of wood-working tools, 24 m/m	$ 192,000
Wood seasoning expert, 12 m/m	96,000
UNIDO technical and administrative support	20,000
Training fellowship	40,000
Equipment	130,000
Miscellaneous, including operations/maintenance	22,000
TOTAL cost per country	$ 500,000
Total cost for four countries	$2,000,000

No. 38

1. Title of project

Leather industry development.

2. Subregion/countries concerned

Initially Somalia with eventual extension to cover other countries.

3. Objectives

To assist the newly established Somali Leather Agency in the following tasks to:

- co-ordinate the activities of the existing enterprises engaged in the trade and process of hides, skins and allied materials and manufacture of leather and leather goods;
- remove the bottlenecks and eliminate competition in the collection of hides and skins and to ensure regular supplies of raw hides and skins to the tanneries and leather industries;
- improve productivity and efficiency of the existing units through consolidation and co-ordination amongst the units;
- obtain better terms of trade in export market for raw hides and skins, semi-processed and finished leather and leather products;
- achieve economy through bulk purchase of confinement of importation under single management and explore cheaper sources of supplies;
- pool resources, technical know-how and efforts to develop and promote new designs, products, improve quality and establish new schemes and projects in the leather sector; and
- make a twinning arrangement with a more advanced institute.

It is a large-scale project in which Italy is highly interested. However, in view of its size and considering that the project proposal was prepared a year ago, it was recommended that a preparatory mission should take place mainly in order to up-date the project document. This recommendation was communicated to the Government of Somalia asking for its approval.

4. Activities

- The activities of the project will include:
- Mobilization of the required financial resources;
- selection and appointment of project personnel;
- ordering of equipment for quality control laboratories;
- preparation of project manager work plan;
- fielding of international staff;
- selection of fellowship trainees;
- prepare training manuals and prepare syllabi for training seminars, workshops, etc.;
- conducting of training courses and seminars;
- conducting direct technical assistance in the factories;
- assistance to SOLIA in all phases of their activities;
- Install quality control laboratory;
- train personnel for the operation of the laboratory;
- initiating and putting into operation a suitable training arrangement with a more advanced institute in another developing or developed country.

5. Background/justification

A UNIDO project, SI/SOM/79/801 "Leather and Leather Products Development", was completed end-March 1980. The main recommendations of this project were :

- The shortage of technologists and taking into account the time for education made it necessary to stress the recommendation to utilize fellowships for higher training as leather technologists;

- To smooth the communication between Ministry of Industry and the factories it is recommended to create a position for an operations office specifically assigned to the leather and shoe industry;

- Assistance through agreements between Somali Democratic Republic and outside on bilateral and consultant base is recommended to continue.

- Besides this assistance, it is also recommended to seriously consider the advantage to development to have an international and neutral team from UNIDO working along the lines specified in the three years project "Leather and Leather Products Industries Development" which has been submitted to the Somali Government.

- Different investments are suggested to facilitate quality improvements of the leather and to balance existing equipment in order to enable a better utilization of the total production machinery.

Since this report was submitted to the Government of Somalia, a draft law on re-organization of enterprises in the leather sector was elaborated and submitted to consideration and promulgation by the President of the Supreme Revolutionary Council. The Somali Leather Agency has now been established. This autonomous agency, under the supervision of the Ministry of Industry, will have the objective of re-organizing, consolidating and co-ordinating the following existing enterprises in the leather sector: (a) Hides and Skins Agency (HASA), (b) KM 7 Shoe Factory and Tannery, (c) Kismayu Tannery, (d) Hargeisa Pickling Plant and (e) Burao Pickling Plant.

The creation of the agency has been well motivated and was badly needed by the Somali Leather Industry Sector. The main constraints now to get this agency to function effectively will be the lack of experienced, well-qualified leather industry expertise in the agency, as well as on the plant level.

6. Estimated costs (for about 3 years)

Leather industry specialist (ITL),	36 m/m —	$ 288,000
Training officer,	24 m/m —	192,000
Tanning expert,	24 m/m —	192,000
Tannery machine expert,	24 m/m —	192,000
Leather marketing expert,	6 m/m —	48,000
Hides and skins improvement expert,	24 m/m —	192,000
Consultants,	12 m/m —	96,000
Subcontract		100,000
Experts travel		30,000
Training fellowships		80,000

UNIDO technical and administrative support ------	50,000
Equipment ----------	870,000
Miscellaneous, including reports and sundries —	30,000
TOTAL	$2,360,000

No. 39

1. Title of project

Promotion of the leather industry.

2. Subregion/countries concerned

Two countries to be selected, including Tanzania.

3. Objectives

The objectives of the project are to provide:

- Training to the key-operators, middle managerial staff and other specialized personnel in all aspects of the leather industry.
- Quality control services to the industry.
- Research and development work in order to overcome production problems, initiate and introduce new processes or new products through laboratory scale experiments.
- A suitably equipped and well-staffed informatica and documentation services.

4. Activities

1. Preparation of a realistic work plan covering all aspects of the planned activities.

2. Preparation for and execution of training and retraining courses for trainees at different levels, and for different subjects and duration.

3. Training of selected counterparts in actually carrying out the training activities foreseen, to enable them to run the institute independently in the future.

4. Training of selected national specialists in performing physical and chemical tests and quality control of raw materials, semi-processed leather, finished leather, different types of leather products and actually carrying out such tests and quality controls as required.

5. Assistance in the selection of candidates for and the actual implementation of the fellowship training programmes and study tours foreseen.

6. Carrying out of applied research and development work aiming at utilizing indigeneous raw materials, chemicals and other locally available materials in the leather and leather products industries, as well as to develop new or improved processes and products, and training selected counterparts in these activities.

7. Arrange a twinning of the institution with a more developed one in another developing or developed country.

5. Background/justification

One of the targets of the long-term industrial strategy in African countries is to establish and promote local resource-based industries with a view to maximizing foreign exchange earnings through increased value

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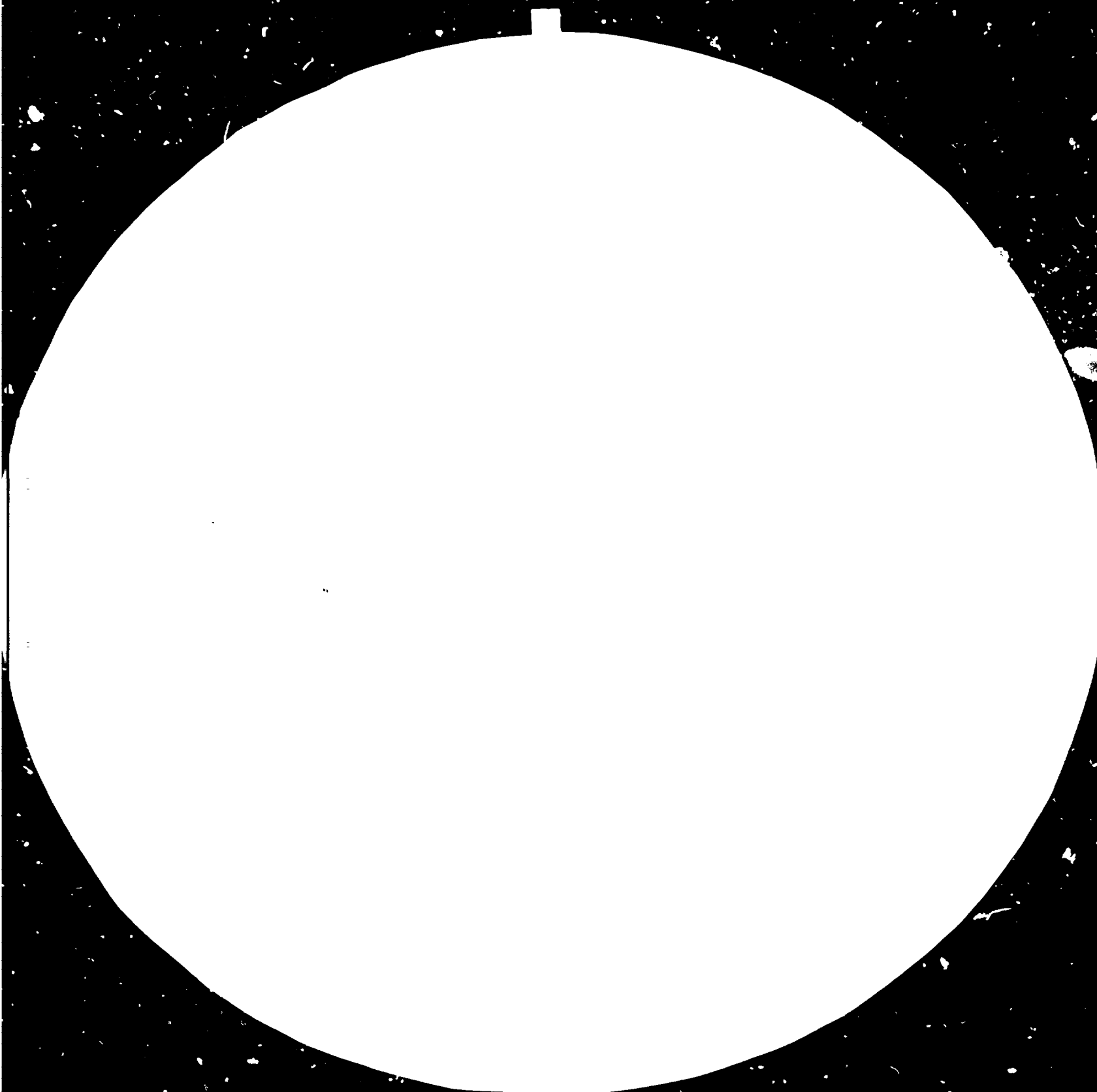
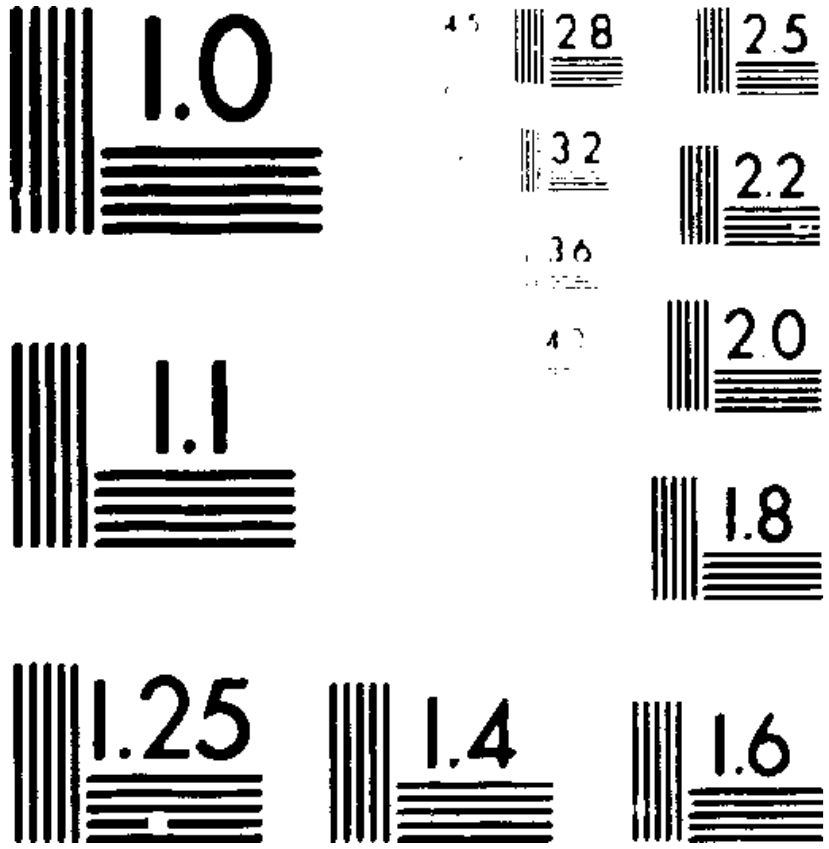




added. Most of these industries will be agro-based and agro-related, and one of the industrial sectors to be promoted is the leather and leather products industry sector.

The development plans of many of these countries emphasize the need to increase industrial production in order to satisfy basic needs of the population, such as food, shelter and clothing. This plan further aims improving the balance in foreign trade through increased added value in the industrial sector and increased export earnings, giving priority to industries which are utilizing indigenous raw materials.

The development of the leather and leather products industry sector is being promoted in accordance with this general economic policy of the Governments. New production plants have been established and serious efforts are being made to increase the sector's productivity and raise the quality level of the different types of products manufactured.

(i) Hides and skins

Many African countries produce a significant amount of hides and skils. For example, Tanzania, after Ethiopia, is the second largest producer of cattle hides in Eastern Africa. The animal population of the country is estimated at approximately (FAO, 1982): 13,1 million cattle; 5,9 million goats; and 3,9 million sheep. The availability of raw hides and skins is estimated at: 1,4 million cattle hides; 1,5 million goat skins and 0,9 million sheep skins.

The actual collection and commercialization for domestic industries, however, is much below the potentially available quantities which means that a considerable amount of these valuable raw materials, hides and skins, were not accounted for. Export of raw hides and skins from the countries is banned by the Governments. In Tanzania, for example, the collection and distribution of raw hides and skins is handled by the Tanzania Hides and Skins Ltd., THS, a parastatal body which is closely linked with the Tanzania Leather Associated Industries, TLAI, the Government corporation which controls all government-owned industrial plants in the leather sector.

(ii) Leather Industry

There are a number of mechanized tanneries in several African cuntries producing wet blue and finished leather. Presently, the tanneries are operating under low capacity utilization as a result of lack of spare parts and chemicals due to scarce foreign exchange earnings, insufficient power supply and lack of well-trained staff. In addition, there are a number of small tanning units in the country, which produce semi-processed and finished leather products.

(iii) Footwear Manufacturing Industry

The controls also dispose of shoe factories, some of which operate at low capacity levels and produce both for domestic as well as for external markets. Some of these factories have layouts similar to production systems mainly used in industrialized countries, and the installed machinery is rather sophisticated. Some have been financed through the World Bank, and established as joint ventures with foreign companies.

Full production by the factories would need a great number of semi-skilled and skilled workers as well as a large number of additional personnel (key workers, supervisors, designers, quality controllers).

(iv) Leather Goods Industry

Leather goods for different uses made of locally produced genuine leather with ornaments and motives of folk-art origin have for a long time been traditionally produced by a number of African countries in small rural workshops and sold throughout the country. Efforts are being made to erect mechanized leather goods manufacturing plant, in partnership with foreign companies. This factory also lacks qualified national personnel. A few local entrepreneurs are also are producing different leather products in quite sizable quantities in some countries.

(v) Training Needs and Establishment of TILT

There is a great need for adequately trained specialists in the entire leather, footwear and leather goods manufacturing sector, in order to enable the important industrial plants established to operate efficiently and to contribute significantly to the overall economy of the country.

6. Estimated costs (for a period of about 3 years)

Expert services, 60 m/m	$ 480,000
Equipment	250,000
Subcontract (for twinning arrangement)	100,000
UNIDO technical and administrative support	50,000
Training	90,000
Miscellaneous	30,000
TOTAL cost per country	$1,000,000
Total cost for two countries	$2,000,000

No. 40

1. Title of project

Rehabilitation of tannery and footwear factories.

2. Subregion/countries concerned

Three countries to be selected, including Angola.

3. Objectives

(a) To diversify effective industry in Angola and develop an integrated leather and leather products industry, capable of processing locally available hides and skins into semi-tanned or finished leathers or leather products (footwear, leather goods, etc.) of such quality that reasonable local and international demand will be satisfied.
(b) To rehabilitate a functioning tannery and leather footwear factory, eliminate a proportion of the imports of leather and leather footwear and thus save large amounts of foreign exchange.

4. Activities

(a) Detailed planning of the organization of the tannery will be carried out.
(b) Training will be provided for counterpart staff.
(c) The manpower and skill needs of the entire leather sector will be assessed and training programmes will be carried out.
(d) Technical assistance will be given to the tannery and the leather footwear factory on the correct implementation of suitably adopted processing and production techniques.
(e) Assistance will be provided in improving the quality of the raw hides and skins by using correct flaying and conservation methods.
(f) Government and industry will be advised as required on all technical organizational and marketing matters.

5. Background/justification

The project is based on the findings and recommendations of previous assistance by UNIDO to a number of African countries. In Angola, for example, a leather industry consultant who, in October 1981, carried out a one-month assignment in Angola under UNIDO project DP/ANG/80/012 and amply demonstrated that technical assistance to the leather and leather products industry is urgently needed. The proposed project will concentrate its efforts on the rehabilitation of tannery leather footwear factories in the selected countries including the CURBOL factory in Angola.

6. Estimated costs

Expert services, 90 m/m	$ 720,000
Training	50,000
UNIDO technical and administrative support	20,000
Equipment	200,000
Miscellaneous	30,000
TOTAL cost per country	$1,000,000
Total cost for three countries	$3,000,000

No. 41

1. Title of project

Assistance to the cement industry.

2 Country/region concerned

Initially Niger with eventual extension to cover other countries.

3. Objectives

(a) To develop and strengthen the cement industry, particularly in Malbaza, taking intc account forecast cement needs for the period 1985/90.
(b) To train at least 2 instructors and 20 technicians and streamline operation methods in the factory.

4. Activities

(a) A team of experts will be sent to provide advice and aqssistance on improving the factory output and operation througjh the introduction of modern systems of maintenance and control.
(b) Training courses will be organized together with study trips for the administrative and technical personnel of the factory.

5. Background and justification

UNIDO has already provided assistance to the Malbaza cement works for increasing its production between 1972 and 1976. When the Organization started to provide this assistance, the plant's annual production over the previous ten years had averaged 20,000 tons/annum. When assistance ceased, the plant was producing 1,000 tons of cement per week, i.e. some 50,000 tons per annum. Since that date, there have been fluctuations in the output and the high turnover of staff has had a detrimental effect on production. Demand for cement, however, has increased and the authorities are currently preparing plans for the development of the cement industry. The Government has thus decided to request assistance from UNIDO to modernize the Malbaza plant in order to increase production and to provide training for personnel from this and other plants by using existing installations.

6. Estimated costs

Training expert, 12 m/m	$ 96,000
Short-term experts, 12 m/m	96,000
Raw materials expert, 12 m/m	96,000
Spare-parts expert, 12 m/m	96,000
Production expert, 12 m/m	96,000
Electrical maintenance, 12 m/m	96,000
Mechanical maintenance, 12 m/m	96,000
Financial analysis, 12 m/m	96,000
UNIDO Headquarters technical and administrative support	20,000
Subcontracts	50,000
Training	60,000
Equipment	30,000
Miscellaneous	22,000
TOTAL	$950,000

No. 42

1. Title of project

Mobile plant for brick production.

2. Subregion/countries concerned

Thre selected African countries.

3. Objectives

To improve the output and the quality of burnt-clay brick production, without increasing the prices.

To promote local assembly and/or manufacture of the mobile plant.

4. Activities

(a) A preparatory mission will take place to identify availability of raw materials, suitable infrastructure and to plan project activities.
(b) Equipment for the mobile plant will be selected, requisitioned, purchased and supplied.
(c) Expert assistance will be recruited.
(d) Equipment will be installed and the plant operated for a period of six months.
(e) Necessary conditions for local assembly and/or manufacture of the plant will be ascertained and recommendations made.

5. Background/justification

The construction of large, centrally located, mechanized brick plants involves relatively high investment costs, reduced demand for labour, and increased expenditure for transportation of the product from the plant to scattered construction sites. To obtain the advantages of mechanized technology without high investment and transport costs, a small trailer-mounted mechanized plant was developed which can be installed and made operational within a few hours. Driven by a 40 kw engine, it can produce 1,000 to 1,500 good quality bricks per hour, close to the construction site. The bricks could then be fired in the traditional type cottage kiln. Having satisfied the demand of the area, the mechanized unit can be towed to the next production site.

In view of the local assembly and/or manufacturing of the mobile plant in the selected country(ies), the services of national and/or subregional and regional institutions such as TEMDO, ARCEDEM, etc., will be enlisted.

