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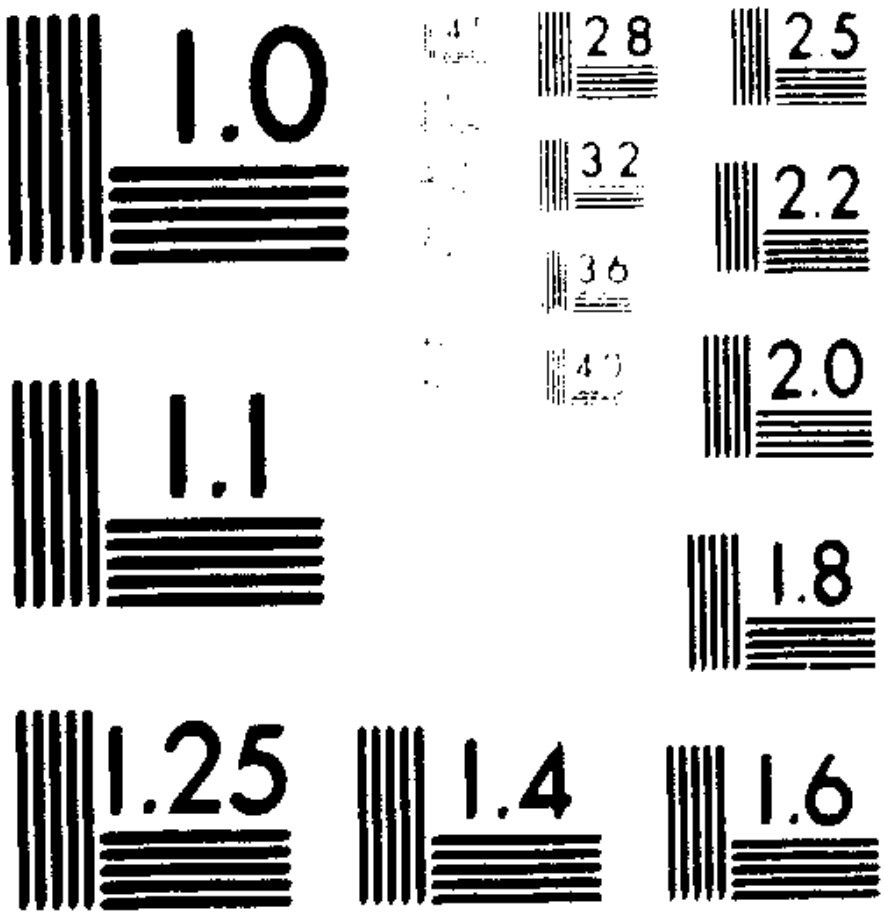

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COUNTRY REPORT

1979

(R) BASIC METAL AND ENGINEERING INDUSTRIES DEVELOPMENT PROGRAMME

for

THE PROVISIONAL MILITARY GOVERNMENT OF SOCIALIST ETHIOPIA

Field Mission
from
9-17 January 1979

A.K. Mitra
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ECA/UNIDO Joint Industry Division
Economic Commission for Africa
Addis Ababa

Addis Ababa
June 1979

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ECONOMIC COMMISSION FOR AFRICA

COUNTRY REPORT

OF THE

ECA/UNIDO BASIC METAL AND ENGINEERING INDUSTRIES DEVELOPMENT PROGRAMME

THE PROVISIONAL MILITARY GOVERNMENT OF SOCIALIST ETHIOPIA

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CHAPTER I

INTRODUCTION

Mission Authority and Terms of Reference

United Nations General Assembly resolutions 2626(XXV), 3201 (S-VI); United Nations Economic Commission for Africa resolutions 218(X), 256(XXI), 267 (XXI) and 319 (XXXI); Declaration on Industrialization in Africa; an Principles and Guidl'nes for Co-operation and Development underlined the importance of developing basic industries in Africa. The basic metal and engineering industries development constitutes the part of the basic industries development programme which was:

- adopted by the Second Conference of African Ministers of Industry held in Cairo, December 1973 1/

- recalled in subsequent meeting of the Follow-up Committee on Industrialization in Africa in September 1974 stressed the African countries could no longer follow the policy of trying to meet their economic requirements by way of exports of raw material 2/

- further recommended at its Second Meeting in August 1975, the Follow-up Committee proposed the promotion of a variety of basic industries as priority areas for action in the African region 3/

- reaffirmed agreed conclusions of the Third Conference of African Ministers of Industry held in Nairobi, December 1975 also underlined the importance of developing basic industries in Africa 4/

1/ Declaration on Industrialization in Africa: Principles and Guidelines for Co-operation and Development, 1974, E/CN.14/613 and E/CN.14.INR/208 Part II, Para. A (IV) and (VII) page 23.

2/ Report on the first meeting of the Follow-up Committee on Industrialization in Africa, October 1974 (E/CN.14/INR/211); part III, para G(XI) page 11.

3/ Report of the Second Meeting of the Follow-up Committee, August 1975 (E/CN.14/INR/213) para. 31 (a) (i), (ii) and (iii) page 7.

4/ Report of the Third Conference of African Ministers of Industry in Nairobi 1975 (E/CN.14/649), part II, para 19,20,21,24 page 21.

- recognized in Lima Declaration and Plan of Action on Industrial Development and particularly co-operation among developing countries adopted by UNIDO in March 1975 in Lima 5/

- further reaffairmed on agreed conclusions of Third meeting of the Follow-up Committee on Industrialization in Africa held in November 1976 6/

- strongly recommended and agreed conclusions of the Fourth Conference of African Ministers of Industry held in Kaduna in November 1977 7/ underlined the importance of developing basic industries.

Integrated development of basic metals and engineering industries are part of the basic industries development recommended for establishing in developing countries particularly outlined in Lima Plan of Action 8/, and endorsed as a programme by the Follow-up Committee at its Third Meeting in Addis Ababa in November 1976 as agreed conclusion for development of Basic Industries in the African Region with concrete industrial project development, the Committee endorsed the following four programmes formulated by ECA as basis for achieving integrated industrialization :

- Basic metal industry development programme
- Engineering industry development programme
- Chemical industry development programme
- Building materials development programme

5/ Lima Declaration and Plan of Action, March 1975, para 58 (F,k,o) page 10, 11.

6/ Report of the Third Meeting of the Follow-up Committee on Industrialization in Africa, December 1976 (E/CN.14/INR/218) part II para.9(D) Section (a) and (b) page 8.

7/ Report of the Fourth Conference of African Ministers of Industry in Kaduna, November 1977 (E/CN.14/689) part II, para 7(c) item (iii) and (iv) page 12.

8/ Lima Declaration and Plan of Action, March 1975. UNIDO PI/38 para 58 (f) (i) and (ii) page 10 & 11.

It approved the following action programme

(a) Comprehensive studies in each of the above area to establish the stage of development so far reached in Africa and to determine the linkages among these branches and with the rest of the economy, training needs and steps to be taken to meet these requirements.

(b) On the basis of the studies, preparation of an integrated comprehensive industrialization policy and a programme of action for implementation

(c) Organization of an inter-governmental meeting of experts from Ministries of Industry and Planning to consider the industrialization policy and the programme of action.

(d) An invitation to experts from ECA member States and other developing regions to prepare projects, programmes and policy papers for national and multinational implementation within the framework of the agreed strategy and to provide advice on the rationalization within the framework of the agreed strategy, and to provide advice on the rationalization of industrial development, for submission to the fourth conference of African Ministers of Industry and Later to the OAU Summit[2/]

In line with above agreed resolution, terms of reference and number of isolated projects in the ECA Work Programme for 1976-1981, programme for the development of basic metal and engineering industries in the African developing countries are being planned within the ECA/UNIDO Joint Industry Division (JID).

Outlook of Present Industrial Situation in Africa

Since the decolonization period 1950's,and 1960's the majority of the African developing countries are exporting cash crops (processed and unprocessed) and valuable minerals and ores to foreign developed countries. In exchange African countries are importing capital, intermediate and consumer goods from those developed countries. This is creating enormous constraints both in the field of deterioration in the balance of payment situation and recurrent multiplication in unemployment figure in majority of the African developing nations,

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2/ Report of the Third Meeting of the Follow-up Committee on Industrialization in Africa (E/CN.14/INR/218) Part II para 9 and 10 page 8.

with exception to the African oil exporting countries. Moreover, there is a conspicuous absence of basic industries particularly basic metal and engineering industries sector in the majority of the African developing countries. The major difficulties in recent industrialization policies in African countries clearly indicate excessive external dependency for capabilities in formulating financing, technology, capital goods, intermediate inputs, management, manpower, designing, developing and implementing the various types of industrial programmes and projects.

There is a tendency to encourage industrialization on the basis of inadequately co-ordinated inter-sectoral policies and search of opportunities for complementarities among large number of small African economies. Past and current industrial policies in the region have led to national industrial structures characterized by hetrogenity, high costs, low value added, unbalanced urban-rural industrial development, absence of internal forward and backward linkages and are, in short, insignificant in their dynamism and structural impact.

In order to come out from this [illegible] of industrial convulsion it is necessary for the African policy makers to look into the core of the development process which constitutes the development of basic industries. One of the important sectors of basic industry development required the development of basic metal and engineering industries. The requirements for the development of basic metal and engineering industries demand the development of raw material and energy producing industries and infrastructures; adequate, diversified and expanding intermediate products-using industries; and both technological and high proportion of management and skilled manpower inputs at all levels of production activities.

In many instances, African countries have no choice but to use the technology, capital and intermediate goods, that do not conform to their actual needs. The lack of coherent institutional and organizational structures, that could reflect the interdependence of economic activity, has retarded the efforts of many countries to develop, determine and carry through fundamental industrial development measures on the necessary scale.

There is also an ugrent need to promote multinational industrialization strategy and to enable African countries to develop a common framework for sub-regional, regional and international cooperation within the context of an integrated strategy to promote and foster self-reliance and self-sustaining development in the African developing region.

Within this context the ECA mission visited selected African countries in order to design a moderate guidelines to the policy makers, planners and programmers of African developing nations for an integrated development programme of basic metal and engineering industries.

Objective of the Mission and Future Guidelines to the Planners and Programmers

The mission's main objectives that will be recommended to the selected African developing countries for the integrated development of basic metal and engineering industries can be summarised below:

- to bridge the existing institutional gaps that are being observed by the mission to facilitate the planners and programmers in each country visited to create conditions institutional support for the integrated development and implementation of priority projects in basic metal and engineering industries sectors within the framework of the physical and visible constraints existing in each country;

- to facilitate the planners and programmers with concrete plan for the development of managerial and technical skilled manpower programming;

- to design policy objectives for the planners and programmers for

  a. possible expansion of existing industries through the utilization of internal natural resources in basic metal and engineering products;

  b. identification of new products which the government is not aware of and those which can easily be manufactured within the capacity of the existing plant;

  c. to improve the basic support industries e.g. foundry, forging, heat treatment, machine shop, tool room, repair, maintenance, spare parts in order to manufacturing facilities for the balanced growth of this sector;

- to facilitate the planners and programmers for the creation of a priority programme based on:

  a. the government's own identified priority projects;

  b. the projects identified during the mission;

  c. the projects to be recommended by the mission;

- to assertain projects that are common for the subregional African countries and those projects that cannot be implemented without sub-regional co-operation in the priority sector;

- to advice the member government, ECA, UNIDO, OAU regarding the implementation of these projects for the accelerated development of basic metal and engineering industries high lighting the need for intra-regional and inter-regional co-operation among the developing countries in line with Lima Declaration and resolution adopted in African Ministry of Industry conferences

ECA/UNIDO Field Mission Plan (November/January 1979)

The mission mounted by ECA, visited selected African Developing Countries from 5 November 1978 to 17 January 1979 which includes land locked, islands, small countries and large countries in order to assess the status of these countries within the context of industrial development.

The mission has explored the existing status of the basic metal and engineering industries in:

(a) Kenya, Ethiopia, Uganda, Zambia, Nigeria, Ivory Coast, Mali, Senegal consisting of ECA team Mr. A.K. Mitra (Engineering Industries), Mr. V. Ivanchenko (Basic Metal), Mr. K.K. Peki (Industrial Economist) and Mr. W.P. Wong Min (Engineering Industries, joined the team in Ethiopia).

(b) Kenya, Ethiopia, Tunisia, Egypt, Sudan, Mauritius, Lesotho consisting of ECA team Dr. Y.K. Mazhar (Team Leader, Engineering industries), Mr. M.K. Mwango (Basic Metal) and Mr. M. Afeta (Industrial Economist).

Within the context of the development of basic metal and engineering industries it was planned that the respective team should assess the present performances and activities in the following area of each country mentioned above. Although due to lack of time, the mission was unable to visit in all these areas:

- National Institutions e.g. Ministries responsible for planning, Economic development, Industry, Research and Development and Finance.
- Parastatal Organizations e.g. Development Corporations, Development Banks, Credit Institutions, Productivity Centres.
- Chambers of Commerce and Industry
- Large Scale Engineering Establishments producing Basic Metal and Engineering Products
- Medium and Small Scale Industries producing various engineering products and agricultural implements

- Industrial Estates which includes ancillary and common services facilities

- Large Repair and Maintenance Shop, and Railway Workshops

- Technical Training Institutions, Polytechnique and Technical Colleges

- International Organization within the country e.g. UNDP

Activities of the Mission

The activities of the mission in each country where detailed discussions were carried out can be summarised below:

- priority areas where integrated development of basic metal and engineering industries can be achieved with particular reference to the utilization of natural resources, engineering skill and available machinery and equipment within the country. Basic availability of foundry, forging, heat treatment, machine shop tool room etc.

- rationalization, upgrading and ongoing priority projects that are being undertaken by the Public and Private Sector Industries in basic metal and Engineering Development

- quantitative and sizeable priority projects which are being identified by the Government but unable to implement them in these two sectors due to various constraints

- the sectoral and subsectoral constraints in basic metal and engineering industries sector

- the major financial constraints jeopardising the projects implementation targets

- the major financial constraints in repair and maintenance, and spare parts manufacture within the country

- manpower planning particularly managerial, technical and engineering skills for the development of basic metal and engineering industries.

- assessment of the level of technology in each country and possible solution for transferring such appropriate technology to the priority industries.

- scope for subregional and regional integration through joint venture, subcontracting in basic metal and engineering industries,

- scope for technical co-operation among the inter-regional developing countries.

Proposed Follow-up of the Mission Report

The country Report of each Country visited by the team together with the Regional Report, will be critically examined by a high level Expert Working Group meeting in Addis Ababa 10/. The final findings and recommendation thereafter to be forwarded to the conference of African Minister of Industry. The purpose of this expert group meeting will be to bring the African planners and programmers to discuss and pin point the actual priority projects, identify the major constraints and workout a formula for actual implementation of the development programme set out in these two critical sectors of basic metal and engineering industries. The important feature of this group meeting will be to identify how this basic metal and engineering industries development programme should fit in with ECA/UNIDO work programme during 1980-81 and within the framework of Lima Declaration up to the year 2000 AD.

10/ Report of the Third Meeting of the Follow-up Committee on Industrialization in Africa (E/CN.14/IND/218) Part II para 10 (c) page 8

COMPOSITION OF THE TEAM FOR ETHIOPIA

The ECA field mission which visited Ethiopia for the Basic Metal and Engineering Industries Development Programme consists of the following team:

Engineering Industries

Dr. Y. K. Mazhar Team Leader (Egypt)
Electrical & Mechanical Engineer
Director, Engineering and Industrial Design
Development Centre Egypt
ECA/UNIDO Joint Industry Division

Mr. Aloke Kuma Mitra (India)
Mechanical an Industrial Engineer
UNIDO Regional Adviser Engineering and
Machine Tools Industries
Joint ECA/UNIDO Industry Division

Mr. Weng Pee Wong Min (Mauritius)
Electrical Engineer
ECA Economic Affairs Officer
Joing ECA/UNIDO Industry Division

Basic Metal

Mr. Vladimir Ivanchenko (USSR)
Iron and Steel Engineer
ECA Senior Economic Affairs Officer
Joint ECA/UNIDO Industry Division

Industrial Economist

Mr. Merga Afeta (Ethiopia)
ECA Consultant
Formerly General Manager
Ethiopian Food Corporation
Joint ECA/UNIDO Industry Division

CHAPTER II

SCHEDULE AND REPORTS OF INSTITUTIONS AND FACTORY VISITS AND MEETINGS

A. Schedule of visits and meetings

The following is the schedule of visits and meetings as prepared and executed with officials of the Ministry of Industry and National Metal Works Corporation.

Monday 8 January 1979	9:30 hrs	Ministry of Industry and National Metal Works Corporation
Tuesday, 9 January 1979	9:00 hrs	Ethiopian Iron and Steel Foundry
Tuesday, 9 January 1979	11:00 hrs	Sabean Metal Works
Tuesday, 9 January 1979	15:00 hrs	Kaliti Steel Industry
Wednesday, 10 January 1979	9:00 hrs	Ethiopian Metal Tools Factory
Thursday, 11 January 1979	9:00 hrs	East African Aluminium Company
Thursday, 11 January 1979	11:30 hrs	Automative Manufacturing Company of Ethiopia
Thursday, 11 January 1979	15:30 hrs	Ministry of Mines and Energy
Friday, 12 January 1979	9:30 hrs	National Productivity Centre
Friday, 12 January 1979	11:45 hrs	Agricultural and Industrial Development Bank
Tuesday, 16 January 1979	10:00 hrs	Handicrafts and Small Scale Industries Development Agency
Wednesday, 17 January 1979	15:30 hrs	Concluding meeting at the Ministry of Industry.

B. Reports on visits and meetings

The following is a brief series of reports on the visits and meetings.

The Ministry of Industry and National Metal Works Corporation, (8.1.79)

Officials of the above ministry were briefed by the mission team leader about the purpose, scope and objectives of the study on basic metals and engineering industries.

The Head of the Planning Department of the Ministry of Industry then gave the mission team a general picture of the manufacturing sector of the country, from which the following points were gathered, namely:-

(i) The manufacturing sector contributes over 10 per cent to the national gross domestic product, employing less than 10 per cent of the urban labour force and contributing about 5 per cent to export earnings.

(ii) Areas of interest are; the production of consumer goods, textile, furniture and joinery, building materials, chemical and engineering industries, the last two being on a modest scale.

Some of the characteristics of the manufacturing industries were also described such as the areas of concentration of the manufacturing industries and the effects thereof. The team came to know that after the land reform and nationalization of industries in 1975, the local demand in consumer goods such as sugar and beverages increased at a fast rate. This was due to the increased purchasing power of peasant farmers as a result of the redistribution of wealth in the rural sectors.

The team was informed that at present the government is in direct control over 14 State Corporations whose activities are controlled and co-ordinated by the Ministry of Industry. The latter also supervises the operations of nine enterprises in which the State is a major owner. Additionally, the Ministry also has responsibilities in overseeing the activities of the Handicrafts and Small Scale Industries Development Agency (HASIDA) and the National Productivity Centre.

Finally, the team requested the Ministry to arrange for the team to visit some of the basic metal and engineering industries.

Visit to the Ethiopian Iron and Steel Foundry (9.1.79)

The team visited the various sections of the factory and had a discussion with the management who supplied the team with some of the necessary informations, the rest being obtained at a later date.

The factory operates an electric are furnace of a capacity of 5 tons per charge and a rolling mill of full capacity of 40,000 tons per year. But the team was told that the present production is only 20,000 tons per year, and that scrap iron, collected in the neighbourhood of Addis Ababa, is being used as raw material. In addition, some ingots are also imported.

The products manufactured are; (i) Re-inforcement iron bars; (ii) Round iron bars (iii) Iron nails (iv) Bed spring net (iv) Fencing net (v) Barbed and Wire and (vi) Black wire.

The team made the following observations, namely:-

(i) The machinery is old

(ii) Fire brick linings are imported

(iii) New building is being erected to cater for the extension of the wires and nails production section. (The team was told that new machinery had been ordered for same).

(iv) The nails produced are not galvanised.

(v) The steel rolling mill is working two shifts daily

(vi) No manufactured products are exported.

The main constraints are;

(i) Difficult to obtain spare parts as the machinery is old— 18 years old.

(ii) Inadequate quality control facilities

(iii) Financial problems

(iv) Limited training facilities

(v) Prospect for scrap iron as raw material is poor

Visit to Sabean Metal Works (9.1.79)

The team was first shown a galvanised and corrugated steel sheets factory where there were two lines of production each having a capacity of 60 tons per day of three shifts. However, due to demand constraint, only one line, working at full capacity, was being utilized. The team came to know that flat galvanised sheets were imported as raw material and was told that the yearly local consumption of galvanised corrugated iron sheets was estimated at about 16,000 tons.

The team next visited a galvanised pipe plant adjacent to the above factory. It was revealed that due to the local demand of galvanised water pipes being far less than the capacity of the plant of 12,000 metric tons per year, production had stopped since a few years ago. The plant is able to produce the following:-

(i) Galvanised steel water pipes from 3/8" to 3" diameter.

(ii) Square and rectangular steel pipes

(iii) Black and round steel pipes.

It has been noted that the plant in general was still in a good condition, although some maintenance and repair would be required to revive the machinery. The existence of a large galvanising plant did not escape the attention of the team who felt that proper care should immediately be paid to this plant before it became too rusty to be serviced for re-operation.

Expansion project:-

A. In view of increasing demand for corrugated sheets, the second line of the present factory will be started when the volume justifies doing so.

B. Another plant of the same type with a capacity of 6,000 tons is expected to re-open shortly.

C. The idle pipe plant is expected to be revived following the completion of a study now under way

D. A shearing line to form a linkage to the existing galvanising/corrugating line will be installed after a feasibility study on the subject has been completed.

Constraints and problems:

A. Corrugated sheets factory:-

(i) Difficulty to obtain cold rolled steel sheets of thin gauges. They only become to be available from Japan.

(ii) Present demand limits the factory from running at full capacity

(iii) Up-grading of workers' general skill required.

B. Pipe plant:-

(i) Un-availability of information regarding the local demand of galvanised water pipes.

(ii) No qualified personnel to maintain the machinery during the idle period.

Kaliti Steel Industry (9.1.79)

This plant was established in 1972. Since then it has been producing welded structural pipes and tubes profile for door and window frames, galvanized and corrugated sheets and all types of sheet metal works. In addition to the above products, it has also introduced the manufacture of some alumirium products, furnitures, shelves and beds, the last three items are produced mainly for government needs.

The production development of the factory is shown in the following table:-

Table 4 Production from July 75-June 78

Year	Total Production	Percentage increase
1975/76	1,777,981 kgs	
1976/77	1,867,400 kgs	5.25
1977/78	3,086,876 kgs	39.51

The team visited the factory and has made the following observations:-

(i) The welding system of the pipe plant is of the contact type. If this could be replaced by a high frequency one, after consultation with the plant supplier, and after a study of the market demand situation, galvanised water pipe could be produced in the same factory.

(ii) The factory produced its own dies for its profile producing machine

(iii) The factory has built a grinding machine by copying from an existing imported one.

Constraints:

(i) Spare part problems due to unavailability of machinery documents

(ii) No preventive maintenance

(iii) No training facilities

(iv) No quality control.

Ethiopian Metal Tools Factory (10.1.79)

Established in 1968 under a co-operation agreement with a foreign government, the factory manufactures hand tools for the agricultural sector such as axes, pick axes, shovels, spades, hammers, crow bars etc and also household hinges and door bolts.

The production of the factory has been erratic as shown in the following table:-

Table Production Statistics

Year	Production (Kgs)
1975-1976	403,458.34
1976-1977	510,915.83
1977-1978	466,209.61

The imported raw materials are steel bars, sheets and strips.

The team visited the factory and has noted the following points:-

(i) Most of the machinery are old though they are still in working condition.

(ii) Dies for pneumatic power hammer are manufactured locally

(iii) Production of door hinges was one third of the country requirement.

(iv) The expansion project at present is the production of sickles.

(v) The factory has a fairly well-equipped tool room. The team has discussed at lenth with representatives of the factory on the problem of bearing and gear spares which they were facing, and some on-the-spot advices were given to them in this respect.

Constraints:

(i) No spare parts due to the machinery being either old or obsolete, gears and bearings being the most acute ones

(ii) No training facilities, specially in the fields of metallurgy and heat treatment

(iii) No development in the design of agricultural implements and tools.

(iv) Production of door hinges being hindered due to the low production capacity of the rivetting machine.

Considering the good quality of the products manufactured by the factory and the facilities available, the team felt that the factory could be used as a Development Centre for Agricultural implements.

East African Aluminium Company (11.1.79)

The team visited all the departments of the factory and has observed that most of the machinery was still new and that the work-shops in general were well-equipped. There was a good stock of raw materials which consisted mainly of aluminium profiles. The factory produces aluminium doors and windows, movable partition walls, sun breakers, accoustic ceiling materials, curtain walls, staircase railing, selves, condolas and enjera ovens.

The team had an exchange of ideas with officials of the company and was told that 51% of the company equity belonged to the AID Bank 25% to the Ministry of Industry and the remainder to private concerned. The company is therefore not yet nationalised.

The precarious position of the company was made known to the team who has noted that the liabilities of the company was in the region of 400,000 Birrs, loans amounted to about 2,200,000 Birrs at 9½% interest rate and that the turn-over was roughly 700,000 Birrs. The bad financial situation of the company is causing a deadlock in the process of taking-over either by the National Metal Works Corporation or the AID Bank.

In addition to financial problems, availablity of raw materials/ accessories is another constraint. It is felt that market research, both locally and overseas, is one of the important factors to revive the company.

The team strongly recommends the immediate finalisation of the handing over of the company to either the AID Bank or to the Ministry of Industry, and the sooner the better. Of course the present financial aspect of the company has to be sorted out first.

Visit to the National Productivity Centre (12.1.79)

The team was welcome by the General Manager who was accompanied by the ILO Chief Technical Adviser. After the team had briefed the General Manager on the purpose of its visit, he opened and chaired the meeting by highlighting the activities and objectives of the National Productivity Centre (NPC).

