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Analyzing Industrial Development, Market performance, and Competitiveness

Case study on
AWASH MELKASSA ALUMINIUM SULFATE
AND
SULFERIC ACID SHARE COMPNAY

Advisor
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ANALYSIS INDUSTRIAL DEVELOPEMNT, MARKET PERFORMANCE AND COMPETITIVENESS

Case study on: Awash Melkassa Aluminum Sulfate Sulfuric Acid Share Company (AMASSASC)

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List of Abbreviation used

1. Awash Melkassa Aluminum Sulfate and Sulfuric Acid Share Company	AMASSASC
2. Ton per year	tpy
3. Addis Ababa Water and Sewerage Authority	A/AW.S.A.
4. Single Super Phosphate	SSP
5. Sulfuric Acid	H_2SO_4
6. Aluminum Sulfate	Al_2O_3
7. Ethiopia Mineral resource Development Share company	EMDSC
8. National Chemical Corporation	NCC
9. Dicalcium phosphate	DCP

Abstract

The purpose of this thesis is to analysis industrial development relative to the importance of Awash Melkassa Aluminum Sulfate Sulfuric Acid Share Company product to different sub-sector in Ethiopia. It is evaluated integrated development of AMASSASC products like aluminum sulfate and sulfuric acid to other industries, and it is seen the contribution of the company product with other sub-sectors and analysis contribution to the development of industries. AMASSASC market performance and competitiveness is evaluated by considering internal and external factors that affected its market and competitiveness. Some of the factors included on this thesis that affected the company market performance and competitiveness are analyzed based on the current economical, political, social and technological factors.

In order to evaluate its market performance and competitiveness of AMASSASC different analytical tools are used, some of them are: PEST analysis, SWOT analysis, cause and effect diagram, Pareto analysis and cost analysis are used. By using PEST analysis the market performance it evaluated by considering the current political, economical, social and technological conditions of the country. Using SWOT analysis the competitiveness of the company is seen based on the strength, weakness, opportunities and threats the company has and faced, and in this thesis it is looked mainly its weakness opportunities and weakness threats. It is also described in the cause and effect diagram the possible causes why the company is not competitive, and by using Parato analysis it is described the vital few and trivial many problems that make the company not competitive.

The results of the study indicate that the company has low demand in the country, high idle time expense, and has high production costs. The main consumer of the product of aluminum sulfate is A/AWSA should be given much consideration by providing the pre-requisite product hydrated lime, this could be achieved by working in coordination with product of hydrated lime.It is observed that the successful development of the sub-sectors plays a main role for AMASSASC to product at full capacity. It is therefore must focus on strategy in promoting the product and look for market distributing channel, and study the domestic and neighboring country demand and buying price.

Chapter One

Introduction

1.1. Statement of the problem

Ethiopia is rich in agricultural and mineral resources; there are industrial raw materials that are not adequately processed yet. The structure of industry is basically oriented to the production of consumer goods and is overwhelmingly dependent on imported raw materials and other factor inputs. Although there is scope for forward and backward integration of industries within each sub-sector and between sectors (e.g. agriculture - industry linkage) there are problems in industrial development, market performance and competitiveness in different sub-sectors.

Since the beginning of industrialization, different industries have emerged in the development of one sector depending on others. One industry depends on raw material or input on the product output of other industries. Due to many application of sulfuric acid, these days most industries are dependent on sulfuric acid, and this product is considered to be a sign of the industrialization. Most industries use aluminum sulfate and sulfuric acid as an input or as a raw material for different processing stage.

The manufacturing industry in Ethiopian is a modest contributor to the country economy and employment. The manufacturing industry among other major sub-sectors consists of the chemical sub-sector that did not show significant growth and transformation over the past decade due to very low capital investments and there are no large-scale in sub-sectors that take the product as an input. But the chemicals industry's significant role as producer of intermediate and final products is beyond doubt. Efforts had thus to be made to promote industries in the sub-sector, but there is not much progress seen in the users of chemical products.

This days the main products of AMASSASC are aluminum sulfate and sulfuric acid. Aluminum sulfate is mainly used for the treatment of drinking water, cola, textile pulp, and paper production industries are users of the product. Sulfuric acid is widely consumed by the manufacturing industry sub-sector such as textiles, leather, car battery manufacturing factories and beverages industries are some of the users.

The raw material inputs required for the production of aluminum sulfate are all locally supplied except aluminum hydroxide, which has to be imported, but in small quantity. Kaolin is the main raw material and it is supplied by the Ethiopia Mineral resource Development Share Company (EMDSC) from Borena Zone of Oromia Region. Similarly, the inputs for the production of sulfuric acid are supplied from domestic sources except sulfur, which has to be imported. Thus, the project is partially based on local resources and it is expected to contribute considerably to the development and exploitations of local resources.

Awash Melkassa Aluminum Sulfate and Sulfuric Acid Share Company uses relatively larger and modern technology, but the company could not produce at its full capacity. Under the new economic environment the project does not have sufficient market for its products. The existing as well as forecasted demand provides sizable opportunity for the company but it did not allow it to operate as a viable commercial entity above its break-even point current years. AMASSASC could not produce at its full capacity and could not sell its product substantial quantity because of different constraints. The first main reason is in the past one year the company could not produce at its full capacity is due the Addis Ababa Water and Sewerage Authorities is not purchasing aluminum sulfate for water purification instead using substitute imported product of polyelectrolite chemicals. Neither such water purification plants come into existence in spite of pure delivery of water needs of the country as anticipated during the feasibility study of AMASSASC. In addition to the above problem industries or sub-sectors in Ethiopia do not have large capacity to use AMASSASC's product as a raw material, and most industries investigated to be establish are not developed and there is slow industrial development in the country which has affected the market performance of AMASSASC, the situation is common with most projects that have huge investment costs. In addition there is poor marketing effort by AMASSASC to sale the product for different customers.

