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A BRIEF ASSESSMENT OF
THE IRON AND STEEL INDUSTRY IN ETHIOPIA ^{1/}

by

A. Negash*

* National Metal Works Corporation, Addis Ababa, Ethiopia.

^{1/} The views and opinions expressed in this paper are those of the author and do not necessarily reflect the views of the secretariat of UNIDO. This document has been reproduced without formal editing.

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I INTRODUCTION

This paper is prepared with a view to introduce the iron and steel industry in Ethiopia and to provide a brief assessment of the status of the operation. The contents in the subsequent sections show that the iron and steel industry, in spite of having started beyond a quarter of a century, is yet at an infant stage. As a foreign enclave sector, investment in the area was mainly in fast maturing and quick paying ventures regardless of the effect on the national economy. Thus the industry's contribution to the national economy by way of employment, value of production, linkage and foreign currency saving or earning was at an abysmally low level. In fact, the haphazard and unguided development of the sector had harmful effects in some areas when viewed from the national stand point.

In this report the status of small and large operations, among which a few are nationalized, handicraft and artisan operations is outlined. A brief assessment of the latter is included due to the impact these units had in facilitating agriculture in rural Ethiopia and the role they could play in the attainment of the self-reliance cornerstone laid by the Economic Declaration. With proper guidance, co-ordination and re-organization of the establishments, the iron and steel sector could play a dynamic role in the economy. With this understanding as will be found later, adequate re-arrangements are being made contrary to the passive attention it had received in the past. The report also identifies major areas of problem in particular with the nationalized enterprises and a few proposals and short-term plans envisaged are stated.

II STATUS OF THE INDUSTRY

A. Role of Cottage and Artisan Operation

The country has a long tradition in cottage and artisan operation. Local craftsmen have been able to meet the immediate needs of their locality long before the advent

of modern steel manufacturing activities which first came into the scene in the middle of the 1960's. Still, cottage and artisan operations maintain their important role in most areas of rural Ethiopia where either factory-made products are beyond reach or tend to be expensive. These artisans supply the largest segment of the rural population with a wide array of simple handicrafts including agricultural implements, household utensils, spears, swords, knives ornaments etc. As such the country owes much debt to this sector of the economy for its contribution towards maintaining the historical heritage and for the persistent effort exerted to provide the basic implements for agriculture.

A striking feature of the artisan operators, which the modern sector of the economy had not been able to attain, is their dependence on local sources of material. Except in the last 10-15 years in which time a gradual shift to scrap iron has been noticed in the vicinity of the major cities like Addis Ababa, the handicraft sector wholly depended, and still depends, on iron ore scratched from the hills or mountains in the surroundings. Although the technique of exploitation is very rudimentary, it has, however, been self-sufficient as far as raw material supplies are concerned.

In spite of the contributions the handicraft operation provides to the economy, however, it has not received its due attention except in the last few years.

Therefore, records are not available on the number of people engaged in the trade, their annual output etc. In the last two or three years, however, those around the major cities are being organized to form co-operatives to improve their operation and to assume their rightful position in the development of the industry gradually.

B. Role of small and large scale industry

1. Historical Background

Before the middle of the 1960's when the first modern and semi-integrated large scale metal manufacturing enterprise appeared in the Ethiopian industrial sector with the establishment of Ethiopian Iron and Steel Company in Akaki, the major urban centers dwelt on small scale operations for their relatively sophisticated and diversified requirements of metal products. Small industry came into the market in the early 1950's with imports as its only source of supply for materials. In the early stages of its development, its organization was simple workshop-like with a primary concentration on the production of beds, door and window frames, water tanks, furnitures and fixtures. After a slow and gradual diversification it included the production of nails, wire mesh, car body repair and modification.

It was in the second half of the 1960's that most of the modern large-scale units commenced operation. Among these the only integrated plant is Ethiopian Iron and Steel Company which depends to a significant extent on local scrap iron and imported billets and auxiliary inputs to produce re-inforcement bars, wires and nails. The others are engaged in the fabrication of imported steel into structural and water pipes, corrugated sheets, joineries, hand tools and related products.