The NPC, under the auspices of the Ministry of Industry, was established to provide a pool of skilled manpower in the nationalized sector of the economy, in particular the manufacturing sub-sector. It is located in Addis Ababa but works throughout the country, offering training and management consultancy. For management, training is offered in the following fields;

a) Accounting
b) Production Management
c) General Management
d) Personnel Management
e) Marketing Management

NPC has seven workshops for Vocational Training cartering for the following activities:

a) Automechanic
b) Metal Working
c) Welding, plumbing, steel work
d) Electrical
e) Building
f) Woodwork
g) Leatherworks.

The output capacity for vocational training is expected to be 600 next year.

NPC has adopted a practical in-plant training approach with a target of 750 trainees in 1979. This new approach ensures that industry is committed to training and training is related to industrial situations and objectives. In this context NPC has started giving Training Officers and Instructors courses last year with an output of 300 per year. The NPC also has an Operational Research Section which identifies productivity problems and conducts surveys for the manpower requirement of the country. Surveys carried out in 1976 revealed that there is an immediate training need for more than 3000 workers and that for Asmara alone over 1000 workers are needed. It is hoped to expand in-plant training as much as possible. At present there are two UN Technical Advisers giving training in the mechanical trade for repair and maintenance of auto-mechanic.

NPC is also giving consultancy services to various corporations for technical assistance when requests are received from these corporations.

To upgrade training NPC has planned to give specialized training in the following branches of the industry;

a) Textile technology
b) Leather technology (Starting in 1980-a UNIDO project)
c) Food processing
d) Maintenance and repair

Opportunities will also be given for specialized training abroad.

NPC is a member of the Higher Education Committee and it also works in close collaboration with the Manpower Department of the National Revolutionary Development Campaign and Central Planning Supreme Council.

NPC claims to have the following constraints;

Lack of manpower. The present number of training staff -- 35 nationals and six from the UN--is not sufficient. Fifteen more staff would be required.

Visit to the Automative Manufacturing Company of Ethiopia, A.M.C.E. (11.1.79)

The team briefed the manager on the purpose of its mission and the manager outlined the activities and objectives of the company as follows:-

The company was set up in March 1975 and at present has the following equity structure.

Foreign investment	:	70%
SACAFET (ETHIOPIA)	:	20%
Ministry of Industry	:	10%

The company is involved in the simple assembly of 5-10 ton truck and also trailers with about 20% local substitution consisting of the following local components:-

Leaf spring
Wooden parts
Exhaust pipe (partly made in the factory)
Fenders (locally subcontracted)
Tyres
Tool boxes (without tools)
platform
paints

The present production is one unit per day with an installed capacity of one and a half unit per day of 8 hour shift.

The company employs ninety persons with two technical staff, ten administrative staff and two expatriates.

The main constraint of the company is the transport situation.

The company has a project for the manufacture of bus bodies. (35 seaters)

Visit to the Agricultural and Industrial Development Bank (12.1.79)

After being briefed by the team about the purpose of its visit, the manager of the Industrial Department of the Agricultural and Industrial Development Bank, AIDB, described the activities of the institution by highlighting the following points:

The governing body of AIDB is the National Bank of Ethiopia and it has seven branches throughout the country. Whilst priorities are given to State Enterprises and Cooperative Societies, AIDB is also very much concerned in the development of small scale industries in the private sector in order to reach the poor artisans and also to create employment opportunities. In this connection, the Handicrafts and Small-Scale Industries Development Agency, HASIDA, undertakes to prepare feasibility studies for private individuals and AIDB collaborates in financing viable projects. The team was informed that pursuant to the objective of developing small-scale industries, negotiations were underway to secure a loan of 6 million US $ from the World Bank for the development of this sector 50 million US$ sere also requested from the World Bank for large and medium size projects.

AIDB does not entertain any preparation of feasibility study but undertakes detailed project evaluation and appraisal. However, AIDB sometimes identifies projects. In fact 98 projects are being identified for HASIDA. The team came to know that the total loan expected to be granted to the industrial sector for the period 1978-79 was approximately 98 million Birr, and that the lending programme for other sectors was expected to amount to a total of approximately 100 million Birr. It has been revealed that these loans consisted of 65% foreign exchange committment in terms of raw materials and equipment. The team was informed that credits by the World Bank were interest free. However, the only charges were committment charges of 7% to 8%. Loans given by AIDB is at 9½% interest p.a.

The main constraint of AIDB is inadequate World Bank resources.

Visit to the Handicrafts and Small Scale Industries Agency, HASIDA (16.1.79)

The team briefed the officials of HASIDA on the purpose of the meeting. The General Manager chairing the meeting gave the team a general idea on the activities and objectives of the Agency by highlighting the following points.

HASIDA is an autonomous public authority with the purpose of promoting and coordinating the development of handicrafts and small-scale industries, and also promoting the establishment of service and producers' co-operatives.

It has three major departments, namely

(a) The Industrial Promoting Department
(b) The Project Preparation Department
(c) The Co-operatives Promotion Department

HASIDA also has a metal sector which has been developed very recently and which promotes the development of small scale basic goods such as agricultural and farming implements.

The team came to know that at Asmara there is an urgent need for agricultural implements and tools which are now being produced by the local blacksmiths. Asmara also has a large concentration of small metal industries. There are sixty nine such establishments among which there are four small foundries and one electro-plating plant including silver, copper and chrome platings facilities. There are also some beater mills and a few bus body works. In Addis Ababa there exists six small foundries producing only rough castings. The team was informed that scrap metals obtainable from sunken warships at Massawa could be utilized to develop the small metal sector.

With a budget of 2½ million Birr, HASIDA has no financial problem, promoting 97 industrial profiles. The bottleneck is that there is no proper project orientation. Assistance from a Project Implementation Expert, say from UNIDO, is solicited here. It has been made known to the team that design and technical assistance is mostly required for the handicraft sector, and that there is UNIDO experts working in the Technology section.

The team was informed about the following constraints:

a) Lack of manpower and expertise to upgrade the technical skill.
b) Shortage of raw materials
c) No technology transfer at artisan level
d) Production methods for agricultural and household equipment have to be upgraded
e) No know-how in tools production
f) No coke for iron smelting (semi coking process only is being used)
g) Institutional gaps
h) No iron and steel development project.

Concluding meeting at the Ministry of Industry (17.1.79)

During the wrap-up discussion at the Ministry of Industry, there was an exchange of views between senior staff of the Ministry and National Metals Works Corporations. Among the points discussed the followings were highlighted:-

1) Priority to factories producing consumer goods

2) The necessity of setting up an iron and steel development institution

3) The importance of the erection of a Foundry Complex for spare parts

4) The necessity of carrying out a survey of Engineering Industries in Ethiopia with a view to rationalizing, upgrading and re-structuring this sector of the economy.

5) The development of fire clay in Ethiopia as refractory for melting furnace

6) Request of staffing assistance from ECA and UNIDO

CHAPTER III

ECONOMIC AND INDUSTRIAL BACKGROUND

Basic Information

Socialist Ethiopia: Capital - Addis Ababa

(i) Population (1975 Estimate)11/ : 29.5 million
Urban : 11.8%
Rate of growth : 2.5%
Population (1978 Estimate) : 29.5 million

(ii) Area : 1,221,900 sq.km
Suitable for cultivation : 789,000 sq.km
Cultivated : 84,000 sq.km

(iii) Infrastructure: Roads - about 7,000 km, 1,600 km of them surface
External communications: Important ports of Assab and Massawa in the north-east province of Eritrea.

International Airport: Three

(iv) Official Language - Amharic

11/ Ethiopia statistical Abstract 1976

REVIEW OF ECONOMIC PERFORMANCE

1. Basic National Accounts Figures (1975/76, Million Birr)

(a) GNP (Current Market prices)	6,040.8
(b) GDP (Current Factor Cost)	5.588.1
(c) Per capita GDP	145.9

(d) Sectoral Distribution of GDP (in percent)

	1974/75	1975/76
Agriculture	48.3	48.5
Manufacturing	4.3	4.1
Building and Construction	5.4	4.9
Handicraft and Small-scale Industries	4.8	4.6
Wholesale and Retail Trade	9.0	8.9
Transport and Communication	6.5	6.6
Other	21.7	22.4
	100	100

2. Balance of Payments (Birr)

	Current A/C	Overall
1977	- 68.7 million	30.0 million
1977	-173.7 million	-133.8 million

3. Foreign Trade (Birr million)

	TOTAL	
	Imports	Exports
(a) 1976	729.5	560.6
1977	728.6	689.0

(b) Composition

Imports value (end use) (in per cent)	1976	1977
Raw materials	3.3	4.8
Semi-finished products	18.2	15.4
Capital goods	29.8	31.0
Consumer goods	32.2	40.9
Other	16.5	7.9
	100	100

Exports value (major items) (in per cent)	1976	1977
Coffee	56.7	75.4
Oilseeds & pulses	15.2	8.8
Hides and skins	9.7	6.9
Fresh fruits and vegetables	1.4	1.1
Other	17.0	7.8
	100	100

(c) Direction (major partners 1977)

	Percentage	
	Imports	Exports
1. USA	10.1	25.8
2. GDR	0.6	14.5
3. Federal Republic of Germany	9.0	8.6
4. Saudi Arabia	4.0	8.6
5. Japan	17.7	7.0
6. Djibouti	0.2	4.8
7. Italy	11.1	4.8
8. UK	6.4	2.6
Other	40.9	23.3

4. Government Revenue and Expenditure (1974/75)

	Revenue (Source) (in per cent)		
Direct tax	19.2	Domestic	72.2
Indirect tax	21.8	Foreign	22.8
External Assistance and Capital Receipts	23.3		100
Taxes on Foreign Trade	23.3		
Other	12.2		
Total: 921.7 million Birr =	100		

Distribution of Expenditure 1974/75
(in per cent)

Current		Capital	
General Services	46.0	Education	9.8
of which		Public Health	5.3
National defence	(25.0)	Infrastructure and Commerce	27.5
Internal order and justice	(14.9)	Industry and Commerce	4.8
Economic Services	10.5	Agriculture	33.4
of which		Other	19.2
Agriculture and Land Reform	(3.5)	Total:	100
Social Services	28.4		
Other	15.1		
Total: 811.2 million Birr =	100	273,7 million Birr	

5. External Aid and Public Debt
(in million Birr)

A. Public debt (foreign) by type

Multilateral	780.0
Bilateral	573.0
Other	43.6
Total	1,396.6

B. External Aid 1977:

Sectoral Distribution of Capital Assistance
(in per cent)

Agriculture	29.7
Education	10.4
Industry	5.2
Relief	22.0
Transport & Communication	32.6
Other	1.1
Total Capital Assistance	100

Birr 153.6 million

Sectoral Distribution (major sectors) of Technical Assistance
(in per cent)

Agriculture	48.9
SIDA	17.6
USAID	12.6
UK	8.6
USSR	7.6
Total: Birr 60.1 million	100

6. UNDP Assistance (in million US$)

	1978	1979	1980	1981
Annual Ceilings (IPF)	5.5	7.86	11.3	12.1
SMLDC	1.8	-	-	-
Programme Reserve	0.2	-	-	-

7. Price Index

Retail Price Index (Addis Ababa) 1963 = 100

	1976	1977				1978
		I	II	III	IV	I
Food	248.4	262.1	271.9	315.0	307.9	319.6
Household Items	205.5	236.1	236.9	271.9	299.8	279.1
Clothing	204.9	214.2	222.2	226.5	232.2	238.6
Medical Care	194.9	202.0	206.7	213.7	215.3	225.7
General Inde	218.7	232.1	242.1	271.7	272.8	278.7

II

Miscellaneous Facts

(a) Agriculture absorbs 85 per cent of work force
(b) The population in Addis is estimated at 1.1 million with 31 per cent illiterate. About 60 per cent of the adult literates are men.

NOTES:

Sources: Quarterly Bulleting Vol.4 No. 2 - June 1978
Economic Research and Planning Division, Addis Ababa.

Development Assistance Report - 1977 (UNDP)

Gross Domestic Product (At constant 1960/61 Factor Cost)

Selected Sectors — Million Birr

Selected area	1970/71	1971/72	1972/73	1973/74	1974/75	Average Growth rate 1970/74
						% p.a
Agriculture	1,766	1,826	1,837	1,822	1,785	0.27
Mining and quarry	9.6	9.3	10.2	9.7	8.7	-2.3
Manufacturing	158	164	175	173	170	1.9
Construction	209	221	217	215	211	0.24
Electricity and Water	38	39	42	44	44	3.9
Transport & Communication	215	236	250	254	255	4.6

Source: Ethiopia Statistical Abstract 1976

Basic Economic Informations

The Gross Domestic Product (1974/75)
at constant 1960/61 Factor Cost = 3,939 Million Birr
Growth rate (1970/71-1974/75) = 4% per year
The Share of the manufacturing Sector (1974/75) = 4.3 %
The share of the minning and quarrying sector (1974/75) = 0.2 %

External Trade:

Coffee is Ethiopia's major export commodity, about 75 per cent of the major export items in 1977. Other items include oil seeds and pulses - 8.8 per cent, hides and skins - 6.9 per cent. Ethiopia imports chemicals, fertilizers and petroleum products.

Ethiopia's balance of trade fluctuates in recent years in line with the ups and downs of the coffee market. In 1973, the trade balance moved into its first surplus ($55 millions) for fifteen years. However the balance of trade deficit continued in 1974 and 1975. The high price of coffee in 1976 coupled with a decline in the importation of consumer goods and non-military equipment, enabled Ethiopia to maintain a very favourable foreign exchange reserve, in spite of a marked decline in two of the country's othert important export crops, oil seeds and pulses.

Natural Resources

The present natural resources of Ethiopia are coffee, oilseeds and pulses, hides and skins.

A study has shown that a reserve of about 1,000,000 metric tons of Haemetite - Magnetite (60 - 70 per cent pure iron) is located at Wollega region. Low grade iron in the form of Quartzite is estimated to exist in about 12 millions metric tons in the same region.

The occurrence of lignite (coal) was also detected at Hejo, and the reserve is estimated to be at 10 millions metric tons. Deposits of copper, cobalt, Nickel and potassium were also identified, though to a small-scale.

Ethiopia also has an abundance of water resources. It has an electric potential of 56 billions kwh. The actual production is only 1.1 million kwh or merely 2 per cent.

General Economic situation in Ethiopia

Economic development in Ethiopia started in 1936-1941 during the Italian occupation. It was followed by a period of relative economic stagnation. However, development received new impetus under the first five-year plan covering the period 1957-1961. This gave priority to the development of infrastructure which represented a pre-requisite for accelerating economic growth. In the second five-year plan 1963-1967, priority was given to such areas as manufacturing, mining and electricity. In the third year plan 1968 to 1973, a substantial shift toward revenue - producing agriculture was given the highest priority.

In February 1974 the Government was taken over by the Provisional Military Administrative Council (PMAC), which, in December 1974, nationalized all banks and insurance companies. This was followed by the nationalization of industries, buildings and lands during 1974 and 1975. Since the nationalization measures were introduced there has been almost no private investment.

Coffee is the backbone economy of Ethiopia. As a matter of fact, the country's balance of trade follows the same fluctuation pattern as that of the coffee market. As a result of the takeover of the coffee states in 1974 and also a serious outbreak of coffee berry disease, coffee production in that year fell by 31 per cent; production was only slightly higher in 1977.

The Nationalization in 1974 which made an extensive changeover in economic policy has run into considerable problems, one of which was the excessive growth of money supply, as the National Bank itself pointed out it has not been accompanied by any real production. Between December 1975 and March 1976, total money supply rose from $883 million to $1205.6 million (16.2 per cent); over the 16 months previous to March 1976 it was increasing at 37 per cent a year.

Foreign credits have been successfully obtained but they have also been used up at an alarming rate. These stood at a record as high as $650 million in mid-1975, but between November 1975 and April 1976, they declined at an annual rate of 33 per cent a year. National Bank claims on the

Government has been rising at an even faster rate. In August 1975 the PMAC published its first socialist budget. Internal resources only accounted for $1,016 millions of the total $1,231 million. It might be noted that some 40 per cent of the budget ($362 million) went on defence, public safety and interior.

The balance of trade deficits were $46 million and $202 million for 1974 and 1975 respectively. Production of coffee however recovered in 1976 and Ethiopia was able to take some advantage of the sharply rising coffee world prices, 69,838 tons were exported worth 285 million birr. The estimate for 1976-77 season was at 85,000 tons at an estimated worth of 500 million birr. Export of other commodities like hides and skin, pulses and oil seeds, were down due to falling production and world prices.

Faced with the falling world prices of coffee, the Government encouraged producers to move out of the cash crops into food grains for local consumption. While the population shows a yearly growth of 2.5 per cent, production of major crops has been declining in the past three years. Grain production which was 5.5 million tons in 1975, went down to 5.3 million tons and 4.7 million tons in 1976 and 1977 respectively. It is hoped that the National Economy will grow by 5.9 per cent and 6.8 per cent in 1978 and 1979 respectively as compared to the average annual increase of 2.8 per cent and 0.8 per cent for 1968-75 and 1973-76 respectively.

The economic situation as a whole does not seem to settle down for a while as a result of the radical change in the economic structure; but it could be said that the land reform, the groundwork for future development, has been successful, and despite shortage of trained personnel the industrial takeovers have been successful as well.

General Industrial Situation in Ethiopia

Industrial development in Ethiopia is still at its infancy. There are at present about 138 factories fully or partially owned by the Government. Manufacturing industries contribute slightly over 10 per cent of the urban labour force and contribute about 5 per cent to export earnings. Areas of interest are: the production of textiles and fibres, leather and shoe, food (sugar, meat, vegetable oil, flour tobacco, salt), beverages (beer, liquors, soft drinks), furniture and joinery, building materials (cement and bricks), and metal works. A modest beginning has been made in the field of chemical (soap, paints, pulp and paper, tyre), and engineering industri s.

Following is the comparison of the industrial output for the year 1977 and the anticipated output for 1978:-

Table

Industrial Outputs — Million Birr

Sub-sectors	1977	1978	Increase in million birr	Increase in %
Food	240.2	351.2	111.0	46.2
Beverage	109.5	176.2	66.7	60.9
Tobacco	28.4	36.1	7.7	27.0
Textile	195,1	264.0	68.9	35.3
Leather and shoes	59.7	90.5	30.8	51.5
Wood	13.3	19.3	6.0	45.2
Non-metal mineral products	16.3	23.6	7.3	45.1
Paper and printing	30.3	44.0	13.7	44.9
Chemical	40.1	62.7	21.6	52.6
Metals	54.0	79.9	25.9	47.9
Total	787.9	1,147.6	359.6	45.6

Source: The Ethiopian Herald, 28 January 1979

As can be seen the industries have been mostly oriented towards the production of consumer goods for the domestic market. Negligible attention was paid to the growth generating activities like engineering, chemical and basic industries.

The heavy dependence on foreigners in the ownership and management of industrial enterprises during pre-nationalization period is having its effect on the present day manufacturing industry in that there is a problem of skill manpower shortage. Last year, owing to a shortage of raw materials and unstability in the northern part of Ethiopia, most factories were underutilized. Much attention is now being paid by the Government to promote small-scale and handicraft industries.

Engineering and Allied Metal Products Industries in Ethiopia

In Ethiopia, the engineering and allied metal products industries may be classified under the following categories, namely;

a) Basic iron and steel industries producing mainly construction materials such as reinforcement iron bars, wires, corrugated iron sheets, nails, structure and furniture pipes, and also agricultural implements.

b) Manufacture of handtools, general hardward and cutlery which includes enterprises producing different handtools, aluminium household utensils and spare parts workshop.

c) Manufacture of structural metal products producing different types of structures, furnitures, large drums and tanks.

d) Manufacture of fabricated metal products except machinery and equipments such as crown corks, cans, household utensils, buckets, foundry products and aluminium windows and door frames.

e) Manufacture of electrical and mechanical apparatus like dry cells and batteries.

Cottage and artisan operations still play an important role in Ethiopia. These artisan supply a wide range of simple handicrafts such as agricultural implements, household utensils, spears, knives etc. There is also a large number of blacksmith scattered over the country.

The following industrial establishments are worth mentioning:-

- Kaliti Steel Industry which produces mainly galvanized sheets, structural pipes, rectangular and circular hollow sections, household and office furniture, stretches, water tanks and other metal works on order.

- Ethiopian Iron and Steel Foundry. Produces reinforcement iron bars, round bars, nails, bedspring nets and barbed wires.

- Ethiopian Metal Tools, Produces agricultural implements, household hinges and door bolts.

- East African Aluminium Company which produces aluminium household as well as office doors and windows, staircase railing and enjera ovens.

The iron and steel industry accounts for 5 per cent to 6 per cent of the total value of the output in manufacturing. The share of the value added in this sector is also about 5 per cent to 6 per cent which makes its contribution to the Gross National Product stand at a negligible 0.3 per cent.

Small-scale and Handicraft Industries

In Ethiopia, there is a substantive number of small-scale and handicraft industries such as goldsmithary, tannery, wood-work, basketry, carpet weaving, taxidermy and emeroidery, metal works and grain mills. Most of these small-scale industries operate on a cottage or artisan scale and they form co-operatives under the [illegible] and supervision of the Government. During 1978, Ethiopian Government in close co-operation with a high level mission team provided by the Government of India has identified 90 small scale projects those are feasible for implementation. The identified projects by the Government of India's mission are attached in Annex - II of this report.

It is to be highlighted here that so far HASIDA has promoted training aspects of small scale industries development programme. No programme has so far been formulated by HASIDA of actual expansion and installation of small scale industries which require substantial entrepreneurship promotion, incentives schemes, extension services, installation of co-operative industrial estates, ancillary industries development and expansion of common services facilitities. Handicraft and small scale industries cannot be developed without private and co-operative entrepreneurship promotion which is lacking very much in HASIDA's small scale industries development programme.

Gross Value of production of basic metal and allied industries

Eth.'000

Description	1971/72	1972/73	1973/74	1974/75
Iron and steel basic industries	[illegible],797	34,447	35,819	34,4784
Machinery and equipment	3,420		2,777	3,840
Manufacture of cutlery hand tools and general hardware	2,261		1,427	2,168
Manufacture of structural metal products	1,159		1,350	1,672
Manufacture of fabricated metal products except machinery and equipment	6,510	9,933	10,746	7,456
Manufacture of electrical machinery, apparatus, appliances and supplies	261	952	322	432

Statistics of selected metal products 1970-1975

Description	1970/71	1971/72	1972/73	1973/74	1974/75
Round Iron bars (tons)	14,413	6,581	11,865	9,479	6,233
Wires (tons)	674	1,147	977	409	233
Nails (tons)	4,383	3,448	2,833	2,353	1,661
Corrugated Iron Sheets (tons)	19,941	13,251	12,852	10,534	12,039

Source: Statistical Abstract of Ethiopia 1975, 1976.

Gross Domestic Fixed Capital Formation of the Manufacturing Sector

Million Birr

Description	1970/71		1971/72		1972/73		1973/74		1974/75	
	All industries	Manufacturing	All industries	Manufacturing	All industries	Manufacturing	All industries	Manufacturing	All industries	Manufacturing
Land, building and works	270.0	47.9	289.3	48.7	279.6	26.8	279.8	6.2	270.0	4.6
Machinery and equipment	181.1	47.1	208.5	46.4	182.3	50.1	160.1	35.9	197.6	46.0

Source: Ethiopia Statistical Abstracts 1975, 1976

Number of establishments and total employment by industrial branches

	1970/71		1971/72		1972/73		1973/74		1974/75	
	No. of establishment	No. of employees	No. of establishment	No. of employees	No. of establishment	No. of employees	No. of establishment	No. of employees	No. of establishment	No. of employees
Food	94	8,865	100	9,045	102	9,722	105	11,614	106	13,449
Beverage	32	2,910	32	2,961	32	2,884	32	2,905	32	3,068
Tobacco	2	542	2	581	2	603	2	479	2	689
Textile	51	22,342	54	23,548	54	23,926	62	23,484	62	23,795
Leather & shoes	19	2,177	17	2,154	18	2,609	18	2,748	17	2,900
Wood	75	4,090	81	4,090	77	3,994	78	4,258	80	4,441
Non-metallic miner	43	3,866	46	3,994	47	4,050	46	4,069	46	3,953
Printing	21	1,548	22	1,546	22	1,525	21	1,500	21	1,500
Chemical	35	3,126	36	3,275	37	3,550	42	4,289	40	4,400
Steel, Metal and electrical	29	2,194	30	2,125	30	1,955	30	1,973	29	1,809

Source: Ethiopia statistical Abstracts 1975, 1976.

Import statistics of raw materials for basic metal and engineering industries

Ethiopian Birr

Description	1972		1973		1974		1975	
	Tons	'000	Tons	'000	Tons	'000	Tons	'000
Iron & steel scrap	1,610	232	3,982	458	951	237	493	72
Non-Ferrous metal scrap	3.2	0.9	81.8	13.9	2.4	17.5	0.5	0.1
Pig iron, spiegeleisen, sponge iron and steel, Powders and shot and Ferro-alloys	24.5	14.3	40.0	37.8	-	0.3	61.1	48.6
Ingots and slabs of iron or steel	619	482	3,309	1,540	5,821	2,727	2,337	1,571
Copper and brass	47.6	130.2	32.0	151.8	105.0	427.7	136.7	620.2

CHAPTER IV

PRESENT STATUS OF THE BASIC METAL AND ENGINEERING INDUSTRIES IN ETHIOPIA

In order to assess the present status of the industrial sector in Ethiopia, it is important first to consider the industrial characteristics in the country prior to the revolution in 1974 and the effects inherited from these characteristics.