The project was expected to operate at 52% capacity for aluminums sulfate during the initial year producing 7027 tones and at 33% capacity for sulfuric acid producing 5722 tones. Capacity utilization was also expected to increase steadily in the subsequent years as the demand for end products increase. At full capacity, the project was expected to produce aluminum sulfate and sulfuric acid at 13600 tones/annum and 17000 tones/annum, respectively, but part of the sulfuric

acid will be used as an intermediates input for the production of aluminum sulfate. To date the company productions have not increased to reach even capacities expected of productions. Though the company has capacity to produce 17000 ton per year of sulfuric acid, but it did not sell more than 6000 ton per year in the past five years (2001-2005), one of the main reasons is due to Addis Ababa Water and Sewerage Authority is using alternative product that substitute aluminum sulfate, and also the product of AMASSASC these days have lesser demand in the market. On the other hand occasionally those, which are imported, sold with lesser price. Even though this company has capacity production of 13600 aluminum sulfate and 17000 sulfuric acid ton per year, demand in the country is less than 7000 per year aluminum sulfate and on average 582.116 ton per year sulfuric acid sold in the domestic market.

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The products of AMASSASC vital and necessary to many other industries in the country to processed as raw material. Some of the industrial sectors that use sulfuric acid and aluminum sulfate are: Leather, Soap, textile, Sugar, paper and pulp industries. In addition it is used in flower production, mining areas, pharmaceutical, and water treatment, schools …etc.

Due to market difficulties and other constraints the company is becoming less competent in the market, and could not produce at its full capacity and sell its product. Addis Ababa Water and Sewerage Authority accounts for 66% of the sales of aluminum sulfate. It can be said the existence of the factory as is entirely dependent on one organization and that is becoming a very serious problem now because A/AWSA is using alternative product these days.

Ethiopia as developing country will have to reassess domestic industrial performance and development and production with a view of taking advantage of the opportunities offered by globalization. In addition to this, the free market policy in the country forces domestic industries to compete with the developed countries, which is becoming very serious problem for the industries, which are not using high technology. The government protection for this company is invaluable in order to be competitive in the domestic market; consideration should be given for domestic initiatives and investments, which is the most important contributors to the country's economic and industrial development. A great deal of potential for foreign and direct investment should be explored.

AMASSASC is using larger and modern technology, but it has faced a number of problems in producing at full capacity and even selling the product it produced and also has constraints to be competitive in the market, some of the problems are:

- The company could not produce at its full capacity and sale all its products. Although the company is considered to have a number of customers that use sulfuric acid and aluminum sulfate such as: leather, soap, textile, Sugar, paper and pulp, flower production, mining areas, Pharmaceutical, etc. However all of them purchase small quantity of the company's products .
- Major customers that purchase large number of quantity of aluminum sulfate is shifting to other sellers and other alterative products. The existence of the factory is entirely dependent on one organization major customers that utilize of aluminum sulfate accounting for about 66% of the factory product is Addis Ababa Water and Sewerage (that is very serious problem now because in 2005 and 2006 Addis Ababa Water and Sewerage Authority stopped buying the product).

- Some times production competitive dimension such as cost of selling of AMASSASC product is relatively higher than the competitor selling price and those imported product of sulfuric acid, aluminum sulfate are sold with lesser price than the company selling price..

- There is more machine idle time and failure, due to lesser demand in the market forces AMASSASC to produce less quantity in less productions days.

- There is less flexibility in new product introduction and not many research done to improve its production and market.

- Company selling price and production capacity is highly affected by external macro environment factors in which the firm operates such as: tax policy, employment laws, trade restriction and tariffs, political stability, interest and exchange rate, inflations rate etc...

- There is hardly any research work devoted to improve the industrial development, market performance and competitiveness that indicates it is neglected industries in the chemical sector.

These and other factors have affected its market performance and hinder the company's competitiveness. In spite of the potential dynamic role the company contribution to different sectors in various economies and the company has great role for the development of other sub-sectors, it is not well understood or provided with adequate support by government either in domestic or foreign market because of different reasons.

First, the need is felt for a better understanding of the role played in industrial development and market in different socio-economic settings. A search of the literature reveals no evidence that research has been conducted to show the role and impact of the company production in the industrial development and market and in the economy in general.

Second, it seems that the factory lacks appropriate recognition on the part of the Government or other sectors. The amount of investment allocated on the sub-sector which makes the company to produce at full capacity and sell its products, as well as the overall conditions instituted by the government, the amount of research work devoted to improve the industrial development, market performance and competitiveness indicate that it is neglected industries in the chemical sector.

Therefore, the need is also felt to indicate the appropriate conditions under which the industry can play a more and effective role in the development of the industries of the sub-sectors by improving market performance and its competitiveness. This thesis aims to cover trend analysis of the industrial development, market performance and competitiveness of AMASSASC focusing on especially in the area of market performance and competitiveness. In this thesis considerable effort has been made to clearly indicate the direction for improving the market performance and competitiveness of the company.

It is the recognition of these problems, which has given rise to the objectives of this study.

1.2 Objective of the study

The objective of this study is to analysis industrial development market performance and competitiveness of Awash Melkassa Aluminum Sulfate and Sulfuric Acid Share Company (AMASSASC) focusing on production, capacity utilization l, especially in the area of market performance and competitiveness.

The specific objectives of this study are the following:

i. To analyze the role of aluminum sulfate and sulfuric acid in different sub-sectors
ii. To establish the relative importance position of the company product, in the light of the analysis under the first objective;
iii. Evaluate and analyze the operational efficiency of the company, relative to market performance and competitiveness.
iv. Investigate the reasons why the company has become less competitive and does not sale its product fully and make recommendation.
v. Based on the above findings, making relevant recommendations in order to improve the market performance and its competitiveness, and sustain existing production with more efficiency within the existing business environment.

1.3. Significance of the study

As there are rapid growth of industries and market globalization, good market performance and being competitive in the market are inevitable. A clear knowledge of these particular circumstances are essential in order to better plan for the future and have strategy of development in the industry and market. This is lacking in the Ethiopian case as substantiation by market performance, competitiveness and globalization.

This study is a modest attempt to fill the information gap. Furthermore, the study will serve as a beginning to arouse the interest of other researchers to undertake extensive and intensive studies in this particular field.

The study would have significance to focus on some of the direction for improving the competitiveness of the company, and show the relative importance of company's products, in the light of other sub-sectors.