2. Contribution to the National Economy

According to the recent survey of manufacturing industries, there were 30 establishments under the metal category with each employing more than 10 workers. Of the 30 establishments, only 5 have been classified as basic iron and steel industry since the rest mainly convert products obtained from the former group to make durable goods. According to the survey, with an employment of nearly 2,000 workers, the sector occupied about 4 percent of the total workers employed in the national manufacturing sector. The share of employment from the total national wage labour is far less than 1 percent.

With a gross value of production of around 45 million Birr, the iron and steel industry accounts for 5 to 6 percent of the total value of the output in manufacturing. The share of the value added in this sector is also about 5 to 6 percent which makes its contribution to the Gross National Product stand at a negligible 0.3 percent. In absolute term, value added of the metal sector has been between 14 and 18 million Birr. Production is primarily concentrated in materials required for construction purposes.

Foreign trade in metal products, specially when considering imports of machinery, equipments and semi-finished iron and steel products amounted to more than 210 million Birr, which was close to 45 percent of the total value of imports. Of the metal products, about 75 percent is accounted for by imports of machinery and equipment. The rest 25 percent consisted of billets, black sheets and other semi-finished products for further processing locally.

On the other hand, in spite of the rise observed in the exports of such products very recently, the absolute value is very insignificant to be given any consideration. From the total value of exports, metal products mainly manufactured iron and steel products account for a meagre 0.4 percent which amounts to 1 to 2 million Birr.

Moreover, this sector existed as a foreign enclave as foreigners were the majority shareholders in most of the enterprises. As inferred from the survey mentioned above, share-ownership to the extent of 59 percent, on the average, has been in foreign hands. Even from the remaining 41 percent the major portion was subscribed by foreign individuals residing in the country. In addition management functions and major technical operations were handled by expatriates despite the existence of

adequately trained national to occupy some of these posts. Unskilled and semi-skilled Ethiopians were employed only as simple operatives.

In general with a historical background of a quarter of a century, the sector has not developed to the extent expected and has failed to create much spill over on the economy. This, it is understood, is mainly due to the ownership structure whereby the individual investor was interested in fast maturing and early paying ventures regardless of the effect on the economy. Private profit and quicker repatriation was the rule than an exception.

3. Structure of the Metal Working Industry

The available information on the metal industry does not conform to international classification. In addition, the breakdown lacks consistency since enterprises producing more or less similar products are put under different categories. According to the annual surveys made on the manufacturing industry, production units in the metal sector are classified into the following five classes:

- (a) Iron and steel basic industries consisting of enterprises producing reinforcing bar, nails, wires, corrugated sheets, structure and furniture pipes, sickles etc.
- (b) Manufacture of cutlery, hand tools and general hard-ware which includes enterprises producing different hand tools, 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, can, household utensils, buckets, foundry products and aluminium window and door frames.
- (e) Manufacture of electrical and mechanical apparatus, like dry cell and other batteries.

It is observed that those under the iron and steel classified as basic industry contribute 61 percent of the value added in the total metal category, followed by manufacture of fabricated metal products (excluding machinery and equipments) which take-up 24 percent. Manufacture of cutlery, hand tools and manufacture of structural metal products together share 10.9 percent of the value added. The remaining 1.1 percent is taken-up by machinery and appliances which indicates that the effort exerted in the development of this class is even at a more depressed level.

C. Government Role

Eventhough iron and steel industry is basic in the development of young economies, the conditions provided in Ethiopia have not allowed the operation to assume the dynamism expected.

The role played by the government until recently, to say the least, has been very unwise. Direct participation by way of equity subscription has been limited to nearly 10 percent on the average. Apart from the incentives normally given to all types of manufacturing activities in the form of tariff barriers, income tax holidays etc. there had not been any specific encouragements to enhance the growth of the industry. As such the growth has been limited to import substituting operations. Disappointingly one finds high investment and capacities far beyond the country's requirements in a few areas while others remained without any investment. Also it is observed that competition

in the few lines for the limited market forcing one to succumb to the whims of a stronger unit with sufficient financial backing. Research in the area of product development and diversification of existing operations was non-existent. Similarly, attempts to explore possibilities of iron ore was limited.