6. Estimated costs

Expertise	$ 100,000
Follow-up missions	20,000
Training	30,000
Equipment	200,000
Miscellaneous	50,000
TOTAL cost per country	$ 400,000
Total cost for three countries	$1,200,000

No. 43

1. Title of project

Promotion of local manufacture of building materials.

2. Subregion/countries concerned

Each of the four subregions of Africa. Countries to be chosen in the subregions will include Cameroon and one CEAO Member State.

3. Objectives

To encourage the production and utilization of local building materials, with the aim of improving housing and increasing the availability of decent living accommodation for a larger proportion of the population.

4. Activities

The project was conceived and proposed by a joint UNIDO/Habitat mission undertaken in Cameroon during 1981, but has application in other countries and subregions.

Phase I A preparatory phase will be undertaken to focus on the identification of possibilities of the production of local building materials, the installation of small production units and the use of locally produced materials.

Phase II In this experimental phase, the results of Phase I will serve as a basis for the production of materials, the execution of activities and the application of results to particular rural and semi-urban conditions.

Phase III Assistance will concentrate on: acquisition and transfer of skills; improved techniques in the production and utilization of local building materials at the pilot plant level; popularization of experience and skills through practical instruction in each area; preparation of catalogues of technical innovations; and the identification, preparation and promotion of investment projects and potential. In this way there will gradually be an increasing transfer of operational responsibility to national personnel.

5. Background/justification

This project will have a considerable social impact. It is foreseen that a high percentage of the houses in several countries would be built from locally available construction materials, estimated to be five times cheaper than the cement and baked bricks in current use. On the basis of the results of the project, the concept and approach will be promoted in other African countries within each subregion.

6. Estimated costs

Experts, 60 m/m	$ 480,000
Equipment	250,000
Local support experts (60 m/m)	150,000
UNIDO Headquarters technical and admin. support	40,000
Training	60,000
Miscellaneous	20,000
TOTAL cost per country in one subregion	$1,000,000
Total cost for countries in all four subregions	$4,000,000

No. 44

1. Title of project

South-East African Centre for development of clay-based industries.

2. Subregion/countries concerned

SADCC countries (Botswana, Lesotho, Malawi, Mozambique, Swaziland, Tanzania, Zambia and Zimbabwe).

3. Objectives

(a) To establish a centre capable of carrying out the following functions:

- raw material exploration, investigation, and testing;
- development of technologies to match available raw materials and other local conditions;
- advise on the choice of technologies, on the feasibility of projects and on the selection of consultants or suppliers of goods and services;
- technical and administrative extension services;
- training of national advisers, entrepreneurs, supervisors and other technical personnel;
- documentation and information services.

(b) To operate the Centre and to reach the maximum level of self-reliance among the staff recruited from the participating countries with a view to:

- enhancing the technical capabilities of local technicians engaged in or about to engage themselves in the manufacture of clay-based products including bricks, tiles and pottery, thus leading to a subregional independence and self-sustained growth of the sector;
- develop appropriate clay-based industries, taking into account the diversity of technology required to provide optimum facilities applicable to a variety of situations within the subregion;
- maximize the employment possibilities in a labour-intensive industrial sector relying on domestic raw materials.

4. Activities

Phase I

A survey mission by a consultant, for three months, in order to prepare the ground for the organization of a conference in Lusaka, Zambia, with the participation of representatives of all the governments concerned to agree on the relevant administrative and financial arrangement for the "Centre".

Phase II

The establishment and the initial operation of the "Centre" which comprises office, library, laboratory, and pilot plant.

5. Background/justification

In South-East Africa there is a particularly rich tradition for pottery and artisanal brick-making. The manufacture of cooking vessels and food storage pots is a widely practised craft which, for instance in Tanzania, has reached a high level of quality and skills. Small-scale manual brick-making is practised in all of the countries of the subregion typically as a family-type operation located directly on a small clay deposit and producing solid clay bricks for the immediate surroundings, in most cases an urban centre. Today, however, building materials of a higher standard are needed and mechanized brick and tile plants have already been established in most of the countries concerned, and efforts to upgrade the existing traditional manufacturing units are on-going.

With a view to initiating a process of self-sustained growth based on the gradual building up of indigenous know-how and experience, it has been decided to establish a centre for the development of clay-based industries and the Ministry of Commerce and Industry of the Republic of Zambia has accepted the proposal to host the centre and to provide the premises for it.

6. Estimated costs

Expert services (42 m/m)	$336,000
Administrative support	10,000
Follow-up missions and technical support	20,000
Training	100,000
Equipment	120,000
Miscellaneous	14,000
TOTAL	$600,000

No. 45

1. Title of project

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

2. Subregion/countries concerned

Five selected countries, including Gabon.

3. Objectives

To assist the Government in assigning priorities for the establishment and growth of the ferro-manganese industry and of the iron and steel industry, based on the direct reduction/sponge technological route and using the country's high-grade iron ore and oil/natural gas resources.

4. Activities

(a) The project activities will include preparation of a master plan for the development of the mineral and metallurgical industries in the country will be prepared;

(b) Formulation of a capital financing plan for the establishment and development of mineral/metallurgical industries (sponge iron and steel, low-, medium- and high-carbon ferro-manganese, silico-manganese, etc.) based on bilateral and multilateral financial and technical assistance, supplier's credits, consortium aid pattern; and

(c) Preparation of a techno-economic analyses of:

(i) capital and operational/production costs of the respective product mix;
(ii) capital and overhead charges;
(iii) overall profitability of the mineral and metallurgical industries, including the social cost/benefit analyses; and
(iv) attendant economic gains and national benefits.

(d) International technical consultancy contract/services will be provided for the formulation of the master plan based on activities (a), (b) and (c) above, taking into account the need for the requisite infrastructure and ancilliaries. Attention will also be paid to the phased and well-timed implementation of the major recommendations of the master plan.

5. Background/justification

Many African countries, such as the Republic of Gabon are endowed with rich mineral reserves, including iron ore and ferruginous manganese ore, and possesses existing and potential hydropower, water, oil and

natural gas resources. It has been reported that the European Investment Bank (EIB) has agreed to grant loans to assist some African countries to develop their mineral resource. This includes a loan totalling approximately $2.3 million to help fund a $10.35 million pre-feasibility study of the Mekambo-Ivindou iron ore project in Gabon and Congo. As part of a package which may include a $6 million loan from the European Development Fund to the Government of the Peoples' Republic of the Congo, the EIB loan to the Societe des Mines de Fer (SOMIFER) in Gabon will aid two years of studies into cross-border deposits of about 870 million tonnes of 52 - 63 per cent ferrous iron ore.

6. Estimated cost

Expert services, 9 m/m	$ 72,000
Subcontract	80,000
UNIDO technical and administrative support	15,000
Miscellaneous	3,000
TOTAL cost per country	$170,000
Total cost for five countries	$850,000

No. 46

1. Title of project

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

2. Subregion/countries concerned

Each of the four subregions.

3. Objectives

To create the technological and manufacturing capacity for the manufacture of parts for agriculture, building and food-processing equipment as well as of basic industries.

4. Activities

Phase I

(a) Sites for subregional production development centres and for their associated MPPDU's will be identified, along with the availability of such utilities as power, water, wood, gas, etc;
(b) consultants will identify and estimate a basic group of products and services required within the subregion to be serviced by the centre, and their distribution within the subregion;
(c) a draft programme for the establishment of the Centre will be prepared along with a preliminary analysis of its financial implications;
(d) the level of training and availability of suitable local personnel will be assessed; and
(e) existing workshops and plants in the subregion which may be linked to the subregion centre will be identified and analysed.

The results of Phase I will be analysed to determine whether or not to proceed to Phase II.

Phase II

Detailed project design and execution programmes will be prepared for each subregional centre, including detailed installation drawings, production development and training programmes at all levels.

Phase III

Implementation.

5. Background/justification

The MPPDU centre is made up of a series of jobbing foundry/forge/machine-shops, each carefully located so as to supply essential parts and services to the surrounding area. The network is so arranged as to offer the maximum efficient coverage at a minimum cost. The subregional centres would be located around a production development centre which will be located in, or close to, the principal city of the zone. (Existing plants may be incorporated into the network as MPPDU's).

The centre will house the advanced technical and administrative staff, technical library, testing and quality control equipment, and in addition, those production services which are required by the MPPDU's but whose operation is not considered either technically or financially feasible at MPPDU level. The technical and administrative staff of the centre will visit each MPPDU on a regular basis and give assistance, and will select these products which should be manufactured at the centre. The centre will also offer training facilities to MPPDU personnel.

The location of the centre is of utmost importance in order to obtain a maximum pool of scarce technical staff. Also, such personnel should be available to universities and training institutions as teachers and instructors; they may also be required to participate in government administration as advisers.

The equipment and processes and training programmes to be installed at the MPPDU's and centre will be selected in accordance with local requirements for parts and services.

6. Estimated costs

UNIDO will provide expert assistance for the execution of Phases I and II. This is estimated at: Phase I up to $ 200,000
Phase II up to $ 800,000

Total cost for subregional centre for Phases I and II	$1,000,000
Total cost for all four subregions	$4,000,000

No. 47

1. Title of project

Establishment of subregional welding centres.

2. Subregion/countries covered

Each of the four subregions.

3. Objectives

To improve the range and quality of welding techniques required to sustain the industrial development programme of the subregion. In particular, the project aims to:

(a) Adapt and make available new welding techniques in the subregion;

(b) Undertake systematic training programmes for conventional welding and also for more sophisticated welding techniques as in (a) above;

(c) Establish and maintain welding standards and norms throughout the subregion.

4. Activities

(a) During 1985, a survey of existing welding institutes and facilities in the subregion will be carried out in order to identify one or two which could be strengthened to become a subregional centre for welding technology. On the basis of the findings of the survey, a subregional workshop will be held in one of the countries with specialists from adjoining countries together with a number of experts from welding institutes or centres of high technical standard, such as the Welding Research Institute in Tiruchirapalli, India, established by UNIDO (DP/IND/79/026). The participants will discuss and elaborate the programme for the proposed subregional welding centre. Particular attention will be paid to: the need to adapt new developments in welding technology for the subregion; the training programmes in welding techniques to be undertaken by the Institute; and the extent of the work required to establish and maintain welding standards for the subregion.

(b) Based on the recommendations of the workshop, subsequent consultations will be held with the interested countries of the subregion with a view to obtaining agreement on the establishment of the subregional centre. Initially, experts will be provided to monitor and adapt welding technology and also to train welders. At the end of the project in 1990, the Institute's programme of work will be established and carried out by locally trained specialists and welding technicians.

5. Background/justification

In industrialized countries, advances in welding have been considerable of late. In the developing countries, on the other hand, developments in welding technology have had to cope with insufficient

infrastructure. There is a growing need for development and adaptation efforts in order to strengthen the local technology infrastructure for the selection, adoption, and assimilation of technological advances in welding (e.g. laser, electron beam and underwater welding) for overall industrial development. In addition, the capability to undertake normal general purpose welding is a prerequisite for industrial progress in the developing countries.

The Welding Research Institute in Tiruchirapalli, India (DP/IND/79/026), established with technical assistance provided by UNIDO, undertakes applied research projects in the field of welding process technology, machine development, welding rod production and also metallurgical investigations. Consultancy and quality control services are being extended by the Institute to various industries and specialized training in welding and allied fields is also being provided throughout local industry; the Institute will serve as a prototype for the project proposed.

The welding centre, with appropriate subregional centres, will meet the present needs and future requirements of the subregion in order to sustain the various industrial development plans that have been projected. The expertise and equipment required to carry out the programme of work for the Institute will be provided by the UN. Land, buildings and local operating personnel will be provided by the Governments of the countries of the subregion.

6. Estimated costs

Costs are based largely on the experience obtained in establishing the Welding Research Institute in Tiruchirapalli, India. However, they will need to be considerably revised to meet the specific demands of the subregion, which will be determined at the workshop to be held at the beginning of the project and verified by a detailed design study of the Institute needed to carry out the programme required in the subregion.

Expert services, 10 m/m	$ 80,000
Subcontracts	20,000
UNIDO technical/administrative support	15,000
Workshop	30,000
Training	50,000
Equipment	200,000
Miscellaneous	15,000
TOTAL cost per subregion	$ 410,000
Total cost for all for subregions	$1,640,000

No. 48

1. Title of project

Women's assistance programmes for salt production.

2. Subregion/countries concerned

Four countries to be determined, including Nigeria.

3. Objectives

To increase and improve the salt-making technologies in the rural areas thereby improving the livelihood of several women who are running village-type salt-production units.

4. Activities

To increase the salt production and make it more effective by:
- Providing the services of an experienced salt engineer in split missions over a period of two years.
- Providing better trained personnel.
- Installing brine and drinking water storage tanks.
- Installing meteorological observatories and using its data to monitor the operations for solar evaporation of brines in the main brine spring area.

5. Background/justification

Due to the climatic conditions and unavailability of large quantities of saline brines, there is no commercial large-scale production in the remote areas of several African countries. In the Plateau State of Nigeria, for example, there are small village-type salt-producing units run by women using very dilute salt brines producing about 1,000 t/y. The century-old craftmanship in use in many African countries needs to be improved by better training and more efficient operations in order to enhance the income of the women and produce more urgently needed salt in these remote areas.

There are no statistics available indicating the level of salt production in the countries. As some brine springs are available, the Governments have approached UNIDO for assistance in carrying out studies on whether solar salt production from the available underground brines will be viable and if so, to carry out a feasibility study.

Under project SI/NIG/82/801, a salt expert was sent to the Plateau State in Nigeria to advise the Government of Nigeria on whether the production of solar salt in the Plateau State would be viable. The expert's report shows that about 1,000 tonnes of salt is being presently manufactured by the local inhabitants by the luxiviation process by about 2,300 workers and almost all of them are women. His findings are summarized as follows:

"The soil tests, examination of meteorological data and chemical composition of brine reveal that the area is suitable for solar salt production. The weak density brine and existing quantum of its

availability from the existing source, however, show that production of salt by solar evaporation will not be economically viable but it can be made feasible by getting copious high density brine from bore holes. Till bore holes are made, steps to improve the existing process of manufacture by increasing its production and improve working conditions of workers engaged in the salt industry, are necessary."

To increase salt production by the existing process and to improve the working conditions of the women workers engaged in the village-type salt industry and their training in salt manufacture, are the immediate measures to be taken up and are the objectives of this project which finds the continued support of the governments. Women salt workers will be trained; pumps and several storage tanks for brines and drinking water will be provided to increase the efficiency of production salt; meteorological observatories will be installed to collect data which will be helpful in monitoring the present and future operations of the solar evaporation brines in the main brine spring area.

6. Estimated costs

Expert, 3 m/m	$ 25,000
Training of women in India where salt is made from brine wells	35,000
Technical and administrative backstopping	5,800
Equipment	300,000
Miscellaneous	4,200
TOTAL cost per country	$ 370,000
Total cost for four countries	$1,480,000

No. 49

1. Title of project

Subregional salt and marine chemical institute for SADCC member countries.

2. Subregion/countries concerned

SADCC subregion.

3. Objectives

The development objective is to create and make operational a regional salt institute for SADCC member states in Dar es Salaam.

The immediate objectives will be to enlarge the existing salt laboratory, by increasing staff and equipment, into a regional salt and marine chemicals institute.

4. Activities

Strengthening of the Salt Testing and Research Laboratory in Dar es Salaam to:

(a) Establish a network of data collecting points on salt production, import/export, salt grades and prices in different SADCC countries.
(b) Establish and carry out training courses on a regular basis on salt production, quality control, packaging and storage.
(c) Collect data, print and distribute a quarterly bulletin with statistics on salt production, import/export, salt grades and prices in the SADCC states.
(d) Give advice on salt production problems, marketing and quality control to small-scale industrial entrepreneurs.

5. Background/justification

Salt is a basic material both for human food and for industrial uses. In Africa, 25 developing countries produced 1,933 million tons of salt in 1977. There are 24 countries in Africa with a population of 156,658 million which do not produce salt at all. In African countries, per capita consumption ranges from 2 - 3 kg or even less, which is far below the minimum 5.5 kg required as per nutritional standards. Out of the nine SADCC countries, only Angola, Mozambique and the United Republic of Tanzania are big producers of salt. The other countries rely mainly on imports.

Although a number of African countries produce salt, this salt is often crude and not refined. The higher qualities are mostly imported and packaged outside the country.

Endemic goitre is widespread in Africa and is caused by lack of iodine. This can be corrected by producing iodized salt in the countries concerned.

Due to lack of expertise, finance and trained personnel, the natural salt resources in ocean sea waters, underground brines, salt lakes or rock salt have not been fully developed. This technology is simple and can be imparted locally by trained personnel.

There is a need for a central institute in Africa to cater to the needs of the region in the design, development, and training of personnel in salt technology and to collect and publish data on salt, its production and its origin in general.

A small testing and research laboratory was established in Dar es Salaam under project DP/URT/75/015, its main purpose being to train local personnel in quality control methods, testing of salt, brine and bittern samples, to design solar salt works and to undertake research on problems of local salt production. Since there is no central salt laboratory in Africa, it is proposed to enlarge this laboratory and develop it into an African Regional Salt and Marine Chemicals Institute which will help to enlarge, improve, upgrade and strengthen the salt industries in the SADCC countries.

The aims of the institute will be to:

(a) Collect, disseminate and store information on salt production, imports and exports, salt grades and prices, etc.
(b) Conduct research on salt manufacturing problems.
(c) Maintain and run a model salt farm for training purposes and train personnel in salt technology.
(d) Conduct experiments on the manufacture of iodized salt, using locally available salt.
(e) Assist member states in the economic exploitation of their natural salt wealth.
(f) Act as a Bureau of Standards for the member states.

6. Estimated costs

High-level salt expert,	48 m/m	$ 400,000
Experienced statistician,	24 m/m	190,000
Two UN volunteers to assist the above,	48 m/m	120,000
Internal travel (within SADCC)		60,000
UNIDO technical and local administrative support		30,000
Training, including fellowships and training workshops		120,000
Equipment		140,000
Miscellaneous, including preparation of training material		40,000
TOTAL		$1,100,000

No. 50

1. Title of project

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

2. Subregion/countries concerned

Three countries to be selected.

3. Objectives

(a) To utilize locally available natural resources for industrial development.

(b) To adapt fertilizer technologies to the needs and possibilities of African conditions and increase the supply of fertilizers from local production facilities.

(c) To increase agricultural production and improve productivity, in order to increase food supply and alleviate poverty.

4. Activities

Four of the African countries identified in the study on mini-fertilizer plants (UNIDO/IS.416 and Add. 1) are to be selected for further in-depth study. The study already undertaken would be complemented by a visit of small teams to the selected countries in order to reassess: the availability (quality and amount) of natural resources for fertilizer production; potential arable land; government agricultural policy; type of crops and projected food supply and cash crop production; projected fertilizer demand and sources of supply; structure of fertilizer supply by type and source of supply; fertilizer prices and pricing policy and agricultural extension policy. Infrastructure, utilities, financing capabilities and other requirements and constraints involved in fertilizer production will also be examined. The work will be done in three phases.

Phase I

One or two teams of two experts (one generalist and one fertilizer specialist) will visit the four selected countries. Prior to their visit, a local team of specialists from each country will be formed to collect information and to be involved in the subsequent phases. Out of the four countries considered in the first round, two countries should be selected for a more detailed study involving what would amount to a pre-feasibility study of a mini fertilizer plant for the production of ammonica/urea/ammonicum nitrate fertilizers.

Phase II

A team of two specialists in fertilizer production will visit the two countries selected and work with the national team already established there. A process flow sheet will be chosen and an estimate of investment needed for a fully commercial plant as well as of a pilot plant will be made, with recommendations as to sources of technology, method of implementation, means of financing and schedule of construction.

Phase III

A team composed of UNIDO personnel and officials from the two selected countries will be formed to contact financing agencies and/or the industry for participation in the implementation of the project including financing, detail engineering, delivery of equipment, construction, training, etc. The project itself could be either a fully commercial plant or a pilot plant or both, with one in each country.