1.4 Methodology

1. In pursuit of the first objective, analysis was made on f the following:

i. The historical development of the industry

ii. Evaluate the working condition of AMASSASC product comparing with the output, employment, foreign exchange and government revenue in the development of the industries

iii. Comparing the its market performance and competitiveness.

iv. Analyze the market performance by looking into the external and internal influences on its market performance and competitiveness by using: PEST analysis, by using this analysis evaluate the company market performance considering:

1. Political factors,
2. Economic factors
3. Social factors
4. Technology factors

v. Evaluating the competitiveness of the company using strength, weakness, Opportunity and threats (SWOT) analysis,

vi. Cause and effects diagram to see why the company is not competitive

vi. Evaluating the performance using Parato analysis considering the vital few and trivial many , and also used cost analysis

Vii Analytical techniques such as average, percentages, figures as well as Qualitative methods was made and cost analysis of AMASSASC also included

2. To establish the relative importance of the aluminums sulfate and sulfuric acid Producer Company in the Ethiopia industrial development, and analysis will be made on the following:

i. The possible linkage effects within the sub-sector and different sectors of the industries, i.e. the extent to which the sub-sector purchases domestically produced inputs and production, other than importing the same products that would help the production of the company relative to the market performance and competitiveness;

ii. Government revenue, foreign exchange

The above-mentioned analysis would be made based on simple analytical techniques and comparison would be made. It considers assessing the degree of efficiency of the enterprise, in saving foreign exchange.

3. Consider determining productivity, market, performance and competitiveness situation of the company.

i. The nature and quality of the raw materials used in the production process employed to sell its product;
ii. The size and efficiency of plant;
iii. The continuity of production and the extent of effective utilization of human resource;
iv. The demand of the product in the customers side and the distribution system of the company's final products

The methods to be employed to achieve these are; estimation of production function, Visit to companies and gather all the available data, conduct interviews, proper consultation was conducted with experts in the related fields and finally survey of literature and previous research works on similar topics.

1.5 Sources of data and data collection process

This study relies on the data and information gathered from both primary and secondary sources as follows: -

1. To analyze the industrial development, market performance and competitiveness of the company, it is considered as source data obtained from the questionnaire and other source including both published and unpublished records of the company and others literatures are considered.

2. The data and information sources to provide the theoretical framework of aluminum sulfate and sulfuric acid industry in different socio-economic settings referring published documents of international agencies such as UNIDO, the World Bank, the United Nations year Book of Industrial statistics.

3. Data and information for the case study was taken from the files and records of the company finance, marketing, administrative, production, personnel departments from year 2000 to 2005.

4. From feasibility study of the company, marketing reports, international magazines, website, was considered for the development of historical information of the AMASSASC and its products.

Chapter Two

2. Background History of AMASSASC

2.1 Background of AMASSASC

The purpose of this chapter is to review the overall conditions of AMASSASC the only chemical industry in Ethiopian producing sulfuric acid and aluminum sulfate. Awash Melkassa Aluminum Sulfate and Sulfuric Acid Share Company (AMASSASC) is the biggest chemical factory in the country established through the year 1982- 1987 with an initial investment of about 108 million Birr on the total area of 14 hectares.

In any industrial establishment the main motive of implementing various techniques is profit maximization with customer satisfaction reduced at production cost. Awash Melkassa Aluminum Sulfate and Sulfuric Acid S.C. (AMASSA.S.C), with this motive produce the two major chemicals stated as indicated by aluminum sulfate and sulfuric acid.

To achieve maximum production at lower cost and at desired quality with no doubt, effective management of production, good market performance and effective competitiveness is a must.

The complete designer and supplier of the latest production machines and equipments is 'CHEMADEX, Poland based company, which has started a similar plant in Egypt some months before. The factory is designed to produce three major chemicals namely; Sulfuric acid, Aluminum sulfate, and Oleum. Currently, it is only producing aluminum sulfate an sulfuric acid [6].

2.2 An Overview of AMASSASC

Awash-Melkassa Aluminium Sulfate and Sulphuric acid Factory (AMASSAF) is located at Awash-Melkassa, 15kms from Nazareth, 100kms from the capital, on the way to Assela, which is at absolute 1600m above sea level. AMASSAF is one of the basic chemical industries established in the country. The factory produces sulphuric acid, Oleum (currently blocked), and aluminium sulfate utilizing mostly locally available raw materials.

The capacity of the plant is sufficient to fully cover the country's requirement of aluminium sulphate and sulphuric acid at the percent and for a number of years to come, thereby fulfilling the import substitution objective of the country. The products are of very high quality tot meet all necessary standards for technical application in the industries of the nation, as well as for export market. It is believed that the availability of these products especially of sulphuric acid shall spur the development of a number of technologies by users who have the vision of harnessing local resources in their industrial endeavours.

The process design production capacity of the factory is 17,000 and 13600 tones per annum (270 working days) for sulphuric acid (98% +or - 0.5 wt), Oleum (25% free SO_3) and aluminium sulfate (17% $Al_2 S O_3$), respectively.[2]

The factory is also able to produce battery acid provided that instead of process water, demineralised water is used.

Main Applications of the products: -

I) Sulfhuric acid

It is a chemical used in the production as raw metrical or as a medium of production in aluminium sulfate, Oleum, phosphate fertilizers (e.g., , single super phosphate), car battery, pulp and paper, steel picking, textiles, refinery, beverages, leather, metals, etc...

II) *Oleum*

No end-user in the country for the time being. Otherwise it is used for sulphonation, dye manufacture, nitro-geycerine, nitrocellulose, petroleum, weaker acid fortification, explosives, etc...

III). Aluminium sulfate

It is a coagulant used in drinking water purification, industrial waste water treatment, paper sizing, Dyeing, pharmaceutical, soap modification, tanning and etc... it is also used in leather industries, textiles, food and beverages, metals, chipwood, plywood and others. The main raw material for sulphuric acid plant, sulphur is bought from abroad and hydrated lone and diatomaceous earths are auxiliary materials. For aluminium sulfate unit kaolin, which is locally obtained, and aluminium hydroxide auxiliary raw material, imported from abroad.

2.3 The Historical Development of the Industry

Awash Melkassa Aluminum Sulfate and Sulfuric Acid Share Company (AMASSASC) in recognition of the situation the Ministry of Industry launched a programmed in 1988-1990, which gave priority to the establishment of chemical industries. The programs was aimed at substituting imports of various chemical products for local consumption, and make the country self-reliant in the supply of major chemical products due to their strategic nature. Among the projects identified in the chemical sub-sector for implementation were the Aluminum Sulfate, Sulfuric acid and Oleum factory project. Priority was accorded to this importance and the necessary preparation including identification of foreign source of finance and technology choice was finalized in the second half of 1980's. The ex-National Chemical Corporation that was responsible for the promotion of the chemical sub-sector made the necessary arrangements for the propagation of a feasibility study and sponsored the British Sulfur Corporation Ltd. Co. to make feasibility study. The company completed its feasibility study of the project in September 1986.