It was only in the last two years after the nationalization of basic industries, that a clear and direct involvement by the government was thought of. Due to the dynamism and linkage effects of such an industry the government has intended to give the industry the necessary boost and has reserved the sector to remain under its direct control according to the Economic Policy Declaration of the country. To carry over the objectives stipulated in the Economic Declaration and administer existing nationalized industries the National Metal Works Corporation was established in July 1975. As the Corporation is young, all attempts since inception has been gauged to the standardization of day-to-day operations, streamlining of existing enterprises and lay the groundwork for future development in this area. As a branch of the government and according to the tasks entrusted upon it by the proclamation of establishment, the Corporation is preparing itself to achieve the main objectives stated with a view to put the industry in its rightful perspective.

Unfortunately lack of experience inherited from predecessors in the operation has been a major handicap.

D. Nationalized Industries

Following the new line the country started to pursue, basic manufacturing activities have been put under the control of the government in February 1975. Accordingly five establishments engaged in iron and steel manufacturing were put under the direct jurisdiction of the National Metal Works Corporation.

The Corporation accounts for 80-85 percent of the gross value of output in the metal category and employs over 60 percent of all people engaged in the metal operation. In addition, since most of the other plants depend on plants under the Corporation for their supplies of inputs and repair and maintenance services, the Corporation plays the major role in the development of the metal sector in the country. As a background a brief summary of the standing of plants under the Corporation is given hereunder.

1. Ethiopian Iron & Steel Co. (EISCO) & Magnotti Feriera

These two establishments are the pioneers in the history of the iron and steel industry in Ethiopia. Magnotti Feriera (Asmara) although equipped with a rolling mill has been limited to the production of nails, bed spring fencing net, galvanized and black wire from imported wire rods. EISCO, in addition to the products listed above, produces re-inforcement bars. Contrary to Magnotti, the latter plant operates an electric arc furnace with scrap iron as its main source of raw material, and rolling mill. At a production of 14,000 tons annually, both plants satisfy the market requirement to the extent of 90 percent.

2. Sabean Metal Products

Established in 1968 as a joint venture with Japanese investors, Sabean produces galvanized and corrugated steel sheets from imported flat sheets. With an average production of 14,000 to 15,000 tons annually, Sabean meets about 80 percent of the national demand. In addition to the corrugation line, a pipe plant has been installed in 1971 with an annual capacity of about 12,000 tons. As the country's consumption does not exceed a level of 4,000 tons, the facility is idle for most of the time.

3. Akaki Steel Industry (ASI)

This plant produces welded structural pipes and tubes, profile for door and window frames, galvanized and corrugated sheets and all types of sheet metal works. ASI has been in a neck-to-neck competition with Sabean Metal Products in both the pipe and corrugated sheets market since its establishment in 1972 up until the nationalization. Under the program of co-ordination envisaged by the Corporation, the two plants are in the process of specializing to cater to different markets so as to eliminate the competition and to secure co-existence.

Both Sabean and ASI producing more or less identical products were allowed to be established despite the limited market that existed in the country for such products. Thus both were forced to operate far below their attainable capacities for the last five years. With the present trend of organization and diversification plans, it is hoped that a higher utilization of the idle capacity will soon become achievable.

4. Ethiopian Metal Tools

This factory was established in 1968 under a co-operation agreement with the Polish Government. Unlike the other plants under the Corporation which concentrate more on building materials, Ethiopian Metal Tools manufactures hand tools required by the agricultural sector such as axes, pickaxes, shovels, ploughs and the like. Even though the plant has primarily been involved in the production of basic hand tools, it has, however, proved successful in producing improved agricultural implements on the basis of designs prepared by engineering units of agricultural organizations. It is hoped that the experiences gained here will serve as a spring-board for the future attempts to uplift the standards of agricultural implements used by the majority of the Ethiopian farmers. Although minor, services rendered by way of producing urgently required spare parts to a few of the industrial enterprises, has indicated that the existing manpower can be put in the central workshop intended in the foreseeable future.

III MAJOR PROBLEMS

A. Lack of a strong Domestic Resource Base

Although the role that iron and steel industry could play in a growing economy is immense, the need for a strong domestic resource for their development cannot be discounted. In this line, due to the lack of sufficient effort in the area of exploration of the potentials and inconclusive studies on the matter, an assured mineral base to be put into immediate use is lacking. Several studies made by foreign visiting experts starting in the late 19th century indicate the existing reserves of iron ore and coal to be promising. The existing supplies and the potential for hydro-electric power and water, which are required in abundance for iron and steel industry, are sufficiently available to create no critical problems. There is also a room to import other materials required in smaller quantities provided the ore supply is secured.