5. Backgroumd/justification

An initial survey of natural resources that could be utilized for the production of mineral fertilizers has been conducted for the African countries (UNIDO/IS.416 and Add. 1). In the study, demand for different types of fertilizers has also been estimated and projected until the year 2000. It was found that the level of demand for fertilizers in most African countries is far below the lowest financially viable production capacities commercially available in the world market. This means that most African countries, if confined to internationally marketed fertilizer technologies, would never have the possibilities of establishing viable fertilizer production facilities based on their local resources.

A study conducted by the UNIDO Secretariat on the mini-fertilizer plant projects (UNIDO/IS.416 and Add. 1) indicates, however, that in the majority of cases the cost of production of nitrogen and phosphate fertilizers from small plants is competitive with that from standard large plants built in the same area and also that of imported fertilizer produced in large plants. Furthermore, an assessment of the availability of raw materials and other resources used for the production of fertilizer (i.e. crude oil, natural gas, refinery products, phosphate rocks, sulphur, coal and hydropower potential) and of the projected market demand in 1990 and 2000 indicates that a total capacity of 1,788,000 tonnes/annum nitrogen and 725,000 tonnes/annum P_2O_5N could be established up to the year 2000 using mini-fertilizer plants in 24 African countries.

Although process flow sheets and technologies are available for small-scale fertilizer plants, there is still a need for proof of the commercial viability of these technologies. There is also a need to stimulate the interest of contractors and manufacturers in this new market, in which the total value of new contracts is estimated at more than $25 billion. UNIDO could play a catalysing role in promoting the concept of mini fertilizer plants to policy-makers in developing countries and to the industry in the industrialized countries. A commercial or pilot plant in one or two African countries could serve this purpose.

6. Estimated costs

Phase I	Four case studies One consultant, 8 m/m and one staff member, plus travel for both ———	$110,000
Phase II	Two case studies Team of 2 experts, 4 m/m and UNIDO staff, plus travel ———————————	40,000

Phase III	Presentation and negotiation of 2 cases One expert, 1 m/m, and 4 government representatives and UNIDO team, plus travel	30,000
	TOTAL cost per country	$180,000
Total cost for three countries		$540,000

No. 51

1. Title of project

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

2. Subregion/countries concerned

Two countries to be selected, including one from the Sahelian zone.

3. Objectives

(a) To preserve and improve the environment and rationalize the use of soil moisture in order to prevent and fight desertification of the subregion.
(b) To assist the Government in the establishment of a pilot compost plant by determining the most appropriate process, design, location, etc., for successful operation.
(c) To develop a national programme for city garbage composting, including standardization of plant design and processes, training of plant operators, marketing of compost, etc.

4. Activities

(a) All preparatory work will be undertaken for the establishment of a pilot plant for composting, including project formulation, tender specification for pilot plant, etc.
(b) The pilot plant will be constructed and equipment installed.
(c) The plant will be operated on a trial basis.
(d) Performance data for the design of future plants will be collected.

5. Background/justification

Composting can be an attractive alternative to sanitary landfill or incineration as a method of municipal solid waste disposal. Furthermore, urban refuse composting can provide readily available fertilizers, particularly for market gardeners around cities. Composting may also provide the most environmentally acceptable and, in the long run, economic method of disposal of wastes.

6. Estimated costs

Expert services, 36 m/m	$ 270,000
UNIDO technical and administrative support	50,000
Training	80,000
Subcontract	100,000
Equipment	500,000
Miscellaneous, including operation and maintenance of equipment	50,000
TOTAL	$1,050,000

No. 52

1. Title of project

Local production of essential drugs.

2. Subregion/countries concerned

Three countries to be selected.

3. Objectives

To establish facilities for the formulation, packaging and quality control of essential drugs.

4. Activities

(a) Equipment and services will be provided for the adaptation and demonstration of technologies for the production of tablets, capsules, syrups and ointments.
(b) An analytical laboratory will be set up for the testing of raw materials, for in-process controls and for chemical, physical, instrumental and microbiological analyses of medicaments.
(c) Training will be provided for local personnel.

5. Background/justification

In many African countries, including Cameroon, essential drugs for the prevention and treatment of the most common diseases are not available in sufficient amounts to cover the needs of the population. To a large extent, pharmaceuticals are still imported and countries are using a high percentage of their health budget for drugs which could be locally produced.

In many African countries, the budget allocation exclusively for drugs and medical supplies has been rising significantly. As most of these countries do not have pharmaceutical industries, supplies of urgent and essential drugs, particularly for hospitals, are frequently in great shortage. Therefore it is a matter of priority to set up production facilities so that essential and large consumption items can be produced on a regular basis, and kept ready in stock for distribution.

6. Estimated costs

Expert in production of dosage forms, 24 m/m	$ 180,000
Expert in quality control, 18 m/m	135,000
Expert in maintenance, 8 m/m	60,000
Consultants, 6 m/m	45,000
UNIDO technical and administrative support	20,000
Fellowships	50,000
Equipment	400,000
Miscellaneous	30,000
TOTAL cost per country	$ 920,000
Total cost for three countries	$2,760,000

No. 53

1. Title of project

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

2. Subregion/countries concerned

Three countries to be selected, including Liberia and Sudan.

3. Objectives

The proposed production unit will have the following immediate objectives, and economic manifestations:

- The manufacture of pharmaceuticals based on the natural resources of the country and thereby the saving of hard currency through import reductions. This will include the production, testing and quality control of tablets, capsules, syrups and ointments to satisfy local demand.

- The creation of a central regulatory and control body which will carry out the following activities:

  i) evaluation and licensing of medicines and their suppliers;
  ii) inspection of all places where medicines are sold or handled;
  iii) laboratory testing of drugs.

- The development of indigenous capabilities in production management and quality control in order to establish a pharmaceutical industry.

- The transfer of extraction and distillation technologies to the country involving the establishment of pilot demonstration plants for the extraction of active ingredients.

- The further development of existing local technology for preparation and formulation of therapeutic agents.

4. Activities

(a) National graduates will be trained in the technology concerned with the production and formulation of plant-derived pharmaceuticals.

(b) Services of experts will be procured to develop and accelerate the research and production of pharmaceuticals based on medicinal plants (3 experts: one agronomist for 6 months; one analyst for 3 months, after the delivery of the laboratory apparatus; and one technologist for 6 months, after the delivery of the pilot plant equipment), and to train national specialists.

(c) Existing equipment and other facilities of local medicinal and aromatic herbs research units will be improved by supply of equipment for analysis and quality assessment.

(d) A pilot plant for extraction of plant material, including active ingredients, will be established at an institution.

(e) Mechanisms will be developed for collaboration between the R + D centres and the national pharmaceutical industry.

5. Background/justification

The progressive manufacture of pharmaceuticals based on medicinal plants in the developing countries is one of UNIDO's most important programme components. Sudan possesses a rich variety of valuable plants that are a potential source of biologically active substances. The processing of these medicinal plants should be promoted in order to obtain pharmaceuticals to meet the demand within the country. During November 1979 UNIDO, in co-operation with the Joint UNIDO-Romania Centre, organized a mobile unit under project RP/RAF/79/005, which visited Sudan in order to collect samples of medicinal and aromatic plants for quantitative and qualitative determination of active principles, as well as for demonstrations on the possibility to prepare pharmaceuticals in co-operation with locally available specialists.

In particular, the country Sudan possesses a species of Cassia from which Sennosides A and B are isolated. which are the most valuable vegetable laxatives. Investigations on plants used in Sudanese folk medicine have already been initiated in Sudan and their chemical constituents classified. Initiation of a planned programme for the industrial utilization of plants would also help enhance the pharmaceutical industry in the country.

Also in Liberia, the country is at present entirely dependent on imports for all medicines used in the country as no local manufacture is existing. The annual imports of drugs exceed US$ 10 million. The Government being aware of these dnagers, requested UNIDO's assistance for a feasibility study which was undertaken in late 1980 (under SI/LIR/79/803) having the objective of preparing the grounds for the establisnment of a quality control laboratory. In the feasibility study, a UNIDO expert recommended the establishment of a pharmaceutical quality control laboratory and the parallel development of local drug production in order to reduce the financial burden of the drug bill or health services and to make available the essential drugs.

The results obtained and the pharmaceutical products prepared have established the fact that there is a distinct potential for the setting-up of a pilot production unit for pharmaceuticals, based on raw materials not only in the Sudan, but alo in other African countries. In this connection it would be appropriate to foresee the collaborative role of local R + D institutes in the commercial scale processing and final production of pharmaceuticals.

6. Estimated costs

Consultants (3 experts, total of 40 m/m)	$ 320,000
UNIDO staff mission costs (for evaluation of progress - two scheduled visits) and administrative support	40,000
Training: individual fellowships 2 specialists, chemical technology, product formulation	80,000

Laboratory equipment (extraction and distillation pilot plant, including electrical steam generator) ---	400,000
Miscellaneous, including operations/maintenance ------	30,000
TOTAL per country	$ 870,000
Total for five countries	$4,350,000

No. 54

1. Title of project

Filling, packaging and quality control of vaccines.

2. Subregion/countries concerned

Three countries to be determined, including Cameroon and Madagascar.

3. Objectives

To define which of the most needed vaccines could be blended, filled and packaged in the existing facilities with minimum remodelling or extension and to define follow-up actions for introducing manufacture of vaccines at a later stage.

4. Activities

A mechanical engineer and production and quality control expert will be recruited to assist in:

- Preparation of a production programme for filling and packaging of vaccines.
- Supervision of construction/remodelling works.
- Selection and purchase of equipment.
- Installation of equipment.
- Conducting trial runs.
- Introduction of quality control for vaccines.
- On-the-job training for production and quality control of vaccines.
- Starting routine production.

5. Background/justification

The project has a particular relevance to children as a group since the six most dangerous communicable diseases (diphtheria, measles, poliomyelitis, tetanus, tuberculosis and whooping cough) mostly affect children and can be avoided by immunization. The vaccines for the above diseases are mainly manufactured in the industrialized countries. The demand for the vaccines in developing countries is much higher than the purchasing power of such countries, therefore they are dependent on donations.

The Ministry of Health recently requested assistance in improving production facilities at the Institut Pasteur in Antananarivo, establishing a national quality control laboratory for biologicals and expanding existing production facilities. It seems to be feasible to recommend the development of vaccine manufacture by purchasing bulk vaccines for blending, filling and packaging. This would require only a minimum of remodelling and investment. Similar assistance has already been initiated in Cameroon and could be further extended to cover other countries.

6. Estimated costs

Experts, 30 m/m	$ 225,000
UNIDO technical and administrative support costs	30,000
Training	50,000
Construction costs for a new building	350,000
Equipment	250,000
Miscellaneous	20,000
TOTAL cost per country	$ 925,000
Total cost for three countries	$2,775,000

No. 55

1. Title of project

Production of oral rehydration salts (ORS).

2. Subregion/countries concerned

Four countries to be selected, including Tanzania.

3. Objectives

To strengthen the national primary health care programme by the establishment of a production facility for oral rehydration salts (ORS) as a part of the National Programme for Control of Diarrhoeal Diseases and also for Health for All by the Year 2000.

4. Activities

(a) Preparation of layout and design of production facilities for ORS.
(b) Preparation of specifications for production and quality control equipment and for civil works.
(c) Execution of civil works.
(d) Purchasing and installation of equipment.
(e) Purchasing raw materials and packaging materials.
(f) Initial production trials.
(g) Training of local staff and labour in production and quality control techniques as well as in maintenance of equipment.
(h) Start-up of routine operation.

5. Background/justification

Diarrhoeal diseases are one of the leading causes of morbidity and mortality among infants and young children in developing countries. The total annual number of acute diarrhoeal episodes for children under 5 years of age in Africa, Asia (excluding China) and Latin America was estimated to be 744 million in 1980. The medium annual mortality rate from diarrhoea is estimated 13.6 deaths/1000 population, that is about 6 million children per year.

Oral rehydration therapy is the main strategy to reduce the mortality from acute diarrhoea, since the primary cause of mortality is dehydration. Administration of rehydration fluids by mouth is relatively simple and cheap.

The estimated consumption of ORS sachets in Tanzania will be 3.7 million in 1985 and 13.3 million in 1990. At present UNICEF pays US$ 0.11/sachet to make ORS available in Africa. The estimated production costs/sachet range between US$ 0.08 and 0.06 based on which the local production can be justified.

At present, the demand for ORS in the country is met by the donations of UNICEF. Since donations cannot be the final solution in long term, it could be the subject of discussions with UNICEF to provide raw materials in stead of ORS in sachets to the country for a transitory period, as the first phase of self-reliance in this particular product.

Based on the results of a study prepared by the UNIDO in 1983, the Government is in a position to make a final decision whether to create a new production unit for ORS or to assign the production of ORS to the above mentioned companies. It is suggested that the ORS production unit could be established at the Keko Pharmaceutical Industries Ltd in Dar es Salaam.

6. Estimated costs (for the new plant)

Experts, 12 m/m	$ 102,000
Equipment	100,000
UNIDO Technical and administrative support	20,000
Construction costs	30,000
Raw materials (for 3 million sachets ORS)	120,000
Packaging materials (for 3 million sachets ORS)	80,000
Miscellaneous	18,000
TOTAL cost per country	$ 470,000
Total cost for four countries	$1,880,000

No. 56

1. Title of project

Recycling waste oil.

2. Subregion/countries concerned

Two selected countries.

3. Objectives

The immediate objective of this project is to assess whether there are enough used oil quantities in a given region/country in order to decide the feasibility to establish and operate a used oil recycling plant. Moreover, an assessment should be made on the type of technology to be used for the recycling of used oils as well as on the way to organize a collection system of used oils.

4. Activities

In order to achieve these objectives, the following activities are envisaged:

(a) Phase I - Fact-finding

- To determine the collectable quantities of used lube oils within the region/country/area where the establishment of a recycling plant is under consideration.
- To determine the type of lube oil users and the relative quantities consumed by each type of user. This is important because there are different rates of generating and collecting used oils depending mainly on the type of usage. For example, engine oils have an approximate 63 per cent used oil potential collectable rate; metalworking oils and gear oils 80 per cent; and turbine oils 87 per cent collectable potential rate.
- To determine the current ways that used oils are handled, stored, segregated and re-used. This is another factor which determines not only the recovery rate of used oils but the cost of reprocessing them as well into fuel and/or lubricating oils. For example, used oils that are handled poorly may sustain contamination from rain, solid waste, chemicals, etc. This contributes to lower the quality of used oils and to require a more elaborate and expensive process to clean it.
- To determine whether there is a collection system for used oils and if not what possibilities exist to develop an efficient collection system based on the following information:

  - location of sources using lubricating oils and generating used oil;
  - quantities of used oils generated by individual sources;
  - proposed location of used oil recycling plant.

The following problems should be taken further into consideration:
- used oils generating sources are dispersed;
- quantities of used oils generated by individual sources may be relatively small.

- To determine whether there are competing uses for used oils and what are these uses.

For example, used oils can be used directly as fuel and as dust suppressors on country/unpaved roads, etc. Both of these uses have serious environmentally adverse effects. When used oils (especially automotive used oils) are burned as fuel without pre-cleaning, a range of metals (principally lead) are released into the atmosphere. These metals are dangerous to health. If the used oil contains gasoline or other flammable material when it is burned, it may present risk of fire or explosion. Used oil applied as dust suppressor is also dangerous to health. It may contaminate ground water sources and/or adjoining water bodies and fields.

Another competing use of used oils is recycling into fuels and/or lubricants. Recycling may itself generate certain environmental problems but these problems are controllable and newer technologies are relatively pollution free.

- To determine what are the potential local and/or export markets for recycled used oil products.

Once the aforementioned activities have been completed and assessments have been made we would like to proceed to the second phase of a used oil recycling project. This phase is the establishment of an integrated used oil recycling system. During this phase the following activities must be undertaken:

(b) Phase II - Establishing an integrated used oil recycling system

- to determine the location and size of the plant based on information on the location of used oils generating sources and the quantities of generated used oils;
- to decide on the type of technology to be used in recycling used oils. This decision will be based on the information available on the type of used oils collected, level and type of contamination sustained, storage, and transportation. Last but not least selection of technology will be based also on the type of desired end-product.

Technology choice will be based as well on the available alternatives in neutralizing, treating, disposing and/or re-using waste products generated during the recycling process.

- To advise and assist on type of equipment and plant layout required for the selected technology to operate efficiently.
- To advise on technologies and methods to treat/re-use and/or market wastes and by-products generated during recycling.
- To advise on packaging and marketing the recycled products.
- To advise on a regulatory system that creates such incentives and constraints that will channel used oil to desired uses in terms of resource conservation, reutilization and environmental safety.
- To organize and develop training courses for technical personnel of recycling used oil plants.

These objectives and activities should be guided by available state-of-the art surveys on used oils/recycled oils integrated systems as

have been implemented in industrial countries. Industrial countries have substantial experience in recycling their used oils and their experience can be useful not only selecting cost-effective, environmentally acceptable technologies, but in devising effective collection and regulatory frameworks. The final aim of a used oil recycling project should be to develop information based on the experience obtained in individual country/region/plant in order to gradually develop more general guidelines that would be particularly relevant to the conditions prevailing in developing countries.

Finally, the public should be educated in order to obtain voluntary compliance in handling and disposing used oils in environmentally sound ways.

5. Background/justification

Sahelian countries present an interesting case in relation to waste oil environmental effects because of their special geological conditions. Specifically, sandy grounds absorb faster surface contamination and seep it into the ground water. Although these countries utilize lubricating oils, the scale of generated waste oil may be such that only a regional waste oil recycling activity could have any commercial viability. However, good housekeeping methods in handling, storing and disposing waste oils can be taught and the public at large can be educated. UNIDO can assist the governments of these countries with appropriate guidelines.

6. Estimated costs (for a period of three years)

Phase I (1 year)		
Expert services, including short-term consultants, 24 m/m	$192,000	
UNIDO technical and administrative support	20,000	
Miscellaneous	8,000	
Sub-total		$ 220,000
Phase II (2 years)		
Expert services, including short-term consultants, 36 m/m	$288,000	
Training	50,000	
Subcontract	200,000	
Equipment	550,000	
UNIDO technical and administrative support	50,000	
Miscellaneous, including operation and maintenance of equipment	42,000	
Sub-total		$1,180,000
TOTAL cost per country		$1,400,000
Total cost for two countries		$2,800,000

No. 57

1. Title of project

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

2. Subregion/countries concerned

Nigeria with the application of project results in other countries in the region.

3. Objectives

To establish a synthetic fibre R + D centre which will serve the man-made fibres industry in Nigeria and other African countries.

4. Activities

(a) The centre will be established by providing:

(i) wet spinning apparatus for the extrusion of rayon fibres;
(ii) melt spinning units for the extrusion of polyamide and polyester fibres;
(iii) dry spinning units for the extrusion of polyacrylonitrile fibres;
(iv) drawing, heat-setting and texturizing units for the after-fragments of the fibres.

(b) Experts will be recruited and national/international personnel trained to improve the performance and efficiency of available production units.

(c) A twinning arrangement will be made with a similar more advanced centre in another developing or industrialized country.

5. Background and Justification

There is currently an acute shortage of cotton fibres as a basic raw material for the local textile industries in Nigeria, and the situation will definitely grow worse as more emphasis is placed on cultivation of food crops and as demand for cotton grows with increased industrialization. A timely expansion into the area of man-made fibres technology would be of immense benefit to local industries through the provision of:

(a) adequately trained manpower in the technology of man-made fibres which can be used to supplement the decline in cotton production;

(b) research facilities for product development, e.g. proper use of man-made fibres in blends with available cotton fibres.

The Textile Department of Kaduna Polytechnic, Nigeria, is the only institution of its kind in West Africa to offer fully integrated textile technology courses at the higher levels, and it is now anxious to expand activities in the area of man-made fibres. Since there is only one

man-made fibre plant in Nigeria, and its production capacity is far below the national requirements, the establishment of a synthetic fibre R + D centre at Kaduna Polytechnic would be of great benefit to the industry not only in Nigeria but also to other countries in the region.