Awash Melkassa Aluminum Sulfate and Sulfuric Acid Share Company is the sole producer of Sulfuric Acid and Aluminum Sulfate in Ethiopia. It is the biggest chemical factory in the country established through the year 1982-1987 with an initial investment of about 108 million Birr .The complete designer and supplier of the latest production machines and equipments is "Chemadex", Poland based company. The objective of the company is to produce aluminums Sulfate, sulfuric acid and Oleum, which are found vital for the country. But the planned production of Oleum has been suspended.

Sulfuric acid being one of the most important chemical products in the world with a wide application in the chemical process industries in particular and in the manufacturing industry in general has demand by many enterprises in the country. Induced by the demand, there have been attempts since long times ago to study the possibility of establishing a sulfuric acid plant in Ethiopia with a view of import substitution and production of various derived chemicals by forward integration. However, economies of scale had made its implementation unattractive for a long time until kaolin ore was found around the beginning of the 1980s in the Borena Zone at a place called Bomba Wuha, 430 km south of Addis Ababa on the way to Adola, creating the possibility of producing aluminum Sulfate, a chemical used mainly as a coagulant in the

purification of drinking water, in combination with sulfuric acid.

Accordingly, the ex-National Chemical Corporation (NCC) under the ministry of Industry collected and prepared the necessary initial data for a feasibility study. British Sulfur Corporation Ltd. of England in Sept.1986 conducted the feasibility study of the project. The feasibility study considered the production of 7000 tpy Sulfuric acid, 13600tpy aluminum Sulfate with and without the alternatives of producing sodium Sulfate within the complex. The capacity of sulfuric acid was determined based on aluminum sulfate production and future expansion to produce sodium Sulfate.

The inclusion of sodium sulfate unit in the complex was not economically viable and as such as dropped for future consideration when the market capacity would justify its installation. Seeking of financial sources took a few years and the implementation of the project was delayed till a polish credit line was signed in Dec. 1978 between Ethiopia and Poland was allocated to the project covering 85% of the cost of commodities imported from Poland. A contract was signed between polimex Cekop Ltd. of Poland and the then National Chemical Corporation in , 1988 for the design, supply, partial erection, supervision and commissioning of a 14000 tpy sulfuric acid and 13600 tpy aluminum sulfate manufacturing units. Capacities of the units were determined on a 270 working days per year basis. The contract came into force on October 31, 1988.

The capacity of the sulfuric acid unit was expanded due to the switch of production of dicalcium phosphate (DCP) fertilizer to single super phosphate (SSP) fertilizer one of the small project then under design in India, by request of the National Chemical Corporation (NCC) in conjunction with the change of technology in the production of caustic soda from electrolysis to lime-soda process which has no hydrochloric acid as a by-product. NCC also had a sulphonation plant project study for production of di-decyl-benzene-sulphonic acid (DDBAS) underway. Demand for sulfuric acid from different quarters was growing with additional requests to produce Oleum (an enriched sulfuric acid with Sulfur trioxide) within the complex. And as such a supplementary contract to include an Oleum unit with a capacity of 5000 tpy utilizing part of the sulfuric acid of the complex was signed on March 17, 1989. the inclusion of the additional unit could be accommodated due to the fact that sulfuric acid units usually operate 330 days/year and the capacity of the sulfuric acid plant is not less than 17000 tpy in actuality.

Aluminum Sulfate is made from an aluminum source Kaolin being a suitable material in Ethiopia by the action of sulfuric acid. As the only indigenous sulfur raw materials is pyrites, which is expensive to transport and requires a much more expensive plant for its utilization than a sulfur burning plant, the comparative economics of importing sulfur are examined and until this time 2006 sulfur is imported from abroad [6].

2.4 Capacity utilization

The production of aluminum sulfate and sulfuric acid are held in two production sections, aluminum sulfate production section and sulfuric acid production section. aluminum sulfate production (full capacity 13600 ton/year), In this manner aluminum sulfate and sulfuric acid plant have been designed for production capacity of 13,600 & 17,000 tones per year at 270 working days through out the year of the plant

2.5 Technology used

Aluminum sulfate and sulfuric acid are produced in the modern plant with respect to applied equipment and process. The plant uses modern high duty apparatuses and equipments. Compared with the other technologically developed countries like India or China the production scale of AMASSASC is far lesser than 6% around 300,000 ton per year, which they produce. It uses acid resistance material to many years work in the environment of sulfuric acid. The applied coolers, not big in size and high over all heat transfer coefficient have the best reference. World known, demisters, provide pure atmosphere by eliminating acid mist from waste gases.

The plant can be characterized by high heat recovery coefficient and equipment for steam production is widely applied in numerous similar plants, the accepted process solution temperature and concentration parameters provide many years futures plant operating. In this manner aluminum sulfate and sulfuric acid plant have been designed for production capacity of 13,600 & 17,000 tones per year with concentration 16.3% Al_2SO_3 and 98.5% H_2SO_4 respectively. Due to machine failure there are costs that the company has for replacement of the parts and maintenance until the year 2006, which would reduce the production capacity, and additional cost in the production.

AMASSASC quality control department has built a good laboratory center that guarantees the quality for all products supplied. The section is equipped with latest analytical technology instrument. Nature of production system of AMASSAY.S.C is continuous for sulfuric acid and batch type for aluminum sulfate. Since during sulfuric acid production all chemical reactions are exothermic and chemicals which go through the steps should be accompanied by hot steam, which otherwise solidify rapidly, the system is continuous.

2.5.1 Technology used for Sulfuric acid

Sulfuric acid being one of the most important chemical products in the world with a wide application in the chemical process industries in particular and in the manufacturing industry in general is required by many enterprises in the country. Induced by the demand, there has been attempts since long times ago to study the possibility of establishing a sulfuric acid plant in Ethiopia with a view of import substitution and production of various derived chemicals by forward integration. However, economies of scale had made its implementation unattractive for a long time until kaolin ore was found around the beginning of the 1980s in the Borena Zone at a place called Bomba Wuha, 430 km south of Addis Ababa on the way to Adola, creating the possibility of producing aluminum Sulfate, a chemical used mainly as a coagulant in the purification of drinking water, in combination with sulfuric acid.