Needless to say, this situation has forced the country to depend on imported materials except for about 60 to 65 percent of the requirements of the rolling mill which is supplied from domestic scrap iron. As normally expected in countries in the industrialization process, the flow of capital or process scrap is small to sustain such operations even at a modest scale. In our case, production is limited to an annual melt of about 10,000 tons.

Imports of semi-finished products destined for further processing locally take about 30 million Birr annually. The dependence on foreign sources of material, apart from having a heavy burden on the foreign balance, drains much needed foreign currency for purchases of capital equipment. In addition the excessive exposure to the rising international prices has resulted in an equally instable domestic transactions coupled with unreliable and inadequate supplies.

B. Size of the Market

It is understood that scale economies have an important bearing in iron and steel industry. This being the case capacities of the installed plants are comparatively much less than similar production units operating in countries that could compete to export to Ethiopia. Moreover, the installed plants in the country operate far below the attainable capacity due to the narrow existing market for such products. This state of affairs, thus, makes the cost of production extremely high even to the extent of making the plants incompetent in the domestic market without government control.

Attempts to initiate exports to increase production and at the same time bring down costs face similar problem in a competitive international market. So the industry is entangled in a sort of a vicious circle problem which can only be overcome by diversification of production and trying to penetrate areas which have not been catered to.

C. Lack of Skilled Technical Manpower

In most cases the established plants were owned by foreigners who preferred to employ expatriates from abroad either people of their nationality or people somehow related to them. As such nationals, if existed with the specific technical background, were deprived of the opportunities of employment and those employed were not provided with a conducive atmosphere to acquire the necessary experience. This being the case, the advent of nationalization created a vacuum in the critical and key areas of operation.

Secondly, since the existing technical institutions, both at the intermediate and higher levels, are equipped to provide only with a general background in the different technical areas, specialists in metal and metallurgical fields, unless trained abroad, are not existent. Particular areas of bottleneck are in the field of product

designing and development, metallurgy, spare parts manufacturing, planning and programming of maintenance and repair, inspection and quality control, production planning and scheduling etc.

D. Problems of Spare Parts

As has been indicated earlier, all plants under the Metal Works Corporation were owned by foreign investors. As such each plant has a different origin and separate source of machinery depending on the nationality of the investor. This has created the existence of varied standards of equipments and machinery in the Corporation. Having such multi-national standards had caused sizeable difficulties to program timely spare parts acquisition and to establish systematized maintenance procedures.

In most plants machinery were originally supplied as second-hand and they are now in a state of obsolescence. In some cases producers, which manufactured the equipment are no more existent, which aggravates the situation even more.

Most serious of all, is the lack of technical documents with respect to specifications of equipment and spare parts, design drawings, blue-prints and technical instructions. This fact holds true with other industrial sectors as well. In the absence of such important information, it is evidently not so easy to order and buy spare parts and carry-out maintenance works effectively.

IV SHORT TERM PLAN

Several indications including the growth in construction activity and the need to improve the existing agricultural implements show that the consumption of iron and steel will grow at a steady pace than hitherto experienced. The depressed current per capita consumption of nearly 3 kilograms of factory-made iron and steel products in itself suffices to show the prospects that could be exploited in the future. This is the background with which the major bottleneck areas are looked into.

The limited market for the standard products in view of the existing excess capacity necessitates diversification of the end-uses to which the products are geared so that the excess can be put into economic use. Introduction of the products to a wider spectrum of consumers and penetration of markets which unto now have been inaccessible requires an aggressive demonstration work. In the short-run main emphasis will be in areas of product development and demonstration.

Secondly, imbalances in successive production units due to over dimensioning have been found to create excess capacities in some areas. Even if the market for the final output exists, it has become difficult to push up production due to lack of synchronized capacities of production equipment in the same plant. Thus bottleneck removal will receive utmost attention.

Thirdly, with an adequate analysis of the ingots produced from local scrap and with the necessary control in quality, interdependence could be created, whereby the plant with the furnace can meet the requirement of raw materials for the plant producing hand tools. Such scheme could perhaps lead to a gradual and ultimate achievement of the self-reliance goal.