6. Estimated costs

Experts, 60 m/m	$ 450,000
Training	200,000
UNIDO technical and administrative support	50,000
Subcontract (twinning arrangement	100,000
Equipment	1,500,000
Miscellaneous	50,000
TOTAL	$2,350,000

No. 58

1. Title of project

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

2. Subregion/countries concerned

Egypt with application of project results in other countries in the region.

3. Objectives

To support and strengthen the expansion of the plastics processing industry in the African countries and thereby make a contribution to economic development, especially in the areas of food production and water conservation.

4. Activities

(a) Quality and consistency of plastics products will be improved by determination of the necessary performance parameters on which draft standards can be prepared and product quality controlled.
(b) Assistance will be provided for the expansion of the plastics industry by undertaking necessary technological developments, especially regarding the application of plastics in agriculture.
(c) Performance and efficiency of production units in Africa will be improved through provision of experts and training of personnel.
(d) Experimental stations in uses of plastics in agriculture will be set up.

5. Background/justification

Cultivating land in arid and semi-arid zones such as those which exist in some parts of Africa causes problems related to soil, climate, water management, crop conservation, transport, storage and pest control. Plastics can be used to tackle these problems through a variety of applications and their use in agriculture and water management is a means of increasing agricultural production.

Under project DP/EGY/77/004 - Plastics Development Centre (PDC), UNIDO provided assistance to Egypt in establishing a Centre in Alexandria. This Centre is equipped with a pilot plant for plastics processing, laboratories for R + D, testing and quality control, functional management, technical and administrative support, library, engineering services and information facilities. A second phase (DP/EGY/81/029) is currently under implementation to deal with the application of plastics in agriculture and water management. A strengthened Plastics Development Centre in Egypt could co-operate better with the African countries in their endeavours to attain self-sufficiency in food production.

6. Estimated costs

Experts	$ 150,000
Training	300,000
Equipment	600,000
Miscellaneous	50,000
TOTAL	$1,100,000

No. 59

1. Title of project

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

2. Subregion/countries concerned

Three countries to be selected, including Ethiopia.

3. Objectives

To establish a ceramic pilot plant demonstrating the technology and techniques developed for the manufacture of ceramic electrical household appliances used for cooking traditional Ethiopian food.

4. Activities

(a) Suitable technology for the local manufacture of electrical ceramic heating appliances will be identified.
(b) Physical, human and financial requirements for the pilot plant, utilizing the above technology will be assessed.
(c) Supervision will be provided for local manufacturing and technical personnel at each stage of the design and manufacture of the machinery and equipment of the pilot plant.
(d) Detailed specifications will be prepared with regard to raw material and other inputs needed for the manufacture of 10,000 electrical ceramic plates and 10,000 pots, and an assessment will be made of local availability and import requirements.
(e) Machinery and equipment will be installed and the start-up operation supervised.
(f) On-the-job training programmes will be provided for personnel in the fields of raw material testing and formulation, body-forming and casting methods, firing and glazing techniques, clay and glazing techniques, clay and glazing technology design selection of electrical components, proven and product design, quality control, production planning and marketing techniques.
(g) Further training needs will be identified and relevant fellowship programmes drawn up.
(h) Final reports will be prepared setting out guidelines and recommendations for the future planning of larger or similar scale production facilities.

5. Background/justification

Firewood and charcoal are generally used for baking and cooking traditional Ethiopian food and their inefficient and costly use is causing great economic losses to the country. In Ethiopia, for example, it has recently been estimated that 180,000 tons of charcoal is used annually for a variety of domestic and agricultural purposes in the urban and rural areas. The Ethiopian Electric, Light and Power Authority (EELPA), has therefore undertaken investigations to develop prototypes of electrical hot plates and pots, replacing traditionally used cooking utensils.

The workshop of EELPA currently has a production capacity of 10 electrical plates per 8-hour day and the Government has requested EELPA to develop local technology for the manufacture of 10,000 plates and pots respectively per annum at a pilot plant. Following the establishment of the pilot plant, EELPA will also be in a position to assist in the acquisition, installation and operation of similar plants in other rural parts of one country and will also provide training facilities. In view of the relevance of this project to other African countries, it is envisaged to extend it to two other countries.

6. Estimated costs

Expert services, 40 m/m	$ 300,000
UNIDO technical and administrative support	20,000
Training, including fellowships	80,000
Equipment	150,000
Miscellaneous	20,000
TOTAL cost per country	$ 570,000
Total cost for three countries	$1,710,000

No. 60

1. Title of project

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

2. Subregion/countries concerned

Initially in Upper Volta with eventual extension to cover other countries.

3. Objectives

To organize and strengthen local repair and maintenance capacities for tractors and other heavy agricultural machinery in order to make optimum use of the existing pool of equipment. In this way, support will be provided for agricultural development and for government efforts to make the country self-sufficient in foodstuffs.

4. Activities

In co-operation with the Government, two workshops will be selected at strategic sites allowing the whole country to be covered: AVV (Amenagement des Vallees des Volta) in Ouagadougou and SOFITEX (Societe de Fibres Textiles) at Bobo-Dioulasso. These two locations have been proposed because they already possess relatively well-organized workshops.

Under the guidance of the Ministry of Rural Development, the workshops will be responsible for preventative maintenance, repair and overhaul of machinery, breakdown repair, supply and distribution of spare parts and training mechanics in relevant skills. Under the terms of this project, these workshops will be strengthened through provision of equipment and manpower, so that they can provide the required services on a national scale.

The following specific activities are proposed :

(a) Draw up technical data lists of required tools and equipment, procure such equipment and install it. At the same time, plans will be drawn up for the extension of workshops and office buildings.

(b) Assess the current stock of spare parts for the machine pool.

(c) Reorganize the spare parts store, and introduce a supply service.

(d) Introduce metalling and repair skills and train various specialists through on-the-job courses.

(e) Launch and develop repair and maintenance methods in the two workshops, take care to ensure rational work methods and quality control.

(f) Renovate, repair and maintain tractors and other heavy mobile equipment which has broken down or is immobilized due to lack of maintenance and spare parts.

(g) Strengthen the activities of metalworking units by introducing specialization in the manufacture of certain high-demand spare parts.

(h) Upgrade technical skills of national staff by way of a training system covering both theoretical and practical knowledge; a training programme for cadres and managers will also be elaborated and implemented.

5. Background/justification

Under project SI/UPV/81/801 UNIDO, in 1982, carried out a study on the maintenance of agricultural tractors and other heavy agricultural equipment in the country. This study showed that half the national pool of tractors belongs to the different public bodies under the Ministry of Rural Development. The maintenance of these tractors brings about a number of technical, economic, logistic and human problems which reduces the machinery's productivity. An increasing number of tractors are lying idle. To remedy this situation, UNIDO recommended the creation of two repair and maintenance centres located at strategic points in the country, which would constitute centres for repair, supply of spare parts and training in the field of agricultural equipment.

6. Estimated costs

Chief technical adviser, 36 m/m	$ 310,000
Workshop manager AVV, 24 m/m	200,000
Workshop manager SOFITEX, 24 m/m	200,000
Storeman AVV, 12 m/m	90,000
Diesel expert AVV, 12 m/m	90,000
Pump technician/electrician AVV, 24 m/m	200,000
Tractor mechanic SOFITEX, 12 m/m	90,000
Project travel	30,000
UNIDO technical and administrative support	30,000
Training	70,000
Equipment	800,000
Miscellaneous, including maintenance of equipment	60,000
TOTAL	$2,170,000

No. 61

1. Title of project

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

2. Subregion/countries concerned

SADCC member countries.

Objectives

(a) To promote SADCC regional co-operation in technology development and manufacturing promotion in rural areas with emphasis on action at national levels through strengthening of existing institutions/manufacturing units within the framework of the Industrial Development Decade for Africa (IDDA). In addition, to interlink relevant African regional projects and programmes to national activities and to develop a harmonious programme on industrialization and rural development.

(b) To develop and elaborate a project on strengthening of the capabilities of national institutions/production untis through a SADCC regional network programme of action with reference to policies, equipment and analysis, applied R + D, co-operative technology transfer and adaptation, information and prototype exchange, training and manufacture in the area of agricultural tools, implements and machinery.

4. Activities

(a) The counterpart organization for the preparatory phase is the Industry Unit of the SADCC, Dar es Salaam. SADCC will provide the administrative support and will take the necessary action to organize the expert and policy level meetings and will undertake the follow-up action.

(b) A chief technical adviser, who will be a mechanical engineer, will be attached to the Industry Unit of SADCC, Dar es Salaam. His assignment of 12 months will be split into two six-month periods each. During the first mission, the expert will visit the nine member countries and will identify in each country the need and ministry/institution/organization which can become the focal point for the following five areas of activities:

- strategy, policy and planning;
- immediate manufacturing promotion;
- mechanical engineering/design service;
- agricultural machinery testing and development; and
- documentation and information dissemination.

He will prepare a draft project document. In addition, he will complete the preparatory organizational aspects of the proposed SADCC technical expert group meeting and SADCC policy level meetings.

(c) He will participate in the above two meetings which will discuss the draft project document and modify accordingly. The chief technical adviser will prepare the revised draft of the project document, visit member countries for discussions and will present the final project document and mission report highlighting the modalities of the implementation of SADCC and UNIDO.

5. Background/justification

The strategic importance of the development of agricultural machinery and implements and their subsequent manufacture for the intensification of food production, particularly in the African region, has been highlighted in various meetings of the African Ministers of Industry, Lima Declaration and Plan of Action, New Delhi Plan of Action and the Lagos Plan of Action 1980 by the African Heads of States.

The Governments of SADCC countries have given significant emphasis on the development and local manufacture of appropriate agricultural machinery and implements. The promotion of rural development and rural industrialization has been awarded a high priority. As the majority of the farmers have small holdings and rural small- and medium-scale industry is the backbone of the industrial development, the national governments wish to develop simple and intermediate agricultural machinery manufacture suited to the small-/medium-scale rural industrial sector. As there exists some facilities in the region, they should be strengthened and upgraded to undertake manufacturing work.

The Governments of the developing countries of Africa, with the assistance of the UN, have established an African Regional Centre for Design and Manufacturing at Ibadan, Nigeria. The African Regional Centre for Design and Manufacturing has given a priority for the promotion of appropriate agricultural machinery. However, there is a great need to link the activities of the African Regional Engineering Centre for Design and Manufacturing in the field of agricultural machinery with appropriate sub-area institutions which would be the nucleus for promoting national level activities within the framework of a sub-area/regional programme. Similarly, the selected activities of the African Regional Centre for Technology Transfer (ARCT) has to be directed to this area.

The SADCC countries have a potential to locally develop and manufacture simple and intermediate agricultural machinery and implements, with emphasis on small and medium manufacturing levels. The Lagos Plan of Action has recommended the creation of subregional/area engineering complexes. The promotion of appropriate agricultural machinery is to be given a significant priority. In this context, SADCC is to be regarded as a focal point for the promotion of an agricultural machinery programme and may be considered by UNIDO as a model with reference to the follow-up of the Africa Regional Consultation meeting on Agricultural Machinery Industry (Addis Ababa, 5 - 9 April 1982). This may also serve as a practical example of the activity within the framework of the Industrial Development Decade for Africa.

6. Estimated costs (for a period of two years)

Chief technical adviser, 24 m/m	$192,000
Short-term consultants, 24 m/m	192,000
UNIDO technical and administrative support	20,000
Training, including:	
(i) technical expert group meeting, and	
(ii) policy level meeting	50,000
Miscellaneous	6,000
TOTAL	$460,000

No. 62

1. Title of project

Assistance in agricultural modernization.

2. Subregion/countries concerned

Four countries to be selected from each of the four subregions.

3. Objectives

To assist in initiating a comprehensive programme for the design and manufacture of agricultural tools, implements and machinery.

4. Activities

- to carry out applied research designed to facilitate the designing, adaptation and development of machinery and equipment suitable for use in agricultural and rural development;
- to develop and manufacture approved prototypes, components and cultural techniques and technologies, and evaluate their suitability for local adaptation;
- to adopt foreign designs of agricultural machinery and equipment to suit local conditions of manufacture and maintenance;
- to perform tests on all types of machinery and equipment intended for use in agricultural and rural development in the subregion and to publish their results;
- to conduct short training courses designed to provide practical training and knowledge to village communities in the use and maintenance of agricultural machinery and other appropriate technology devices;
- to offer consultancy services on the designing, testing and other technical aspects of agricultural modernization;
- to act as the national link with other national and international institutions engaged in activities related to the functions of the centre.

5. Background/justification

The Governments of the African countries are giving top priority to agricultural production and rural development. Current agricultural policies place emphasis on making available industrial inputs for agricultural development. In this context, local manufacture of agricultural tools and animal-drawn implements and improved bullock carts is to be stepped up by the ministries responsible for industry. The demand for improved hand tools and animal-drawn implements is currently growing very fast in many African countries and the governments intend to make every effort to expand production of such goods. In addition to the existing national factories, efforts are being made to establish additional local manufacturing units. The objective is to have all these production items easily available for the purchase by villages and peasants, and to develop repair facilities in the villages themselves.

In Tanzania, for example, a UNIDO study in 1978 showed that out of the total cultivated land in Tanzania, 85% was done by hand, 10% by animal-drawn implements and 5% by tractors. In order to liberate the peasant from the hoe,

many regions have introduced animal-drawn implements. A few regions have established oxen-training centres. For example, the Iringa region - under EEC grant - has established 9 oxen training courses (OTC) and 110 oxen training units (OTU). In the years of 1977 - 81, 500 farmers and 6,000 pairs of bullocks were trained. During 1982-86, 2 OTC in each district and a total of 48 OTU will be opened and 1,500 farmers will be trained. The Tanzania Rural Development Bank (TRDB) has assisted 45 villages in the purchase of 60% of implements and carts in the Iringa region.

The Centre for Agricultural Mechanization and Rural Technology (CAMERTEC), now being established at Tengeru, Arusha, could be developed to become a subregional centre for Eastern and Southern Africa. It could serve as a source of information and advice on technologies that help the development of rural economy and the improvement of the quality of rural life, and to give assistance in the application of these technologies. One of its most important functions will be to collaborate with the development programmes and project being identified and implemented in the regions. In many cases, the success of these programmes is dependant on the correct choice of the technologies to be introduced and promoted. It is intended that CAMERTEC could become a source of expertise for programme planning and implementation especially in the selection of technologies. CAMERTEC is also expected to take an active role in the dissemination and practical application of technologies which are being developed by other specialized institutions to meet the needs of the agriculture and the rural areas. Similar centres will be identified and selected for other subregions, including the national agricultural machinery development centre in Cameroon, for the Central African subregion.

CAMERTEC is an independent para-statal organization which resulted through a merger of two separate institutions in 1982: one formerly known as Tanzania Agricultural Machinery Testing Unit (TAMTU) and Arusha Appropriate Technology Project (AATP). TAMTU used to test agricultural machinery for their suitability to Tanzanian conditions. TAMTU's activities date back from 1955. AATP was started in 1977 as a project under Small Industries Development Organization (SIDO). The functions of AATP was to do research and development in building materials, rural transportation, energy and water supply. CAMERTEC is a body corporate established by an Act of Parliament, which received assent in November 1981 and which became operative on the 13th of January 1982.

6. Estimated costs (over a period of 3 years)

Expert services, (60 m/m)	$ 480,000
Training	80,000
Subcontract	100,000
Equipment	250,000
UNIDO technical and administrative support	50,000
Miscellaneous, including equipment maintenance	40,000
TOTAL cost per country	$1,000,000
Total cost for four countries	$4,000,000

No. 63

1. Title of project

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

2. Subregion/countries concerned

All subregions.

3. Objectives

(a) To assist the African Regional Centre for Engineering Design and Manufacturing in the formulation of a long-term programme for rationalized industrial development with due consideration to planned local ancillary industry promotion. In this way, the country's foreign exchange requirements would be significantly reduced and local technological capabilities could be developed, with emphasis on a judicious horizontal integration within the engineering industrial sector, and
b) Initiating the local production of automotive components.

4. Activities

(a) Analysis of existing stock (park) of engines, trucks, motorcycles and tractors and estimation of the number of spare parts required during the next 8 - 10 years based on "replacement turnover factor" of life period.
(b) Systemization of common components for the above products, taking into account the degree of simplicity, product specification, raw material requirements, production techniques and quality control.
(c) Analysis of those components which could eventually be locally manufactured during the period 1982/83 - 1989/90 and recommendation of a programme of production.
(d) Initiation of a programme for establishing an appropriate automotive ancillary industry, promotional institutional facilities to co-ordinate the activities and to develop local entrepreneurship and guidance in quality control, standardization and technical training.
(e) Recommendation of progressive establishment of new ancillary industries during 1984/85 - 1989/90.
(f) Revising ways and means for the production of local components with marginal additional facilities and investment, taking into account existing engineering manufacturing facilities.
(g) Assisting the Government and industry in the rationalization of existing and proposed production programmes of motor vehicles, motorcycles, diesel engines, tractors and mobile loaders, trucks and land-rovers and to engines, etc., with special emphasis on horizontal integration and local manufacture of ancillary automotive components.

5. Background/justification

The African development strategy, both at the national and subregional levels, clearly recognizes the importance of low cost standard rural vehicles as an important factor for the industrial development, in general, and the improvement of the quality of life in rural areas, in particular. The essence of this strategy has been highlighted in the

Lagos Plan of Action for the Economic Development of Africa; in the Industrial Development Decade Programme for Africa (IDDA) and in the ECA/UNIDO Work Programme for 1984 - 1985.

Most of Africa's rural areas mode of transport is still be manual or animal effort or by a combination of both. The justification for the local manufacture and usage of standard low cost multipurpose vehicles are as follows :

- the investment of vehicle is low;
- the operating cost, service and maintenance cost is low;
- manufacturing technology and subequent adaptation is flexible and simple;
- size of the parts and components are relatively small and can easily be manufactured within local conditions;
- increased utilization of this equipment can create greater industrial activities in rural areas.

6. Estimated costs

Expert services, 36 m/m	$288,000
Training, including the organization of a regional workshop	150,000
Subcontract	150,000
UNIDO technical and administrative support	30,000
Miscellaneous	12,000
TOTAL	$630,000

No. 64

1. Title of project

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

2. Subregion/countries concerned

All subregions, especially the Sahelian zone.

3. Objectives

To assist the African Regional Centre for Engineering Design and Manufacturing to:

(a) design and fabricate a mobile production system for improved simple kitchen stoves which rural families could afford to buy or fabricate;
(b) undertake a rural demonstration programme in selected countries, especially those in the Sahelian Zone; and to
(c) train local staff in the repair and maintenance of the stoves.

4. Activities

The ARCEDEM will:

(a) assess the needs of the rural population of the subregion with a view to providing specifications and parameters for an improved kitchen stove;
(b) collect and analyse information on available techniques in other developing countries on the manufacture of simple kitchen stoves;
(c) design, on the basis of (a) and (b) above, such a simple stove;
(d) produce a pilot sample of the stove and demonstrate its use in a selected number of countries;
(e) promote and assist the commercial production of the stoves by a local entrepreneur, including the training of staff in its repair and maintenance.

5. Background/justification

The countries of the Sahel subregion must conserve wood. Improved kitchen stoves will decrease wood requirements by 66%, provide healthy environmental conditions in rural areas, and provide an opportunity for rural/small-scale industrialization and entrepreneurship development. The Governments of countries of the subregion and concerned intergovernmental organizations/institutions are seeking to develop an integrated programme in this field.

6. Estimated costs (for a period of four years)

Expert services, 160 m/m	$ 480,000
Training, including group training programmes	80,000
UNIDO technical and administrative support	50,000
Subcontract	100,000
Equipment	250,000
Miscellaneous	40,000
TOTAL	$1,000,000

No. 65

1. Title of project

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

2. Subregion/countries concerned

All subregions, especially the Sahel subregion and island developing countries.