A brief review of pre-revolution industrial situations in Ethiopia

Before the revolution in 1974, Ethiopian industries were predominantly characterized by a strong orientation towards the production of consumer goods and heavy dependence on foreign ownership and management. The effects of each of these characteristics can be summarised as follow:

Effects of consumer goods orientation

1. Neglect of Growth Activities

The concentration on the production of consumer goods in the past to satisfy the local market demand had the effect that little attention was given to the growth of activities with high forward and backward linkages like the establishment of basic metal, engineering and chemical industries. The existance of these industries might not only have triggered off the energency of other new activities, but might also have increased the efficiency of existing industries; for example agricultural development was hampered by the non-existence of industries producing proper agricultural implements, and productions in factories were often halted because of lack of spare parts which could have been produced locally.

2. Limiting Growth of Investment

The consumer goods orientation further meant that the establishment of new capacity (investment) was limited by the growth of domestic demand which in turn was limited by the highly skewed distribution of income and wealth which characterized the past social order. The result was a vicious circle of near stagnation and social inequity.

3. Neglect of Export

Minimum effort was exerted to manufacturing for export as a result of over-emphasis on the production of consumer goods, in spite of the fragile dependence of the economy on foreign exchange earnings of only a few commodities. When it is realised that the share of the manufacturing sector export is only to the time of 5% and that contribution of a single commodity

(coffee) exceeds 60%, the need for diversifying the one-crop economy becomes very obvious. Manufacturing was oriented towards the domestic market with high tariff protection and fiscal incentives.

Effects of Foreign Domination

The pre-revolution industrial system in Ethiopia was also characterized by the heavy dependence on foreigners in the ownership and management of industrial enterprises.

Foreigners have exploited the industrial situation where industrial policies and measures were non-existent to control their participation in the ownership and management in industries. The effect was that for 1969/70, 43% of the paid-up capital in the manufacturing sector representing claims on ownership of equity was held by foreighters 12/. Worse still, foreign ownership was even more dominant in those industrial activities which are among the more dynamic and technology - intensive. Where levels of foreign ownership did not prevail, control was secured through contractual arrangements (such as management contracts) which gave foreigners extensive powers in key areas. The substantial and regular recruitment of expatriates excluded the Ethiopians from acquiring industrial skills, although those expatriates holding key positions had only secondary or vocational education and their industrial skill were essentially acquired through on-the-job training.

The regular and sometimes fraudulent repatriation of foreign exchange had a detrimental effect on the national economy. The UNTAD study mentioned earlier estimated that for 1969/70 alone, about one third of the export earnings have been expatriated outside Ethiopia.

Another fact of the Ethiopian industries prior to the revolution was that small scale industries were neglected although they are generally more labour intensive and generate more jobs per unit of invested capital, in addition to the advantageous employment of indigenous available skill.

Industrial situation in Ethiopia after the 1974 Revolution

The situation changed dramatically after the revolution with the Land Reform Proclamation of 1975 which raised the income of peasants by allowing them to own their produce without sharing it with Landlords. The impact was that demand for traditional consumer goods, such as edible oil, sugar, leverages, textiles and footwear increased to such an extent unable to be satisfied by the local manufacturing industries.

Subsequent to the land reforms, all banks, insurance companies and large number of manufacturing enterprises were nationalized. At present the State owns over 130 industrial enterprises, accounting for over 90% of the country's manufacturing output.

12/ An UNCTAD Report on Major Issues in Transfer of Technology to Developing Countries: A case study of Ethiopia.

But the socialisation process encountered great difficulties in terms of lack of industrial skill, manpower and machinery spare parts. Nevertheless, the nationalisation measures have provided the framework for the development of a free and self-reliant national economy.

The Development Plan

As the country Development Plan was not made available to the mission team when this report was being prepared the following paragraphs reflect only views of government officials during the field mission.

The National Revolutionary Economic and Cultural Campaign - 1979/80

In order to overcome the difficulties in the economic field as a result of the damaging effects outlined in the foregoing paragraphs, the Government of Socialist Ethiopia has launched a two-year medium term economic campaign to accelerate economic rehabilitation.

It is envisaged in the above campaign to give top priority to agricultural development. Industrial development ranks second and Trade third in order of priority. The primary objective of the Economic and Cultural Campaign is to effectively utilize the existing limited resources of the country to obtain optimum results.

As far as industry is concerned, the main objectives of the Campaign are to remedy the inherited weaknesses of the sector and to lay the foundations for the development of a self-reliant economy.

The general objectives cover the following activities:

- To increase industrial output that contributes towards the development of agriculture and to strengthen industries which are dependent on domestic raw materials. This implies increasing output of such items like agricultural implements, building materials, packaging materials etc. It also means increasing output in the food processing and textile sub-sectors for which the agricultural sector is the main raw material supplier.

- To increase the output of goods which meet the basic needs of the broad masses, in particular those that ease the strain on the balance of payments. This would also mean increasing the output and local content of such items like leather and canned food.

- To increase the output and promote the development of small scale industries, especially those producing items in short supply. This would involve encouraging the production and marketing activities of such enterprises. It would also involve strengthening the number, location, activity and capacity of existing small scale industries for subsequent use in elaborating detailed development strategy.

- To lay the foundation for future long-term development with emphasis on the elaboration of a detailed strategy indicating future development priorities, manpower requirement and expansion of project development capacity.

The aim of the medium-term plan is to increase the national economy by 5.9% and 6.8% for the year 1978 and 1979 respectively, as compared to the average annual increase of 2.8% and 0.8% registered during the period of 1968-75 and 1973-76 13/ respectively. The share of the industry in the gross national output is expected to reach the 37% mark during the Campaign 14/.

Strategy of the Manufacturing and Processing Sub-sector

Increased production in these sub-sectors will be promoted by:-

- the rehabilitation or replacement of old plants;
- re-activating idle or underutilized factories (especially in the northern part of the country);
- implementation of additional workshifts;
- improving maintenance and repair practices;
- relieving manpower and technical constraints;
- improving the process of industrial project implementation;
- ensuring a regular supply of raw materials and other inputs.

Institutional Structure

The present instituional machinery in Ethiopia can be briefly summerised as stated below:

The Central Planning Supreme Council (CPSC)

The Central Planning Supreme Council together with Ministry of Industry have the direct responsibilities for the industrial development in Ethiopia.

The main functions of CPSC are:

- to prepare short and long term development plan and to follow up implementation programmes;
- to determine the overall size of investment and to decide on priorities for sectoral allocation;

13/ Source: Ethiopian Herald dated 19.1.79

14/ Source: Same as 13/

- to approve proposals for new projects.
- to determine policies for production, trade, finance and credit facilities;
- to approve proposals for new projects.

The Ministry of Industry

The Ministry of Industry is the government institution most directly concerned with the industrial activities in Ethiopia. The Ministry attempts to implement its responsibilities and programmes by formulating industrial policy which suitable for equitable and accelerated development in Ethiopia. It also directly supervise the activities of public sector industries as well as those establishments in which the government has majority shares.

Under Ministry of Industry there are three important institutions e.g.

- National Productivity Centre (NPC)
- Handicrafts and Small Scale Industries Development Agency(HASIDA)
- 14 Corporation according to industrial sub-sectors e.g. Printing Corporation, National Textile Corporations, National Metal Works Corporations etc.

The Ministry of Industry has the following departments:

- Project Policy and Planning Department;
- Industries Department;
- Management Department; and
- Finance Department.

The main functions of the Ministry of Industry are:

- initiate the country's industrial policy, and determine industrial priorities and strategies;
- initiate, study and implement industrial projects;
- negotiate and conclude agreements necessary for the undertaking of feasibility studies of projects and the implementation of such projects;
- undertake the expansion of the industrial sector and determine for each project the manner in which local and foreign capital and technology can be jointly utilized;
- determine, for each project, the appropriate technology most suited to the country's economic and social re-quirements;
- establish, manage, expand and supervise the public industrial enterprise except insofar as specific power thereof has been legally delegated to another Government office;

- safeguard the interests of the Government in industrial enterprises of which the Governement is the major shareholder;
- in co-operation with the appropriate Government offices, make the necessary contacts with international and regional organizations and friendly countries in the field of industrial development;
- register, license and regulate all private industrial and handicraft enterprises, except in sofar as specific power thereof has been legally delegated to another Government offices;
- in co-operation with the appropriate Government offices, encourage and promote the organization, growth and expansion of private small-scale industries and handicraft enterprises, except in sofaras specific power thereof has been legally delegated to another Government office;
- conduct research and experimental development at all levels to enhance industry, technology and industrial productivity; equipment and techniques and ensure that fruitful results thereof are put to use.

The Present Structure of Industry

The development of manufacturing industries in Ethiopia is very much at its infancy with its contribution to gross domestic product limited to slightly over 1 per cent, employing less than 10 per cent of the urban labour force and contributing about 5 per cent to export earnings. Areas of concentration have been the production of textiles and fibreas, leather and shoe, food (sugar,meat, vegetable oil, flour tobacco, salt), beverages (beer, liquers, soft drinks), furniture and joinery, building materials (cement and bricks), and metal and engineering products. There are also modest beginning in the chemical (soap, paints, pulp and paper, tyre), and engineering industries.

The annual production capapcity of the more important branches manufacturing in the public sector given below assist in providing an indicative perspective of the size of these activities during 1977/78:

Metal Products	-	27,402 tons
Textiles	-	23,000 tons yarn 85 million m. square fabrics
Sugar	-	140,000 tons sugar
Leather & Shoe	-	15.2 million sq.ft upper leather 1.5 million pairs shoes
Bldg. Materials	-	100,000 tons cement 11 million pcs bricks
Beverages	-	635,000 hecto litres beer 567,000 hecto litres soft drinks.

Some Industrial Characteristics

Established industries have been characterized by a strong orientation towards the production of consumer goods for the domestic market on the one hand and a heavy dependence on foreign wownership and management on the other.

Pre-occupation with consumer goods production meant that negligible attention was paid to growth generating activities like engineering, chemical and basic industries; it also contributed to insignificant effort being exerted to process goods for export and thereby reducing the country's dependence on the foreign exhcange earnings of a handful of commodities. The consumer goods orientation further meant that the establishment of new capacity (investment) was limited by the growth of domestic demand which in trun was limited by the highly skewed distribution of income and wealth w which characterized the now defunct social order. The result was a vicious circle of nearstagnation and social inequity.

The second major characteristic of the industrial system was the heavy dependence on foreigners in the ownership and management of industrial enterprises. This menat, firstly, that a substantial part of the surplus generated by industry had to be repatriated outside the country. (A study by UNCTAD estimates such repatriations for 1969/70 to have totalled Birr 10[illegible] million - a third of the country's export earnings!) Dependence on foreigners also resulted in the deliberate exclusion of Ethiopians from acquiring industrial skills and decision making powers.

The Socialization Process

The role of the state in manufacturing has increased dramatically following the nationalization of medium and large scale enterprises in February, 1975. There are at present just over 130 industrial enterprises, accounting for over 90 per cent of the country's manufacturing output, under state ownership.

The socialization measures would have the following beneficial effects:

- Surplus generated by the enterprises would be employed to maximize the interests of the nation at large rather than those of foreigners and their local counterparts.
- Dependence on foreigners would be reduced by placing Ethiopians in all phases of management.
- Workers' participation in the operation of the enterprises would be easier to realize.
- Information flow between the enterprises and the state would be facilitated thus easing implementation of policy decisions required for industrial development.

Still, the socializationprocess was not without its difficulties. The following are cited as examples.

- Machinery condition in many of the factories was very poor partly because the former owners had installed used machinery and in some cased out dated ones.

Operating manuals did not exist and such basic information like origin and life of machinery were not available. This created problems in ordering spare parts which was further compounded by the reluctance of some suppliers to sell spares on realization that Ethiopia opted for the socialist path.

- Foreign technicians associated with former owners left the country. This created a "skill gap" which forced the operation of factories with inadequate number of qualified personnel.
- Heavy debts to local commercial banks characterized the financial structure of many enterprises. The resulting high interest burden contributed to the financial weakness of the enterprises.

Ministry of Mines, Power and Water Resources

This Ministry is responsible for the development of mining, power and water resources in Ethiopia. The Ministry has the following important sections e.g.

- Mining Department;
- Geological Survey;
- Surveying Section;
- Geothermal Project Sections;
- Mineral Exploration and Mining Development Section.

Ministry of Transport and Communication

This Ministry is responsible to administer the following activities.e.g.

- Planning and Programming Department;
- Ethiopian Postal Services;
- Ethiopian Air Lines;
- Ethiopian Shipping Lines;
- Civil Aviation Authority;
- Railway Administration;
- Road Transport Administration;
- Sea Transport Administration;
- Ethiopian Telectommunications Services.

Ministry of Education

The Ministry of Education conducts its activities through:

- Department of Formal Education;
- Division of School Operation;
- Addis Ababa University.

The activities are co-ordinated through:

- Programme Divison;
- Community Schools Programmes;
- Physical Education and Sport;
- Department of Non-Governement Schools;
- Teachers' Education Department;
- Work Oriented Adult Eduction.

Ministry of Labour and Social Affairs

This Ministry has the important responsibility to develop manpower and employment in Ethiopia. The main activities are co-ordinated through:

- Employment and Manpower Studies Divison;
- Manpower Studies and Statistics Section;
- Employment Section;
- Foreigners Employment Section;
- Department of Labour and Employment;
- Rehabilitation Section;
- Ethiopian Mapping Agency.

Ministry of Agriculture and Settelements

The activities of this Ministry are co-ordinated through:

- Agricultural Marketing Corporation;
- Agricultural Research Institutes;
- Coffee and Tea Development and Marketing Authority;
- Horticultural Development Agency;
- Livestock and Meat Board;
- River Valley Development Authority;
- State Forest Development Agency.

Ministry of Finance

The main activities of the Ministry of Finance are carried out through the following machinery:

- Customs and Excise Administration ;
- Inland Revenue Administration;
- National Lotory Administration;
- Property Purchasing and Distribution Organization.

Other Ministries

Ministry of Commerce and Tourism
Ministry of Culture,Sports and Youth
Ministry of Defence
Ministry of Foreign Affairs

Ministry of Health
Ministry of Information and National Guidence
Ministry of Interior
Ministry of Urban and Housing

Parastatal Organizations

There are 14 Corporations in Ethiopia dealing with each sub-sector of industry. The Corporations related to the Basic Metal and Engineering Industries are the following:

National Metal Works Corporation

At present there are 8 factories owned by this corporation. These metal working factories produces wide range of iron bars, wire, nails, steel structure, corrugated iron sheets, G.I. pipes, metal tools and agricultural hand tools etc. This Corporation is under Ministry of Industry.

Ethiopian Wood Works Corporation

There are 8 companies under this Corporation manufacturing builders wood products and furnitures.

Handicraft and Small Scale Industries Development Agency (HASIDA)

This agency on behalf of the Government promotes, developes and controls handicrafts and small scale industries in Ethiopia. The Agency is under the Ministry of Industry. The main functions of this parastatal organization are:

- to identify small scale projects and prepare the prefeasibility studies for small entrepreneurs;
- to promote industrial activities through the supply of inputs, machinery and technology;
- to promote co-operative action;
- to provide design and technical assistance and organising training programmes.

So far 93 small scale industries projects are identified by HASIDA and AID Bank in co-operation with India Government's mission in 1973.

National Productivity Centre

Themmain function of this organization is to promote industrial training, management consultancy and research section for manpower survey.

The following are the major NPC activities:

- Industrial Training includes management and voccational training.
  (a) Management Training includes general management, production, accounting, personnel, marketing and distribution training particularly for the state owned industries;
  (b) Vocational Training includes training in automechanic; metalworking welding; plumbing and sheetmetal; electrician; building; woodwork; leather.

There are 7 workshops for vocational training and particularly geared to train the personnel from the various state owned corporation. The training period for each discipline is one year duration.

- Consultancy and Advisory Services of the Centre includes ad-hoc management consultency services to nationalized industries particularly in the manufacturing sector.
- Research Section of the Centre is devoted to the survey of manpower requirement for the industries in Ethiopia. The 1976 survey indicates the demand for manpower in industrial sector exceeds 3000 persons. In line with this NPC organized through their inplant training unit courses to train officers, operatives etc. 300 persons 1976 for existing factories of state owned industries. The present workshop capacity is only cater for 300 persons in existing industries for inplant training programme.

- Proposed Appropriate Technology Section under NPC During 1976 UNTACD mission suggested to create a Transfer of Technology Section under NPC. It is expected that there will be a joint UNTACD/UNIDO mission to finalize the recommendation to the Government wheather to install this section under NPC or under the Central Planning Supreme Council(CPSC).

Financial Institution

The following are the financial institutions in Ethiopia.

National Bank of Ethiopia

The National Bank of Ethiopia is the controling and regulating centre for all financial transactions in Ethiopia. It is a nationalized bank under Ministry of Finance and has the following division:

- Management Office;
- Administration Division;
- Control Division.

It issues legal tender notes and coins and control and preserve all foreign exchange reserves for national economic development.

The Commercial Bank of Ethiopia and Addis Bank

There are state owned commercial bank and carry out all commercial transaction within the rules and regulations laid down by the National Bank they have many beranches throughout the country.

Agricultural and Industrial Development Bank (AID Bank)

This is a state owned bank under National Bank and generally assists all the industrial development activities relating to agricultural and industrial sectors. The bank has the following departments e.g.

- Agricultural Department;
- Industrial Department;
- Finance and Banking Department;
- Legal Department;
- Administration Department.

The main functions of the AID Bank are:

- to assist in identification of industrial projects;
- to assist in financing industrial projects for detailed evaluation;
- to extend fund for viable public sector industrial projects;
- to assist small scale projects under HASIDA for project evaluation and appraisal (for private individuals).

The AID Bank has 8 branches and employes about 230 persons out of which 50% are professionals. The Bank's present interest rate is 9½% same as commercial banks in Ethiopia.

The AID Bank has recently negotiated US$ 6 million from World Bank for Small Scale Industries and US$ 50 million for large and medium size projects. The Bank has identified 98 projects for small scale industries with HASIDA (the list is shown in Annex II). The Bank is expected to provide Ethiopian Birr 98 million for the projects to be implemented by Ministry of Industry of which 55% will be in foreign exchange component.

Technical Institutions

The following are the technical institutions available in Ethiopia.

(a) Technical Schools: In Addis Baba, Asmara, Mulugeta Buli.

(b) Polytechnique : In Bahrdar.

(c) University: In Addis Ababa (Faculty of Engineering and Technology for degree and diploma including technical teachers' course).

(d) Training Workshops (under National Productivity Centre): 7 Workshops for training in Automechanic, metal working, welding/plumbing/sheet metal work, electricians, building, wood work and leather.

(e) Education Material Production and Distribution Centre: Under Ministry of Education.

(f) Agricultural Research Institutes: Under Ministry of Agriculture

Industrial Establishments

The Present Industrial Organizations

There are at present 14 state manufacturing corporations whose activities are controlled and co-ordinated by the Ministry of Industry. A tabular summary of some activities of these corporations are shown below:

Corporations under Ministry of Industry

	Name of Corporation	No.of Plants	No. of Permanent emp.	Major products
1.	Ethiopian Food Corporation	19	3288	flour,oil, macaroni,spagetti, bread and biscuit,fafa(soap)
2.	Ethiopian Beverage Corporation	10	4403	beer,liquors,wine,soft drinks, mineral water,alcohol,gas(Co_2) and glass bottles.
3.	National Textiles Corporation	15	28179	Cotton fabrics,nylon fabrics, cotton yarn, blankets,hosieries
4.	Ethiopian Printing Corporation	9	1435	printed matters, newspaper books
5.	National Metal Works Corporation	8	1491	iron bars, wires,nails,G.I. pipes steel structures, corrugated iron sheets & other metal tools and agricultural hand tools.
6.	National Fibre Corporation	3	3199	gunny bags, ropes.

	Name of Corporation	No.of Plants	No. of Permanent emp.	Major products
7.	National Leather & Shoe Corporation	13	4305	Leather shoe, leather upper, leather sole.
8.	Ethiopian Salt Corporation	2	410	salt.
9.	Ethiopian Building Material Corporation	12	2109	cement, cement blocks & tubes, cement floar tiles, bricks.
10.	National Soap Corporation	4	212	soap
11.	Tobacco & Matches Corporation	3	857	cigarettes, cigars, matches
12.	Ethiopian Meat Corporation	8	1857 2505 (a)	Zighini wott, vegetable soup, Shiro wott, boiled beef.
13.	Ethiopian sugar Corporation	2	7240 4216 (a)	sugar
14.	Ethiopian Wood Works Corporation	8	1143	builders wood works, furniture.
	Total	124	60128	

Notes: (a) Seasonal Workers.

The Ministry also supervises the operations of nine enterprises in which the state is a major owner. Additionally, the Ministry, also has responsibilities in overseeing the activities of the Handicrafts and Small Scale Development Agency and the National Productivity Centre (Catering for the training needs of the industrial sector).

Future Industrial Policy

Future industrial policy would aim at improving firstly, the efficiency of the human and physical capital resources operating in the existing enterprises. Secondly, it would aim at rectifying past deficiencies by developing new skills and plant capacities required to develop an expanding and independent economy. This would involve increasing existing production capacity to meet the demand for such requirements like food and textiles; it would also require laying down the groundwork for the development of growth generating "high linkage" activities such as the chemical, engineering and metal working industries.

Human and financial resources available within the country are not likely to be sufficient to meet these policy objectives adequately. Substantial external participation in assisting the fulfillment of these objectives may, therefore, be inevitable.

Industrial Establishments in Basic Metal and Engineering Industries Industries in Ethiopia

(a) Foundry and Steel Industry

1. Small foundries : Six number in Addis Ababa
Four number in Asmara.

2. Ethiopian Iron and Steel Company (EISCO) at Akaki

Type - State owned under National Metal Works Corporation

Products - Melting of iron scrap in ingots
- Deformed iron bars
- Round iron
- Iron nails
- Bed spring net
- Fencing net
- Barbed wire
- Black wire

Plant Capacity:

Rated Capacity (Capacity Utilization)

Theoretical

Finished goods	No. of shifts	Manifacturing department	Rated capacity
1. Bars 8-32m/m	11 hours	Rolling Mill	7185 tons
2. Nails	2 shifts	Nails	6448 "
3. Bedspring net	2 "	Bedspring	289 "
4. Fencing net	2 "	Bedspring	120 "
5. Barbed wire	2 "	Bedspring	265 "
6. Distempered wire	Intermittent	Distempering	Intermittent
Work-in-progress			
7. m/m coils (round iron)	11 hours	Rolling Miss	4149 tons
8. Ingots	2 shifts	Melting furnace	6300 "
9. Drawn coils	3 "	Draw bench	6411 "
10. Galvanized drawn wire	2 "	Draw bench	305 "

Production (in tons)

Products	1975/76	1976/77	1977/78
Deformed Iron Bars	6,179.97	2,974.57	3,406.31
Round Iron		4,581.43	3,580.59
Iron Nails	2,212.52	2,443.95	2,705.00
Bedspring Net	121.12	90.79	125.08
Fencing Net	23.41	34.83	40.41
Barbed Wire	0.67	0.43	23.80
Black Wire		140.10	128.23

Raw Materials

Imported from Abroad	1977/78 (Actual Purchase)	Unit Price
1. Manganese	91 Tons	991.24Birr/ton
2. Ferrosilicon	21 "	2,200.00Birr/ton
3. Billets	4,350 "	630.00Birr/ton
4. 5.5 m/m dia.coils(Wire rod)	500 "	840.00Birr/ton
5. 2.2 m/m dia. galvanized wire	260 "	1,010.00Birr/ton
6. 0.75 m/m dia. galvanized wire		

Local Scrap Requirement

The rate of [illegible] should be 7000 tons (1978), 10,500 tons (1979) and 13,650 tons (1980).

Manpower	1977	1978
	424	295

Wages

Total wages paid during 76/77 - Eth. Birr 033,121.54.

Machinery and Equipment

Production Section

Machines	Capacity	Quantity
1. Rolling Mill	(35) (45) ton/8 hours	1 unit
2. Arc furnace	20 ton/16 hours	1 "
3. Wire Drawbench	18 ton/24 hours	1 "
4. Draw bench wet system	1.2 ton/24 hours	1 "
5. Nail making machine	12 ton/shift of 11 hours	20 "
6. Bedspring making machines	20 rolls/16 hours	20 "
7. Fencing wire making machine	10 rools/16 hours	2 "
8. Wire annealing furnace	3 ton/8 hours	1 "
9. Barbed wire making	1.4 ton/20 hours	1 "

Work Shop

1. Lathe machines 2 unit 1 big & medium size
2. Boring and milling machine 1 unit
3. Rolling mill rolls lathe machine 1 unit
4. Surface grinder 1 unit
5. Hydraulic press capacity 100 ton 1 unit.

Turnover - 1976/77	1977/78
9.8 million Birr	9.9 million Birr

Expansion Programme - The company wants to increase the production from 10,500 tons year to 13,670 tons year 1980. Long term expansion project is carried out by National Metal Works Corporation.

Constraints - Main constraints is the lack of scrap iron in Ethiopia, very little scrap is available in Addis Ababa. The Company is procuring scrap from Diredawa, Harrare and Asabe etc. The existing collected quantities can carter for 1 year only. A serious study is required for the production of iron and steel from local ores.

- Lack of laboratory facilities for steel testing
- Lack skilled manpower
- There is urgent need for training programme.

3. Magotti Feriera (Asmara)

Informations not available.

4. SABEAN Metal Products (Akaki metal products)

Type - State owned under National Metal Works Corporation.

Products - (a) Galvanized corrugated steel sheets from imported flats USG 30,35, 32, 30, 28, 26, 24.

(b) -Galvanized steel water pipes from $\frac{3}{8}$" to 3" diameter.

-Square and rectangular steel pipes;
-Black and round steel pipes; (the pipe plant is closed without any production).

Plant Capacity - (a) Galvanized sheets 15000 tons/year

(b) G.I. pipe - 12000 tons/year (no production at present).