Table 2.1 Material used for the production of sulfuric acid

Material	use	Consumptions in tons per year
filtered sulfur	Basic raw material	4678.6
process water	SO3 absorption	1697-2554
	Steam production	
Diatomite	Filter aid	1426
Hydrated lime	Sulfur neutralization	23.4
Atmospheric air	Sulfur burning	
	Converter cooling	

2.5.2 Aluminum sulfate

Aluminum sulfate (or alum) is a metallic salt formed for commercial purposes by the action of 98% sulfuric acid on an aluminum source such as bauxite, kaolin, or aluminum oxide or hydroxide. The alum is produced at an Al_2O_3 content of 14-18% in the form of slabs, lumps or powder. The major end-uses employ the fact that alum hydrolyses reversibly to aluminum hydroxide and sulfuric acid.

Table 2.2 Material used for the production of aluminum sulfate

Materials	*Reason for use*
Kaolin	Basic raw material
Aluminum hydroxide	Alternate basic raw material
	Neutralizing agent
Sulfuric acid	Leaching agent
Process water	For suspension
steam	Leaching facilitator

In addition to sulfuric acid, a source of aluminum is required for aluminum sulfate production, and frequently pure minerals like Kaolin or bauxite are used. Prepared materials such as aluminum hydroxide may be employed, but it is also possible to use waster products including coal-mining shale, or other alumino-silicate materials.

After treating the kaolin or other mineral with sulfuric acid, the insoluble silicates or silicates acid are removed by filtration. The quantity of aluminum raw materials feed is determined by its Al_2O_3 content: thus 0.486 tones of kaolin (36% Al2O3) is required per tone of product (17.5% Al203), together with 0.515 tones of sulfur acid (100%). Aluminum oxide (i.e. 100% Al_2O_3) is a world-traded commodity, which can be used for aluminum Sulfate production.

Aluminum sulfate production is based up on leaching of Al_2O_3 contained in Kaolin with H_2SO_4 under raised pressure and temperature. In result of successive operations, post reaction suspension, filtration, filtrate concentration and then solidifying and crushing the received

product containing 16.3-17% of calculated A1203.

I another word Aluminum sulfate is produced by the action of 98.5% H_2SO_4 on either Kaolin or Aluminum hydroxide, which are the raw materials of aluminum sulfate at high temperature of 145^oC and pressure of 0.5 MPa in a result of successive operation.

According to the production process, it proceeds as follows:

1. Preparation of Kaolin wetted portion and mixed with water to make water-kaolin suspension in the tank.
2. Filling the reactor with water-kaolin suspension as well as with measured concentrated H2S04 and then heating by steam under pressure of 0.5Mpa.
3. Neutralization of excess H_2SO_4 by means of Aluminum hydroxide suspension.
4. After filtration of post suspension reaction in the filter press crystallization of aluminum sulfate on open-air crystallization tray with 17% aluminum oxide is delivered to the market in the for of powder.

2.6 AMASSASC product

2.6.1 Uses of AMASSASC product

The company product is used for different sub-sectors as a raw material. The company final products are used for different purposes for various sub-sector.

a) The main uses of aluminum Sulfate are: -

I) **Water Treatment**

Most maturely waters contain undesirable constituents such as materials in suspension, co lour or microorganisms. Alum is widely used to provide the gelatinous precipitate of hydroxide, which captures and retains by physical and electrochemical means the suspension and colloidal matter.

Its main uses in Ethiopia are applications in the purification of drinking water from surface water sources and other industrial uses. In Ethiopia, as is the case with most developing countries, water and effluent treatment form by far the largest sub-sector of alum consumption. Its consumption in the pulp and paper industry contributes the only other measurable requirement for alum in the country.

II. Effluent Treatment

Effluent are of widely varying composition, the nature of the waste requiring treatment is not critical and covers a wide ranger of effluents: including those from textile dyeing and bleaching, paper making, sewerage plants, and food processing…etc.

It is also used to remove impurities in coarse suspension, colloidal suspension or true solutions.

III. Paper making

Major use of alum is in the pulp and paper industries where its functions are manifold, they include: -

A) Precipitation of rosin size: This is the most important application as it renders the paper impervious to penetration of by water or ink.

Conditioning of stock, the wood pulp is alkaline and alum is used to cover and control the pressure steam within the limits used in paper making process.

IV. Other uses.

In addition to the major applications stated above alum can be used in a variety of industrial processes including tanning, dyeing: fire extinguishing materials, Pharmaceutical, electroplating and others

b) The current market study conducted indicates that the main users of sulfuric acid in the country are as follows: -

I. For production of alum

Alum is prepared by the action of 98 % sulfuric acid on kaolin, or other sources of aluminum (Oxide or hydroxide).

II. For production of Oleum (25%)

Oleum is produced by the absorption of Sulfur trioxide gas in Sulfuric acid. To produce, 6000 tones/annum of Oleum (25%) 5281.25 tones per annum of sulfuric acid equivalent is required.

III. For direct use by other Industrial sectors

Sulfuric acid is one of the most important chemical products and could be used as raw material with multi-purpose uses: -

- Active reactant in a number of chemical processes e.g. in the
- Production of salts such as Sulfate, phosphates, acids, fertilizers, pharmaceutical, dehydrating agent, catalyst, solvent, absorbent for bromine recovery from its salts, refinery, etc.

IV. For production of single super phosphate (SSP)

By sulfuric acid treatment with raw phosphates or animal bones SSP with 18-21% P O content can be produced. SSP is the first chemical/inorganic fertilizer manufactured by mankind.

V) Stiffening the sheet of paper

Addition of extra alum gives increased stiffness and “rattle “ to the paper.

VI) Fixing of colour

The dye or pigment is moderated to the paper enhancing the brightness and stability of the colour.

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Chapter Three

3. Industrial Development and Effects in Different Sub-Sectors

Industrial development should be supported by industrial technology and its continuous innovative change, if properly shaped by market and policy incentives, makes an important contribution to most sectors.

Economic development is crucially dependent on industrial development, both with respect to the industrial sector's pivotal contribution to economic growth and even more conspicuously with regard to the structural transformation of an economy. The importance of the latter is underlined by the fact that economic development is largely thought of as being synonymous with industrialization.