3. Objectives

To assist the African Regional Solar Energy Centre and the African Regional Centre for Engineering Design and Manufacturing to:

(a) develop techniques for the utilization of solar energy in the selected countries especially those in the Sahel subregion and island developing countries, specifically by establishing demonstration units for the desalination of sea and brackish water to supply fresh water to small isolated communities (up to 250 persons), or institutions (e.g. hospitals); and to

(b) carry out work on design, technology adaptation and materials substitution to bring the cost of such units within reach of the people of the countries concerned.

4. Activities

Phase I A fact-finding mission will assess the overall potential for solar desalination technology in the country; determine those Government authorities, institutions and organizations which will be responsible for the development; and select the sites and the type of unit to be set up as a demonstration plant.

Phase II The recommendations of the fact-finding mission will be implemented, equipment will be designed, manufactured and installed and technical advice and training will be provided.

5. Background/justification

A number of techniques have been developed for the production of fresh water from sea or brackish water by means of desalination units which are powered entirely, or largely, by solar energy. These techniques have tremendous potential for application in hot, sunny developing countries where the supply of fresh water to small, isolated settlements (e.g. small island communities or remote police, military or customs outposts) is a daily problem. Conventional desalination technologies require the supply of electricity or of liquid fuel whose transportation may pose considerable problems.

6. Estimated costs

Phase I		
Expert services, 6 m/m	$	48,000
UNIDO technical and administrative support		10,000
Training		10,000
Miscellaneous		2,000
Sub-total	$	70,000
Phase II		
Expert services, 36 m/m		288,000
UNIDO technical and administrative support		50,000
Training		80,000
Subcontract		100,000
Equipment		450,000
Miscellaneous		32,000
Sub-total		$1,000,000
TOTAL		$1,070,000

No. 66

1. Title of project

Manufacturing of equipment for mini hydro-power plants in Africa

2. Subregion/countries concerned

All countries in Africa.

3. Objectives

To assist the African Regional Centre for Engineering Design and Manufacturing to:

(a) identify and evaluate domestic design and manufacturing facilities and capabilities for the fabrication of equipment and the use of microprocessors in mini hydro-power plants;

(b) To collect and analyse information on hydro-power potential and projects, including those in certain other countries, which would represent a potential market; and to

(c) strengthen some of the facilities identified in (a) above in initiating the production and installation of mini hydro-power generation equipment and the training of personnel in its maintenance.

4. Activities

(a) An in-depth survey of domestic capabilities in Africa will be undertaken covering:

(i) Design and engineering services

- Engineering consultant institutions and R + D institutions in the country capable of product design, analyses, product development (metal products, capital goods)
- Laboratories and other facilities for model testing
- Number and qualification of professional work force employed by the institutions surveyed
- Ongoing and planned activities, possibilities of incorporating and absorbing new functions relating to hydro-power equipment development
- Eventual co-operation with foreign R + D organizations as well as product and process development divisions of foreign industrial enterprises
- Relevance of domestic design and engineering experience to hydro-power adaptation and development.

(ii) Manufacturing capacity

- Foundry, forge and metalworking/machining units
- Tool, die and mould making
- Assembly of machinery
- Marketing and after-sales services
- Use of existing production capacity
- Medium-term plans and concepts for further development
- Evaluation of findings.

(b) A survey of demand for mini hydro-power equipment will be made, covering:

- Mini hydro-power plants in operation
- Mini hydro-power plants in construction
- Mini hydro-power plants in design
- Mini hydro-power plants in various stages of study
- Other information on mini hydro-power potential in the country and region, long-term development programmes
- Domestic capabilities in river management (river regulation, irrigation, dams)
- Repair and maintenance services in the energy generating sector
- Operating conditions of existing and planned plants relevant to the assessment of equipment needs.

(c) The opportunities for initiating the production of mini hydro-power equipment will be assessed and the necessary measures specified through:

- Selecting equipment and parts which could be produced in the country
- Indicating the design and development (adaptation, manufacturing preparation) requirements in terms of manpower needs
- Indicating the testing and other R + D facilities required
- Indicating which factories (companies) could be associated with hydro-equipment production and development in the country, since the basic manufacturing processes (e.g. casting, forging, machining) are common to various branches of the capital goods industry
- Indicating the need for upgrading and expanding production facilities
- Specifying training requirements.

(d) Following an in-depth survey of domestic capabilities on designing and manufacturing of mini hydro-power equipment, pre-feasibility as well as feasibility studies will be carried out in selected African countries, in order to assist in the local manufacture of mini hydro-power equipment for the establishment of mini hydro-power stations in Africa.

(e) Imported electronic load controllers will be installed and tested in selected existing mini hydro-power stations. A design team, including international experts, will be set up in selected African countries to improve and develop imported electronic controller designs and to design and manufacture electronic load controllers in Africa.

5. Background/justification

To promote the development and application of mini hydro-power in the developing countries in general, particularly in Africa UNIDO has been carrying out a number of programmes and projects.

There is a recognized need to promote the local manufacture of mini hydro-power equipment and machinery in Africa, and furthermore, it is essential to have design and manufacturing capabilities for such equipment and machinery in the continent.

One of the constraints on exploiting the continent's abundant but unused energy resources has been the high capital cost of small-scale hydro-electric installations, a major component of the cost being the mechanical device controlling the water flow on the turbine. This flow controller adjusts the water supply for variations in electrical demand and keeps the turbine running at a constant speed. Modern solid state electronics have allowed the development of a cheaper alternative system to the flow controller, with its associated mechanical applications. In the solid state system, termed load control, the turbine runs continuously with the maximum available water flow; the surplus electrical output is shed into a "ballast load". An electrical black box performs the entire function by switching power from the consumer's load circuit to the "ballast load", and vice versa, on demand.

After the identification and evaluation of design and engineering service capabilities and of manufacturing capabilities in a selected country of Africa, simple low-cost turbines, generators, penstock electronic load controllers could be considered for local manufacture.

6. Estimated costs (for an estimated period of four years)

Phase I - In-depth survey		
Expert services, 10 m/m	$ 80,000	
Local ARCEDEM experts, 6 m/m	30,000	
UNIDO headquarters technical supervision	10,000	
Sub-total		120,000
Phase II - Design and installation of plant		
Expert services, 60 m/m	480,000	
UNIDO technical and administrative support	50,000	
Training, including workshops on repair and maintenance	100,000	
Subcontract	250,000	
Equipment	1,500,000	
Miscellaneous	20,000	
Sub-total		$2,400,000
TOTAL		$2,520,000

No. 67

1. Title of project

Promotion of the capital goods industry in Africa.

2. Subregion/countries concerned

Each of the four subregions.

3. Objectives

Provision of subregional supportive studies on:

(a) existing capital goods industries and promotion institutions;
(b) scope for installing new industries (including analysis of present and projected supply/demand gap);
(c) identification of concrete requirements and possibilities for production facilities;
(d) determination of promotional support activities, preferably on a subregional basis in the scope of regional co-operation.

To contribute in the long- and medium-term to enhanced and balanced industrial growth in individual countries, to contribute to a regional co-operation in the promotion of capital goods industries and to contribute to trade development in capital goods among African countries. To identify, in a concrete manner, the number and nature of capital goods production facilities most needed by African countries.

4. Activities

Firstly, in respect of each subregion, a systematic diagnosis of past and present production of capital goods and existing industrial production structures, including factor inputs such as manpower, technology and finance, as well as of the prospects and constraints faced by industry, will be made. Secondly, an analysis of institutions dealing with capital goods production, especially with the promotion of their domestic or subregional production will be carried out and the future regional levels as well as their interactions will be outliend. Thirdly, the supply and demand of capital goods on national and regional levels in the short-, medium- and long-term will be determined and based on both economic and technical considerations, additional production possibilities and production facilities will be identified and recommendations for their location will be presented. Emphasis will be given to subregional complementation of production. Furthermore, a programme containing policy measures, both on national and regional levels, for active support of production of capital goods will be drawn up. This approach will strengthen efforts of regional and subregional industrial complementation and institutional co-operation.

The activities would be undertaken by teams of carefully selected local experts, UNIDO staff and internationally recruited high-level specialists, as appropriate. While the exercise will be organized and monitored from UNIDO headquarters, the work would be carried out largely in the subregions concerned through short-term missions to the countries in the region. The substantive responsibility for implementing the programme would rest with the Sectoral Studies Branch but close co-operation would be established with other relevant Branches/Sections in UNIDO.

5. Background/justification

The efforts launched in the context of the Industrial Development Decade for Africa provides a framework for programmed action of the nature described above. Various meetings within UNIDO's System of Consultation and elsewhere have clearly underlined the crucial role of the capital goods industry and it has been stressed that special efforts to develop this industry must be made in countries with no or very little domestic capital goods industry. Particular emphasis will therefore be put on such countries but also on further development of already existing industries, the improvement of capacity utilization of such industries, etc. Supply to limited domestic markets through small-scale operations, subregional or regional co-operation, co-operation between developing countries as well as export industries oriented towards the world market will be considered as strategic alternatives in appropriate cases. Special emphasis will also be put on the development of an institutional framework on the national and subregional levels for promotion and support of the capital goods industries. (It should be mentioned in this context that similar work has already been carried out for the Latin American as well as the Arab regions).

6. Estimated costs The average cost per subregion is estimated to be:

12 m/m of locally recruited experts, including travel	$ 30,000
12 m/m short-term specialized expert services at headquarters and field, including travel	96,000
UNIDO headquarters participation, including presentation and discussion of findings with policy-makers	15,000
2 m/m research assistance/GS temporary assistance at headquarters	6,000
Miscellaneous	3,000
TOTAL cost per subregion	$150,000
Total cost for four subregions	$600,000
Regional meeting on capital goods	150,000
TOTAL	$750,000

No. 68

1. Title of project

Strengthening of African institutions dealing with engineering, design and manufacturing, including the Tanzanian Engineering, Manufacture and Design Organization (TEMDO).

2. Subregion/countries concerned

Four countries to be determined, including Tanzania.

3. Objectives

To assist the Government in enhancing its domestic engineering design and manufacturing capabilities through manpower development and strengthening of relevant institutions.

4. Activities

(a) A design engineer will be provided to assist in organizing a design office, advise and assist in product design, train local personnel, and outline a workplan for the next 2 - 3 years. During a second mission, the expert will advise and assist in product design and train local personnel.

(b) A toolroom engineer will analyse industries' needs for tool engineering (tools, jigs, fixture, dies, etc.), and elaborate the physical facilities that should be established to meet the national needs. A detailed equipment list will be prepared with specifications, technical manpower, finances, and raw material stock. The expert will outline a workplan and implementation schedule, and train local personnel.

(c) A material engineer (laboratory analysis) will investigate industries' needs with reference to the services required in the area of material engineering, especially in chemical, physical and metallurgical laboratory testing. The physical facilities that TEMDO should establish to meet the national requirements will be outlined, including equipment and instrumentation specification, manpower requirements, raw material and finances. The expert will outline the workplan and implementation schedule and train local personnel.

(d) A mechanical engineer (production) will analyse a proposed layout and equipment list, recommend necessary improvement and finalize the layout, equipment specifications and the list of machinery. A workplan and implementation schedule will be outlined and training will be provided for local personnel. During a second mission, the expert will assist in the installation of new machinery received, train local personnel and develop a programme of industrial liaison with the manufacturing enterprises.

(e) A study tour will be organized to enable four local technical personnel to visit two countries of Africa (Egypt and Zimbabwe) and four countries of Asia (e.g. India, Republic of Korea, Philippines and Thailand) for a total duration of three months (12 m/m) to visit engineering R + D institutions and selected manufacturers with the aim of identifying specific products that may have a potential for local design/development and manufacture.

5. Background/justification

Since mid-1974, UNIDO has provided assistance to a number of countries in the establishment of engineering and design centres. This assistance included study tours for local experts to exchange experience with counterparts in other countries which enabled them to analyse industries, infrastructure, construction and foundry, the industrial market for metalworking industry and the country's long-term industrial plans, and made detailed recommendations for the programme and activities of an Engineering and Design Centre. On the basis of the experience acquired and the great emphasis placed on the development of engineering industries, it has become desirable to extend this assistance to other countries.

6. Estimated costs

International experts

Design engineer,	24 m/m		
Toolroom engineer,	12 m/m		
Material engineer (laboratory analysis),	12 m/m		
Mechanical engineer (production),	12 m/m		
Project personnel costs	60 m/m		$ 480,000
Experts internal travel			25,000
UNIDO technical and administrative support			35,000
Training, including study tours			60,000
Equipment			
Prototype of equipment/machines/products selected as a result of study tour		$40,000	
Design and drawing office equipment		50,000	
1 station wagon and 1 jeep		30,000	
Total equipment			120,000
Miscellaneous			30,000
TOTAL cost per country			$ 750,000
Total cost for four countries			$3,000,000

No. 69

1. Title of project

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

2. Subregion/countries concerned

Ten countries to be determined.

3. Objectives

(a) To develop training programmes in appropriate institutions in selected African countries for negotiation and acquisition of technology. Particular attention will be given to the sectors identified by the Lagos Declaration and Plan of Action and the Programme for the Industrial Development Decade for Africa. The courses will be based on the UNIDO guidelines, checklists and model contracts prepared for these sectors.

(b) To increase the skills of senior managers of private and public enterprises from African countries in the selection of technology and negotiation of its acquisition, taking into consideration the specific environment in which such acquisition will take place by means of training seminars for the duration of three weeks at a centre of excellence in each of the six selected African countries.

(c) The training of course leaders from appropriate institutions in the selected countries in the design and implementation of advisory services in the selection of technology and the negotiation of its acquisition.

4. Activities

(a) Review of available training material.

(b) Adaptation of training material to suit the needs of the African countries.

(c) Selection of institutes to carry out training seminars.

(d) A training course for potential course leaders and senior managers from selected African countries.

(e) Implementation of at least one training course in the selected African country with the advisors and institutions identified in activities (c) and (d).

5. Background/justification

A considerable degree of awareness for the importance of technology for development is displayed by most developing countries. However, limited attention is given to the selection of technology at the micro or enterprise level. Selection of technology is often hindered by

non-availability of processed information and lack of capacity for evaluation. Selection from available options is further hampered by such factors as the availability of credit facilities from one country or supplier of equipment. It is also observed that the absence or non-association of indigenous consultancy services and availability of multi-disciplinary teams trained in technology evaluation is an important bottleneck.

6. Estimated costs

International consultants, 6 m/m	$ 45,000
Locally recruited consultants from a centre of excellence	20,000
UNIDO staff, including administrative support	20,000
Travel and per diem of participants	30,000
Printing	5,000
TOTAL cost per country	$ 120,000
Total cost for ten countries	$1,200,000

No. 70

1. Title of project

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

2. Subregion/countries concerned

All subregions.

3. Objectives

(a) To develop and conduct training programmes for trainers in the field of industrial accountancy.

(b) To elaborate and carry out refresher courses industrial for accountants and book-keeping experts in order to accelerate implementation of the accounting systems adopted at the subregional level and adapted to each country.

(c) To assist in the establishment of subregional centres for carrying out the above-mentioned training programmes.

4. Activities

(a) To develop the sub-systems required for the application of the national industrial accounting systems modelled on the one common system adopted at the subregional level.

(b) Formation and training of a team of expert accountants within selected national and foreign firms to ensure the maintenance, popularization and improvement of standard industrial accounting systems.

(c) To assist in the organization of seminars for chief accountants from industrial enterprises, so that they may adapt standardized systems in which they have been trained to the conditions in their respective countries.

(d) To identify the modalities of the systems to be set up within the framework of the subregional industrial accounting system in order to:

- keep a check on prices in relation to production costs;
- provide Governments with statistical data for the formulation of investment policy and to ensure rationalized development.

(e) To carry out research for the preparation and publication of appropriate accounting manuals for developing countries.

5. Background/justification

In 1979 UNIDO, in co-operation with the Government of Benin, organized an Expert Group Meeting at Cotonou on the subject of standardized accounting systems for industrial enterprises in the

developing countries. The meeting revealed that most African countries suffer from a lack of professionals with practical accounting experience. Moreover, the small- and medium-scale enterprises often have no trained personnel who can use accounting systems for financial administration. So far, training of nationals at universities abroad has provided the basic theoretical elements to fill these gaps, but complementary practical training in line with the national plan is needed for a more effective application of accounting methods.

To solve all these problems, it is proposed that UNIDO, in co-operation with international organizations and bilateral and multilateral sources of technical assistance, set up a regional pilot centre for provision of training and refresher courses for national accountants and for assistance to small- and medium-scale enterprises in the developing countries.

6. Estimated costs

Experts and consultants, 120 m/m	$800,000
Formation	50,000
UNIDO headquarters technical and administrative support	50,000
Equipment	40,000
Miscellaneous	20,000
TOTAL	$960,000

No. 71

1. Title of project

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

2. Countries concerned

To be determined.

3. Objectives

To improve the management of small and medium-scale industrial enterprises run by women.

To introduce a systematic approach for transmitting management strategies to women entrepreneurs of small/medium scale enterprises and enhance local training institutions' capacity to provide management for the advancement of women ertrepreneurs.

4. Actitivies

A management training expert, in conjunction with a Training Institution (PAID - ESA) will undertake a local needs assessment to determine the locations and the specific areas in which training is required in a given training cycle.

Three international experts, together with counterparts from a national training institution in a van equipped with training material, will form a mobile team which will give training courses in different geographical areas with a duration of one to two weeks at a time. A complete training cycle will comprise :

Course 1 - 2 weeks	a) enterprise organization b) management principles and practices c) planning d) technical aspects
Course 2 - 1 week	a) Organizing b) Controlling c) technical aspects (cont'd)
Course 3 - 1 week	a) Commercial management b) Financial management c) Technical aspects (cont'd)
Course 4 - 1 week	a) Accounting b) Personnel management

Note: The focus of each phase will be on problem identification and logical solutions.

- Each phase is to include a collectively designed self-help series of episodes to overcome current management/production deficiencies.

- A 3 to 6 weeks' time interval will be programmed into the training cycle between each phase for each of the areas.

A Course 1 programme will be offered consecutively in different geographical locations. Likewise, following this activity, course 2 will be offered. Course 3 and 4 follow in similar order. A complete training cycle for the geographical locations will take eight months.

5. Background/justification

Women represent an important management force in small and medium-scale industries in Africa. Education and training facilities for industrial management generally neglect the specific problems related to women in industry. In view of their dual responsibilities (child raising and household duties), women find it difficult to absent themselves for lengthy periods of time to upgrade their management skills and improve the productivity of their enterprises. Management training focusing on local conditions and given in a cycle of short-term training courses not too far away from the place of work will facilitate the access of women entrepreneurs to training and enable women employed in industries with a heavy female component at lower level to obtain training thus enhancing their possibilities for advancement to managerial levels in these industries. The trainers of the National/Regional Training Institution, through which the mobile training teams will be operating, will be able to continue this type of training after the international experts have completed their assignments. Thus, the project will develop a capacity of local management/training institutions to offer extension services, i.e. the infrastructure for this kind of operation on a permanent basis as well as training of local trainers. This project was discussed during the African Regional Workshop on the Integration of Women in the Industrial Planning and Development Process (RP/RAF/84/042), Harare, Zimbabwe, in April 1984 with the representative of the Pan African Institute for Development - Eastern and Southern Africa (PAID-ESA).

6. Estimated costs

Preparatory phase	
1 exploratory mission, 3 m/m	$ 24,000
Preparation of training material based on local conditions identified during exploratory mission, 3 experts, 2 m/m each	48,000
Sub-total	$ 72,000
Main phase	
3 experts, 6 m/m each	144,000
Training equipment	15,000
1 fully equipped van	20,000
Technical and administrative support	10,000
Miscellaneous (including printing of training material)	9,000
Subtotal	$198,000
TOTAL	$270,000

No. 72

1. Title of project

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

2. Sibregion/countries concerned

Regional Africa.