Production

Galvanized Corrugated Sheets

1974/75	-	12,770 tons
1975/76	-	9,555 tons
1976/77	-	10,335 tons
1977/78	-	14,063 tons
1978/79	-	15,750 tons (planned)

Raw Materials (a) Cold rolled steel sheets

Requirement = 900 kgs per 1000 kgs. of finished product.

Year	Quantity purchased	Average price
1977/78	13,003 tons	Birr 1,018.00 per ton
1978/79 (planned)	9,600 tons	Birr 1,250.00 per ton

(b) Galvanizing materials

Requirement per 1000 kgs of finished product price 1978/79

Zinc Ingots	-	100 kgs.	Birr 2,490.00/ton
Lead Ingots	-	1.7 kgs.	Birr 2,[illegible]75.00/ton
Ammonia Chloride	-	7 Kgs.	Birr 813.00/ton
Hydrochloric Acid	-	5 kgs	Birr 1,201.00/ton
Chronic Acid	-	.93 kg	Birr 2,507.00/ton
Antimony	-	.30 kg	Birr 5,926.00/ton
Sulphur Sul	-	.20 kg	Birr

Manpower - (for corrugated sheet plant)

Management	-	6
Skilled	-	17
Semiskilled	-	79
Unskilled	-	-
Total (1979)		102 (figures were given by the factory)

The report of National Metal Works Corporation during 1977/78 fiscal year indicates the following employment figure:

January 1977	June 1978
162	157

Wages - 1977/78 - Eth. Birr 436,993.00

Machinery & Equipment - Detailed list not received

Turnover -

1977	1978
Eth.Birr	Eth. Birr
16.3 million	24.[illegible] million

Expansion programme

(a) In view of increasing demand, the pipe production plant of the factory can be restarted.

(b) The production in this plant can be started with 6000 tons/year.

(c) The plant can be merged with KALITI Steel Indusry which has no galvanizing facility at present.

(d) A feasibility study report has already been prepared by National Metal Works Corporation 4 February 1977 for integratdd plant of pipe production.

Constraints - - Lack of highly skilled engineer to start the pipe factory;

- Lack of foreign exchange to purchase essential raw materials;
- Lack of long range training programme to up grade existing skill;
- Lack of quality control engineer.

Observation - The company's pipeplant has been installed 1971 and at present the plant is not in operation. It is suggested to start this plant with planned initial production of 4000/5000 tons year. The National Metal Works Corporation report indicates that it is feasible to revitalize this plant which is of national importance.

5. Kality Steel Industry

Type - State owned under National Metal Works Corporation

Products -

I. Main Product from black sheet
   a. Structural Pipe
   b. Flat sheet
   c. Angle iron

II. Main product from galvanized sheet
   a. Window & door profile
   b. Flat sheet
   c. Ribbed sheet BGA500

III. Main product from aluminium
   a. Plane sheet
   b. Other shapes

IV. Subsidary products from black sheet
   a. Structural unit
   b. Furniture unit
   c. Ribbed or pressed sheet
   d. Channel or flat

V. Subsidary products from galvanized sheet
   a. Window and door frame
   b. Furniture unit
   c. Other shapes.

Plant Capacity -

Machinery	Annual Capacity Per shift in tons
- OIE pipe making machine	2,772.0 tons
- Secco door & window frame machine	1,020.6 "
- Roof sheet making machine	793.8 "
- Press machines (2)	436.3 "

Production

Type of product	July 75-June 76 Kgs	July 76-June 77 Kgs	July 77-June 78 Kgs	July 78-Dec.78 Kgs	July 78-Dec.78 PCS
I. Main Product					
Black Sheet					
a. Structrual Pipe	1,075,291	627,655	286,421	504,271	25915
b. Flat sheet	338,034	416,392	963,550	690,197	-
c. Angle iron	56,410	139,375	107,022	95,777	10112
Galvanized sheet					
a. Window & door profile	130,219	165,548	196,647	153,172	23041
b. Flat sheet	215,061	303,002	234,204	1,556	480
c. Ribbed sheet DGA500	-	-	105,992	205,453	-
Aluminium					
a. Plane sheet	-	11,397	18,712	33,076	-
b. Other shape	-	177	157	2,200	240
II. Subsidary product					
Black Sheet					
a. Structrual unit	-	-	221,802	240,094	4293
b. Furniture unit	-	-	66,002	58,424	7413
c. Ribbed or pressed sheet	249	44,867	43,293	5,760	-
d. Channel or flat	-	-	42,777	38,604	-
Galvanized sheet					
a. Window & door frame	-	-	56,001		
b. Furniture unit	-	-	4,496	64,442	2496
c. Ribbed or pressed	117	87,991	82,508	8,423	1343
d. Other shape	-	-	36,594	54,528	-
TOTAL	1,777,991	1,857,490	3,006,876	2,412,772	75333

Raw Materials

Imported Raw materials

F.Y. 1977/78

Item	Description	Kgs	PCS	Value (Eth.Birr)
1	Black steel coil	1,653,130	-	2,006,991,50
2.	Galvanized coil	622,749	-	1,018,426.63
3	Imported material for pearls	-	[illegible]	297,677.35
4	Spare parts	-	119,603	26,961.00
	TOTAL	2,275,879	195,420	3,350,070.98

Manpower

Manpower in January 1979

1.	Unskilled	- 52
2.	Semi-skilled	- 89
3.	Higher level skilled	- 48
4.	Higher level technical	- 5
	Total	194

January 1977	June 1978	March 1979
121	153	194

Wages -- Average wages 188.43 Birr/person

Machinery and Equipment

Item	Description	Capacity	Size	Quantity in pcs
1	Press machine	7.92 kg/meter	270x150cm.	1
2	Press machine	7.92 kg/meter	420x150cm	1
3	Sheet rolling machine	-	500x200cm	1
4	Shearing machine	2567 kg/hr	700x500cm	1
5	Slitting machine	20700 kg/hr	450x500cm	1
6	Corrugating machine	-	210x90cm	1
7	Pipe producing machine	2432 kg/hr	3750x300cm	1
8	Profile producing machine	538 kg/hr	205x200cm	1

Turnover:	1973/74	1974/75	1975/76	1976/77
Production(Tons)	2,557.4	2,177.8	1,693.9	1,741.7
Sales (Tons)	1,524.7	1,702.0	1,534.5	2,076.1
Sales Eth.Birr	2,82k,794	2,729,193	2,593,903	4,252,951

Expansion Programme - The company should integrate its production of pipes with SABEAN Metal Products. A complete feasibility study of expansion programme by National Metal Works Corporation December 1977 has been prepared and implementation has already been started. Total investment proposed for expansion Eth. Birr. 1,059.000 (1977).

Constraints: -
- Lack of market in construction industry which is the major outlet for the products of Kaliti Steel;
- Bank debts amounting 2.5 million Birr to the Commercial Banks (1977)
- Lack of appropriate costing and pricing system;
- Lack of quality control engineer;
- Lack of electroplating and galvanizing plant.

6. Ethiopian Metal Tools Factory

Type - State owned under National Metal Works Corporation

Product - Axes, hammers, pick axes shovels, hings, doorbolts, spades, crow bars, proughs, sickles, special machette, stone chiesels, screw drivers, round bar.

Capacity - The present rate capacity of production is about 500 tons of products per year.

Production -

1976	1977	1978
403.5 tons	510.9 tons	466.2 tons

Raw materials - Import of raw materials

Steel bars	-	US$ 450 per ton
Sheets	-	US$ 450 " "
Strips	-	US$ 450 " "

Manpower -

Management	-	6
Skilled	-	35
Semi-skilled	-	74
Total		115(1979)

January 1977	June 1978	March 1979
132	131	115

Turnover - Eth. Birr 2 million in 1977/78

Expansion Programme - (a) Expansion project on hand to increase the sickle production from 100,000 to 200,000 units.

(b) Stud manufacturing project.

(c) Rivette manufacturing project.

Constraints - - Lack of metallurgical and design engineer - 2 number
- Lack of general mechanic (maintenance) - 2 number
- Lack of tool room fitter - 1 number
- Lack of heat treatment engineer - 1 number
- Lack of spare parts (the company is facing acute problem)
- Lack of product development and design facilities.

7. Kolfe Household Utensils

Type - State owned under National Metal Works Corporation

Product - Aluminium kettles, cooking pans, wash basins etc.

Capacity - Not known

Production - 1977/78 43.[illegible] tons of Alunimium kitchen utensils

Raw Materials - Aluminium circles and sheets imported from abroad.

Manpower - 74 (June 1978)

Wages - Not known

Machinery and Equipment - Not known

Turnover - Eth. Birr 0.9 million 1977/78

8. United Abilities Company

Type - State owned under National Metal Works Corporation

Product - (a) Dry cell primary batter casing R-20,R-14,R-6
(b) Umberella etc.

Capacity - (a) Battery - 720,000 pieces/shift
(b) Umbrella - 30 million pieces/year

Machinery and Equipment

No.	Description	Department
1	Guillotine Shears	Forging
2	Universal Shears	"
3	Frame Sawing Machine	"
4	Eccentric Press	"
5	Eccentric Press	"
6	Eccentric Press	"
7	Eccentric Screw Press	"
8	Friction Screw Press	"
9	Triple Crank Press	"
10	Spring Hammer	"
11	Pneumatic Power Hammer	"
12	Pneumatic Power Hammer	"
13	Double Acting Drop Hammer	"
14	Drop Belt Hammer	"
15	Tumbling Barrel	"
16	Double Disc Grinding Machine	Machine Shop
17	Bench Drilling Machine	"
18	Column Drilling Machine	"
19	Turret Lathe	"
20	Capstan Lathe	"
21	Universal Milling Machine	"
22	Universal Milling Machine	"
23	Milling Machine Attachments	"
24	Rigid Eccentric Press	"
25	Friction Screw Press	"
26	Riveting Machine	"
27	Spoting Welding	"
28	Bench Griner	Grinding
29	Double disc grinder	"
30	Double disc grinder	"
31	Polishing Machine	"
32	Polishing Machine	"
33	Polishing Machine	"
34	Bench Drilling Machine	Tools Room
35	Column Drill machine	"
36	Turning Lathe	"
37	Tool Milling Machine	"
38	Shaping Machine	"
39	Surface Grind Machine	"
40	Universal Cylinderical Grinding Machine	"
41	Universal Tool Grinding Machine	"
42	Grinding & Sharpening Machine for Wood Cutting Saws	"
43	Grinder	"
44	Welding Machine	"
45	Compressor Agregate	"
46	Compressor Agregate	"
47	Welding Bench	"
48	Air REserviour	"
49	Circular Saw Machine	Wood Shop
50	Drilling Machine	"
51	Washing Machine	Hardening

Production	-	(a) Battery - 327,518 pieces/shift (b) Umbrella - 5.8 million pieces in 1977/78.
Raw Materials	-	Various component and textile materials
Manpower	-	January 1977: 413 — June 1978: 455
Wages	-	Not known
Machinery & Equipment	-	Not known
Turnover	-	1976/77: Eth.Birr 2.4 million — 1977/78: Eth.Birr 3.3 million
Expansion Programme	-	Not known
Constraints	-	- Lack of demand for battery - Lack of training programme - Heavily dependent on imported parts for assembly - Lack of quality control facilities - Lack of design facilities.

9. **A.M.C.E. Ltd. (Truck Assembly Plant)**

Type	-	70% Foreign investment 20% SACAFET (Ethiopia) 10% Ministry of Industry.
Product	-	Assembly of - 5 ton truck - 10 ton truck - Land Rover - Trailers
Capacity	-	1½ unit/day
Production	-	Per day - One unit of Truck of Land Rover.
Locally procured and manufactured parts	-	Leaf spring, wooden parts, exhaust pipe, fenders, typers, tool boxes, platform for trucks and paints (local import substitution is 20%)
Raw materials	-	Knock down component other than above are imported from Western Europe.

Manpower	-	Technical staff 2 Expatriate 2 Administration 10 Operatives 90 Total 104
Wages	-	Local - 500 Birr/month Expatriate - 3000 Birr/month.
Machinery & Equipment	-	Not known
Investment	-	Eth. Birr. 3.5 million
Expansion Programme		(i) Company wants to introduce 30/35 seater bus body for assembly. (ii) Assembly of trailors.
Constraints	-	- Imported truck cost cheaper than locally assembled - Lack of transport facilities from the sea port - Productivity and production has been deteriorated due to high absenteeism.

10. East African Aluminium Company

Type	-	Private Company with majority 51% share held by AID Bank (state owned).
Products	-	(a) Aluminium doors and windows assembly, from extruded aluminium sections from abroad. (b) Aluminium framed electric cookers (c) Steel furnitures.
Production	-	Not known
Raw materials	-	Most of the raw materials are imported from abroad

1974	1975	1976	1977
Eth.Birr	Eth.Birr	Eth.Birr	Eth.Birr
440,724	1,019,596	1,082,539	122,490

Main raw materials are, Aluminium profiles, Aluminium sheets, Iron material, Tools etc.

Manpower - 39 (Permanent)
22 (Temporary)

Wages -

1974	1975	1976	1977
Eth.Birr	Eth.Birr	Eth.Birr	Eth.Birr
255,841	311,551	321,566	179,751

Machinery and Equipment and Capacity

SCHEDULE IX

Item No.	Model & Serial No.	Description	Quntity	Annual Capacity/Shift Tons
1	B-41542/130329	Electrilompressor "CECCATO" (2 group)	1	400 Lt. 12 ATM
		Complete of motr protector 300/50	1	400 Lt. 12 ATM
2	PRC/15 13914	Transformer (point welding machine)	1	15 KVA
3A	No Target	Fly press with 4 m/m Chandle	1	500 Kgs.
3B	No Target	Tank with two pumps (lubrification equipment for cutting machines)	1	
3C	No Target	Authomatic multiple Shearing M.	1	
4	Italtrapani	Column Drilling machines	1	Ø 22 m/m 140/3200 round per minute
5A	Mariani mode Cin 30	Guillotine shearing machine with engine and electrical equipment		L = 3000 m/m cutting power 3m/m diameter
5B	Mariani Mode PE 75/40	Bending machine with engines and equipments		L = 4000 m/m 75 tons of power with 251
6A	Sala Mode asige	Cutting machine for aluminium complete of electrical and penumatic equipment	1	Cutting = 110m/m Dia.
6B	Sala Mode asige	Cutting machine for iron complete of elect. equipment	1	
6C	Sala asige LL90	Cutting machine for aluminium complete of elect. and peneumatic equ.	1	Cutting = 210 m/m Dia
7	Velocette	9 pressing olespneumatic machines complete of olesdinamic equipment	9	3.5 tons poer mounted on support 5 tons power
8	Velocette T7/3	Pressing machine	1	
9	Velocette SPB 4/4C	Facing machine for aluminium	1	

SCHEDULE IX (cont'd)

Item No.	Model & Serial No.	Description	Quantity	Annual Capacity/Shift Tons
10	Velocette MF 8/3	Milling (vertical) machine for Aluminium	1	
11	Bimak	Column Drilling machine	1	Ø33 m/m, 400/2800 round per minute
12	Bimak	Column Drilling machine	1	Ø33 m/m 400/2800 round per minute
13	Stayar ST 5 Mod C	Upright grinder machine	1	2860 round per minute
14	Stayar Mod SD	upright grinder machine	1	1430 round per minute
15	Stayer	Upright grinder machine	1	1955 round per minute
16	White Star NVD 90/3	Disk sharpening machine	1	-
17	Stayer ST/9 Mod D	Upright grinder machine	1	2860 round per minute
18	ERNO	Welding Machine	1	Store-out of order
19	Erno	Welding Machine	1	-
20	Erno	Welding Machine	1	-
21	Makita	Hand grinder machine	1	Until 10 MA 3/2!
22	Marchesi	Threading machine	1	150 m/m dia.
23	Marchisi G Lovis 150/800	Leath machine	1	
24	CL 500	Shaper machine	1	500 m/m sq.
25	Makita	Hand drill machine	3	Store out of order
26	ELU DES 61	Cutting machine for Aluminium	3	
27	Mantegazza Mod appuania Type PR 20	Pressing machine	1	

SCHEDULE IX (cont'd)

Item No.	Model & Serial No.	Description	Quantity	Annual Capacity/Shift Tons
25	CL 500	Shaper machine 500 mm	1	
27	Makita	Hand Drill machine	3	
28	ELU DES 61	Cutting machine for aluminium	3	
29		Oxyacetylene welding set	1	
30	Mantegazza Mod Apuaniz Type PR 80	Pressing machine 80 tons	1	
31	TRL 300 No 55237	Cutting machine for aluminium	1	
35		Cutting stamp		
36	Gavazzi	Universal tester	1	
37	National	Amperometer and tester	1	
38		Circul saw per aluminium (1973/5000 three years)	1	
39	TI/7 Previtali	Pressing machine 7 tons power	1	
40		Pantograph machine per aluminium	1	
41	Mubea	Hand shearing machine	1	
42		Hand shearing machine 350 mm	1	
43	No target	Gacing machine per aluminium (500-1975)	1	

Turnover	-	1974 Eth. Birr	1975 Eth.Birr	1976 Eth.Birr	1977 Eth.Birr
		8[illegible],786	1,770,163	1,249,335	456,209

Expansion programme - Company's financial situation is extremely critical. The accumulated loss in 1977 was Eth. Birr 795,102.53. The company has good technology and well trained people. It is suggested that the company should be taken over by National Metal Works Corporation and the AID Bank should consider this before the further deterioration of the situation takes place.

Constraints -

- Non payment by the creditors to the tune of Eth. Birr 322,066.23;
- No decision yet been taken either by the Ministry of Industry or the AID Bank regarding the fate of this company. The Ministry wants to write off all the past liabilities of this company where as AID Bank wants to recover all the Bank overdraft to the tune of Eth. Birr 2,013,730.41;
- Lack of marking facilities particularly in export aspects;
- Lack of factory area.

Besides the above companys are number of industries involved in metal products manufacture e.g.

11. Ethio Steel Tools Company

    Manufacturer of Sickles.

12. Ethiopian Alluminium Company

    Manufacturer of Alluminium utinsils.

13. [illegible]nio Ghori and Armando Valle

    Mechanical Workshop.

14. D'Enisic Ernesto

    Foundry and Mechanical Workshop.

15. Kifle Desta

    Manufacturer of structural metal products.

16. Foccacio (CCFA)

    Manufacturer of drums and tanks.

17. Costa Vincenzo

Manufacturer of structural metal products.

18. Nicole Metal Work

Manufacturer of structural metal products.

19. General Metal Work and Pattern Making

Manufacturer of structural metal products.

20. D'Mauro Matteo

Manufacturer of structural metal products.

21. Vibro Cement

Manufacturer of structural metal products.

22. Ethiopian Crown Cork and Can Making Industry

Manufacturer of crawn cork and metal cans for industry.

23. Ethiopian Household Utilities

24. Panto Scavi Foundry

25. Pinsenti Stefano

26. Fabrica Accumulator Eritrea (FAE)

Manufacturer of electrical batteries.

27. Asmara Battery Industry

Manufacturer of battery.

General Outlook of Technology Level

Iron and Steel Sector

The level of technology attained in these two sectors of manufacturing industries in Ethiopia can best be summerised as stated below:

- Cast iron products from scraps in small foundries about ten in Ethiopia for the small spare parts manufacture. Quality of cast iron castings are upto Grade 14 using pit type or culpola furnace;

- Steel ingots are produced in Ethiopian Iron and Steel Company and Magnetti Ferriera by electric arc furnace followed by the production of rolled steel section particularly reinforced concrete rods. No steel castings are produced in Ethiopia and this technology has so far not been developed in this country.
- The level of technology observed in the fabrication and process shops needs further improvement. General electric arc welding, spot welding and gas welding technique has developed considerable. Application of CO_2 or submurged Arc welding technology has not yet been developed in Ethiopian industries.
- The metal pressing, forming and bending technology has developed considerably in selected Ethiopian industries KALITI STEEL Industry has developed and manufactured a roll forming machine capable to produce formed roof panels.
- In selected industries forging technology has developed consider bly. This can be observed in Ethiopian Metal Tools where three stage forging operations are being carried out with one compound pressed tool. Forged tools are in many cases produced locally.
- Heat treatment technolgy is developed in selected industries manufacturing agricultural machinery etc. Through hardening technology is more often used rather than case hardening technology. Induction hardening technology is so far not seen in Ethiopian Industries. The heat treatment technology development is also limited due to the lack of metallurgical testing and laboratory facilities in Ethiopia.
- Ethiopia has limited facilities for metal surface coating technique e.g. nickel-chrom plating, phosphating etc. Only technology developed so far is galvanizing particularly for corrougated roof sheets. In Asmara there is a plant for electro-plating.
- In general the technology level developed in Ethiopia so far is in primary level and considerable development activities for the improvement of appropriate industrial and metal working technologies are of immediate need for Ethiopian industries.

Requirement of Raw Materials

The perspective of Iron and Steel requirement in Ethiopia by 1990 can be summerised below[15]. The following figures are being adjusted by the recent change in the demand. The figures are only indicative one.

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15 Figures obtained from Uganda Steel Corporation 1978.

Country	Estimate based on ECA Report		Estimate derived in Consultant's report	
	Tons in 1980	Percent of 12 countries	Tons in 1980	Percent of 12 countries
Ethiopia	80,332	4.9	96,315	6.3
Total of sub region (12 countries)	1,633,708	100	1,076,483	100

However, the recent asessment[16] by National Metal Works Corporation indicates the output of metal products (mainly steel).

1976/77	1977/78
23,077 Tons	27,482 Tons

Demand at various sources in Ethiopia [17] figures are only indicative one.

In tons

Location	Pig Iron	Wire Rod	Rods & Bars	Sections			Pipes and Seamless Tube
				Light	Medium	Heavy	
1. Demand by existing factories							
Addis Ababa	-	1,425	1,781	19	37	-	-
Asmara	-	475	594	6	12	-	-
2. Demand by direct consumer's in 1980							
Addis Ababa	-	197	4,001	157	315	-	12,000
Asmara	-	66	4,666	60	120	-	4,000
3. Demand by proposed new projects in 1980							
Addis Ababa	2,407	10,634	4,909	22	-	-	-
Asmara	802	3,545	1,436	2	-	-	-
4. Total demand of iron and steel in 1980							
Assid Ababa	2.407	12,250	20,691	198	352	-	12,0000
Asmara	302	4,086	6,396	73	73	-	4,000

16/ Report on overall operations of plants uner the National Metal Works Corp.
17/ Figures obtained from Uganda Steel Corporation 1978

Figures are only indicative one

In tons

Location	Plates	H.R. Sheets & Coil	Skelp	C.R. Sheet & Coil
1. Demand by existing factories				
Addis Ababa	285	2307	-	4476
Asmara	95	768	-	1493
2. Demand by direct consumers				
Addis Ababa	39	1066	1478	11725
Asmara	13	356	493	3909
3. Demand by proposed new project in 1980				
Addis Ababa	285	2307	-	4476
Asmara	95	768	-	1493
4. Total demand of iron and steel				
Addis Ababa	371	3634	1666	18444
Asmara	124	1212	622	6149

Import Substitutions

Ethiopia's industrialization is primarily based on unplanned import-subsitituion. From the previous regime the Revolutionary Ethiopia has inherited a very weak industrial sector. Manufacturing industry's contribution to Ethiopia's GDP is very small. Output of the the total gross value of production of manufacturing industry 60 per cent was contributed by food, beverages and textiles. The engineering and metal working industries played an insignificant roll in the national economy. The five year development programme[18/] envisage only one metal engineering project i.e. integrated

18/ Source : First year Programme of the National Revolutionary Development Campaign May 1979, page 72 para. 49 and 51.

spare parts factory and selected engineering small scale projects in private anc co-operative sector. Therefore, the Government of Ethiopia is at present aendeavouring to rehabilitate the existing metal working industries. Although there exists number of reports and feasibility studies on specific industrial projects particularly in metal sector, the report of first year development programme does not include relevant projects those can be considered as import substitution oriented industries in basic metal and engineering sectors. The entire development programme is devoted for the expansion of exportable non-metallic and agricultural product based industries rather than the basic development approach for integrated metal and engineering industries in Ethiopia. If such trend continues the mission has serious doubt about the future self relience of Ethiopian industries particularly the engineering sector which in past and at present completely depends on foreign import of essential engineering raw materials. Therefore, the policy regarding import substitution is not very clear from the One Year Development Programme. Nevertheless, Government of Ethiopia seeks foreign assistance from the friendly countries and international institution in order to compensate their technology gaps and the necessary foreign exchange on priority projects.

Rationalization and Up-grading Projects Initiated by the Ethiopian Government.

Project Operational/under study

High priority projects for Basic Metal and Engineering Industries Development Programme.

Project Title	Government Implementing Institutions	Total Cost Eth.Birr	Foreign Exchange
A. Basic Metal			
1. Iron Ores (Meti-Nejo Reserves)			
a. Project for iron ores exploration Hametite Magnetite Type in Wollega region (available reserve 500,000 tons pure iron contents in ores 60-70%).	Ministry of Mines and Power	-	-
b. Project for iron ores exploration Quartzite Type in Wollega region. (Available reserve 12 million tons - pure iron contkents in ores 30-40%).	Ministry of Mines and Power	-	-

Project Title	Government Implementing Institutions	Total Cost Eth.Birr	Foreign Exchange
c. Project for iron ores exploration. Limonitic Ore Type.(Available reserve 0.5 million tons).	Ministry of Mines and Powers		
2. Coal Exploration			
Project for study of availability of Lignite coal in Nejo area. The reserve is estimated to be 0.5-1.0 million tons(ash content 9.2 to 16%).	Ministry of Mines and Powers		
3. Projects on other Minerals			
a. Project for study ov Copper and Zinc. At Adi-Fefas - 2-3 million tons 2% Copper and 7% Zinc. At Debarwa 7-8 million tons 2% Copper and 7% Zinc.	Ministry of Mines and Power		
b. Project for study of Manganese. At Gedem it is estimated 0.5-1.0 million tons of Manganese. At Dalole depression sufficient reserve is located.	Ministry of Mines and Power		
c. Project for study of Nickel At Sidamo the reserve is estimated to be t 5-6 million tons of 1.5% Nickel.	Ministry of Mines and Power		
d. Project for study of Refactory bricks from dolomite, At Ogaden and Blue Nile region.	Ministry of Minies and Power		
4. Feasibility study required for medium size Direct Reduction of Sponge Iron from Lignite (processed).	Ministry of Mines and Power and National Metal Works Corporation.		