Although social development appears to be less closely linked to industry, it too is strongly impacted by industrial development. Often, industrialization is seen as a motor behind many of the processes usually termed "social transformation" and "modernization". More specifically, there seem to be at least three ways in which industry helps to achieve the goals of social development:

- (i) Industry's substantial contribution to economic growth helps to create a large portion of the resources needed to fund social development programs.
- (ii) Creation of employment and hence generation of income take place in the industrial sector directly and are indirectly fostered in other sectors -- like agriculture or services -- through their linkages to industry.
- (iii) Industry promotes various aspects of social integration through its general thrust towards modernization and makes a specific contribution to the integration of women by way of productive employment.

When it comes to measuring contributions to sustainable development, their sector-specificity needs to be reflected in the attendant measures. This is particularly true for the industrial sector. Hence, every system of indicators of sustainable development must contain several indicators that feature developments in (or are closely related to) industry.

3.1 Background Information of AMASSASC

Sulfuric acid being one of the most important chemical products in the world with a wide application in the chemical process industries in particular and in the manufacturing industry in general is demand by many enterprises in the country. Stimulated by the demand, there had been attempts since long times ago to study the possibility of establishing a sulfuric acid plant in Ethiopia with a view of import substitution and production of various derived chemicals by forward integration. After the establishment till 2006 there are many sectors and industries emerged which demand AMSSSASC product. Even if the demand in different sectors increases, there demand capacity is small.

The other product is aluminum Sulfate, which is used as coagulant in the purification of drinking water. As drinking water requirement is growing at a high rate and its demand was expected to increase. Recent changes in economic policy and structural adjustment could also affect the forecasts favorably due to capacity expansion and realization of new projects and the nature of the demand. Most of the remaining water treatment consumption is by the paper industry, leather, textile and other, which operate water and effluent treatment units there are integration with other sectors.

The purpose of this chapter is to review the effects of this industrial development of this chemical industry in different sub-sectors and socio-economic settings and to see the industrial development of the company. Its organizations includes the following main sections: Integrated Development of aluminum sulfate and sulfuric acid, relation of company products to other industries, contribution of the company product for other sectors, Contribution to the employment, direct and indirect taxes and finally analysis the development of the industry.

3.2 Integrated Development AMASSASC

The world economic situation has led most developed countries to establish barriers to imports as well as credit restrictions. These actions forced the developing countries to promoter policies for a more integrated development among the different sectors within their own economies. Those industrial sectors where future growth is very much affected by restrictive measures, as in the case of Aluminum Sulfate And Sulfuric Acid Share Company in Ethiopia. The government polices in the market area has big impact in the productions of this company.

Because of its significant role of supplying basic inputs to the main sectors of the industries as well as to the economy by saving the foreign exchange the company production and selling in developing. In contrary the company production is not increasing this would be seen as because new industries, which demand in higher quantity, are not developed, and there are still imports of the same products or alternatives products in which AMASSASC.

3.3 Relationships of company products with other industries

AS it is described in the second chapter the production of sulfuric acid is seen a as a sign of development for the county. This is because of its final product is the source of inputs to other industries which need they are using for the processing. More over the industries contributes a lot for other sectors saving money, time, energy, resource, etc…industries for processing. Figure3. 1 and Figure 3.2 shows the integrations of the company with other sectors**.**

Fig. 3.1 shows the relationships of sulfuric acid product with other sub-sectors

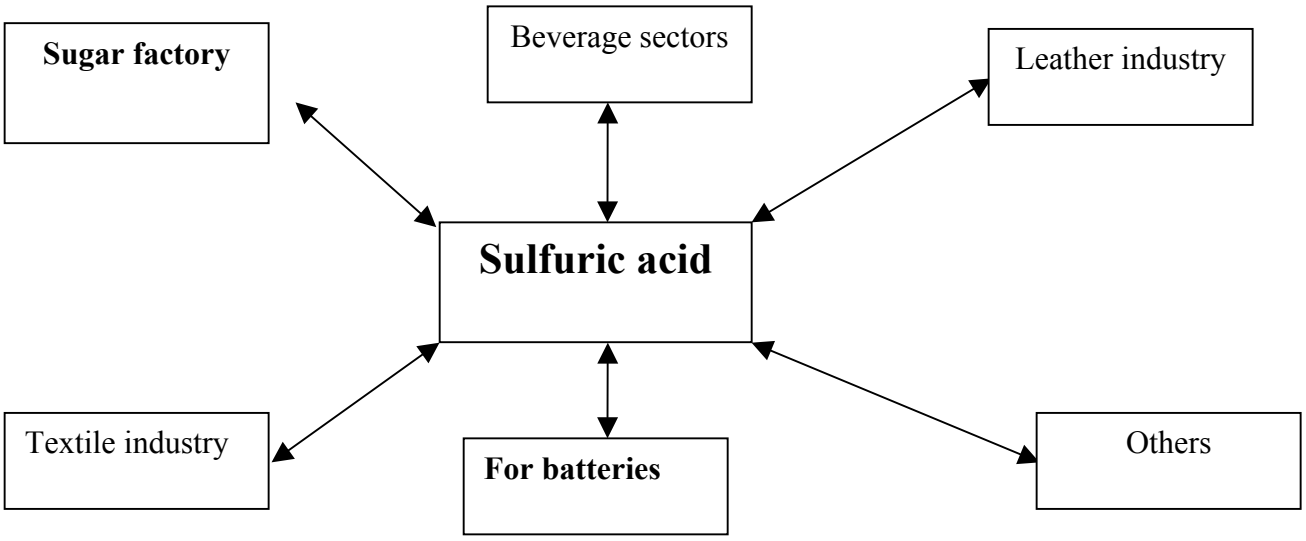


Fig. 3.2 shows the relationships of Aluminum Sulfate product with other sub-sectors