3. Objectives

To hold 17 national and 8 inter-regional workshops on the preparation and evaluation of industrial investment projects in order to strengthen institutions related to industry in selected African countries, so as to increase chances of successful negotiation with potential sources of financing for the realization of industrial undertakings.

4. Activities

The participants will be introduced to a systematic presentation of all experts related to pre-investment studies. They will, in particular, be acquainted with the intricacies of preparing full-fledged techno-economic feasibility studies. The training will consist of theoretical and practical exercises. The course content for each workshop will consist of: project development cycle; market analysis and plant capacity; technical analysis; financial analysis; economic analysis; and investment promotion and project implementation. The UNIDO computer model for feasibility analysis will also be presented and participants trained on its use.

5. Background/justification

One of the major constraints to industrial development in Africa and especially in least developed countries, is the shortage of well-studied industrial projects. It is, therefore, imperative that a nucleus of Government officials in selected African countries be trained in the practical techniques of project preparation, evaluation, financing and implementation.

6. Estimated costs (per workshop)

Short-term experts, 5 m/m	$	40,000
Follow-up missions		10,500
Training		15,000
Equipment		1,000
Miscellaneous		4,000
TOTAL cost per workshop	$	70,000
Total cost for 25 workshops		$1,750,000

No. 73

1. Title of project

Development of a technology support programme for the Decade.

2. Subregion/countries concerned

Africa regional.

3. Objectives

To contribute to and enhance the attainment of the general and sectoral goals of the programme for the Industrial Development Decade for Africa (IDDA) by identifying, assessing and comparing specific technological inputs required for accelerated development of the priority sectors.

4. Activities

The activities of the project will consist of a one-week technical workshop which will examine the possibilities and constraints to the application of selected technologies in the priority sectors of the programme for the IDDA. With reference to identified and proven traditional technologies, the workshop will evolve an action programme for their upgrading and dissemination. Preparatory activities for the workshop will involve the preparation of sectoral papers that will assess the current technological situation in the region, and identify specific technological inputs which might be introduced to accelerate developments in the selected sectors and subsectors, particularly in the rural areas. In order to have a meaningful outcome, the workshop will be limited initially to 5 - 6 sectors/subsectors to be selected in consultation with the Unit for the IDDA, the ECA and the OAU.

5. Background/justification

The programme for the IDDA has identified a number of industrial sectors and subsectors whose development is considered important/necessary to achieving national and collective self-reliance as well as meeting the basic needs of the people. Development of the identified sectors and subsectors will require technological inputs of a type that can be readily assimilated by the population, in particular the rural population who account for nearly 80 per cent of the total population. In certain cases it will involve the introduction of technologies from other regions of the world; in some cases it will involve improving/upgrading known traditional technologies of Africa; in other cases it might necessitate the introduction of new/advanced technologies; in most cases it will probably involve a mix of both traditional and new/modern technologies. What is clear, however, is that an identification and assessment of required technology inputs is necessary. The workshop will, on the basis of selected industrial sectors and subsectors, examine their technological implications, i.e. examine the technology inputs required to achieve the targets of the programme of the IDDA in those sectors, taking into consideration the technological options available not only in Africa but also in other regions of the world, particularly other developing regions.

6. Estimated costs

The workshop will take place in five individually constituted working groups of 20 people each in view of the sectoral content of the discussions.

24 m/m of consultant services, (including travel and per diem for country surveys)	$192,000
Travel and per diem for seven days for 100 participants at about $2,000 each	200,000
10 international experts, (including fee, travel and per diem)	36,000
English/French translators/interpreters, (including travel and per diem for eight	60,000
Headquarters technical preparation and follow-up, (including preparation and participation in workshop)	30,000
Administrative support, (including secretarial and other general services support to workshop	20,000
Miscellaneous, (including reporting costs, local transportation, communications and sundries)	12,000
TOTAL	$550,000

No. 74

1. Title of project

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

2. Subregion/countries concerned

All African countries.

3. Objectives

To improve the skills of African entrepreneurs in the negotiation and acquisition of technology in eight selected subregions as a contributive factor to accelerated industrial growth of African countries.

4. Activities

(a) An examination will be made of current practices in technology transfer negotiation and acquisition for each selected sector. This will comprise desk studies, field visits and support studies by the countries participating in the UNIDO Technological Information Exchange System (TIES). Emphasis will be given to the dynamic aspect of negotiations, taking into account the preparatory and the implementation phases of the contract.

(b) Approaches to selected issues in selected subsectors (e.g. biomass, vegetable oil, etc.), will be outlined for each sector and the results will be subjected to clearance by the African countries through presentation at the African Regional TIES meetings.

5. Backgroumd/justification

In the Lagos Plan of Action and the Programme for the Industrial Development Decade for Africa, priority was given to the development of local entrepreneurship, technical manpower and technical abilities to enable the African people to assume greater responsibilities for the achievement of individual and collective development goals. Furthermore, the Lagos Plan of Action, in paragraphs 151 and 152, outlines a policy on the development and transfer of technology. This project aims to translate the policy into a practical management tool in order to ensure the appropriate development of local entrepreneurship in priority areas of industrial development.

6. Estimated costs

The average cost per sector is estimated to be:

Locally recruited experts, 10 m/m	$ 25,000
Short-term consultants, 6 m/m	48,000
Meeting of African regional TIES	40,000
UNIDO headquarters participation, including presentation and discussion of findings and administrative support	15,000

Miscellaneous, including printing and distribution of documents	22,000
TOTAL cost per subsector	$ 150,000
Total cost for eight subsectors	$1,200,000

No. 75

1. Title of project

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

2. Subregion/countries concerned

All African countries.

3. Objectives

To increase the bargaining power of entrepreneurs (both public and private) in the acquisition of technology in particular in:

(a) Preparation for negotiation of major contracts in the area of joint ventures, turn-key deliveries, licences, know-how, management and franchising services including financial arrangements.

(b) Drafting of agreements enumerated under (a) above.

(c) Negotiation or renegotiation of contracts enumerated under (a) above.

(d) Other contractual areas.

4. Activities

At the request of African Governments, advisory missions of short duration will be undertaken by UNIDO staff and carefully selected consultants during the critical stages of the negotiations. These will be complemented by desk studies and desk advice. It is expected that 10 missions each year will be carried out. These advisory services are complemented by a promotional programme for these activities in the African region.

5. Background/justification

A considerable degree of awareness for the importance of technology for development is displayed by most developing countries. However, limited attention is given to the selection of technology at the micro or enterprise level. Selection of technology is often hindered by non-availability of processed information and lack of capacity for evaluation. Selection from available options is further hampered by such factors as the availability of credit facilities from one country or supplier of equipment. It is also observed that the absence or non-association of indigenous consultancy services and availability of multi-disciplinary teams trained in technology evaluation is an important bottleneck. UNIDO has given technology acquisition negotiation advice to developing countries entrepreneurs on a limited scale through TAS on a cost-reimbursable basis. The present project aims to enlarge this programme as a complement to an appropriate promotional programme to reach the entrepreneurs from the African countries and to assist them through the provision of high-level advice during the negotiations.

6. Estimated costs (per advisory mission)

Specialized expert services, 2 m/m	$	15,000
UNIDO headquarter staff participation, 3 m/m		10,000
Research assistance/GS temporary assistance at UNIDO headquarters, 2 m/m		5,000
TOTAL cost per advisory mission	$	30,000
Total cost for 60 advisory missions		$1,800,000

No. 76

1. Title of project

Assistance in industrial and technological information.

2. Subregion/countries concerned

Initially in Nigeria with eventual extension to other countries.

3. Objectives

To establish a decentralized industrial and technological information and data bank as an integrated part of a large-scale project which was drafted as a follow-up to previous assistance from UNIDO to the country.

4. Activities

Under the project, three consultants will be fielded to carry out the following tasks in accordance with the project objectives:

- To identify the most important industrial and technological information and data required for national planning and development.
- To elaborate standards for denotation and codes for geographical units in Nigeria.
- To elaborate standards for denotation and codes for the most important products, compatible with UNIDO classification.
- To strengthen the existing data bank by providing it with equipment and by training its experts.

5. Background/justification

The government of Nigeria requested UNDP assistance in establishing a computerized information system to support and improve sectoral planning in industry and agriculture. In compliance with this request, UNIDO assisted in the implementation of projects in the above field (DP/NIR/75/066, DP/NIR/75/069 and DP/NIR/78/006). As a result of a UNIDO consultancy mission (DP/NIR/83/003) in July - August 1983, a proposal for the establishment of a coherent data bank system with the creation of a central data bank and several sectoral data banks was accepted, in principle, by the government authorities. The sectoral data bank for industry is part of this project.

6. Estimated costs

Preparatory missions by consultants for the Industrial Data Bank in 1984	$ 80,000
Expert services, 36 m/m	270,000
Training	60,000
Administrative support	20,000
Follow-up by UNIDO headquarters	30,000
Equipment	150,000
Miscellaneous	20,000
TOTAL	$630,000

No. 77

1. Title of project

Assistance in the establishment of National Technology Offices in Africa.

2. Subregion/countries concerned

Fifteen countries to be determined. In the light of past experience, and as other IDDA activities develop, it is expected that many requests will be received.

3. Objectives

(a) To assist in the establishment of National Technology Offices in African countries, utilizing existing infrastructure mechanisms.
(b) To promote the acquisition, development, adaptation and assimilation of imported and local technologies.
(c) Through the National Technology Offices, it is envisaged that the following functions will be performed:

(i) Elaboration of policies and plans for technology transfer development.
(ii) Analysis of documentation and technologies of potential application to the country from both domestic and foreign sources.
(iii) Conduct and co-ordination of demonstration and experimentation activities in technology transfer and development through existing and future government agencies specialized in this field.
(iv) Establishment of a documentation service in technology transfer and development, including existing documentation and reports of demonstration and experimentation activities undertaken in the country.
(v) Provision and co-ordination of services required for negotiation of technology transfer.
(vi) Establishment of linkages with national and international bodies for the purpose of achieving the above objectives.
(vii) Mobilization and co-ordination of expertise, equipment, supplies and other inputs from external assistance sources.
(viii) Training of national personnel in the above fields.

4. Activities

(a) Exploratory missions by UNIDO staff and international experts will be organized, upon request, to check the existing technological infrastructure and its services and recommend a national technology transfer structure appropriate to the country.
(b) A preliminary work programme will be prepared, including an organizational chart and responsibilities to be assumed. The work programme should be based on the function of the National Technology Office entailing:

- preparation of national policies and plans on technology transfer and development;
- establishment of an industrial and technological information system;

- survey of technology needs in the countries as well as available to other developing countries;
- training of the staff of the office in all aspects of training and development;
- organizing workshops, seminars, study tours, etc;
- provision and co-ordination of services in negotiation for technology transfer agreements;
- experimentation and demonstration activities.

5. Background/justification

A central problem is that in most countries of the African region, there does not yet appear to be a proper integrated base for technology transfer. Such transfers take place indiscriminately by private/public industries seeking the sellers of the required technology abroad. Little or no attempt appears to be made in this field, partly owing to the understandable anxiety of the purchaser to buy the technology, and partly owing to his inability to improve his own bargaining position by virtue of the absence of the required information, negotiating competence, background knowledge etc., which would enable him to acquire the most appropriate technology or to pay no more for such technology than it would fetch in the international market.

It should also be stressed that the transfer of technology has generally taken place indiscriminately in line with the needs of various industries, rather than in terms of a national list of priorities in line with identified technological needs in terms of national industrial plans and programmes.

Acquisition is only the beginning of the process of technology transfer. Acquisition has to be matched with development of the capacity to digest the technology, to improve upon it and eventually to be in a position to re-transfer the technology to others.

From these many points of view, it would appear that some national institution is required which would take a synoptic view of the entire gamut of issues involved in the transfer of technology. Such an institution, which could take many forms, is here termed, for purposes of convenience, a "National Technology Office". Different countries will have different institutional and organizational forms for such a centre.

UNIDO has been providing assistance in the establishment of national technology centres in Cameroon, Egypt, Ethiopia, Guinea, Sudan, etc.

6. Estimated costs

Expert services, 3 m/m	$ 24,000
UNIDO headquarters technical and administrative support	9,000
Training (study tour)	6,000
Miscellaneous	1,000
TOTAL per country	$ 40,000
Total for 15 countries	$600,000

No. 78

1. Title of project

Promotion of software development and circuit design in African countries.

2. Subregion/countries concerned

Five countries to be determined.

3. Objectives

To promote the local manufacture of software for use in industry, commerce, public administration, banking and insurance companies in the management of masses of data (text processing, data base systems, information systems, statistical computation), control of processes (manufacturing, quality control, optimization procedures) and governmental and industrial planning (model building, simulation optimization).

In order to obtain the appropriate software supply in African countries, the following objectives should be met:

(a) To establish self-supporting software production in African countries.
(b) To train local staff in advanced programming technology.
(c) To create a basis for developing the local utilization of computers to solve optimization problems, inter alia, of small- and medium-scale industry, as well as other applications.
(d) To promote the export of software from developing countries.

4. Activities

(a) Expert mission

Three experts will visit selected African countries and prepare an assessment (an inventory) of the countries' potential in the field of software as well as software needs. The recommendation of the mission will indicate areas of specific interests for each country and outline the mechanism for regional co-operation. The existing level of software education will be determined.

(b) Preparation of programme and location

Taking into account the recommendations of the mission, and in consultation with national representatives, the location of the software centre will be established. The final recommendation will be made at a meeting of all interested parties. The programme should outline the following functions which the centre will perform:

(1) Application:

- Conduct the research on developing countries users' needs for software applications.
- Propose the new applications appropriate for African countries and search for a mechanism to develop needs for these applications.
- Investigate the efficiency of existing applications of software in developing countries.
- Research an optimization use of microsystems software for the industry and infrastructure in developing countries.

(ii) In advising, the centre will:

- Advise on selection of hardware and software.
- Advise on efficient use of optimization procedures.
- Advise on policy programmes and plans for software development.
- Advise on economical and technological aspects of technology transfer in the software field.
- Advise on the legal regulations (transfer policy, custom policy, etc.).

(iii) In informing, the centre will:

- Provide information on the results of research in the centre.
- Inform on the state-of-the-art in the field.
- Inform on existing application software in developing countries and their effectiveness (clearing house).

(iv) In training, the centre will:

- Create the programmes for trainers in developing countries.
- Train the trainers from developing countries.
- Train the users from developing countries in selected new applications.

(v) In co-operation promotion, the centre will:

- Promote networking of national and regional software procedures and through them promote the results of the regional centre activities.
- Provide a package of services which will enable the creation of the human and institutional infrastructure of a small national development software house together with assistance in the preparation of programmes and policies for further development of software in the country according to its requirements.

(vi) Implementation:

After acceptance of the programme, experts should prepare implementation plans including the purchase of equipment, training regional and international co-operation, etc. Having the plan accepted, the implementation will begin. The present project is limited to the preparation of the project report.

5. Background/justification

Indigenous software production is more immediately attractive than hardware manufacture. The software industry does not have a high demand for capital investment either directly or for physical infrastructure (with two exceptions, telecommunications and educational facilities), and is expected to grow extremely rapidly in the foreseeable future. In African countries the special informatics applications requirements involving hardware and software could be met by importing the hardware (or components of it if local systems integration, etc., is appropriate), and developing the software locally.

6. Estimated costs

Short-term specialized experts services at headquarters and field, 15 m/m	$144,000
Training (study tours and fellowships)	20,000
UNIDO headquarters technical and administrative support	15,000
Miscellaneous	3,000
TOTAL cost per country	$182,000
Total cost for five countries	$910,000

No. 79

1. Title of project

Promotion of the micro-electronics industry in Africa.

2. Subregion/countries concerned

Region of Africa.

3. Objectives

To develop micro-electronics which is one of the basic industrial branches that would contribute to the technological development of African countries.

4. Activities

(a) Mission of experts Experts would visit selected countries and, along with local experts in each country, collect basic data and information on the demand/supply requirements of the country. An assessment of the present situation and future potential for the further development of manufacturing capacities will be made, including an inventory of the major electronic products, parts and components being produced, assembled or imported into the country.

(b) Preparation of programme and location On the basis of the information collected and analysed during the expert mission, a subregional programme for the development of the electronics industry in each of the four subregions will be elaborated for discussion and finalization at a subregional meeting of electronics experts. The programme will include the identification of subregional investment projects for subsequent preparation and for promotion among potential investors, especially local entrepreneurs.

5. Background/justification

The scale of integration of electronic components in recent years is constantly increasing and the result of this trend is the substantial increase of processing power for the given cost and size. The cost and size factors both separately and combined open vast areas for the application of micro-electronics technology resulting now and in the foreseeable future in:

(a) essential change of technological structure through elimination of mechanical and electro-mechanical components combined with the increase of reliability and capability of devices and systems, thus opening new application possibilities;

(b) creating qualitatively new processes, performed without direct human involvement, as a result of incorporating new functions and skills into equipment.

The overall aspects of micro-electronics impact are hardly foreseeable but already now it could be stated that different regions and countries should adopt a different approach to advances in micro-electronics application impact for achieving the optimal results for their societies.

6. Estimated costs

12 m/m of locally recruited experts	$ 30,000
24 m/m of short-term specialized expert services at headquarters and field	192,000
UNIDO headquarters technical and administrative support and follow-up	40,000
Cost of travel and per diems of participants to four technical subregional meetings	120,000
Miscellaneous	8,000
TOTAL	$300,000

No. 80

1. Title of project

African regional network of solar research institutes.

2. Subregion/countries concerned

The following countries where research activities in solar energy utilization is known to be carried out and who have indicated their willingness to co-operate could form the basis for the proposed regional network: Burundi, Cameroon, Ethiopia, Ghana, Ivory Coast, Kenya, Madagascar, Malawi, Mali, Morocco, Nigeria, Senegal, United Republic of Tanzania, Zambia and Zimbabwe.

3. Objectives

To promote joint research programmes and exchange of information on research results, develop co-operative programmes at regional and subregional levels and encourage collective self-reliant research development by:

(a) facilitating the exchange of research achievements between countries which may have concentrated on one or two specific areas and thus acquired a certain competence, and

(b) supplementing and complementing each country's competence in solar energy utilization in a given environment with the ultimate objective of achieving independence in alternative energy.

4. Activities

(a) Based on information available in the Secretariat from the updated directory of solar research institutes:

- appropriate research institutes will be selected;
- a workshop will be organized, in co-operation with the newly founded Solar Energy Society of Africa, with expert lectures on subjects of mutual interest;
- assistance will be provided in the training of personnel from the institutes;
- the exchange of senior and junior scientists between countries will be fostered (in terms of the sabbatical year model);
- the development of relevant technologies will be monitored and the information disseminated to interested research institutes;
- successful new technologies will be spotlighted and demonstrated in appropriate local surroundings by assisting in the building of prototypes that can be tested locally;
- joint pilot plants efforts will be promoted;
- liaison with equipment manufacturers in developed countries may be required for certain types of equipment which may not yet be usefully produced locally;
- the commercialization of research results by local entrepreneurs will be facilitated.

5. Background/justification

As an alternative or supplement to traditional sources of energy, solar energy is available in abundance in most African countries; its exploitation requires limited investment and it offers appropriate solutions especially to rural development. This was also recognized by the recent African Regional Symposium on Solar Energy, held at Nairobi in November 1983, which unanimously passed the Constitution o f a new Solar Energy Society of Africa (SESA). The main activities of SESA will include: organization of seminars, training courses and workshops; establishment of links with other professional organizations; establishment of appropriate mechanisms for exchange of information; development of co-operative programmes at regional and subregional levels; preparation of directories of individuals, institutions and research projects. The activities of the project will be harmonized with those of the proposed African Regional Centre for Solar Energy whose establishment is being provided by the ECA.

6. Estimated costs

Expert advice (estimated at 120 m/m) for the development of projects and selection of prototypes to be built and demonstrated; short-term expert assistance to promote setting up of subregional networks to be later extended to an African Regional Network	$ 900,000
UNIDO headquarters technical and administrative support	50,000
Training of personnel, including organization of workshops and meetings	150,000
Equipment	500,000
Miscellaneous	30,000
TOTAL	$1,630,000

No. 81

1. Title of project

African regional network for biomass technologies.