Project Title	Government Implementing Institutions	Total Cost Eth.Birr	Foreign Exchange
5. Feasiblity study required for Processing of Lignite for for semi-processed Coke.	Ministry of Mines and Power and National Metal Works Corporation.		
6. Strengthening of the Geological Survey(ETH/71/537)	Institute of Geological Survey and United Nations	US$1,572,799	
B. Engineering Industries			
7. Feasibility study for Integrated Foundry and Central Spare Parts Workshop.	Ministry of Industry and National Metal Works Corporation.	Included in the total Cost Eth. Birr 93.8 million for industrial projects.	Foreign exchange compenent of total cost Eth. Birr 50 million.
8. Assembly of Tractors upto 35 HP. - 1000 per year	Ministry of Agriculture, Ministry of Industry and National Metal Works Corporation.		
9. Project for Bus Body Manufacture 30 seater	A.M.C.E. Ethiopia(Private)		
10. Expansion project for 200,000 sickle	Metal Tools Ltd. (National Metal Works Corporation)		
11. Expansion project for Rivett manufacture and Door hinge manufacture.	Metal Tools Ltd. (National Metal Works Corporation)		
12. Expansion of small foundries	HASIDA and Private Sector		
13. Project feasibility studies 98 numbers in small scale sector are prepared for private sector a list is attached at the Annex II of this report. (identified by the Government of India mission 1978).	HASIDA and Private Sector.		

Project Title	Government Implementing Institutions	Total Cost Eth.Birr	Foreign Exchange
14. Project for integrating the pipe factories in SABEAN and KALIT Steel.	National Metal Works Corporation		
C. Technology Research Training Manpower Development			
15. UNDP Project of Training for Rural Electrification (ETH/79/001).	Ethiopian Government	US$666,000	
16. Assistance to Industrial Projects Development (ongoing project) (ETH/75/008)	Ministry of Industry and UNIDO	US$712,711	
17. Handicraft and Small Scale Industry Development (ETH/77/018)	HASIDA and UNIDO	US$1,151,900	
18. Establishment of Quality Control and Testing Centre (ETH/79/003)	Ethiopian Standard Institution & UNIDO	US$1,421,000	
19. Project on Rural Radio-call Service(ETH/73/027)	Ministry of m Communication and ITU	US$ 494,500	
20. Labour Intensive Rural Road Construction (ETH/78/019)	Rural Road Authorities and ILO	US$ 305,000	
21, Assistance to National Productivity Centre for in-plant training advisory services (ETH/77/009)	Ministry of Industry and ILO	US$ 969,474	
22. Hand pump and wind mill research (ETH/77/013)	Science add Technology Commission and Ethiopian Water Resources Authority and Addis Ababa University and UNIDO	US$ 160,062	
23. Prposed National Centre for Transfer of Technology (ETH/77/001)	Ethiopian Government and UNCTAD/UNIDO		

Projects Identified by The Mission

The following projects were identified by the mission for the development of basic metal and engineering industries in Ethiopia.

Ministry of Mines and Power

1. UNIDO mission required for the feasibility study of copper pilot plant project.
2. Study mission(UNIDO) for integrated mineral survey and exploration project.
3. Establishment of a Central Ores Testing and Metallurgical Laboratory.
4. Study on transportation of iron ores and coal.
5. Study on lignite processing for the production of intermediate coke.
6. Project to set up a training centre for iron and steel developmet.

Ministry of Industry and National Metal Works Corporation

7. Feasibility study for integrated mini steel plant 20,000 tons/year sponge iron using processed lignite.
8. Feasibility study for the expansion of Ethiopian Iron and Steel foundry for commercial hot and cold rolled sections 15,000 tons/year.
9. Establishment of a metallurgical laboratory and quality control section for Ethiopian Iron and Steel foundry.
10. Proposed Central spare parts factory should include, steel casting, brass casting, malleable iron and S.G. iron casting facilities, machine shop include tool room and gear cutting machinery.
11. Proposed tractor assembly plant must have an integrated agricultural implement factory.
12. Manufacture of agricultural implements (power driven) in Metal Tools Ltd.
13. Development and Design Centre for agricultural machinery and implements as part of Metal Tools Ltd.
14. Manufacture of water fittings in Sebean and Kaliti Steel and integrated pipe manufacturing plant with existing machinery.
15. Feasibility study for Metal Development and Training Centre.
16. Feasibility study for integrated plant for the manufacture of household and industrial kitchen ware products (existing two companies should be merged).

Sectoral and Subsectoral Constraints

The sectoral and sub-sectoral constraints in basic metal and engineering industries encountered in Ethiopia can be summerized below:

Iron and Steel Industry

The main constraints are:

- Lack of local steel scrap. The net availability of local steel scrap in 1978/79 was only 7000 tons, where as the factory requirement will be 12000/15000 tons/year.
- Lack of quality control engineer and metallurgist.
- Lack of refractory meterials.
- Lack of spare parts and maintenance skills.
- Lack of transport facilities.
- Low level efficiency of labour force.

Engineering Industries

- Lack of steel, malleable and S.G. Iron casting facilities for spare parts manufacture.
- Lack of non-ferrous casting facilities.
- Difficulty in procurement of Pig Iron with carbon content 3.5%.
- Lack of skilled manpower and technicians in existing metal working industries.
- Lack of middle management personnel in key position within industries.
- Lack of maintenance facilities and spare parts requirement for existing plant and machinery.
- Lack of industrial co-operation and co-ordination among the existing engineering industries.
- Lack of sub-contracting facilities due to limited number of ancillary industries.
- Lack of design facilities to develop indigenous products.
- Lack of design facilities to develop local spare parts drawing and manufacturing instructions.
- Lack of skilled fitters, turners, shapers, millers, welders etc.
- Lack of industrial engineers, designers, draughtsman, mechanical and electrical engineers.
- Lack of facilities for Tool Room, Jigs and Tools manufacture, Heat treatment, Press work and ancillary industries.

CHAPTER V

COUNTRY CONTRAINTS

The previous chapter has outlined the existing status of basic metal and engineering industries in Ethiopia, highlighting the major areas of sectoral and sub-sectoral constraints the industries in general are facing today. Apart from these sectoral and sub-sectoral constraints in basic metal and engineering industries, there are many major country constraints the Government of Ethiopia has been encountering at national level. Unless these basic constraints are removed, it will be difficult for the Government of Ethiopia to implement the national development programme envisaged for the economic and industrial development as outlined in the First Year Development Programme 1979-1980. The major constraints can be summarized below.

Institutional constraints

Examining the present institutional structure, Ethiopia has too many para-statal institutions controlling specific industries. Many engineering activities are being duplicated and interlinked activities within various Ministries are not adequately threaded for integrated development of basic metal and engineering industries.

For example, the identification of projects and the necessary feasibility studies are often carried out by the Ministry of Industry, National Metal Works Corporation, HASIDA, AID Banks and even by individual industry. In many instances the gaps of communication between the private sector industries (only small-scale) and public sector industries are wide and many instances the communications for development do not exist. The appropriate decision-making organizations and implementing agencies are not inter-linked at all. This is the reason why a number of important and priority projects do not come into reality owing to the lack of co-operation and co-ordination not only between the Government institutions at national level, but also at multinational and subregional levels. There is an urgent need for the rationalization of institutional bodies and governmental and non-governmental machinery in Ethiopia.

In addition to this, the Government of Ethiopia should introduce procedural reformatipns in administrative implementation machinery, inter-linkage of Ministries, parastatal organizations and financial institutions for effective planning and programming of priority projects within the broad context of industrial development.

The main institutional constraints in basic metal and engineering industries in Ethiopia

Constraints in management services	- lack of technical training programme; - lack of facilities for project evaluation and prefeasibility studies; - lack of facilities for management consultancy services; - lack of higher and middle management personnel to run the existing engineering industries

Product development and design services constraints	- lack of facilities for product adaptation and design; - lack of facilities for product development and design; - lack of facilities for prototype design; - lack of facilities for supply of working drawings;
Constraints in procurement-finance and marketing services	- lack of foreign exchange reserve and heavy dependency on cash crop export in order to import essential goods and services particularly spare parts machinery and transport equipment; - lack of procurement facilities for cast iron and steel particularly scrap materials - shortage of finance for development projects; - lack of facilities for the procurement of appropriate plant and machinery which includes assessment of machine specification; - lack of marketing facilities for engineering products for both internal and export market level; - lack of trained salesman
Constraints in transport and communication services	- heavy port congestion, transport problems to ports and vice-versa, and to the interior from the major cities mainly due to shortage of vehicles and railway tracks as many transport vehicles have been mobilized to the war efforts - lack of railway particularly shortage of railway tracks, rolling stock and locomotives - lack of adequate metal roads - lack of transport equipment - lack of communication network - lack of spare parts to maintain existing transport equipment

The major technological constraints

The technological constraints in Ethiopia can be summarized below:

Constraints in technological advisory services	- lack of facilities for plant layout; - lack of facilities for process planning particularly in engineering industries sector - lack of facilities for methods of improvement (at present the technical institutions do not produce any industrial engineers); - lack of facilities for the appropriate selection of machinery and equipment; - lack of facilities for the improvement of actual production techniques; - lack of facilities for the manufacture of jigs, tools and fixtures, and press tools etc;

- lack of manpower facilities for material and production control;
- work study system i.e. method study and work measurement does not exist even in large industries;
- lack of facilities for quality control and particularly metallurgical testing; requirement where existing foundries exists

Constraints in common engineering services

- lack of facilities for steel casting particularly for sugar, textile and cement industries;
- lack of facilities for the supply of intermediate goods e.g. steel sheets, plants, commercial sections, only building materials steel rods are produced in Ethiopia Steel sections for machining are generally imported from abroad;
- lack of facilities for toolroom work for the manufacture of jigs, tools and fixture and press tools and dies;
- lack of facilities for manufacture of spare parts both for machinery and existing machine tools in local industries;
- lack of electroplating and phosphating facilities;
- lack of heat treatment facilities;
- lack of maintenance facilities, particularly in transport, engineering industries, water supply, textile, cement, sugar and agricultural industries

Constraints in ancillary industries

- lack of industrial estates
- lack of institutional back up support facilities and incentive to promote ancillary industries in Ethiopia
- lack of following essential ancillary industries for which Ethiopia is perpetually importing essential parts and finished goods in order to continue the day-to-day running of industries; e.g.
  a) manufacture of S.G. iron, malleable iron and steel shape castings
  b) manufacture of non-ferrous castings
  c) tool room, press shop, heat treatment shop, forging shop where industries can procure parts and facilities on job order basis
  d) manufacture of brass and bronze bearings
  e) manufacture of hardware i.e. bolts, nuts pins, sockets, etc.
  f) manufacture of transmission gears;
  g) manufacture of automotive accessories;
  h) manufacture of electrical components
  i) manufacture of domestic and industrial water fittings
  j) manufacture of pumps;

k) manufacture of various items as identified in Appendix II of this report

Manpower and training constraints

This is one of the major constraints the Government of Ethiopia is facing today in all sectors of economic and industrial activities particularly in engineering and allied metal working industries sector. The number of manpower requirements for existing vacant posts and posts to be created for the industrial sector will be as follows:

Skilled 604, Unskilled 5,329
Total - 5,933

The metal corporation's requirement will be 115 skilled, 278 unskilled totalling 393 persons. The training facilities for existing institutions are inadequate. Although National Productivity Centre has increased its trade and vocational courses, it is imperative for the Government of Ethiopia to increase the number of seats in the University, Technical Colleges and Training Institutes. The comprehensive training programme for the actual need for the industries has not yet been materialized by the Ethiopian Government. A greater consideration is required in this field as outlined in Chapter VI pages 94 to 102

Constraints in maintenance and spare parts manufacture

Many engineering establishments both large and small are facing acute problems in getting spare parts in Ethiopia. The transport and railways are also badly hit due to inadequate supply of spare parts. This is mainly interlinked with the non-availability of foreign exchange situation in Ethiopia. The main spare parts constraints are:

- lack of parts for existing machinery and equipment (particularly in basic engineering industries)
- lack of ball and roller bearings
- lack of electrical accessories and contactors etc.
- lack of spare parts for motors, generators and switchgear
- lack of spare parts for railways and railway locomotives
- lack of spare parts for automotive equipment and vehicles
- lack of spare parts for electrical distribution
- lack of spare parts for water supply
- lack of spare parts for agricultural implements
- lack of spare parts for textile, coffee, sugar industries

Coupled with this non-availability of spare parts, the existing maintenance facilities are being deteriorated due to lack of skilled maintenance manpower.

Financial constraints

Presently the local and foreign source of industrial financing in Ethiopia is as follows:

- Savings of public manufacturing enterprises;
- Agricultural and industrial development bank loans;
- The two State-owned commercial banks through "roller-over" credit system;
- National Government budget;
- Financial assistance from friendly countries and international financial institutions
- Export earnings from cash crops and other commodities etc.

But the funds from these sources could not adequately cover the finance for industrial investments, especially due to the lack of foreign exchange components. The total investment for twelve industrial projects under implementation are E. Birr 226.6 million and for eight projects for which feasibility studies have reached near completion amount to E. Birr 534.1 million i.e. a total of Birr 310.7 million. Thus the Government is looking for additional funds from bilateral sources and international financial institutions in the form of loan and grants.

Moreover, Ethiopia has a severe difficulty in balance of payment situation which has been further deteriorated in the recent years. Ethiopia mainly experts cash and processed crops and in return imports capital, intermediate and consumer goods. Due to the low production and productivity in agriculture and food industries and general deterioration in production and productivity in agriculture and food industries and general deterioration in production and productivity in all engineering, textiles and associated industries, Ethiopia is at present facing a great difficulty in obtaining necessary foreign exchange investment for the priority projects particularly in the industrial sector.

The low level of performance in existing industries has influenced greatly the country constraints in various sectors as outlined above. In order to overcome these problems and reinforce the industries for higher production and productivity, it is necessary for the Government of Ethiopia to programme an integrated development plan for basic metal and engineering industries. Such programme must interlink the institutional and technological development aspects with special reference to the long and short-term manpower and financial development schemes particularly in the basic metal and engineering industries sector.

CHAPTER VI

PROPOSED INTEGRATED DEVELOPMENT OF BASIC METAL AND ENGINEERING INDUSTRIES IN ETHIOPIA

PROPOSED INSTITUTIONAL DEVELOPMENT

Unification of Industrial Sector

Previous chapter has outlined the major country constraints Ethiopia is facing today particularly in basic metal and engineering industries. In order to overcome these constraints Ethiopia requires the changes in institutional structure for the development of integrated basic metal and engineering industries whose role and characteristics are important mile stone for Ethiopia's self-reliance and self-sustaining economic growth.

The existing strategies and policies outlined in the First Year Programme of the National Revolutionary Development Campaign however has focused a number of institutional development aspects. What is more important will be to examine various institutional interlinkages among the Government Ministries, departments, parastatal organization, financial institutions, training centres and public and private sector industries in order to bridge the existing gaps for harmonious development of basic metal and engineering industries in Ethiopia.

In order to programme an integrated development of basic metal and engineering industries in Ethiopia, it is essential that the institutional mechanism should comply interlinked development process within the framework of Government's policies and strategies those are clearly outlined in the Revolutionary Development Campaign. The proposed structural change and rationalization of existing institutions responsible for the basic metal and engineering industries integrated development, envisages the following important aspects:-

- development and reorientation of institutional mechanism:
- identification and rationalization of institutional activities;
- institutional responsibility and identified work areas;
- interlinkage through horizontal and vertical integration of various institutions responsible for integrated development;
- integration of sectoral and sub-sectoral development programme through the restructuring of institutions with minimum duplication and overlapping activities for development.

A. Central Planning Supreme Council (CPSC)

The Council's main functions among other are to set out policy, strategy, planning and measure for integrated development of basic metal and engineering industries e.g.,

- To install a sectoral Planning and Programming Unit.
- To prepare short-term and long-term development plans including

follow-up implementation schedules;

- To determine the overall investment and to decide priorities for sectoral allocations;
- To determine production target, trade, finance and credit policies;
- To approve proposals for expansions of existing projects and new projects

B. Proposed Ethiopia Development Corporation (EDC)

This proposed Ethiopia Development Corporation will take over all existing corporation (fourteen) in numbers from the Ministry of Industry and will constitute as a parastatal autonomous organization under CPSC with a Board of Directors from CPSC, Ministry of Industry, Ministry of Mines and Power, Ministry of Finance, Ministry of Education, Ministry of Labour, Chamber of Commerce, Ministry of Agriculture including representatives from Public and Private Sector industries. The proposed Corporation will have the following divisions.

- Special Division for the Development of Iron and Steel and Non-ferrous metals;
- Industrial Development Division which will include section for each sub-sector of manufacturing industries eg. metal, food, beverage etc;
- Agricultural Machinery Development Division;
- Industrial Manpower Development Division;
- Management Consultancy Services Division;
- Division for the Promotion of Public and Private Sector Industries;
- Procurement and Marketing Division;
- Finance and Legal Division;
- Proposed National Centre for Industrial Research and Development (In this institution the existing National Productivity Centre, proposed Centre for Transfer of Technology and all training centres will be included);
- Proposed Ethiopia Industries Holding Company Ltd., (All the stateowned industries with majority and minority shareholding companies will be under this company) ;
- Division for Reconstruction and Development particularly for the sick companies;

The main functions of the Corporation will be to devote development of industrial activities and to reduce the red tape and bureaucracies in order to run the existing industries in commercial footings. This proposed Development Corporation could spearhead the industrialization process under CPSC. The following important functions of the corporation are worth mentioning here:-

- Project identification, pre-feasibility study and feasibility study for existing and new enterprises and to be fed back to CPSC for approval.

- Promotion of private and public sector industries
- Promotion of industrial estates, common services facilities e.g., foundry, forging heat treatment, machine shop, tool room etc.
- Enlargement of ancillary industries
- Development and promotion of agricultural machinery and Machine tools
- Expansion of existing industries
- Promotion of marketing and procurement facilities

Proposed National Centre for Industrial Research and Development

This Centre will include the following:

- Existing National Productivity Centre;
- Proposed Centre for Transfer of Technology;
- All existing Training Centres and Research establishments within the country.

This proposed new Centre under proposed Ethiopia Development Corporation will devote all the aspects for the development of management, technology, engineering, manpower training and prototype design and manufacture. Particular emphasis will be given for the adoption, adaptation, absorption and transfer of appropriate industrial technologies. All existing metal working centres and the centres in other industrial sub-sectors will be under this division. The Ministry of Education and the Ministry of Labour should closely co-operate with this centre. The centre will have the following activities through the following proposed sections:

- Section for the development of management services;
- Section for product development and design services;
- Section for technological advisory services;
- Centre for transfer of technology;(proposed)
- National productivity centre (existing) for manpower training programme;
- Workshops for prototype manufacture;

The proposed National Centre for Industrial Research and Development will obviously correlate and integrate the following important aspects of development at the factory and the inter-factory level outlining:

- development of long range planning and programming for each factory within the corporation
- development and expansion of existing corporation's activities particularly the factories under the corporation
- development of existing product range
- introduction of new product line within the existing plants of the corporation
- formulation of inventory of existing plant and machinery of each factory under corporation in order to maximize plant utilization and greater sub-contracting efforts at interfactory level

- introduction and selection of appropriate machinery and equipment for each factory
- selection and standardization of raw material
- a comprehensive study for the development of the foundry, forging, heat treatment at national level
- introduction and installation of metal industries development centre where common facilities for other industries can be extended. This centre must include a modern tool room
- central spare parts and metal working machinery manufacturing workshop. The workshop will also cater for textile and other machinery manufacturing facilities.
- introduction of improved layout, process planning and method studies for each factory under corporation
- improvement in the design of jigs, tools and fixtures particularly development of small tools.
- development in product adaptation, improved design, prototype manufacture and transfer of such improved product into the manufacturing line best suited under local conditions
- development of preventive maintenance, operational facilities and services requirements for each factory under the corporation
- specific policy for the development of management in each factory and introduction of manpower development and training programes
- a comprehensive plan for the manufacture of machine tools and metal working machinery development

C. Ministry of Mines, Power and Water Resources

It is proposed that this Ministry should actively promote the following activities and work in close co-operation with the proposed Ethiopia Development Corporation:

- to promote mining and mineral exploration
- to promote and develop iron and steel
- to promote and develop non-ferrous metal
- to promote and develop precious metal
- to explore oil gas and coal
- to promote power and water resources
- to install central metallurgical and testing laboratory
- to control and plan the activities of geological survey and mapping

D. Ministry of Industry

The main function of the Ministry of Industry will be

- to monitor the existing industries in order to improve the production and productivity
- to issue licences and to control import of engineering products and to advise the Development Corporation on specific import substitution
- to install a national testing laboratory and control Ethiopian Board of standard
- to issue the trade mark
- to identify manpower development plan for the industry
- to carryout industrial manpower survey
- to promote incentives for small-scale industries
- to install an industrial information section
- to recommend CPSC industrial project and to plan industrial development programme
- to promote development of co-operative programme
- to prepare statistics of inventory of plant machinery equipment, manpower etc.
- to develop small scale industries through HASIDA (existing)

E. Proposed Ministry of Transport, Communication and Railway

Industrial development requires development of railways communication and transport network therefore, the railway should be a part of this Ministry. Apart from other activities, this Ministry will work in close co-operation with the proposed Development Corporation and should constitutes:

- Railway Board
- Transport Board
- Communication Board
- Aviation and shipping Board
- Postal Development Board

The main activity of the Railway Board will be to formulate the policy and strategy of the Railway Development in Ethiopia. The overall railways system will be divided into

- Railway development and maintenance section including the railway workshops
- Traffic and control section
- Operation Section

It is necessary the activities of the development of railway, transport and communication should be closely interlinked with the activities of

- Proposed Ethiopia Development Corporation
- Ministry of Industry
- Proposed Ethiopia Industries Holding Company Ltd.
- Small-scale Industries Division (HASIDA under Ministry of Industry)
- Ministry of Labour and Ministry of Education

The existing Railway Workshops and Transport Repair and Maintenance Workshops should be expanded and these workshops should include foundry, tool room, testing facilities.

F. Ministry of Education and Ministry of Labour

These two Ministries activities should be interlinked with the Ethiopia Development Corporation, Ministry of Mines, Ministry of Industry and Ministry of Transport, Communication and Railway. An integrated manpower development programme needs to be planned under the auspices of all these institutions.

G. Ministry of Commerce and Tourism

This important Ministry should play an wider role for the development of Commerce and trade. The activities of Ethiopia Development Corporation should be closely interlinked with this Ministry.

H. Ministry of Agriculture

The Ministry of Agriculture through its existing corporation should liase closely with the proposed Development Corporation for the development and manufacture of agricultural machinery and equipment. It is important that this Ministry should formulate a National Mechanization Plan and a Development Programme for agricultural machinery industries.

I. Ministry of Finance

The main activities of this Ministry will be to provide and control funds for the priority projects. Fund allocation for resource based industries should be given priority. The Ministry through its co-ordinating agencies must approve and allocate funds those projects that are industrially viable. Without the approval of this Ministry no projects will be finance from public fund.

All banking system and commercial and business transaction should be carried out through its agencies e.g.

- National Bank
- A d Bank
- Commercial Bank
- Co-operative Bank
- Treasury Section of the Ministry

The approval for the acceptance of foreign investment must be approved and cleared through this Ministry.

Technology Development

In order to implement the policy, strategy and measure set out by Central Planning Supreme Council (CPSC) through its various Ministries and implementing organs, it is essential that particular attention be given to the technology development in Ethiopia. There is an urgent need for the formulation of a National Technology Plan in order to achieve a harmonious development of institutional and technological linkage during the industrialization process outlined in the National Revolutionary Development Campaign 1979/80.

National Technology Plan

The national technology plan needs to be formulated by a special Technology Committee representing

- Central Planning Supreme Council (CPSC)
- National Commission for Science and Technology
- National Productivity Centre
- Centre for Transfer of Technology(Proposed)
- Proposed National Centre for Industrial Research and Development
- Representatives from the industries
- Representatives of Ministries of Industry, Mines, Labour, Agriculture, Education and interested bodies.