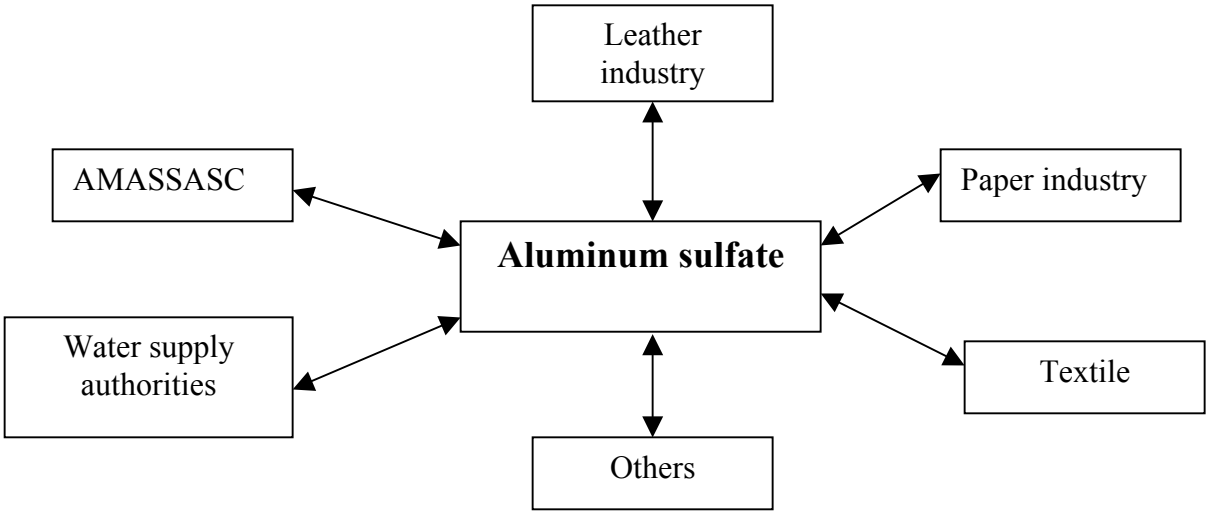
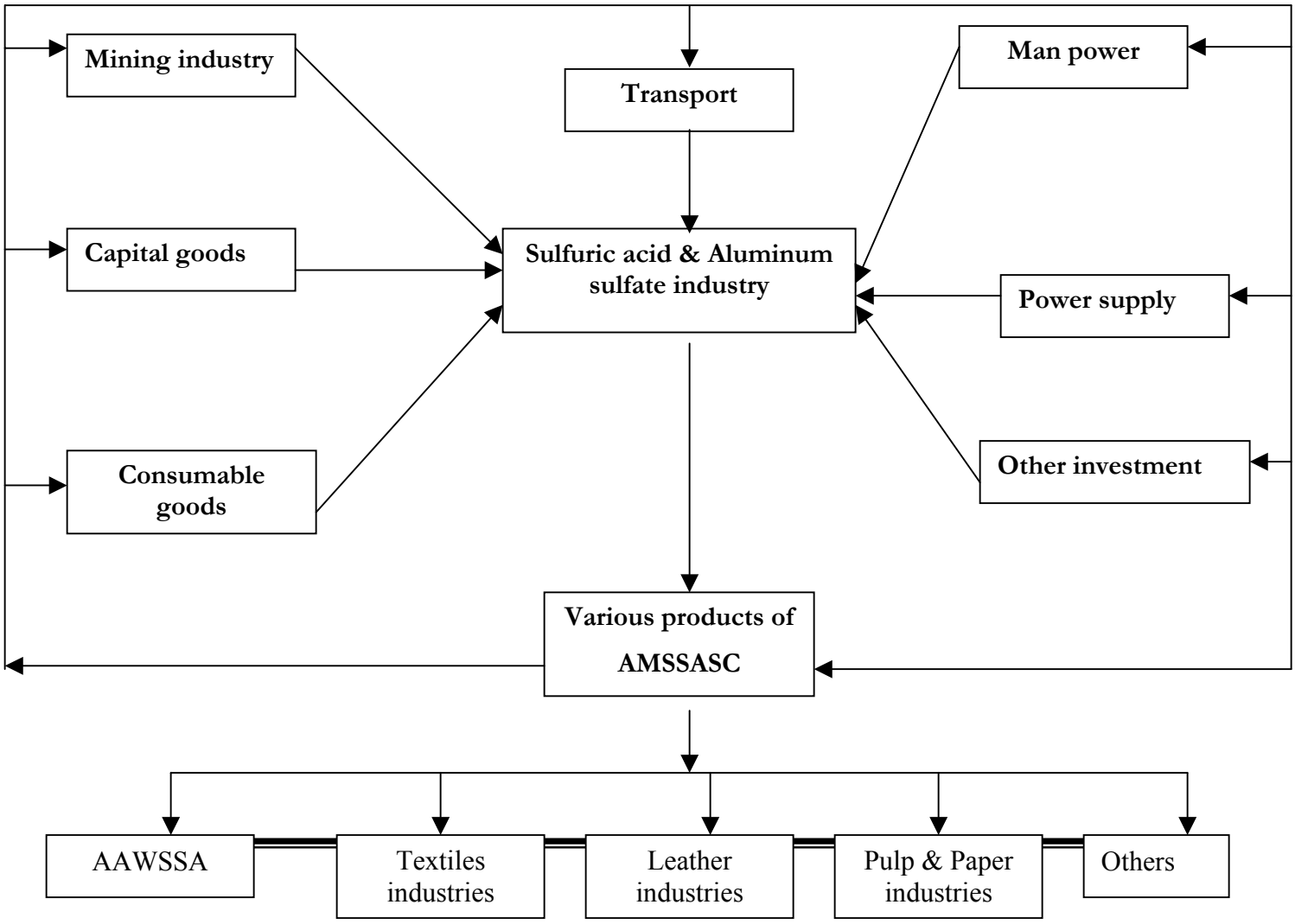


Fig. 3.3 Process of integrated to the market and economic development with sulfuric acid and aluminum sulfate industry



3.4 Contribution of AMASSASC product for other sectors

The company integrated with other sectors as shown in the Fig. 3.3 the company products used for different sectors. Before the establishment of the AMASSASC most industries and sectors were importing aluminum sulfate and sulfuric acid with foreign currency. The company has contribution by saving time, resource, manpower, and foreign exchange etc. Some of the companies, which were, importing these chemicals, were water supply authorities, pulp & paper industry, tannery sector, textile sector, and agriculture sector. This indicate that the company product is very valuable for different sectors shown as shown on Table 3.1

Aluminum sulfate and sulfuric acid are used in different industries and pants for different purpose. The company product in Ethiopia would help a number of sub-sectors to get the product without importing which would save the foreign currency and other costs some of the users AMASSASC products are listed below. This indicates that the industrial development in the country would have higher impact for the industrial development of different sub-sectors.