2. Subregion/countries concerned

Regional - covering all Africa.

3. Objectives

Regional co-operation in the field of biomass technologies related to resources and conversion, to promote the following development objectives:

(a) To foster effective and integrated biomass policies at the national, subregional and regional level.

(b) To assist African countries in examining the concept of biomass as an alternative pathway to industrialization and development.

(c) To improve the generation and industrial conversion of biomass through the dissemination of information on the use of new technologies related to biomass.

4. Activities

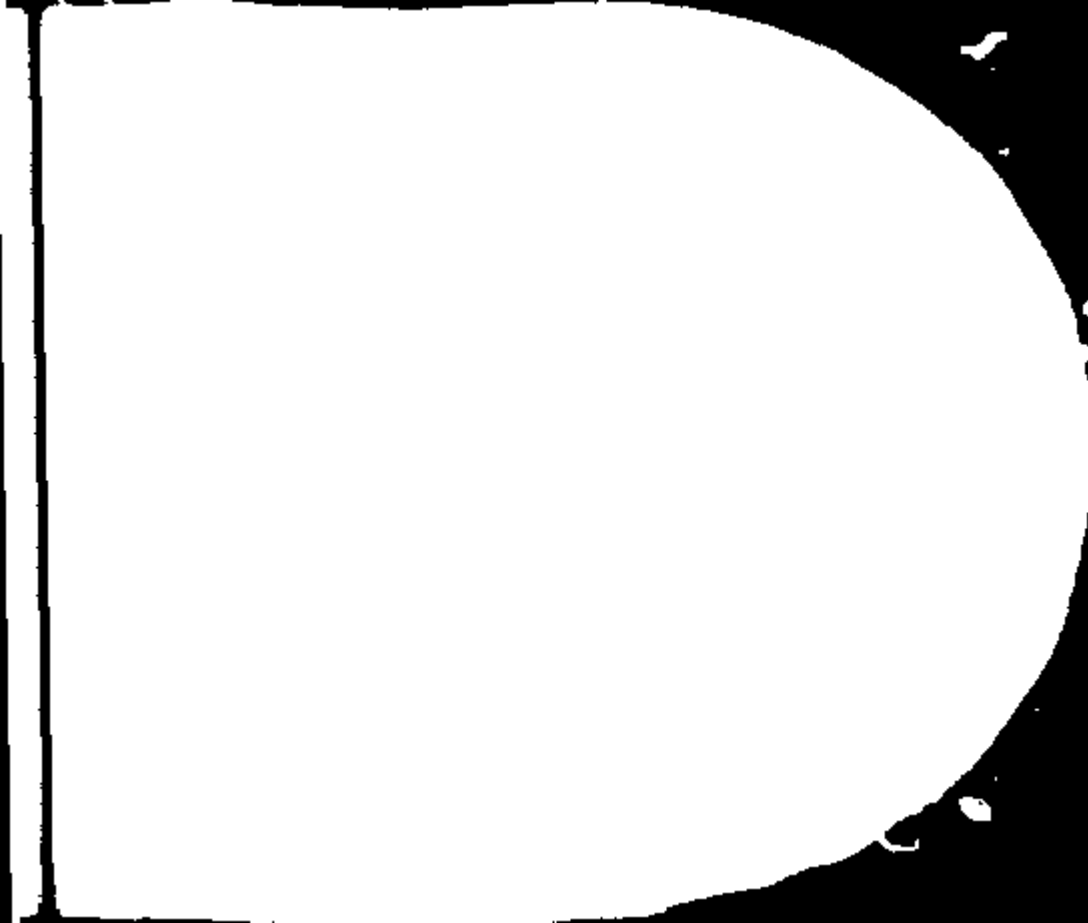
Firstly, identification and assessment will be made of the institutes and groups working on biomass in Africa. Following this, and in consultation with African member states, national focal points for biomass will be selected. A series of meetings of these national focal points will be held to establish an African Regional Network. The members of this network, with the assistance of UNIDO, will then prepare a comprehensive work programme. This would cover all the industrial aspects of biomass (e.g. integrated utilization of cassava, coconut, groundnuts; fuller utilization of aquatic biomass for food, fodder, fertilizer, energy; low-cost building material from agricultural and industrial wastes; and chemical feedstocks from biomass). Such a programme would include exchange of information between members on a regular basis, co-operative research programmes, joint training activities, etc.

5. Background/justification

The development of an integrated and balanced biomass policy covering agriculture, energy and industrial needs is a necessary condition for all the goals and objectives of the Industrial Development Decade for Africa. Advanced technologies in the fields of biotechnology and genetic engineering have reached the stage where major advantage can be gained from them. Africa as a whole is well-endowed with a rich variety of biomass. If this important, but under-utilized resource can be harnessed for industrial purposes, it provides an alternative pathway to industrialization.

6. Estimated costs

Expert services, 80 m/m	$ 600,000
UNIDO headquarters technical and administrative support	40,000
Training, including organization of fellowships, study tours, training workshops and meetings	200,000
Equipment	250,000
Miscellaneous	30,000
TOTAL	$1,120,000



No. 82

1. Title of project

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

2. Subregion/countries concerned

To be determined.

3. Objectives

The project aims at assisting developing countries in Africa to identify projects financing and programme lending needs and to promote better quality national and multinational industrial investment projects with improved chances of efficient operation during the implementation phase. In particular, the project will promote the development of specific priority industrial branches in selected African countries. This will be achieved through the participation and involvement of several industrialized and/or more advanced developing countries in the process of selection of the specific industrial branches to be promoted and in the implementation of the subsequent framework of activities. It is expected that the envisaged methodology, by bringing together potential partners from developed and developing countries from the very early stages of project identification, will automatically enhance the chances of more and better quality projects being identified and promoted.

4. Activities

The project will be implemented through the following steps:

(a) selection of industrial branches and participating industrialized and/or more advanced developing countries. This will be done by IO/COOP in consultation with concerned Branches and Sections from DIO, DPC and DIS as well as with the Co-ordination Unit for the IDDA. This phase will also involve the identification of manufacturers and other concerned institutions engaged in the selected industrial branch, who are interested in co-operating with African countries in the promotion of specific industrial investments;

(b) selection of participating developing countries. In consultation with concerned Branches and Sections from DIO, DPC, DIS, the Co-ordination Unit for the IDDA and participating manufacturers identified through step (a) above, IO/COOP will identify a number of African countries for which the selected industrial branch is considered a priority for further development. The number of African countries participating in the programme will depend on the financing available;

(c) selection of national teams. The participating African countries will submit candidatures to enable IO/COOP to select a national team consisting of at least three qualified professionals from a national development finance institution or investment promotion agency or applied R + D institution in each country;

(d) preparations by participating African countries. Each national team will draw up a list of qualified nationals and organizations who have experience and expertise in the selected industrial branch. They will also prepare a country paper on the selected industrial branch in accordance with an annotated outline provided by UNIDO. Finally they will identify specific investment projects and project sponsors in the selected industrial branch;

(e) preparations by UNIDO. IO/COOP in consultation with the Co-ordination Unit for the IDDA and other concerned UNIDO Branches/Sections will provide each national team with: a background paper on the selected industrial branch; an annotated outline of the country paper; a list of the industrial branch products which will be covered by the project, including industrial profiles on a selected number of the more common types of products; a sample of the industrial investment project questionnaire; a list of all UNIDO documents relevant to the selected industrial branch;

(f) subsequently a series of missions will be undertaken to industrialized as well as to African developing countries in order to negotiate the financing of the selected projects and to clarify specific elements;

(g) the project will proceed with the organization of national workshops and finally with the travel of the national teams from the African countries to the participating industrialized or more advanced developing countries and UNIDO headquarters in Vienna in order to finalize the arrangements for the financing of the selected projects.

5. Background/justification

In compliance with the strategy set out in the Lagos Plan of Action, the Seventh Conference of the African Ministers of Industry (March 1984) stressed the need to undertake concerted actions for the mobilization of financial resources, including technical assistance from the Secretariats of OAU, ECA, UNIDO and others for the implementation of the programme of the Industrial Development Decade for Africa. The Conference further urged member states to assist and encourage African entrepreneurs, industrialists and marketing and distributing companies to intensify their contributions in the investment promotion and implementation of the national and multinational projects. The lack of identified and well-substantiated industrial projects backed by competent local, private or public sponsors is being more and more singled out as a major handicap to industrial development in African countries. This project is intended to lead to identifying in each participating African country commercial, concessionary, grant and other financing means for a selected industrial branch thus leading to facilitating mobilization of financial resources.

6. Estimated costs (for one industrial branch)

(a) Consultations with selected African countries and relevant intergovernmental organizations on the selection of industrial branches and participating developing countries	$ 35,000

(b)	Expert services to assist in the preparation of substantive documentation, 3 m/m	24,000
(c)	Expert services to visit selected countries to collect relevant information, including attendance at national workshop, 8 m/m	64,000
(d)	Local experts, 12 m/m	30,000
(e)	UNIDO technical and administrative support	35,000
(f)	Miscellaneous, including reporting costs	12,000
	TOTAL cost per branch	$ 200,000
Total cost for five branches		$1,000,000

No. 83

1. Title of project

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

2. Subregion/countries concerned

Countries to be selected upon receipt of requests.

3. Objectives

The immediate objective of the project is to provide appropriate and timely advisory/consultancy service in carrying out pre-feasibility and feasibility studies with a view to mobilizing financial resources for the establishment of new industries as well as rehabilitation of existing industries.

4. Activities

The UNIDO feasibility study consulting group will consist of two permanent financial analysts and two secretaries. Upon receipt of a request from governments, a team consisting of UNIDO headquarters staff and recruited experts will be set up to carry out the feasibility study requested. The team will visit the country concerned and conduct a field survey. The result of the survey will be fed into COMFAR and a COMFAR specialist will supply financial data. A complete study report will be compiled within approximately 2 - 3 months after completion of the field survey depending on the scale of the project.

It is expected that approximately six feasibility studies will be undertaken per year. The financial analyst who conducted the study will present the study report to the government officials and discuss appropriate follow-up. The information will be passed on to the UNIDO Investment Co-operative Programme Branch (ICPB) to ensure effective investment promotion for the mobilization of the required financial resources.

5. Background/justification

The UNDP Governing Council has, at its sessions conducted in 1980 and 1981, repeatedly stated the general tendency of the declining contents of pre-investment activities in the Country Programmes. UNIDO has carefully watched this trend which is attributable to various factors, inter alia, the increasing activity of the World Bank and its Regional Development Banks in the pre-investment field, but also due to the insufficient anticipation of pre-investment needs and/or inadequate uncommitted UNDP Indicative Planning Figure resources for ad hoc pre-investment studies. Furthermore, the insufficient linkage between pre-investment and investment work may be responsible for the above-mentioned tendencies.

In order to respond constructively to the needs, particularly of the African countries, of accelerating the industrial development, special measures are required by governments, UNDP and the executing agencies. UNIDO is adopting a standardized methodology based on the UNIDO Manual for the Preparation of Industrial Feasibility Studies. A computer programme (Computer Model for Feasibility Analysis and Reporting) to facilitate the numerous computations needed to prepare and evaluate feasibility studies was finalized and four systems were already installed in Africa. Furthermore, IO/FEAS is assuming a co-ordinating function for all UNIDO-conducted pre-feasibility and feasibility studies.

In African countries where national capabilities for the generation of feasibility studies and thus viable projects yet need to be established or strengthened, UNIDO's concept to create Industrial Advisory Units has proven to be an effective instrument in the promotion of new production units. Furthermore, from experience in the provision of technical assistance to a number of countries and from contacts with different government officials as well as representatives of financial institutions, we learned that the identified projects require immediate follow-up by conducting feasibility studies. However, due to lack of flexible funds and the lengthy approval procedures of the UN technical assistance scheme to commit implementation of required feasibility studies, UNIDO is unable to ensure prompt follow-up at the desirable level.

In addition to conducting feasibility studies, a great need for technical assistance has been experienced among least developed countries (LDCs) in all the stages of the pre-investment phase. In order to cope with different requests received from governments for assistance in the pre-investment field, Assistance to LDCs in Pre-investment Activities was approved in May 1983 and presently continues to provide advisory services to LDCs. The contribution of a regional adviser, recruited at UNIDO headquarters for this purpose, has been greatly appreciated. It may be noted, however, that the contribution of the regional adviser is limited to advisory services in the pre-investment field since it is not possible for him to conduct complete feasibility studies alone.

UNIDO thus strongly feels that a specific consultancy group be established in Vienna to conduct feasibility studies promptly upon request of the government. The group will consist of two financial analysts and two secretaries and will recruit appropriate engineer(s) depending on project requirements. Thus a team of financial analysts and engineer(s) will be dispatched to the field to conduct the feasibility studies without unnecessary delay. The work of the regional adviser mentioned above could also be effectively integrated in the activities of the consultancy group.

The need for such an assistance is great. A number of feasibility studies for new projects and rehabilitation projects are put forward in the Solidarity Meetings and the Donor Round Tables in Africa. The effective operational arm for materializing such requests on a timely basis would be the establishment of the group at UNIDO headquarters to provide a sort of "fire brigade" service to the African countries. The group will be fully equipped with UNIDO Computer Model for Feasibility Analysis and Reporting (COMFAR).

6. Estimated costs

Two financial analysts and one economist based in Vienna, including field travel, 72 m/m	$ 576,000
Short-term experts (engineers and market experts), 36 m/m	288,000
COMFAR operation expert	100,000
Local experts, 200 m/m	500,000
UNIDO technical and administrative support	110,000
Miscellaneous	26,000
TOTAL	$1,600,000

No. 84

1. Title of project

Establishment of a regional industrial advisory service to African development banks.

2. Subregion/countries concerned

Selected countries upon receipt of requests, including Tanzania.

3. Objectives

To assist the selected countries in the identification, selection and preparation of sound investment projects for promotion among potential investors thereby increasing the flow of financial resources into the industrial sector.

4. Activities

(a) Survey and analysis of institutional set-ups, procedures and practices used for appraisal of pre-investment studies in order to establish criteria and methods of project appraisal and selection within the framework of national socio-economic development plans. This will include the development of an integrated computer-aided project development system will be set up to enable the TIB to make "accept-or-reject" investment decisions.
(b) Recommending methodologies and criteria for identification of project opportunities and for the preparation of feasibility studies.
(c) Identifying investment projects and preparing opportunity studies.
(d) Organizing and conducting pre-investment studies at the request of Governments which will serve as a base for investment decisions.
(e) Evaluating existing pre-investment studies, updating them, if necessary, and suggesting measures that would lead to the earliest realisation of sound projects.
(f) Preparing and maintaining portfolios of investment proposals to facilitate investment follow-up action and actual investments, particularly in the industrial and agro-industrial sectors.
(g) Developing, within the existing institutions, capabilities for carrying out pre-investment studies through on-the-job training, training seminars and fellowships and, if deemed appropriated, through suitable institutional changes.
(h) Advising appropriate Government institutions on the investment promotion measures and assist in implementation follow-up.
(i) Providing advisory services to industry in both public and private sectors, e.g. on overcoming technical, production, financial, marketing and distribution problems.
(j) Training national personnel in the above fields of activities through fellowships, training seminars and study tours.

The execution of the activities listed above will involve:

(a) Advisory services

The industrial advisory services will assist African development banks in carrying out the activities related to the objectives outlined in paragraph 3 above and will be executed by a nucleus of international experts consisting of: UNIDO headquarters staff and

recruited experts in the areas of industrial economics, financial analysis, industrial engineering, mechanical engineering and marketing. This group will be assisted by short-term specialists on an ad hoc basis as required by the workplan.

(b) Training

Training will be provided to the technical experts of the development banks involved whose training department will be assisted in preparing and conducting a course for experts in industry on industrial financing.

(c) Equipment

Use will be made of the COMFAR programme which was developed by UNIDO for the computation of the financial schedules needed for the feasibility studies.

5. Background/justification

In many developing countries of Africa, Industrial Development Banks and financial institutions which are responsible for investment promotion and industrial development, lack the required experienced cadres to undertake the task of evaluating feasibility studies, recommending modes of financing, following-up on project implementation, monitoring, project performance and other tasks relating to industrial promotion. For the purpose of meeting the urgent needs of these institutions, it is proposed to set up industrial advisory units at the seat of regional industrial development banks and financial institutions. These regional institutions will work out co-operative arrangements with national financial institutions for collaboration and harmonization of approach in the pursuit of industrial development. The industrial advisory units will also undertake training activities and encourage the formation or strengthening of counterpart units at the national industrial development banks and development oriented institutions.

6. Estimated costs

Three regional projects are proposed to be attached to each of three regional Industrial Development Banks. The budget for each regional advisory unit may differ according to the requirements of the Bank in question. However, the following average cost is estimated: $3 million.

Expert services, 300 m/m	$2,400,000
Use of COMFAR facilities and services	150,000
Local experts, 100 m/m	250,000
Training of experts in development banks including workshops for experts from industry in industrial financing	100,000
UNIDO technical and administrative support	60,000
Miscellaneous	40,000
TOTAL	$3,000,000

No. 85

1. Title of project

Organization and follow-up of investment promotion and solidarity meetings.

2. Subregion/countries concerned

All four subregions and selected countries.

3. Objectives

To increase the flow of financial resources into the industrial sector in the African countries through the organization of investment promotion and solidarity meetings where investment and other projects could be promoted among potential investors.

4. Activities

The activities of the project will include:

- the organization, in co-operation with the ADB, OAU and subregional development banks, about six investment promotion meetings at the subregional level and on the occasion of the All African Trade Fairs;
- assistance to selected countries in the organization of solidarity meetings;
- assistance to countries and subregional organizations, in co-operation with the ADB, subregional and national development banks, in the identification, preparation and promotion of investment projects among potential investors at the investment promotion and solidarity meetings;
- assistance to individual countries and subregional organizations in taking follow-up action with potential investors on those projects of interest to them.

5. Background/justification

While all UNIDO can be said to contribute, directly or indirectly, to investment in the industrialization process in the developing countries, both at the macro-economic and at the enterprise level, UNIDO has, over the years, operated a special investment co-operative programme with the specific task of helping developing countries to obtain foreign co-operation in the form of financing and technical and managerial know-how in order to supplement and strengthen the countries' domestic investment efforts. The Investment Co-operative Programme Office acts as an intermediary, bringing together promotors of industrial projects in the developing countries, in both private and public sectors, and suppliers of investment resources from countries with free market economies and countries with centrally planned economies. UNIDO and the respective governments have opened Investment Promotion Offices in Belgium, the Federal Republic of Germany, France, Japan, Switzerland, the United States of America and Austria. Several African countries are already benefiting from this programme which has also organized a number of investment promotion meetings in Africa. These meetings have been organized for the western and souther subregions. Plans have been made for similar meetings to be held in the central and eastern subregions in 1985 and 1986 respectively.

In addition to the above, UNIDO has also assisted a number of African countries in the organization of solidarity meetings with the purpose of rallying international assistance, especially from other developing countries to a selected country. So far, such meetings have focused on the least developed countries, hence they have been organized in Lesotho, Mauritania, Rwanda, Sudan, Tanzania and Upper Volta. Plans are underway for the organization of similar meetings in Burundi and Mali in the near future.

The experience so far acquired in the organization of the above-mentioned meetings and the encouraging results achieved indicates the need for their continuation and expansion. Furthermore, a need has been recognized for increased assistance to African countries in taking follow-up action, especially with those potential donors indicating interest in some of their projects.

6. Estimated costs

Expert services to assist in the identification and preparation of projects for promotion of investment promotion and solidarity meetings, 100 m/m	$ 800,000
Local expert services to assist in the identification and preparation of projects for promotion of investment promotion and solidarity meetings, 120 m/m	300,000
Organization of six investment promotion meetings (travel and per diems of African participants, etc)	650,000
Assistance in follow-up on projects attracting the interest of potential investors	120,000
UNIDO headquarters technical and administrative support	80,000
Miscellaneous	50,000
TOTAL	$2,000,000

No. 86

1. Title of project

Promotion of Intra-Africa co-operation in mini hydro-power generation.