The technology Committee will be chaired by the Chairman of the Proposed Ethiopia Development Corporation with permanent representative of CPSC. Such technology plan must clearly spell out:-

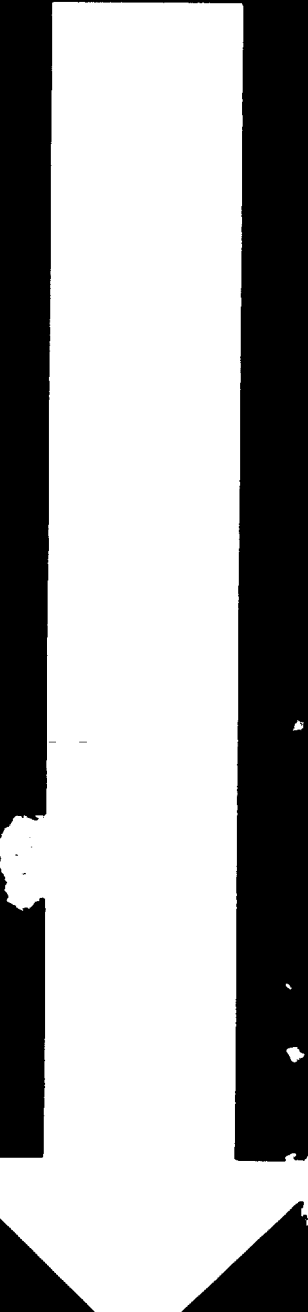
- Various manufacturing technology requirements particularly in basic metal and engineering industries sector with a view to utilize maximum natural resources through the application of such manufacturing technology best suited under local Ethiopian condition. The technology for other sectors of industries will also be included;

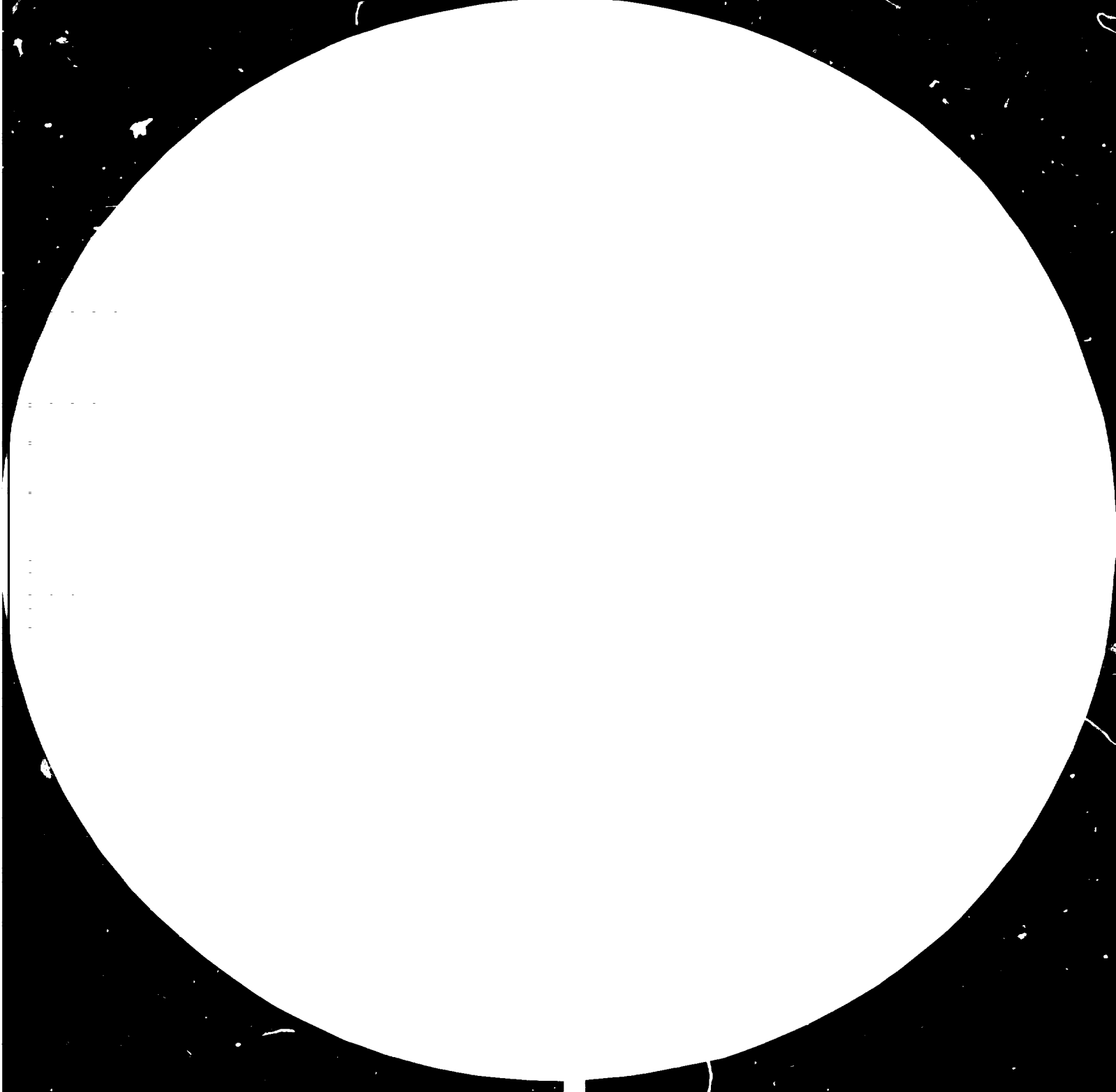
- the development of indigenous manufacturing technology through adaptation, adoption or through transfer of appropriate technology;

- the requirements of machinery, equipment, metal working processes and manufacturing facilities required for the expansion of existing industrial sector;

- comprehensive survey of existing technologies being used in sectoral and sub-sectoral level of industries as outlined in Chapter IV titling General outlook of Technology Level - Pages 6 -69;

- a definite time target to be introduced in the priority industrial sectors for product identification and development of such products as dictated by the technology plan available within the country



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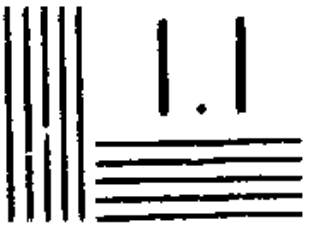
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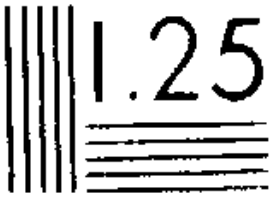
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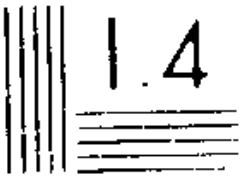
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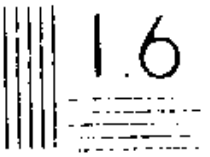
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- the assessment of basic manufacturing process of iron and steel making, foundry, forging, heat treatment, machine shop, tool room, and major basic manufacturing and processing requirements for basic metal and engineering industries development programme

- the accelerated manufacture of indigenous spare parts and components in vital sectors of industries

- the promotion of indigenous sub-contracting arrangement through the interlinkage of manufacturing industries

- the definite plan for manufacture of capital goods and intermediate goods manufacturing industries with special reference to the manufacture of machine tools

- a national plan and target for the requirement of managerial and skilled manpower for Ethiopian industries through the development of a comprehensive training programme for skilled and semi-skilled operatives for the basic metal and engineering industries

Therefore, the national technology plan will regulate the transfer of appropriate technology through the actual assessment of:

- the need for basic manufacturing techniques

- the need for appropriate machinery and equipment best suited under local conditions

- maximum absorption of indigenous and foreign technologies where the important parameter will be to encourage continuous facilities for industrial training of local development of skills and dexterity for engineering manufacturing operations.

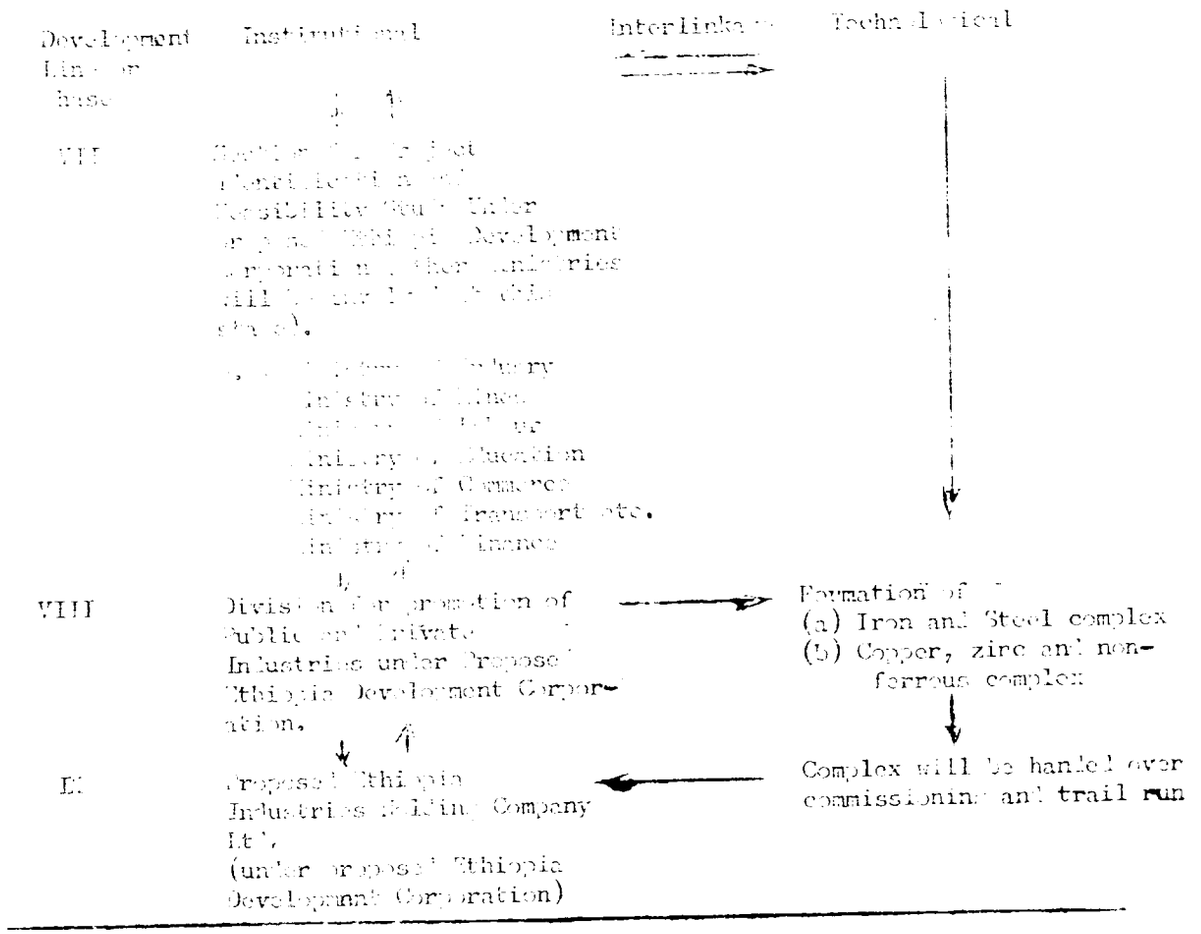
The implementation of technology development and transfer of appropriate technology in Ethiopia will be carried out through the proposed National Centre for Industrial Research and Development.

Institutional and Technological Interlinkage for Integrated Development Programme of Basic Metal and Engineering Industries in Ethiopia

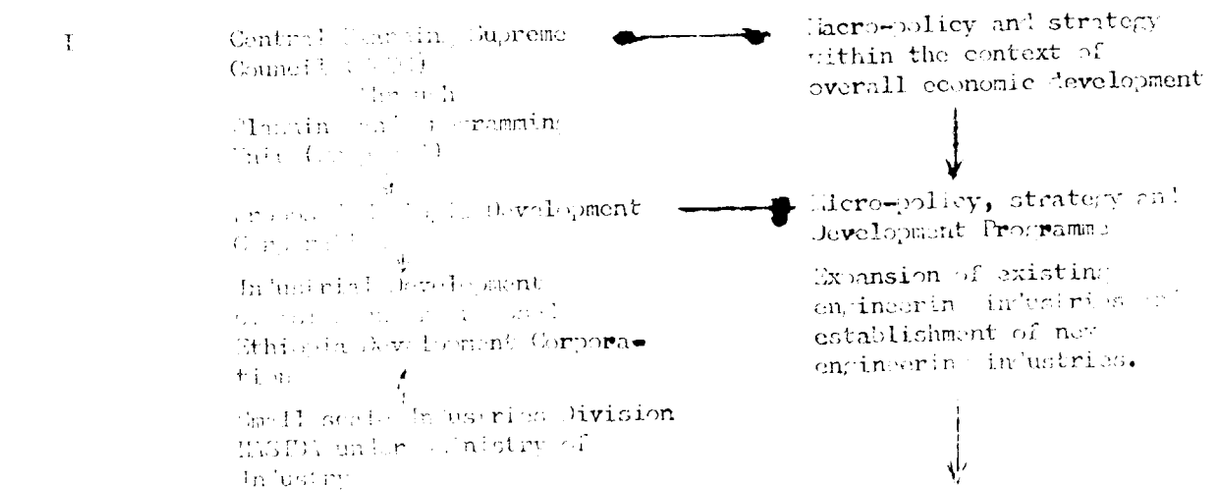
A. Development of Iron and Steel and Non-Ferrous Industrial Metals

Development Line or Phase	Institutional	Inter-linkage	Technological
	Development of Ferrous and Non-Ferrous Metal		
I.	Central Planning Supreme Council (CPSC) through Planning and Programming Unit (Proposed)	→	Macro-policy and strategy within the context of overall economic development

Development Line or Phase	Institutional	Interlinkage	Technological
II	Proposed Ethiopia Development Corporation Special Division of [illegible] and Steel under		Micro-Policy, Strategy and Development Programme
III	Industry [illegible] and Other Resources		Continuous survey and exploration of deposits of Iron, Coal, Copper, Zinc, Cobalt, Pyrites [illegible] all industrial metal and non-metallic exploration.
Assistance from other units			
IV	Proposed National Centre for Research and Development (a) Development of Management Services Section (b) Technical Advisory Services Section (c) Technology Development and Transfer of Technology Section.		Technical development for mining of ores, machinery for mining and spare parts required
V	Proposed Central Ores Testing and Metallurgical Laboratory.		Testing ores for commercial use
VI	Development of Ferrous and Non-Ferrous metal under proposed Ethiopia Development Corporation		Pre-feasibility study and feasibility study for the manufacture of Iron and Steel (a) Processing of iron ores (b) Liquid steel-pig iron of metal pellets (c) Processed Ferro silicon and Ferro-manganese (d) Semi-anthracite coke from Limite (e) Steel ingot and shape castings (f) Rolled section Non-Ferrous Metal (a) Processing of (Cu+n) (b) Smelting of copper (c) Blister copper product and zinc.



B. Development of Engineering Industries



Development Line or P PPhase	Institutional	Interlinkage	Technological
V	Industrial Development Division under proposed Ethiopia Development Corporation (at this stage other Ministries will be involved e.g.).	→	Project identification, pre-feasibility study and feasibility studys of new industries and rationalization of existing engineering industries.
	Ministry of Industry Ministry of Mines Ministry of Labour Ministry of Education Ministry of Commerce Ministry of Transport Ministry of Finance		
VI	Proposed National Centre for Industrial Research and Development (All Sections of this centre and Ethiopia Development Corporation will participate at this stage)	⇄	Design and development of identified engineering products technology assessment, transfer of technology and choice of appropriate machinery and equipment, manpower training programme.
VII	Division for promotion of Public and Private enterprises Under Proposed Ethiopia Development Corporation	⇄	Establishment of Engineering Industries (a) Capital goods (b) Intermediate goods (c) Consumer goods
	Enlargement of - Common Service facilities - Ancillary - Industrial Estates	←	Technology and manufacturing support for integrated development of engineering industries.
VIII	Agricultural Machinery Development Division under proposed Ethiopia Development Corporation. All agricultural Institutes and Ministry of Agriculture should liase closely with this Division.	→	Manufacturing Programme for agricultural machinery and equipment

Development Line or Phase	Institutional	Interlinkage	Technological
IX	Railway Workshops; and Repair and Maintenance workshops Under Ministry of Transport, Communication and railway	⟶	(a) Manufacture of Railway equipment and spare parts. (b) Manufacture of transport equipment and spare parts (c) Development of machine tools.
X	Proposed Ethiopia Industries Holding Company Ltd. under Ethiopia Development Corporation	⟶ ⟵	Manufacture for engineering projects and expansion of existing industries through greater sub-contracting.

Institutional and technological interlinksages will be one of the important aspects of Ethiopia's plan for integrated development of basic metal and engineering industries. At present there is a serious gap in interlinkage of institutional and technological activities in Ethiopia. The existing institutional activities are not well defined and many technological activities are overlapped in various segments within institutions. Harmonious development in engineering industries sector can only be achieved, if the Government of Ethiopia creates specific "responsibility oriented" sections within the existing and proposed framework of institutional and technological activities for greater integration of basic metal and engineering industries development programme.

MANAGEMENT AND MANPOWER DEVELOPMENT

Ethiopia's labour employment statistics indicate that (Refer page 50) in 1978 the total employment in the industrial sector constituted 60, 123 permanent employees distributed in 124 establishments in public sector. The sub-sector of industry e.g. steel, metal and electrical products etc. absorbed only 1,491 personnel during 1978 in public sector. The percentage share of metal sector is only 2.5 per cent of total industrial employment. However the industrial manpower needed by the sub-sectors are given below during 1979/80 development campaign period.

Industrial Manpower Requirements During the Campaign Period

Industrial Corporations	Required Manpower in Number		
	Skilled	Unskilled	Total
1. Textile Corporation	105	2,733	2,838
2. Beverage "	62	672	734
3. Food "	57	307	364
4. Fibre "	30	333	363
5. Metal "	115	278	369
6. Leather & Shoes Corporations	141	1,189	1,330
7. Building Materials "	60	203	263
8. Soap "	32	40	72
9. Salt	27	152	179
10. Wood works "	52	75	127
11. Printing "	196	224	420
12. Meat "	4	47	51
13. Tobacco & Match "	7	5	12
14. Joint State Ventur[illegible]	13	453	466
Total	901	6,711	7,612

The above figures merely indicate the requirement for the metal sector which will be only [illegible] of total requirement of 7,512 of the industrial sector as a whole. So the metal sector will absorb only 0,5% of expected additional manpower requirement industry 1979/80.

The development plan of Ethiopia clearly indicates the Government priority on Management and Manpower Development particularly in the industrial and agricultural industries sector. Moreover the Government has taken adequate measure for the production of semi-skilled, skilled, and middle and higher management cadre personnel through the active planning of National Productivity Centre under Ministry of Industry.

The Development Compaign envisages that during the first year development plan Ethiopia needs substantial numbers of manager, engineering, metallurgist, industrial engineer and middle and lower management cadre personnel. The mission estimates that about 700 qualified managers, engineers, industrial engineers, metallurgist, inspectors and skilled maintenance engineers are required to fulfill the objectives of the development campaign for immediate need. In order to step up the training programme for the growing need of industries in all cadres of trained manpower, the mission identified the following basic management courses to be extended for both higher and middle management level in all industrial activities particularly in the field of basic metal and engineering industries in Ethiopia.

Programme for Higher and Middle Management Development

(a) Training Courses for Senior Executives

(In order to replace the highly paid expatriate professionals, time period of the course [illegible] TO TWO YEARS

These courses must provide the following:

- To acquire clearer experience in economic, social and political factors at macro level which affect the decisions making within an engineering organization and industrial sector as a whole.
- Economic analysis for management decision
- Organization structure and behaviour
- Planning and optimising
- Personnel management and industrial relations
- Financial analysis for planning, control and reports
- Functional management e.g. materials management, production management, marketing management, public services.

(b) Training Courses for Young Managers

(This programme must be on top priority)

This programme will be to inhenance the efficiency of young Ethiopian executive to develop their present performance and to augment potentialities for shouldering broader responsibilities in future. Time period of the course must be at least for three years.

The programme must include the followings:

- the environment in which an engineering enterprises function in a developing country.
- the analytical tools available for planning and control of production.
- the behavioral patterns of operatives working in an engineering enterprises.
- the principle and practice of sound business management.
- expertize in the area of specialization e.g. metallurgical, foundry, forging, heat treatment, machine shop, tool room, etc.
- comprehensive functional management, e.g. production management, marketing management, personnel management, and financial management.

(c) Training Courses for Industrial Engineers

(This programme must be on top priority,

Time period of the course must be at least for two to three years.

Ethiopia has very limited numbers of industrial engineers for all sectors of manufacturing industries. Most of the existing industrial engineers are being hired from the foreign countries. The mission strongly recommend the introduction of an Industrial Engineering Course both at University and at Technical College level.

The programme should include the following important aspects of Industrial Engineering:

- Productivity and main factors affecting productivity;
- Elemination of waste;
- Principles of organization and general management;
- Method study (70 per cent of the time must be devoted for method study as far as work study is concerned). In addition to this, the programme should include basic procedure of works study; working condition including safety; selecting the job, recording and examining the facts, developing the best methods; plant layout and material handlings; movement of workers; methods and movements at the work place; selection of speed, feed, depth of cut etc.; application of jigs, tools and fixtures; installing and maintaining the new methods; job specifications; etc.
- Work measurement (30 per cent of the time of work study must be devoted to work measurement) which should include; basic procedures; selection of equipment or equipment used; selecting the job; making the study; rating; examine the study and calculating the standard time; allowances; job description; production studies; synthetic time;
- Wage structure; payment by results and incentive schemes;
- Factory managemement; e.g. simplification, standardization and specialization of design; production planning and control, quality control; material control; estimating and costing ; plant maintenance;
- Selection of machinery and equipment for specific product; plant layout; job evaluation; merit ratings, etc;
- Project evaluation, pre-feasibility and feasibility study assessment, product identification; introduction of new product lines;
- Formulation of supervisory and operative training within in-plant activities.

(d) Training Courses for Maintenance Engineers

The programme must be immediately introduced owing to the deteriorating situation in the field of repair and maintenance activities in Ethiopia's industrial sector.

Time period for this course will be from two to three years.

Lack of maintenance facilities and particularly the requirement of spare parts jeopardising the day to day normal running of Ethiopia's industrial activities. It is essential that the Government of Ethiopia should make a closer assessment for the need of skilled maintenance engineers and the volume of spare parts required in the priority industries sector. The increasing complexity and importance of maintenance engineering warrants a marked increase in training of machine operators and maintenance operatives. Efficient and economic production requires plant and equipment to be operated and maintained correctly. When breckdowns occur, rapid diagnostic and remedial actions are required. This challenge can only be met by a full understanding and detailed working knowledge of the particular plant and equipment, on the part of a qualified maintenance engineers.

The course should be designed for:

- Service maintenance training programme

- Spare parts manufacturing training programme

These two programmes should ljointly include the following activities:-

- The development of the service engineering function in industry and its integration into the main organizational structure.

- The development of organization, establishment and control for maintenance engineering.

- The development of drawing-office practice which must include:

  (a) Plant characteristics and layouts appropriate to the maintenance function.

  (b) Methods of drawing projections - dimensioning - limits-fits-tolerances.

  (c) Drawing numbering and recording system.

- The development of organization and management for maintenance engineering and jobbing work at workshop level.

- The development preventive maintenance schemes.

- The in plant training on inspection and maintenance

- Training for comprehensive practice on purchasing, store keeping and warehousing for industrial plant maintenance.

- Training on Transport and Communication which contributes to the maintenance function.

- Training on costing and finance for maintenance control and accountability.

(e) Other Major Training Programmes to be Organized in particular fields e.g.

- In-plant training programme for graduate, diploma holders, and successful students from the University, Technical Industries, and Technical Colleges particularly in the field of mechanical and electrical engineering for two-three years.

- Quality control and inspection courses - six months.

- Courses on machine shop practice - one to three years,

- Courses on tool room work (jigs, tools, fixtures, die making, etc.) two - three years,

- Ad hoc courses on preventive maintenances and industrial safety - eight weeks.

- Ad hoc courses for industrial design and tool designs - six months to one year.

Besides these regular and ad hoc courses, it is necessary for the Addis Ababa University to increase its activities in the field of mechanical and electrical engineering. It will be an added advantage if the University includes Industrial Engineering course at degree level along with existing courses. The mission clearly felt that without substantial numbers of industrial engineers in the industries, it is difficult for the industries to improve its present level of productivity.

Manpower Development at Higher and Middle Management Level in Ethiopia for Engineering Industries at Pre and Post University Level

The lack of experienced technical manpower is hindering the planned growth of industries particularly in the field of basic metal and engineering industries in Ethiopia. The mission feels the implementation of the following programmes at the University and Technical College level will assist the industries considerably. This can be summarised as follows:-

- The basic engineering courses e.g. Mechanical, electrical need to be redesigned to suit Ethiopia's industrial requirements.

- Introduction of Industrial Engineering course at University level will create a new dimension in the industrial development.

- Mechanical engineering course must include the specialization in Production Engineering I and II i.e. Quantity Production and Quality Production with particular emphasis to machine tools.

- Planned Post Graduate Work/Training Programme for the Graduate/ Diploma Licence holders to receive practical training in the national or subregional industries at least for a period of two to three years in specific field of engineering.

- Such Training Programme must be designed jointly by (a) University and Technical Institutional Authorities, (b) Local Government Agencies e.g. Ministry of Labour, Ministry of Industry, Ministry of Education, Ministry of Planning, Ministry of Finance; and (c) Industries of Ethiopia both public and private sectors.

- The apprentices undergone to such work/training programme must be remunerated either by the Government or by the industries or by both on a sharing basis.

- The work progress of each apprentice should be recorded and needs to be fed back to the relevant authorities.

- Where industrial training facilities are inadequate, the training programme will have to be carried out on a regional and subregional co-operation basis.

- Every medium and large-scale industries must have a training school maintenance section with appropriate plant and machinery.

Manpower Development at Skilled Technician/Workers Level in Engineering Industries

Ethiopia has a substantial shortage of engineering skilled technician and operatives. The Development Campaign has already envisaged a crash manpower development programme in addition to regular training programme so

as to raise the required manpower in the shortest possible time. Meanwhile, the Government has been endeavouring its efforts to fill the manpower gaps through external technical assistance; but it is recognised that external technical assistance cannot solve the countries basic skilled manpower requirement.

The crash manpower development programme will be implemented by the existing:-

- Technical schools:- In Addis Ababa, Asmara, Mulugeta, Buli
- Polytechnique:- In Bahardar
- University: In Addis Ababa (faculty of engineering and technology for degree and diploma including technical teachers courses)
- Training workshops: (under National Productivity Centre) 7 workshops for training in Automechanic, Metal working, Welding/plumbing/sheet metal work, Electronics, Building, Wood work and Leather.
- Education Material Production and Distribution Centre: Under Ministry of Education
- Agricultural Research Institute: For development of agricultural machines under Ministry of Agriculture
- Proposed National Centre for Industrial Research and Development

The mission feels that the manpower development at skilled technician/workers level should include the following training courses:

- General machinist e.g. turner, borar, miller, shaper, grinder, etc.
- Fitters, welders, fabricators, etc.
- High skilled tool room operatives particularly in manufacturing of jigs, tools and fixtures.
- Quality control e.g. viewers and inspectors.
- Skilled maintenance operative particularly in machine tools, transport equipment, railways, power generating equipment.
- Skilled operatives in forging and heat treatment.
- Maintenance technicians for heavy industries e.g. rolling mills, mining equipment, etc.