Lastly, since over 90 percent of the population is dependent on agriculture, the hand tool factory should serve as a nucleus for the improvement and introduction of relatively advanced agricultural implements. To achieve this objective a research and products designing and development unit is being considered for establishment.

V P R O P O S A L S

A. Exploration and Exploitation of Iron Ore and Coal

Industrialization based on imported machinery and raw material apart from having negligible linkage effects on other sectors, inhibits a strong foundation for future development. In this case a strong and concerted effort must be exerted to secure the basic raw materials from within. Of course, foreign know-how, technology and investment is extremely important. With this understanding,

the Economic Declaration has made it clear that private investment by way of a joint venture is welcome.

The need to strengthen the effort in the mining area become even more imperative with the dwindling and unreliable supplies of scrap iron available in the country. However, in the interim period, assessment is being initiated to identify the amount of scrap available, possible annual flow to the existing stock and also to locate the areas where it is available, to avert immediate shortages. But in the long-run it will be necessary to find ways and means to use the existing iron ore resources to meet part of the countries requirements of semi-finished products.

B. Training of Personnel

Another priority area especially in light of the immediate problems is naturally the development of the human resource particularly in the technical fields. Formal training both within and abroad to un-keep the skill of the existing workers is indispensable. Training in specialized areas should be encouraged to avoid likely problems that could arise in due course of the growth of the industry. Equally important, exchange of experience with countries at the same level of development and with advanced countries can have fruitful results. Since the advancement of indigenous technology and know-how rests on the availability of adequately trained manpower, technical assistance is extremely vital.

C. Need for a Technology Center

The market in developing countries for most metal products is very small to warrant the establishment of the minimum plant capacity in their home country. The situation is exacerbated by the fact that the technology to be imported from the developed countries necessitates the existence of a large market for most products. In addition the tendency in developed countries is towards more labour-saving techniques of production contrary to what the labour proportion and factor costs in developing country may allow. To improve

the situation, it will be important to establish a center to study the objective condition in the developing countries so that productive techniques can be geared towards their needs. Thus such center on a national and regional level must be established to develop indigenous technology and disseminate the results on the national and regional levels.

BASIC DATA ON METAL WORKING INDUSTRY IN ETHIOPIA

	<u>1972/73</u>	<u>1973/74</u>	<u>1974/75</u>
1. Number of Establishments	30	30	29
2. Total Employment	1,955	1,973	1,809
As % of total industrial employment	3.6	3.4	3.0
3. Gross value of production (Million Birr)	45.3	49.7	46.5
As % of total industrial value of production	5.9	5.6	5.3
4. Value of Fixed Assets (Million Birr)	21.0	16.2	14.1
As % of total industrial Fixed Assets	5.4	3.8	3.7
5. Investment (Million Birr)	1.4	0.5	0.4
As % of total industrial investment	3.1	1.3	1.6
6. Production of Major Items (Tons)			
Reinforcement Bars	11,965	9,479	6,233
Wires	977	409	233
Nails	2,833	2,353	1,651
Steel Structures and pipes	N.A	1,625	1,702
Corrugated Sheets	12,852	10,534	12,039
7. Value added by structure of metal industries (M. Birr) -			
Basic iron and steel	8.8	11.2	10.1
Cutlery, hand-tools and general hardware	0.9	0.7	1.1
Structural metal products	0.8	0.8	0.9
Fabricated Metal Products	3.4	5.3	2.6
Electrical machinery, apparatus & appliances	0.2	0.1	0.2
Total value added in metal industry	14.1	18.1	14.9
8. Value of production in nationalized metal industry (M. Birr)	42.5	41.0	32.1
9. Gross domestic from manufacturing (M. Birr)	236.8	266.3	308.8
10. Gross national product at factor cost (M. Birr)	4,595.7	5,104.4	5,073.4
11. Value of exports of metal sector-including machinery and equipment (Million Birr)	0.3	1.1	2.2
12. Total value of exports from Ethiopia (Million Birr)	380.1	493.6	547.3
13. Value of imports of metal products including machinery and equipment (Million Birr)	214.0	194.0	225.0
14. Total value of imports into Ethiopia	428.5	442.3	577.3

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