2. Subregion/countries concerned

African continent (Burundi, Cameroon, Egypt, Ethiopia, Ghana, Guinea, Kenya, Lesotho, Liberia, Madagascar, Mali, Rwanda, Seychelles, Sierra Leone, Somalia, Tanzania, Uganda, Upper Volta, Zambia, etc.).

3. Objectives

To enhance the development of local capabilities in the design and manufacture of mini hydro-power generation equipment.

4. Activities

(a) To carry out a detailed survey and analysis of the requirements of African countries for mini hydro-power generation equipment.

(b) To identify, at the national level of the African member states, actual needs for research and development, manufacturing technologies, information, training, which would formulate the basis for developing the work programme of an African regional centre for MHG.

(c) On the basis of (a) and (b) above, elaborate a programme to promote the development of design and manufacturing capabilities in Africa through national, subregional and regional institutions such as ARCEDEM.

(d) To convene an African senior expert group meeting to discuss and adopt the programme indicated in (c) above.

(a) Technical Board

Made up of one representative (senior expert) of the selected institution (national co-ordinator at national focal point) in each of the participating countries, and of representative of the supporting organizations. The regional co-ordinator of the network will be the Secretariat of the Technical Board.

(b) Regional Secretariat

Forms the headquarters of the network and will be located at a selected/agreed institution (centre of excellence) in one of the participating countries. It consists of a full-time co-ordinator assisted by one staff on information, one staff on research and consultancy, one staff on training and four secretaries to carry out the function of the network. The management and operations of the Regional Secretariat shall be based on the policies and priorities established by the Technical Board.

The host country will provide physical facilities for the Regional Secretariat at a focal institution. It is envisaged that such a network would promote co-operation among the participating members in the areas of information, R + D, training and advisory services and to lay the groundwork for the establishment of a network of African institutions dealing with mini hydro-generation.

Phase II

(a) To identify, elaborate and promote pilot projects for the production of simple parts and components for mini hydro-power generation plants.

(b) To implement the activities contained in the co-operative programme, including the provision of information, training of local staff, carrying out of R + D work, and the provision of extension services, e.g. repair and maintenance.

5. Background/justification

Economic co-operation among developing countries (ECDC), through co-operation in science and technology, would make a crucial contribution towards the attainment of the New International Economic Order.

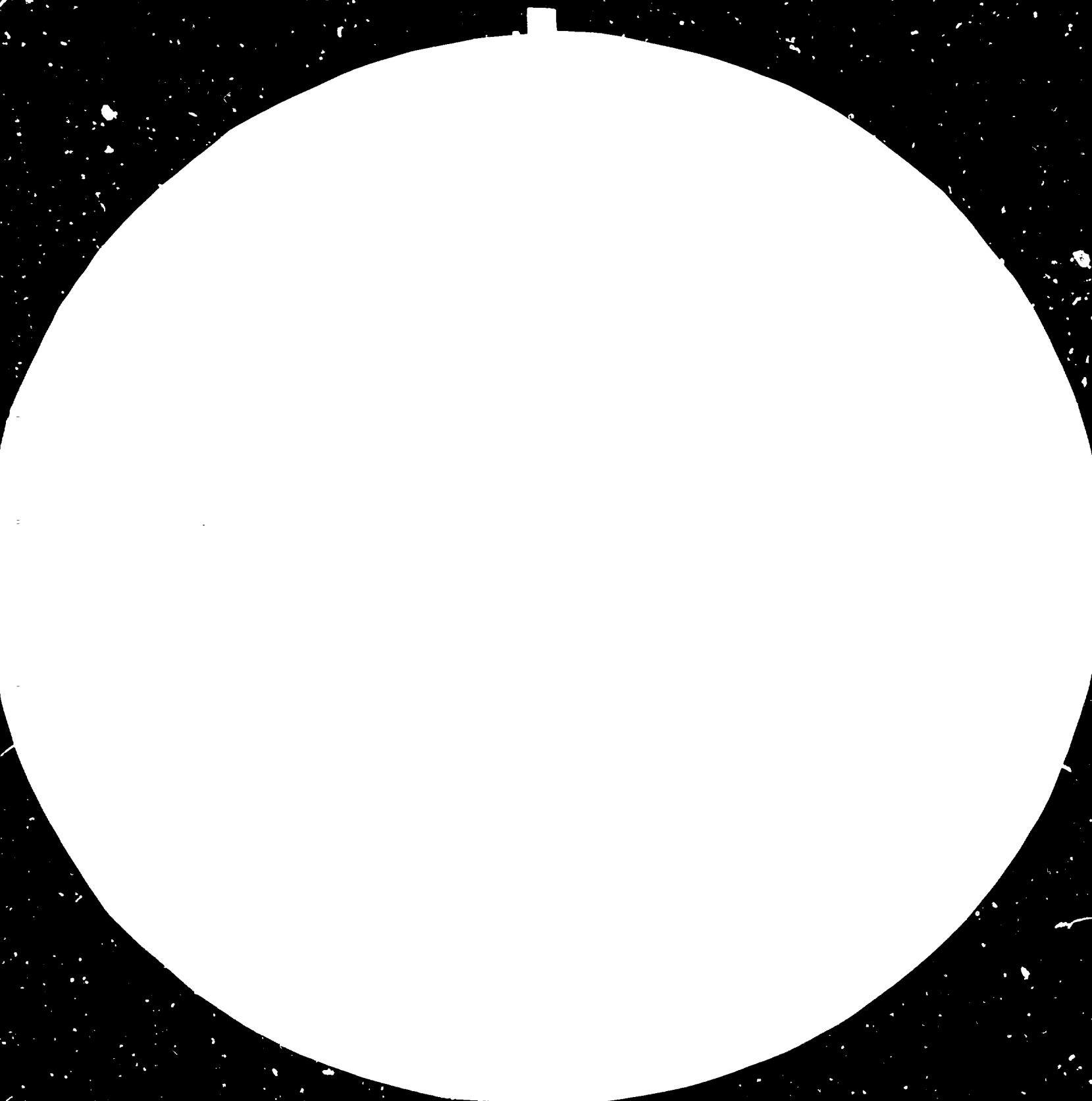
Particular attention should be paid to the recommendations and conclusions reached at the Conference of the Group of 77 on the ministerial level, held in Caracas, Venezuela, in May 1981, as well as those of the Consultative Meeting of forty-four developing countries held in New Delhi, India, in February 1982. These conferences proposed a series of concrete measures on the level of co-operation of developing countries regarding, inter alia:

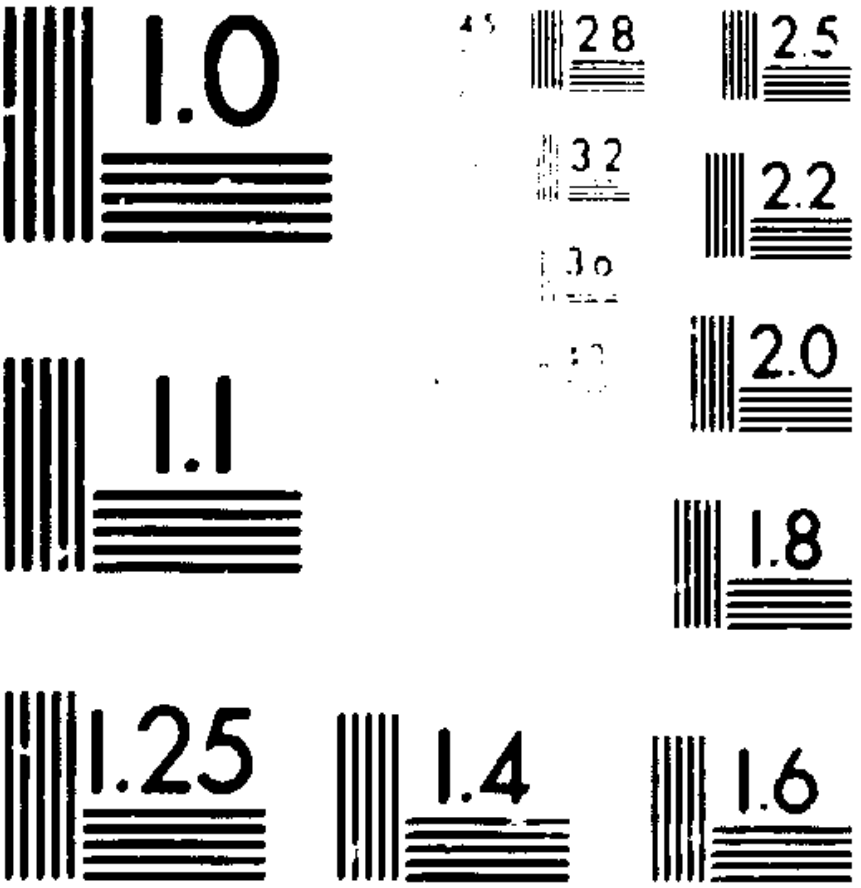
(a) the establishment of networks of scientific and technological institutions for mutual benefit and to facilitate harmonization of strategies and programmes through the exchange of information and experience; and

(b) identification of problems of common interest and selection of projects for joint and co-operative action among technological research and development institutions in specific areas.

In reviewing the energy situation in developing countries within the context of their overall industrialization efforts, the subject of new and renewable sources of energy has become increasingly highlighted, particularly for the majority of the developing countries that do not possess their own fossil fuel resources. The United Nations Conference on New and Renewable Sources of Energy held in August 1981 in Nairobi, Kenya, and particularly the panel of technical experts on hydro-power, focused on the significant role which small hydro-power could play, specifically in connection with the supply of power to remote and isolated rural areas not covered by the national grid network.

UNIDO has already recognized this potential and organized a number of projects and programmes on mini hydro-power generation. Participants of several UNIDO MHG meetings urged the need of an African regional system of network to promote African co-operation between and among the member





states, and recommended the creation of national focal points, which would stimulate and carry out activities that could be beneficial to the national efforts. This is particularly considered of great relevance in the field of R + D, on the one hand, and training of human resources for various disciplines at the various levels, on the other hand.

6. Estimated costs (covering a period of two years)

Phase I

Senior expert group meeting	$ 35,000
Expert services in the formulation of a co-operative programme (consultants, 1 m/m)	8,000
Expert services to assist in carrying out detailed survey, 6 m/m	48,000
UNIDO headquarters technical and administrative support	15,000
Miscellaneous	4,000
TOTAL for Phase I	$ 110,000
Estimated cost for Phase II	$1,000,000
Total cost for Phases I and II	$1,110,000

No. 87

1. Title of project

Pilot experimental briquetting station.

2. Subregion/countries concerned

Four countries to be selected, including Sudan.

3. Objectives

To make use of biomass resources for fuel production in African countries, by identifying optimal briquetting procedures for agricultural wastes (cotton stalks, ground-nut shells, bagasse, etc.).

4. Activities

(a) An operational briquetting station will be set up, equipped with various briquetting presses and laboratory facilities for experiments and tests. To this end, an expert in biomass briquetting will be recruited for two months, in split missions as and when required, to determine the precise requirements for the briquetting station, prepare briquetting procedures, and advise on marketing.

(b) Testing will be carried out to establish methods of pest control for the treatment of cotton stalks.

(c) Personnel will be trained in production techniques.

5. Background/justification

In view of increasing oil prices and energy demand, especially in rural areas, the Governments of many African countries are exploring the possibility of increasing the use of alternative energy sources, especially the utilization of agricultural residues (e.g. cotton stalks, ground nut shells) for energy production.

At the request of the Government, for example, UNIDO carried out in 1983 a study under project SI/SUD/82/802 - Gasification of Agricultural Residues - aimed at the identification of suitable biomass waste conversion processes. The results of the study indicate that, among the various options for conversion processes, briquetting of agricultural residues such as cotton stalks represents a rational approach to production of fuels for domestic needs. The quantity of crop residues reaches 1.5 million tons annually from cotton cultivation and 2.4 million tons from ground nut shells. At the same time, removal of cotton stalks from harvested fields which, according to pest control regulations, must be completed within 6 - 8 weeks after harvest, can be guaranteed. However, some further investigation is required to ensure that pests are entirely destroyed to prevent contamination of the fields. The country therefore recently obtained a mobile piston press and trials with cotton stalks and other wastes would be carried out to determine the optimum briquetting conditions with or without additives. After this, the work left to be done would involve the selection of the best briquetting procedures and to test the burning characteristics of the briquettes. The experience so far acquired from the work carried out in the Sudan provides a good starting point to extend the project to other countries.

6. Estimated costs

(a)	Expert services, 12 m/m	$ 96,000
(b)	UNIDO technical and administrative support	10,000
(c)	Equipment (briquetting press, shredder, tools, laboratory equipment)	140,000
(d)	Miscellaneous	4,000
	TOTAL cost per country	$ 250,000
	Total cost for four countries	$1,000,000

No. 88

1. Title of project

Biofuels demonstration programme.

2. Subregion/countries concerned

Two countries to be determined, including Ethiopia.

3. Objectives

To assist the Government in its programme to alleviate problems of energy supply in rural areas, by demonstrating various processes for the production of solid, liquid and gaseous fuels from biomass raw materials available in the country.

4. Activities

A preparatory phase, presently underway, aims at advising the National Energy Committee on a biomass-based energy production demonstration programme, including the establishment of demonstration units. During Phase II, these facilities will be installed and put into operation. Training opportunities in the relevant technologies will also be provided.

The complete demonstration programme, if feasible, will comprise:

- charcoal production
- biomass gasification/pyrolysis
- biomass densification
- biogas production
- small-scale fermentation alcohol production.

Once completed, the project will serve as a subregional pilot demonstration plant and for training of experts from other countries in the subregion in the field of biofuels. It is thus envisaged to extend the concept to a country in another subregion.

5. Background/justification

Exploration of local oil, gas or coal resources in Ethiopia is still in the development stage. Therefore the programme of the National Energy Committee intends to intensify exploration, research and development work for the utilization of renewable energy resources including biomass and biomass waste material such as coffee husk, cotton seed shells, cotton seed cake, saw mill and lumbering residues and other agricultural wastes. Although annual tonnages of organic residues are not precisely known, coffee husks production is estimated at about 90,000 tons per year, and at present 53,000 tons of molasses (a by-product of sugar production) are available per year.

A range of conversion technologies has been developed in many countries for the production, from various biomass feedstocks, of heat and steam, mechanical energy, electricity (both small- and large-scale), and gaseous and liquid transportation fuels. Other systems have been developed to demonstration plant level. There are also technologies for the densification of biomass in order to make it less bulky and therefore easier and cheaper to transport.

Research and development activities on the demonstration of biogas technology have already started. Twelve biogas plants (6 - 9 m^3 digesters) have been installed under the supervision of the University of Addis Ababa and the Awassa Agricultural Development Institute. The gas produced is used for lighting and cooking in rural homes.

5. Estimated costs

Preparatory Phase: $31,000 (Approved)

Phase II

Consultants, 12 m/m	$ 90,000
Training	130,000
UNIDO headquarters support	35,000
Subcontract	450,000
Equipment (laboratory and kilns)	250,000
Miscellaneous	45,000
TOTAL cost per country	$1,000,000
Total cost for two countries	$2,000,000

No. 89

1. Title of project

Industrial energy management and conservation.

2. Subregion/countries concerned

All African developing countries.

3. Objectives

The development project objective is to contribute to the reduction of the impact of energy imports on the industrial development of African countries through improved management and conservation schemes. This should help to increase the efficiency of energy use in industry.

4. Activities

(a) Strengthening of existing national and subregional institutions for assistance to industry in energy management and conservation.

(b) Direct assistance to selected industries in the assessment of their energy consumption, i.e. in carrying out energy audits and in recommending suitable energy savings measures.

(c) Training of specialized skills in energy auditing and conservation.

(d) Creation of a regional network for exchange of information, experience and expertise in the field of industrial energy conservation.

(e) Organizing of regional meetings to agree on recommendations on creation of the regional network and to verify national inputs required for it.

(f) Identification of existing training and education programmes and training opportunities in energy conservation within the region and definition of additional training needs.

5. Background/justification

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. The situation is seriously undermining the development of industry in the non-petroleum producing African countries where hydro-carbons are used as a direct industrial input as well as in in the production of electricity.

Recent studies of industrial energy consumption in developing countries conclude that there exists a major potential to increase the efficiency with which energy is used. This conclusion is supported by evidence of the different amounts of energy used in the manufacture of similar products across countries, and more telling by the widely varying amounts of energy used in producing similar products by different firms within the country. It has been shown, for example, that in energy

intensive industries up to 10 per cent of total energy consumption could be saved through housekeeping improvements alone or other changes involving minimal investment. Much larger savings, perhaps up to 30 per cent, could be achieved through more elaborate changes in processes and equipment involving capital expenditures.

African countries could obtain substantial benefit from regional co-operation and joint efforts in the field of industrial energy management and conservation. Energy assessment missions undertaken recently by the World Bank in many African countries showed a considerable need for improvement of energy utilization efficiency. This problem also enjoyed priority within the framework of the Industrial Development Decade for Africa. Hence, in adopting the proposals for the formulation and implementation of a programme for the Decade, the sixth Conference of African Ministers of Industry, held in 1981, called for the preparation and implementation of a comprehensive energy development programme at the national, subregional and regional levels. The seventh Conference of African Ministers of Industry, which was held in Addis Ababa, Ethiopia in March 1984, also accorded priority to the question of energy management and conservation of the common African position adopted at UNIDO IV.

6. Estimated costs (for a period of three years)

Expert services, 60 m/m	$480,000
Training, including workshop on energy management and conservation	120,000
UNIDO technical and administrative support	30,000
Subcontract	100,000
Miscellaneous	20,000
TOTAL	$750,000

No. 90

1. Title of project

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

2. Subregion/countries concerned

Each of the four subregions.

3. Objectives

To enhance the development of the food and agricultural industrial sectors through the development of the packaging industry utilizing local raw materials. This should contribute to the attainment of self-sufficiency in food production, the highest priority established in the Lagos Plan of Action and the programme for the Decade.

4. Activities

(a) A survey and evaluation will be made of the main types of packages used in the countries concerned for transport, storage and distribution of food products.

(b) A study will be made of alternative or complementary rationalized types of packages for transport, storage and distribution of food products within the countries and promotion of their national standardization.

(c) A rough statistical survey will be made of the main national imports of packaging materials and packages and other important national needs within the field.

(d) An appraisal will be made of national raw materials and sub-products which could be used for the manufacture of packaging materials and packages and appropriate technology for their conversion will be elaborated.

(e) Prototypes of tools and mechanical aids and non-sophisticated equipment for manufacture of the traditional and rationalized packages will be studied, designed and manufactured.

(f) Models of small-scale production facilities will be studied for the manufacture of traditional and rationalized packages.

(g) A packaging information unit and development pilot plant/centre/laboratory will be set up to act as regional counterpart institution to this project and follow up the activities set up herein above upon project completion. The pilot plant/centre/laboratory might be attached to an existing institution with services of interest to the concerned subregion and will include the production facilities based on the models referred to in subparagraph (f) above.

(h) Investment projects will be identified, prepared and promoted among potential investors, especially local entrepreneurs.

5. Background/justification

Availability of food where and when needed for consumption depends as much on effective and sound delivery as on production. However, in most developing countries scarcity of food produce is considerably aggravated by losses during transport, storage and distribution which very often exceed 35 per cent. The use of appropriate packages can simultaneously reduce losses, contribute to rationalization of the transport, storage and distribution systems involved and reduce the overall cost of the delivered food products.

6. Estimated costs

Costs vary according to the nature of the project proposed for each of the following subregional groupings:

(i)	West Africa	$1,500,000
(ii)	Central Africa	1,000,000
(iii)	East Africa and Southern Africa	1,000,000
(iv)	North Africa	500,000
	TOTAL	$4,000,000