The above training activities require at least two to three years comprehensive training programme in each particular trade mentioned above. The mission proposes that above training activities need special consideration and mobilization of all internal resource and particularly the full utilization of proposed maintenance and repair shop, existing railway workshop and the existing training centres where in-plant training programmes can be established.

PROJECTS RECOMMENDED BY THE ECA/UNIDO FIELD MISSION

In line with the basic metal and engineering industries development programme in Ethiopia and with further reference to the existing Development Campaign outlined in the First Year Development Plan, the ECA/UNIDO field mission recommend the following important projects to be included in basic metal and engineering industries sector. Further studies are necessary in order to implement the projects listed below:-

(A)	Basic Metal Industries		
	1. Development of Iron and Steel complex - Sponge iron (pig-steel) production - Mild steel ingots - Electrode quality carbon steel. - Hardening and tempering quality carbon steel. - Carbon, carbon-manganese and silico-manganese quality spring steel. - Carbon tool steel. - Case hardening quality carbon suphur steel, etc.	Survey and Pre-feasibility study	Ethiopia
	2. Manufacture of fire bricks and refractory materials.	Survey and Pre-feasibility study	Ethiopia
	3. Further exploration of coal and coal based materials in order to utilize the potential iron ores.	Survey and exploration	
	4. Setting-up of welding electrode manufacturing unit. (This can be possible if proposed iron and steel complex manufacture Electrode Quality Carbon Steel	Pre-feasibility and subregional requirement needs to be analysed. Exploration for indigenous flux material needs to be undertaken.	Ethiopia

	5. Setting-up of small foundries for cast iron and brass shape casting at least two in each industrial dustricts.	Possibility study is required. These proposed foundries will assist in producing shape castings for rural small-scale industries	Ethiopia
	6. Manufacture of brass ingots (Cu and Zn) and subsequent semi-finished and finished brass products. e.g. Brass water fittings valve, impellers, etc. with local copper resources.	Feasibility study is required.	Ethiopia
	7. Introduction of S.G. Iron castings and malleable castings for the spare parts and shape castings for capital goods development in proposed central foundry complex for spare parts workshop.	Further study must be included in the existing project.	Ethiopia
	8. Hot (cross) rolled sheets (average 5 mm. thick and 480 to 700 mm. width for agricultural discs etc.)	Detailed study is required and should be included in item 1 (above).	Ethiopia
(B)	Engineering Industries		
	Manufacture of Capital Goods, Intermediate Goods and Durable Consumer Goods by End Products		
	9. Ferrous die-cast component manufacture for pipe fittings, flanges, rings (carbon, alloy and stainless flanges), elbows, toes, crosses, reducers, bends, nipples.	Pre-feasibility study is required and can be included in existing spare parts whorkshop project	Ethiopia
	10. Manufacture of simple machine tools expanding existing railway workshop.	Pre-feasibility study is required	Ethiopia
	11. Manufacture of non-ferrous die-cast components for automobile spare parts, household requirement, railway application.	This study must be carried out in conjunction with Item No.6 above.	Ethiopia

12.	Manufacture of animal drawn and simple power operated agricultural machinery: cultivators, tillers, planters, seeders, reapers, etc.	Feasibility study required and can be included in the Ethiopia Metal Tools Ltd.	Ethiopia
13.	Manufacture of automotive ancillary parts and spare parts: - Radiators, exhaust pipes, brake linings, clutch facings, automotive brake slack adjusters, brake drums. - Filters, gaskets, armature rewindings, fanbelts, brake shoes, copper rivots, etc.	Market study and pre-feasibility study is required	Ethiopia
14.	Manufacture of hardware e.g. bolts, nuts, rivetts screws, locknuts, machined screws, pins, split pins, etc.	Market study and feasibility study is required.	Ethiopia
15.	Forged mechanical hand tools e.g. hammors, pliers screw drivers and small tools.	Feasibility study is required. Export market opportunity exists in subregion.	Ethiopia
16.	Manufacture of agricultural and industrial pumps. (Electric and non-electric).	Feasibility study is required.	
17.	Manufacture of kitchen utensils and cooking ware and hospital and cantean equipment. - Stainless steel cutlery - Aluminium/stainless steel pots, pans, etc. - Hospital, canteen and industrial equipment.	Feasibility study is required and expansion of existing two factories	Ethiopia
18.	Manufacture of metal cans for food industries. Product must include CTS cans, general line containers and clousers (Plain and Lithographed).	Feasibility study is required.	Ethiopia

	19. Manufacture of Bayonet type caps for: - Miniature lamps - Standard lamps - Fluerescent lamps	Potential export market opportunity.	Ethiopia
	20. Manufacture of razer blades.	Feasibility Study is required.	Ethiopia
	21. Manufacture of fabricated stainless steel vessels for small and bulk delivery of milk and liquid chemicals.	Can be included in Sabean Kalit steel expansion project.	Ethiopia
	22. Manufacture of gem clips, paper pin, hair pin, clips, buttons, hangers, etc. in small-scale sector.	Group feasibility study is required.	Ethiopia
	23. Manufacture of electrical accessories, e.g. switch gear, plugs and sockets, for 220 v. house supply, etc. including armature rewinding.	Group feasibility study is required	Ethiopia

INTEGRATED DEVELOPMENT PROGRAMME OF PRIORITY PROJECTS IN BASIC METAL AND ENGINEERING INDUSTRIES IN ETHIOPIA

Proposed sequence of programming of the projects in basic metal and engineering industries development in Ethiopia.

ABBREVIATION (GOVERNMENT INSTITUTIONS)

CPSC - Central Planning Supreme Council
MI - Ministry of Industry
MMPWR - Ministry of Mines, Power and Water Resources
MTC - Ministry of Transport and Communications
ME - Ministry of Education
MLSA - Ministry of Labour and Social Affairs
MA - Ministry of Agriculture
MF - Ministry of Finance
MCT - Ministry of Commerce and Tourism
NMWC - National Metal Works Corporation
NPC - National Productivity Centre
HASIDA - Handicrafts and Small-Scale Industries Development Agency
AIDB - Agricultural and Industrial Development Bank
P - Private Industry

Squence of Programming

(A) BASIC METAL DEVELOPMENT PROGRAMME

No.	Project Title	Refer Page	Source of Abbreviation Shown in Page 106	Government Implementing Agency Refer Page 106	Period of Development
1.	Proposed UNIDO study mission for integrated mineral survey and exploration project.		PIU (Proposed)	MMPWR	1979-80
2.	Establishment of a Central Ores Testing and Metallurgical Laboratory.	76	PIU (Proposed)	MMPWR	1980
3.	Survey and pre-feasibility study for iron ores exploration Wollega region.	72	PRU (Existing)	MMPWR	1979-81
4.	Survey for lignite coal in Nejo area.	73	PRU (Existing) PIU (Proposed)	MMPWR	1979-80
5.	Survey and pre-feasibility study of copper and Zinc deposits at Adi-Nefas and Debarwa.	73	PRU (Existing)	MMPWR	1978-80
6.	Survey and pre-feasibility study of Manganese at Gedem, Dalote.	73	PRU (Existing)	MMPWR	1980
7.	Survey and pre-feasibility study of Nickel at Sidamo.	73	PRU (Existing)	MMPWR	1980-81
8.	Project for the pre-feasibility study for refractory bricks at Oraden and Blue Nile Region.	73	PRU (Existing) PNU (Proposed)	MMPWR	1980-81
9.	Testing and Pre-feasibility study for processing of lignite for semi-processed coke	73	PRU (Existing) PIU (Proposed)	MMPWR	1980-81

BASIC METAL (cont'd)

No.	Project Title	Refer Page	Source of Abbreviation Shown in Page 106	Government Implementing Agency Refer Page 106	Period of Development
10.	Study on transportation of iron ores, coal etc. including power requirement	76	PIU (Proposed)	MMPWR MEC, MF	1980
11.	Feasibility study for integrated mini-steel plant for the production of direct reduction sponge iron using processed lignite (20,000 tons/year) and steel rolling mill.	73 76 & 102	PIU (Proposed) PRU (Existing) PNU (Proposed)	MMPWER MI, NMWC, MLSA, MTC, MF	1980-81
12.	UNIDO mission for the feasibility study of Copper Pilot Plant Project	76	PIU (Proposed)	MMPWR MI NMWC	1980-81

(B) ENGINEERING INDUSTRIES DEVELOPMENTY PROGRAMME

13.	Feasibility study for integrated foundry and central spare parts manufacturing Workshop	74	PRU (Existing)	MI NMWC MTC HASIDA ME MLSA MF	1979-80
14.	Setting-up of small foundries for cast iron and brass shape castings (Two in each province)	103 74	PNU (Proposed)	HASIDA NMWC	1980-81
15.	Feasibility study for the expansion of Ethiopian Iron and steel foundry and rolling mills.	76	PIU (Proposed)	NMWC	1980-81
16.	Setting-up of a welding electrode manufacturing plant (material from item 11 above eletrode quality steel).	102	PNU (Proposed)	NMWC	1981-82

ENGINEERING METALS (cont'd)

No.	Project Title	Refer Page	Source of Abbreviation Shown in Page 106	Government Implementing Agency Refer Page 106	Period of Development
17.	Manufacture of brass ingots and manufacture of semi-finished and finished brass products)	103	PNU (Proposed)	NMMC	1982-83
18.	Introduction of S.G. Iron casting and malleable castings for the spare parts and shape castings for capital goods development in item 13 above.	103	PNU (Proposed	NMMC	1980-81
19.	Manufacture of hot rolled sheets (average 5mm thick and 480 to 700 mm. width for agricultural discs and related products (should be linked with item 15 above).	103	PNU (Proposed	NMMC	1983-84
20.	Ferrous die-cast component manufacture for water fittings, matt tools etc. in existing pipe factories.	103	PNU (Proposed)	NMMC	1981-82
21.	Manufacture of non-ferrous die-cast components etc. (can be integrated with item 17 above)	103	PNU (Proposed)	NMMC	1982-83
22.	Manufacture of simple machine tools in existing railway workshop	103	PNU (Proposed)	MI MTC NMMC	1982-83
23.	Manufacture of animal drawn and simple power operated agricultural machinery (Expansion of Ethiopian Metal Tools Ltd)	104	PNU (Proposed)	NMMC	1980-81
24.	Assembly and gradual increased manufacture of Agricultural Tractors and implements upto 35 HP. (Proposed 3500 Tractors per year)	74	PRU (Existing)	NMMC	1979-80

ENGINEERING METALS (cont'd)

No.	Project Title	Refer Page	Source of Abbreviation Shown in Page 106	Government Implementing Agency Refer Page 106	Period of Development
25.	Manufacture of water fitting in Seaben and Kaliti Steel (item 20 can be integrated)	76	PIU (Proposed)	NMMC	1980-81
26.	Feasibility study for the integrated kitchenware factory (Expansion of existing two factories).	104	PNU (Proposed)	NMMC	1979-82
27.	Manufacture of Agricultural and Industrial Pump (supporting project of UNIDO. Hand pump and wind mill research (ETH/77/013).	75 104	PNU (Proposed) PRU (Existing)	NMMC9 (Science and Technology Commission and Water Research Authority)	1979-81
28.	Project on integrating the two pipe factories SABEAN and KALITI STEEL	75	PRU (Existing)	NMMC	1979
29.	Project for the Bus Body manufacture (35 seater) (Existing Track Assembly Plant can be extended)	74	PRU (Existing)	NMMC	1980-81
30.	Expansion project for 200,000 sickle of Metal Tools Ltd.	74	PRU (Existing)	NMMC	1979-80
31.	Expansion project for Rivet Manufacture and Door Hinge manufacture in metal tools Ltd.	74	PRU	NMMC	1979
32.	Installation of Industrial Estates in each province		PNU (Proposed)	MI HASIDA	1979-84
33.	Expansion of existing small foundries	74	PRU (Existing)	HASIDA (P)	1979-80

ENGINEERING METALS (cont'd)

No.	Project Title	Refer Page	Source of Abbreviation Shown in Page 106	Government Implementing Agency Refer Page 106	Period of Development
34.	Implementation of 98 identified small-scale projects (see Appendix II) As identified by the Government of India mission.	74	PRU (Existing) PNU (Proposed)	HASIDA (P)	1979-80
35.	Manufacture of Hardeware, bolts nuts etc.	104	PNU (Proposed)	NMMC	1979-80
36.	Manufacture of forged mechanical hand tools	104	PNU (Proposed)	NMMC	1981-82
37.	Integrated plant for the manufacture metal cans for food industries etc.	104	PNU (proposed)	NMMC	1979-81
38.	Manufacture of bayonet type caps for lamps	105	PNU (Proposed)	NMMC	1981-82
39.	Manufacture of razor blades	105	PNU (Proposed)	NMMC (P)	1982-83
40.	Manufacture of fabricated stainless steel vessels etc.	105	PNU (Proposed)	NMMC	1979-81
41.	Manufacture of Electrical accessories etc.	105	PNU (Proposed)	NMMC	1980-81

(C) PROJECTS FOR TRAINING CENTRE, EDUCATION, RESEARCH, TRAINING AND MANPOWER DEVELOPMENT FOR BASIC METAL AND ENGINEERING INDUSTRIES DEVELOPMENT

Sequence of Projects

No. Project Title	Refer Page	Source of Abbreviation Shown in Page 106	Government Implementing Agenc, Refer Page 106	Period of Development
42. Establishment of a metallurgical laboratory, quality control and training centre for Ethiopian Iron and steel foundry.	75 76	PIU (Proposed)	MIMC	1979-80
43. Project to set up a training Centre for proposed iron and steel complex	76	PIU (Proposed)	MMPHR	1980-81
44. Feasibility study for metal development and training centre	76	PIU (Proposed)	MMC MLSA TE	1980-81
45. Strengthening of the Geological survey (UNDP/ETH/71/537)	74	PRU (Existing)	Institute of Geological survey	Ongoing project
46. UNDP Project of Training for Rural Electrificiation (ETH/)/001)	75	PRU (Existing)	Ethiopia Government	On going project
47. Proposed National C tre for Transfer of Technology (ETH/77/001)	75	PRU (Existing)	NPC and UNCTAD/ UNIDO	1979
48. Assistance to the National Productivity Centre for in-plant training advisory service (ETH/77/009)	75	PRU (Existing)	MI and ILO	On going

PROJECT FOR TRAINING (cont'd)

No. Project Title	Refer Page	Source of Abbreviation Shown in Page 106	Government Implementing Agency Refer Page 106	Period of Development
49. Assistance to Industrial projects Development (ETH/75/008)	75	PRU (Existing)	MI and UNIDO	Ongoing
50. Handicraft and small-scale Industries Development (ETH/77/018)	75	PRU (Existing)	HASIDA and UNIDO	Ongoing
51. Establishment of quality control and testing centre (ETH/79/003)	75	PRU (Existing)	Ethiopia standard Institute and UNIDO	Ongoing
52. Project on Rural Radio-call service (ETH/78/027)	75	PRU (Existing)	MTC and ITU	Ongoing
53. Labour intensive rural road construction (ETH/78/019)	75	PRU (Existing)	Rural Road Authorities and ILO	Ongoing
54. Programme for Higher and Middle Management Development - Training courses for Senior Executives - Training courses of young managers. - Training courses for Industrial Engineers. - Training courses for maintenance engineers.	100	PNU (Proposed)	NPC ME MI	2 years
55. Post graduate training programme for graduates engineers/Diploma holders.	100	PNU (Proposed)	ME	2 years

PROJECT FOR TRAINING (cont'd)

No.	Project Title	Refer Page	Source of Abbreviation Shown in Page 106	Government Implementing Agency Refer Page 106	Development
56.	In-plant quality control inspection courses.	99	PNU (Proposed)	NPC	1 year
57.	In-plant courses on machine shop practice	99	PNU (Proposed)	NPC MI	3 years
58.	In-plant courses on tool rooms work.	99	PNU (Proposed)	NPC MI	4 years
59.	Ad-hoc courses on preventive maintenance	99	PNU (proposed)	NPC MI	6 months
60.	Ad-hoc courses on Industrial Design and Tool Design	99	PNU (Proposed)	MIMC NPC MI	6 months
61.	Introduction of Industrial Engineering courses at University/ Technical College level.	96	PNU (Proposed)	ME	2 years
62.	Introduction of special courses for engineering design and draughtsmanship	99	PNU (Proposed)	ME NPC MI	2 years
63.	Skilled technician/workers training courses. - General machinest - Fitters, welders, fabricators - High skilled tool room operatives - Quality control-viewers/ inspectors - Skilled maintenance operatives - Skilled operatives for forging and heat treatment - Maintenance technicians for heavy industries	101	PNU (Proposed)	MLSA NPC MI ME	6 months to 1 year

THE ROLE OF ECA/UNIDO/OAU IN PROGRAMMING THESE PROJECTS ACCORDING TO ECA WORK PROGRAMME (1980-81)

The programme for Industrial Development by Joint ECA/UNIDO Industry Division envisages development of basic industries in Basic Metals and Engineering industries sector. The objective of this programme will be to assist the African developing countries in identifying and formulating sectoral policies, strategies, targets, plans, programmes and priority projects and in the promotion and implementation of projects, creation of relevant institutional machineries and manpower development taking into account inter-sectoral and inter-economic linkages and maximum encouragement on resource based import substitution industries.

Ethiopia imports capital, intermediate and consumer goods against either cash crops experts or the export of minerals and thereby completely depend on developed countries for her industrial development aspects. The aspiration for self-reliance and economic development of Ethiopia calls for the development of basic engineering and metal industries. The development of basic metals and engineering industries improve productivity and production not only of its own sector but also for other important economic sectors e.g., agriculture, transport, mineral exploration and very many interlinked industries.

Therefore, the roll of ECA/UNIDO/OAU will encourage Ethiopia to improve and expand these two vital sub-sectors of industries through an integrated development based on fundamental needs for basic development (the parameters for these development as outlined in Chapter VI are reflected in the ECA/UNIDO Mid-Term Programme individual activities during 1980-81.)

These activities are as follows:-

(a) Evaluation survey on policy, strategy planning, technology and training development in selected African countries,

(b) Export working group meeting to finalize the areas for development particularly in the priority sectors as indicated in (a).

(c) Evaluation mission to assess the potential development of basic steel production, foundry, forging, and related resources based on industries development,

(d) Formulation of a market survey and pre-feasibility study mission based on 'c' for the possible manufacture of spare parts, accessories, agricultural tools and power generating parts,

(e) Assist the countries on technical manpower development through seminars,

(f) Mounting another evaluation mission to explore the possibility of local manufacture of machine tools in existing railway workshops or large repair and maintenance workshops with reference to (c) and (d).

(g) A workshop to examine and to set plan of action of integrated development of basic metals and engineering industries projects, for basic steel production, foundry, forging, machine tools, spare parts and technical manpower development required in these two sectors.

Therefore, ECA/UNIDO/OAU will greatly participate in assisting the Government in formulating these programmes which are already highlighted in this report.

CHAPTER VII.

SUMMARY AND RECOMMENDATIONS

Summary

- As mentioned in Chapter III, Ethiopia's economic situation has been adversely affected due to the following reasons:

- Owing to the civil effort
- recent decline in world prices for hides, skins, pulses and oil seeds coupled with falling in national production and productivity
- continued dependence on foreign countries for essential capital goods, intermediate goods, durable consumer goods and consumer products
- lack of essential spare parts in the vital industrial sector of industries which created random breakdown and responsible for low production in industrial sector
- unsatisfactory performances in the nationalized industries since their take over in 1974 particularly difficulty in providing adequate institutional machinery for effective running of the industries
- excessive growth of money supply without sufficient agricultural and industrial production since 1974
- lack of foreign investment particularly in the industrial manufacturing sector due to lack of confidence after nationalization
- serious deterioration in the foreign exchange reserve in recent years

The recent re-organization of selected Ministries, introduction of Central Planning Supreme Council, and the formulation of First Year Development Programme through an effective campaign for industrial and agricultural development will no doubt plough a new furrow into the future industrialization in Ethiopia. It is expected that a general recovery of the economy may occur during 1979/81 due to the various rational measures and administrative changes that are being implemented by the Ethiopian Government.

The policy, strategy and measures set out by the Ethiopian Government includes the development of iron and steel and the engineering industries. The First Year Development Plan can be treated as rehabilitation programme which includes an integrated foundry and spare parts manufacturing workshop. In line with the governments development plan, this report highlights mainly the priority areas for the development of basic metal and engineering industries in Ethiopia.

This report further elaborates the development of institutional, and technological requirements and manpower development of priority projects in order to implement an integrated development of basic metal and engineering industries in Ethiopia.

The Chapter III has reviewed the pre and post economic situation of the revolution in Ethiopia with particular reference to the industrial and manufacturing sectors.

In the same way, Chapter IV has examined the present status of basic metal and engineering industries in Ethiopia. The chapter further highlights the existing functions of Government machinery, level of technology Ethiopia has so far achieved, with a brief coverage on specific priority projects in basic metal and engineering industries identified by the Government of Ethiopia and ECA/UNIDO mission. The sectoral and sub-sectoral constraints in metal and engineering industries are also examined in this section of the report.

The Chapter V the paper has reviewed the country constraints that are jeopardizing the continued and systematic growth of the basic metal and engineering industry sectors. These constraints are lack of institutional co-ordination and co-operation, too many corporations in the industrial sector controlling the industries, lack of management and industrial consultancy services, lack of product development and design facilities for industrial and engineering products, lack of facilities for product identification, and prefeasibility studies, lack of common services facilities, industrial estates and ancillary industries development and finally the lack of skilled manpower in higher and middle management levels, and skilled operative level in the vital sectors of industry.

In order to overcome all these country constraints and set the conomy in better footings, the report suggests in Chapter VI an integrated approach for basic metal and engineering industry development programme for Ethiopia. The report has identified the Government institutions those are primarily responsible for the implementation aspects for such development programme and proposes the creation of Ethiopia Development Corporation for the integrated development aspects and controlling and expanding all existing engineering and industrial enterprises now under various corporations. Introduction of a National Technology Plan in order to interlink the institutional and technological aspects for integrated development of metal and engineering sector will be the backbone of the entire development process. The management and manpower development will be another important aspect of this interlinked development activities. Within this framework this report further suggests the Government of Ethiopia to establish a comprehensive sequenced development programme for the basic metal and engineering industries which includes:-

- Projects those are identified by the Ethiopian Government; - page 72
- Projects those are identified by the ECA/UNIDO mission during their discussion with the Government authorities; - page 72
- Projects those are recommended by the ECA/UNIDO mission - page 102

Finally, the report highlights the role of ECA/UNIDO/OAU to assist the Government of Ethiopia in implementing this development programme for basic metal and engineering industry.

Recommendations

In line with the foregoing discussion this report recommends the following important strategy, policy and measures that should be considered for the integrated development of basic metal and engineering industries by the Government of Ethiopia.

The recommendations are as follows:

1. It is recommended to formulate an integrated sequenced development programme for basic metal and engineering industries as outline in proposed programme in Chapter VI pages 106 to 114.

2. It is recommended to create proposed Ethiopia Development Corporation and interlink this corporation with the existing institutions who are responsible for the development of basic metal and engineering industries as outlined in Chapter VI page 84.

3. It is recommended to formulate a National Technology Plan as described in Chapter VI page 89.

4. It is recommended to set up a National Centre for Industrial Research and Development and to bring existing National Productivity Centre, all Training Centres, Research Establishments including the setting up of the proposed Centre for Transfer of Technology under the umbrella of this proposed Centre as described in Chapter VI page 85.

5. It is highly recommended to interlink the institutional and technological activities as described in Chapter VI pages 90 to 94.

6. It is recommended to implement the manpower development programme for basic metal and engineering industries as outlined in Chapter VI pages 94 to 102.

7. It is recommended to introduce with immediate effect an Industrial Engineering Course as suggested in Chapter VI page 96 at University and Technical College level.

8. It is recommended to organize in-plant training courses, ad-hoc courses in selected engineering disciplines as outlined in Chapter VI pages 112 to 114.

9. It is recommended to consider and implement the projects that are necessary within the context of integrated development of basic metal engineering industries as suggested in Chapter VI pages 102 to 105.

10. It is recommended to install industrial estates in each province of Ethiopia and expand foundry, ancillary and common services facilities as described in Chapter VI page 93.

11. It is recommended that an early mission be sent from the Joint ECA/UNIDO Industry Division to discuss with the Ethiopian Government the future actions to be taken for integrated development of basic metal and engineering industries as outlined in this report.

12. It is recommended to promote small scale entrepreneurship promotion through private and co-operative participation.

Annex I

List of Persons Visited

1.	Mr. Michael G. Woldu	Head Planning Department Ministry of Industry
2.	Mr. Tadewos H. Work	Co-ordinator for Engineering Industries Ministry of Industry
3.	Mr. Nagash Tekeste	Head, Technical Department National Metal Works Corporation
4.	Mr. Zelleke Alamu	Project Analysist National Metal Works Corporation
5.	Mr. Gebeye	Plant Administrator Ethiopian Iron and Steel Foundry
6.	Mr. Solomon G. Abe	Plant Manager Akaki, Sabean Steel
7.	Mr. Yilma Haile	Technical Manager Akaki, Sabean
8.	Factory Manager	Kaliti Steel Industry
9.	Col. Alula Berhanu	Manager, Metal Tools Ltd.
10.	Mr. M. Abayineh	General Manager East Africa Aluminium Co.
11.	Mr. A. Araya	Technical Manager East Africa Aluminium Co,
12.	Mr. Nadir Valle	General Manager AMCE, Ethiopia
13.	Mr. Kebede Ali	General Manager National Productivity Centre
14.	Dr. A.C. MRELA	ILO, Adviser National Productivity Centre
15.	Mr. Dembel Balcha	Manager, Industry Department A AID Bank
16.	Mr. B. Tadesse	General Manager HASIDA
17.	Mr. W.T. Solamon	Deputy General Manager HASIDA

18.	Mr. Assefa Tilahun	Permanent Secretary Ministry of Mines
19.	Mr. Tesfaye Chemer	Head Mines Control Department Ministry of Mines
20.	Dr. Hegerssa Behzelo	Ministry of Mines
21.	Dr. Alebaw	Ministry of Mines
22.		Hungarian bilateral steel Adviser to Ethiopian Government

Annex : II

FEASIBLE PROJECT IDENTIFIED BY THE ETHIOPIAN GOVERNMENT
IN COLLABORATION WITH GOVERNMENT OF INDIA MISSION 1973

GROUP A

ENGINEERING INDUSTRIES

1. Wire nails and panel pins
2. Blue cut tacks and shoe grindery, hob nails, quarter plate, shoe shank, shoe tip
3. Roofing nails (capped)
4. Wood screw
5. Buckets, troughs, poultry feeders, milk cans and containers: all GI
6. Kerosene wick stoves and lamps
7. Carts and wheel barrow
8. Domestic Utencils: Mugs, bowls, pans, pots, kettles, milk cans, trays, lunch box, tiffin carriers, table wares
9. Bio-gas plant and equipment
10. Sickle
11. Domestic Electric Accessories: Switches, Plugs, lJunction boxes, adaptors, sockets, call bells, fuse carriers, bulb holders, ceiling roses, push buttons, automobile fuses and battery terminals
12. Industrial brushes and mops, wooden clips (stacks) and wooden coat hangers
13. Barbed wire
14. Bolts and nuts
15. Door handles, washers, roofing bolts and nuts including buckles
16. Distribution boxes
17. ACSR conductors and AA conductors for EELPA
18. Shoe eyelets
19. Bobbins for textiles
20. Structural Fabrication
21. Transmission towers for EELPA
22. Wipers blade radiator, petrol and oil caps and radiator grill for automobiles
23. Rewinding of dynamo and starter for automobiles
24. Hospital wares; kidney trays, lotion bowls, spitoons and surgical trays, forceps, scissors, sharp and blunt edges, clamps and knives
25. Balling hoops

NON-ENGINEERING INDUSTRIES

26. Washing soap laundry soap, liquid soap and soft soap
27. Safety matchs - match splints, veneers, match boxes
28. Grinding of spices such as turmeric, corriander black pepper, chillis, cumin seed etc. - Processing of curry powder
29. Retreading of old automobile tyres
30. Injection moulded plastic products by hand operated machines for manufacture of caps closures, fisher plugs, cable clips, combs, buttons soap containers, sppons, forks, cups, snacers, chess and drought pieces, dishes, bowls, plates, trays, ash trays, fountain pen parts, geometric and mathematical sets, toys, feederbottles, automobile light covers, penholders, pincushions and similar novelity items weighing upto 75 gms.

31. Fuel briquettes from agricultural waste and saw dust
32. Films and bags from polyethylene
33. Ready-made garments
34. Buttons from acrylic sheets
35. Plastic buckets and baby bath tubes
36. Milling and crushing of oil seeds
38. Blow moulded plastic containers -hollowwares like bottles, jerricans upto 5 litres capacity
39. Exercise books, file covers and flat files
40. Canned fruits, vegetables, jap jelly, marmalade, pulp, paste, ketchup, sauce processed peas and vegetables.
41. Storage battery and grid casting
42. Hisiery:- cotton, wool and mixed bfibre
43. Surgical bandages - gauze
44. Fountain pen Ink, writing Ink, liquid gum, chalkcrayons
45. Sodium silicate
46. Clay bricks
47. Dyeing and printing of cotton and wollens
48. Paper bags and envelops
49. Gummed paper tapes
50. Corrugated paper boxes and cartons
51. Shoe laces, braded tapes, chord and stove lamp wicks
52. Bakery and confectionery
53. Macaroni - spaghetti

GROUP B

ENGINEERING INDUSTRIES

1. Steel wire drawing and galvanizing
2. Copper wire drawing, tinning and electric fuse wires
3. Cables - PVC and rubber insulated
4. Lead pencils
5. Manual operated agricultural equipment: Winnowers, chaff cutters, corn shellers and cream separators
6. Gem clips
7. Paper pins
8. Staples
9. Machine screws
10. Shuttles for textiles
11. Wire healds for textiles
12. Droppers and picker sticks for textiles
13. Pilfer proof metal caps and vial caps
14. Cuttlery: Sppons, forks, knives, scissors, tin cutters, can openers, cork openers and bottle openers
15. Bib cocks (tap), screw down valves, meter boxes sanitary fittings and cast iron fleshing cistern
16. Hand stapling machines, paper punchers, staple pin removers, file clips and paper cutting machines
17. Metal zip fastners
18. Press buttons
19. Square wire nets
20. Hexagon wire nets
21. Rolling shutters and collapsible gates
22. Dusters and sprayers
23. Automobile leaf springs and coil springs
24. Tail pipe and bumper for automobile
25. Fuel filters and air filters for automobiles
26. Automobile carbon brushes
27. Hub bolts and nuts and grease nipples
28. Thimbles, cables glands and aluminium sleeves for EELPA
29. Cast iron commodes, troughs and vitreous enamelled autencils,
30. Safety pins
31. Hair pins
32. Rivets
33. Fibre cans
34. Torches
35. Tin solder
36. Awning eyelets
37. Aluminium re-rolling
38. Paints, varnishes, thinners, lacquers and paint removers
39. Compounding of Pév Resins
40. Thermo welded plastic goods like plastic rain coats, diary covers, pass book covers, purses etc.
41. Insecticides and Pesticide formulation

42. Granulated mixed fertilizers
43. Films and bags from transparent PVC
44. Absorbent Cotton - Surgical Cotton
45. Incense sticks
46. Tooth brushes
47. Industrial adhesives - Rubber based
48. Moulded Rubber Goods such as automobile engine mountings, kits, bushes, oil seals, O-rings, Ice bags, Hot water bags. Rubber stoppers, furniture shoes, vibration supressors, Erasers, mats, bungs
49. Boot polish, floor polish, car wax and wax polish
50. Cold storage
51. Dehydration of vegetables; garlic, ginger, peas, onion, potato
52. Nylon ropes, ribbons and cloth slines from plastic monofilaments
53. Nylon zip fastners
54. Vials and ampules
55. Disinfectants - Black and white phenyle
56. Nylon socks
57. Sports footwear
58. Sports costumes such as jerseys, shirts, vests, socks
59. Sport nets (all kinds)
60. Foot Ball and Volley Ball
61. Bituminised Laminated paper rolls and bags
62. Card Board from bagasse
63. Paper canes and tubes
64. Hand made paper
65. Small Tanneries.

GROUP C

ENGINEERING INDUSTRIES

1. Grain silos
2. Animal Drawn Agricultural Implements such as; Plough Shear, Mould board, Leveller and graders, Disc harrows, Seed drill, Seed and Fertilizer drill and tiller
3. Screw drivers, spanners, socket and wrench, double ended spanners, wheel spanners and pipe wrench pliers, hacksaw frame, pincers
4. Domestic Electric Appliance such as; Gysers (domestic boilers), Iron, Hot plate, Toasters, Immersion heaters, Cooking range (electric and gas) Room heaters, baking oven, Electric bells, Domestic milk pasteurizer
5. Pickers, Leather aprons, bands and Straps for Textiles
6. Hypodermic needles
7. Pressure stoves
8. Distribution LT transformers for EELPA
9. HRC cartridge fuses
10. Universal joint cross for automobiles

NON-ENGINEERING INDUSTRIES

11. Tooth paste
12. Synthetic detergent, slurry and cake, scouring powder
13. Olio resin from Chilios and ginger
14. Buttons and combs from horns
15. Petroleum Jelly
16. Duplicating Ink and post office ink
17. Baby powder, talcum powder, depilcteries, shaving and face creams, hair oil, nail polish
18. Servicing unit; electroplating and Anodising
19. Low tension insultators
20. Footwear - Microcellular rubber sandals
21. Farm belts and V-belts
22. Woven pilyethylene sacks
23. Thermometers
24. Glass syringes
25. Glass Containers and Bottles
26. Cattle feed and poultry feed
27. Rubberised fabrics
28. Basket Ball and Tennis Ball
29. Pre-Stressed Concrete poles
30. Fibres from pin apple leaves
31. Fibres from Banana Pseudostlm

GROUP D

NON-ENGINEERING INDUSTRIES

1. Bankers Yeast
2. Malt Extract from Barley
3. Insulating and cellophane tapes
4. Ball point pen ink
5. Printing Ink
6. Sensetised paper - Ferro Ammonia paper
7. Carbon paper
8. Type writer Ribbons
9. Abrasive paper and cloth
10. Dipped Rubber Goods from latex such as surgical gloves, Industrial gloves, Feederteats, Cathitar
11. Extraction of pyrethrum
12. Oxalic Acid fram sugar cane molasses
13. Essential oils fram eucalyptus, Lemon grass and any other essential oil bearing natural resource.
14. Sodium sulphide
15. Grinding of minerals like kaolin, Soap stone quartz

ENGINEERING INDUSTRIES

16. Foundry: ferrous and non-ferrous
17. Wighing equipment, weights, measures and shotputs
18. Fabrication of small flour mills, small oil mills, hand milling machine (Ghani), wind mill, pumps and parts, had operated meat mincer, hand grinder, noodle extruder, hand blowers, machine vice, bench vice and carpenters vice and clamps
19. Sockets, U-bends, Adaptors for water supply
20. Shoe lasts
21. Double operation and ground operation Switches and Fuse carriers upto 100 amp. for EELPA
22. Spindles for textiles
23. Tractor Drawn Agricultural Implements such as: Disc harrow, tillers, seed and fertilizer drill, reaper, small harvester, thrashers, seed grader,
24. corn shellers
24. Radio assembley
25. Pressure diecasting
26. Energy and water meter assembly
27. Electric motor and pumps assembly (upto 10 HP)
28. Antisurge fuse, Micro Switches, water switches and toggle switches for TELE
29. Guy wires and guy rod, shackles, cable glands and floor angles for TELE
30. Wire harness for TELE
31. Flexible telephone chord (cable) and Jumber wire for TELE
32. Insulation sleeves
33. Handsets and Telephone instrument body for TELE

34. Ringer generators, 3 watt generators and Ceramic resistor
35. Dial assembly, spring assembly, governor aor shunt assembly for TELE
36. Ignition coils for automobiles
37. Diesel engines assembly (upto 10 HP_
38. Simple machine tools
39. Bicycles assembly
40. Watches, clocks and time pieces assembly

Item	Sub-group	SITC Numbers	1972			1973				Im Et Mi US
			Import by Africa Million US$, FOB	Import by Ethiopia Million US$, FOB	Share of Import by Ethiopia %	Import by Africa Million US$, FOB	Import by Ethiopia Million US$, FOB	Share of Import by Ethiopia %	Import by Africa Million US$, FOB	
1	Total Engineering Product	7	6,093.5	64.1	1.1	8,545.9	66.8	0.8	11,400.0	
2	Total machinery, non-electric	71	2,088.6	29.8	1.4	2,601.3	26.7	1.0	3,55[illegible].4	
3	Total electrical machinery	72	835.0	15.4	1.8	1,087.5	13.0	1.2	1,588.9	
4	Total transport equipment	73	3,156.0	18.9	0.6	4,832.5	27.2	0.6	6,223.9	
5	Power generating machinery	711	253.9	4.6	1.8	330.9	4.8	1.5	427.7	
6	Steam Engines	711.1,2,3	40.4	0.1	0.2	60.9	0.2	0.3	93.7	
7	Other internal combustion engines	711.5	144.9	3.3	2.3	173.2	2.9	1.7	235.5	
8	(a)20% Agriculture use	-	29.0	0.66	2.3	34.6	0.58	1.7	47.1	
	(b)80% Engineering use	-	115.9	2.64	2.3	138.6	2.32	1.7	188.4	
9	Gas turbines	711.6	27.9	0.0	0.0	33.4	-	-	31.5	
10	Agricultural machinery	712	162.8	3.5	2.2	214.6	2.4	1.1	313.4	
11	Agricultural machinery for cultivating soil	712.1.2	41.6	1.2	2.9	54.8	0.8	1.5	79.0	
12	Dairy farm equipment	712.3	1.5	0.0	0.0	2.0	0.0	0.0	4.4	
13	Tractors	712.5	111.0	2.1	1.9	145.4	1.4	1.0	209.2	
14	Metal working machinery	715	122.0	0.8	0.6	144.5	0.7	0.5	187.6	
15	Machine tools	715.1	45.5	0.6	1.3	69.0	0.6	0.9	91.4	
16	Textile and leather machinery	717	147.8	6.4	4.3	213.5	6.6	3.1	256.0	
17	Textile machinery	717.1	126.6	3.8	3.0	186.7	4.9	2.6	217.4	
18	Sewing machinery	717.3	12.4	0.3	2.4	16.4	0.4	2.4	23.0	
19	Special Industrial machinery	718	420.3	4.1	1.0	505.9	2.9	0.6	736.1	
20	Food processing machinery	718.3	51.9	0.9	1.7	63.4	0.6	0.9	64.6	
21	Construction, mining machinery	718.4	248.7	2.3	0.9	293.6	1.7	0.6	464.5	
	(a)30%for agricultural use	-	74.7	0.69	0.9	88.1	0.5	0.6	139.4	
	(b)70%for construction use	-	174.0	1.61	0.9	205.5	1.2	0.6	325.1	
22	Mineral processing machinery	718.51	72.5	0.5	0.7	91.8	0.2	0.2	124.2	
24	Pumps and centrifuges	719.2	173.5	1.6	0.9	200.9	1.6	0.8	264.9	
	(a)40% agricultural use	-	69.4	0.64	0.9	80.4	0.64	0.8	106.0	
	(b)60% engineering use	-	104.1	0.96	0.9	120.5	0.96	0.8	158.9	

* Africa excluding South Africa and Sou

(Africa* and Ethiopia) of Engineering Products

1973		1974			1975			1976		
Import by Ethiopia Million US$,FOB	Share of Import by Ethiopia %	Import by Africa Million US$,FOB	Import by Ethiopia Million US$,FOB	Share of Import by Ethiopia %	Import by Africa Million US$,FOB	Import by Ethiopia Million US$,FOB	Share of Import by Ethiopia %	Import by Africa Million US$,FOB	Import by Ethiopia Million US$,FOB	Share of Import by Ethiopia %
66.8	0.8	11,400.0	95.8	0.8	16,703.3	83.9	0.5	19,100.5	117.5	0.6
26.7	1.0	3,554.4	35.1	1.0	5,505.5	33.9	0.6	5,977.9	42.2	0.7
13.0	1.2	1,588.9	16.6	1.0	2,382.9	15.3	0.6	2,841.6	19.2	0.7
27.2	0.6	6,223.9	43.7	0.7	8,734.9	34.1	0.4	10,161.8	51.8	0.5
4.8	1.5	427.7	5.7	1.3	600.3	4.9	0.8	720.9	7.1	1.0
0.2	0.3	93.7	0.4	0.4	103.1	0.1	0.1	122.8	0.2	0.2
2.9	1.7	235.5	3.1	1.3	349.7	3.2	0.9	397.5	5.6	1.4
0.58	1.7	47.1	0.62	1.3	69.9	0.64	0.9	79.5	1.12	1.4
2.32	1.7	188.4	2.48	1.3	279.8	2.56	0.9	318.0	4.48	1.4
-	-	31.5	0.4	1.3	74.0	0.4	0.5	89.3	0.3	0.3
2.4	1.1	313.4	5.7	1.8	533.6	3.7	0.7	437.9	4.3	1.0
0.8	1.5	79.0	2.0	2.5	140.8	0.7	0.5	87.9	1.2	1.4
0.0	0.0	4.4	0.0	0.0	6.3	0.0	0.0	6.5	0.0	0.0
1.4	1.0	209.2	3.3	1.6	357.9	2.8	0.8	323.5	3.0	0.9
0.7	0.5	187.6	0.5	0.3	191.0	0.8	0.4	293.2	0.4	0.1
0.6	0.9	91.4	0.3	0.3	154.3	0.6	0.4	157.9	0.2	0.1
6.6	3.1	256.0	5.4	2.1	406.1	6.3	1.6	442.3	5.0	1.0
4.9	2.6	217.4	4.4	2.0	360.3	5.6	1.6	396.4	4.5	1.0
0.4	2.4	23.0	0.5	2.2	25.9	0.4	1.5	26.6	0.2	0.7
2.9	0.6	736.1	6.0	0.8	1,227.4	7.6	0.6	1,321.7	11.1	0.8
0.6	0.9	64.6	1.1	1.7	133.2	2.0	1.5	125.5	0.7	0.6
1.7	0.6	464.5	3.5	0.8	744.7	3.6	0.5	774.5	6.4	0.8
0.5	0.6	139.4	1.1	0.8	223.4	1.1	0.5	232.3	1.9	0.8
1.2	0.6	325.1	2.4	0.7	521.3	2.5	0.5	542.2	4.5	0.8
0.2	0.2	124.2	0.6	0.5	256.6	1.2	0.5	300.6	3.4	1.1
1.6	0.8	264.9	2.5	0.9	414.6	2.0	0.5	514.9	2.8	0.5
0.64	0.8	106.0	1.0	0.9	165.8	0.8	0.5	206.0	1.1	0.5
0.96	0.8	158.9	1.5	0.9	248.8	1.2	0.5	308.9	1.7	0.6

SECTION 2

*ica excluding South Africa and Southern Rhodesia

Engineering Products 1973 to 1976

Item	Sub-group	SITC Numbers	1972			1973				
	SECTION 1		Import by Africa Million US$,FOB	Import by Ethiopia Million US$,FOB	Share of Import by Ethiopia %	Import by Africa Million US$,FOB	Import by Ethiopia Million US$,FOB	Share of Import by Ethiopia US$ %	Import by Africa Million US$,FOB	Import Ethiopi Millio US$,FO
24	Air conditioning machinery	719.12	25.9	0.1	0.4	34.3	0.1	0.3	43.7	0.3
25	Industrial furnaces, stokers, oven	719.13,	20.0	0.1	0.5	26.4	0.1	0.4	27.0	0.1
26	Refrigerating equipment	719.15	26.3	0.1	0.4	33.6	0.3	0.9	48.4	0.4
27	Other heating, cooling equipment	719.11.19	59.2	0.8	1.4	81.0	0.4	0.5	103.9	0.9
28	Mechanical handling equipment	719.3	153.2	1.5	1.0	184.8	1.1	0.6	294.2	1.5
29	Powered-tools, other	719.5	36.4	0.5	1.4	50.6	0.4	0.8	96.9	0.4
30	Packaging machinery	719.62	29.1	0.3	1.0	41.2	0.2	0.5	40.9	0.4
	(a) 30% agricultural use	-	8.7	0.09	1.0	12.4	0.06	0.5	12.3	0.12
	(b) 70% engineering use	-	20.4	0.21	1.0	28.8	0.14	0.5	28.6	0.28
31	Weighing machinery	719.63	8.2	0.1	1.2	10.8	0.1	0.9	13.4	0.1
	(a) 30% agricultural use	-	2.5	0.03	1.2	3.2	0.03	0.9	4.0	0.03
	(b) 70% engineering use	-	5.7	0.07	1.2	7.6	0.07	0.9	9.1	0.07
32	Ball, roller bearings	719.7	15.8	0.5	3.2	18.5	0.3	1.6	23.1	0.4
33	Appliances, parts and accessories, other	719.8,9	274.3	3.3	1.2	310.2	2.4	0.8	411.2	3.0
34	ectrical power machinery machinery	722	264.3	2.3	0.9	302.0	2.5	0.8	444.5	3.3
35	Equipment for distributing electricity	723	84.3	1.1	1.3	97.3	0.5	0.5	168.9	1.1
36	Insulating wire and cable cable	723.1	77.8	1.0	1.3	90.6	0.5	0.6	157	1.1
37	Batteries and accumulators accumulators	729.1	44.0	2.3	5.0	60.6	2.6	4.3	70.3	3.6
38	Electric Lamps	729.2	11.8	0.1	0.8	18.3	0.2	1.1	22.2	0.2
39	Valves, tubes etc.	729.3	8.7	0.1	1.0	8.7	0.2	2.3	15.9	0.1
40	Automotive electrical equipment	729.4	32.6	0.4	1.2	39.6	0.4	1.0	53.4	0.6
41	Electro-mechanical hand tools	729.6	3.7	0.1	3.0	5.3	0.0	0.0	9.2	0.1
42	Electric furnaces	729.92	16.7	0.2	1.2	21.9	0.2	0.9	28.0	0.1
43	Electric traffic control equipment	729.93	1.9	0.0	0.0	2.1	0.0	0.0	6.8	0.0
44	Railway vehicles	731	136.9	0.0	0.0	146.5	1.1	0.8	142.6	0.1
45	Electric locomotives	731.2	20.8			17.2	-	-	0.9	-
46	Locomotive, other	731.3	41.7	0.0	0.0	58.7	0.5	0.9	34.0	0.0
47	Passenger, railway	731.4,5	13.0			14.9	-		29.0	-
48	Freight; railway, tramway cars	731.6	23.2			10.2	0.5	4.9	34.5	-
49	Road motor vehicles	732	1,105.1	14.9	1.3	1471.6	20.3	1.4	2,150.0	26.0
50	Passenger motor cars	732.1	318.8	3.7	1.0	417.2	5.6	1.4	604.6	6.3
51	Buses, lorries, trucks	732.2,3,4	454.9	7.0	1.5	635.9	9.3	1.5	968.1	13.7
52	Motor cycles	732.9	41.6	0.2	0.5	48.5	0.1	0.2	62.5	0.1
53	Road vehicles other	73								

1973		1974			1975			1976		
Import by Ethiopia Million US$,FOB	Share of Import by Ethiopia US$ %	Import by Africa Million US$,FOB	Import by Ethiopia Million US$,FOB	Share of Import by Ethiopia %	Import by Africa Million US$,FOB	Import by Ethiopia Million US$,FOB	Share of Import by Ethiopia %	Import by Africa Million US$,FOB	Import by Ethiopia Million US$,FOB	Share of Import by Ethiopia %
0.1	0.3	43.7	0.3	0.7	75.6	0.2	0.3	65.3	0.2	0.3
[illegible]	0.4	27.0	0.1	0.4	45.4	0.0	0.0	58.2	0.1	0.2
0.3	0.9	48.4	0.4	0.8	60.8	0.2	0.3	65.8	0.2	0.4
0.4	0.5	103.9	0.9	0.9	169.8	1.5	0.9	228.9	0.4	0.2
1.1	0.6	294.2	1.5	0.5	633.9	0.8	0.1	507.4	3.8	0.7
0.4	0.8	96.9	0.4	0.4	121.5	0.3	0.2	119.8	0.3	0.3
0.2	0.5	40.9	0.4	1.0	67.7	0.8	1.2	75.4	0.5	0.7
0.06	0.5	12.3	0.12	1.0	20.3	0.24	1.2	22.6	0.15	0.7
0.14	0.5	28.6	0.28	1.0	47.4	0.56	1.2	52.8	0.35	0.7
0.1	0.9	13.4	0.1	0.7	17.0	0.0	0.0	21.8	0.3	1.4
0.03	0.9	4.0	0.03	0.7	5.1	0.0	0.0	6.5	0.1	1.5
0.07	0.9	9.1	0.07	0.7	11.9	0.0	0.0	15.3	0.2	1.3
0.3	1.6	23.1	0.4	1.7	34.8	0.3	0.9	36.7	0.5	1.4
2.4	0.8	411.2	3.0	0.7	649.3	3.0	0.5	820.3	2.9	0.4
3.5	0.8	444.5	3.3	0.7	728.9	3.0	0.4	785.8	1.7	0.2
0.5	0.5	168.9	1.1	0.6	275.3	1.2	0.4	244.9	2.3	0.9
0.5	0.6	157	1.1	0.7	249.5	1.1	0.4	222.8	2.3	1.0
2.6	4.3	70.3	3.6	5.0	92.6	2.4	2.6	105.7	3.8	3.6
0.2	1.1	22.2	0.2	0.9	27.9	0.3	1.1	24.2	0.1	0.4
0.2	2.3	15.9	0.1	0.6	19.1	0.1	0.5	21.3	0.2	0.9
0.4	1.0	53.4	0.6	1.1	61.2	0.5	0.8	71.1	0.6	0.8
0.0	0.0	9.2	0.1	1.1	11.8	0.0	0.0	10.9	0.0	0.0
0.2	0.9	28.0	0.1	0.4	44.8	0.1	0.2	49.9	0.1	0.2
0.0	0.0	6.8	0.0	0.0	12.1	0.0	0.0	14.0	0.0	0.7
1.1	0.8	142.6	0.1	0.07	255.8	0.0	0.0	299.8	-	-
-	-	0.9	-	-	2.1	-	-	16.2	-	-
0.5	0.9	34.0	0.0	0.0	44.9	-	-	106.9	-	-
-		29.0	-	-	79.5	0.0	0.0	63.7	-	-
0.5	4.9	34.5	-	-	53.1	-	-	25.4	0.1	0.4
20.3	1.4	2,150.0	26.0	1.2	3,467.5	28.6	0.8	3,951.1	37.9	0.9
5.6	1.4	604.6	6.3	1.0	765.8	3.5	0.5	942.6	6.8	0.7
9.3	1.5	968.1	13.7	1.4	1,760.9	16.9	1.0	1,910.1	21.4	1.1
0.1	0.2	62.5	0.1	0.16	131.1	0.1	0.08	142.1	0.2	0.1