Table 3.1 End users of aluminum sulfate and sulfuric acid

No.	END USERS			END USERS	
	END USERS OF ALUMINIUM SULFATE			END USERS OF SULPHURC ACID	
1	**WATER SUPPLY AUTORITES**		**1**	**FOR BATTERIES**	
	A/AW.S.S.A.			ADDIS CAR BATTERY	
	W.S.S.A.			ETH.TELE.A	
2	**PULP & PAPER INDUSTRY**			ETH.AIR LINES	
	PULP&PAPER S.C			A.M.C.E	
3	**TANNERY SECTORS**			ADDIS MECHANICAL.F.	
	AWASH TANNERY			NYALY MOTORS	

	ETH.TANNERY			YEDILEFRE BATTERY	
	ETH.PRCKING & TANNERY			PRIVATE-CAR.B.	
	AWASJ TANNARY			RIES ENGINEER	
	MODJO-TANNARY			DEFENCE INDUSTRY	
	COMBOLCHA-TANNARY		**2**	**BEVERAGE SECTOR**	
	ADDIS ABABA-TANNARY			META-BREWARY	
	ETHIOPIAN-TANNARY			n-ALCOHOL& LIQUOR.FACTOR	
	WALLIY-TANNARY			HARAR-BREWERY	
	DIRE-INDUSTRY			AWASH-WINERY	
4	**TEXTILE SECTOR**			STGEORGE-BREWEARY	
	AKAKI TEXTILE MILL		**3**	**OTHER INDUSTRIES**	
	DIRE-DAWA TEXTILE MILL			UNITED ABILITIES	
	BAHIR DAR TEXTILE MILL			ETH.PHARMICEUTICAL	
	DEBRE BREHAN BLANKET.F.			METAHARA SUGER.FACTORY	
	COMBELCHE MILL			MUGAR CEMENT FACTORY	
	EDGET-YARN FACTORY			ADDIS ABABA CEMENT FACTO	
5	**AGRICULTURE SECTOR**			A.S.P.F	
	SIDAMO-AGRO-DAV.ENP.			ADDIS MACHINE TOOLS FACTO	
	TENDAHO-AGRO-DEV.ENP.			LALIBELA CNGENRING CONSTRACTION INTERPRISE	
	A.E.T.S.C.			GATAT ENGINERING FACTORY	
	ABEBO-AGRO-DEV.				
	BELE-AGRO-DEV.				
	ARUSI-AGRO-DEV				
	MIDOLE-AWASH-AGRO-DEV.				
	BAHIR-DAR-EDIBLE-OIL				
	GOJJAM-GONDER AGR.				
	WOLLEGAGR.DEV.EN.				

6	**OTHER SECTOR**				
	ASSELA-MALTERY				
	ABAY-MESK-SOFT				
	MUGAR-CEMENT				
	BATU CONSTRAUCTION				
	ETH.LIVE STOCK &MEAT CO.				
	GONDER SOT DRINKS.F				
	BAHIR-DAR-EDIBILE OIL				
	AKAKI S.P.&H.T.F				
	EELPA				
	PROJECT 40720/DEFENCE INDUSTRY				

Source: An updated market and finance study of AMASSASC

3.4.1 Contribution to Foreign exchange

Before the establishment of the AMASSSSC Ethiopia's entire requirement for aluminum sulfate is imported from abroad using foreign exchange and this foreign currency were continually increasing when the demand for water treatment increased. Not only for water treatment but also for effluents which are of widely used for varying compositions which covers a wide range of effluents, including those from textile dyeing and bleaching, paper making, sewage plants and food processing. Aluminum sulfate is used to remove impurities in coarse suspension. All these industries were buying from abroad with foreign exchange.

In case of developing countries, generally, with poor industrial base like in Ethiopia, the industry made the least performance in the export sector. Generally it can be said that contribution of the sulfuric acid and aluminum sulfate export earning is invaluable. Other than exporting, Ethiopia would save foreign exchange by producing and selling this basic chemical like aluminum sulfate and sulfuric acid for most industries in Ethiopia. In the past years Ethiopian was importing aluminum sulfate and sulfuric acid expending foreign currency. Even if the country is producing these products, still there are imports of the same products or alterative products due to uncoordinated efforts of AMASSASC with customers and customers' attitude to the domestic

product are the main factors that have affected the contribution of the AMASSASC products for the country.

On Table 3.2 show Ethiopian imported of aluminum sulfate in year (1987-1994) and also on Table 3.3 shows the net sales AMASSASC product from the year (2001-2005), which save foreign currency.

Table 3.2 shows the amount of imported tones/annum of the year (1987-1994) [19].

YEAR	IMPORT OF ALUMINUM SULFATE
1987	388
1988	1558
1989	1043
1990	243
1991	370
1992	430
1993	1143
1994	301
TOTAL	5175
AVERAGE	685

SOURCE: a) National Bank of Ethiopia

b) Custom and excise Administration: External Trade Statistics

Table 3.3 Sales of AMASSASC in birr

Years	2001	2002	2003	2004	2005
Sales	21,569,082	20,116,234	21,093,061	21,566,974	10,458,123

Source: AMASSASC finance department

3.4.2 Contribution to Government Revenue

Industrialization is one of the effective tools of increasing the national income of a country. Among the other benefits, there is the contribution which industry makes by generating a surplus (through indirect taxes and operating surplus). This social surplus provides funds to finance government programmers and development projects. It is therefore important to assess relative significance of the contribution of Awash Melkassa Sulfuric Acid and Aluminum Sulfate Company implying that its sales of the product have significant value for government revenue and easy accessibility of the product of AMASSASC for others sectors in the country. Even if the company have a lot of expenses indirectly in the other sectors the contribution to government revenue is significant.

3.4.3 Direct and indirect taxes

The contribution to Government revenue of different sectors varies according to the income and sells of the company. This would contribute much in the area of direct tax. This shows that if the company has good market it will have a lot to contribute to the direct and indirect income to the Government.

As there are many factors that contribute for the final product of the company, when it produce the final product there are many costs. These cost indirectly goes there are different taxes the company pay. In addition to the company cost, there would be others company that they are going to pay when the sell the product or by the product. These and other condition contributes as income for the government.

Table 3.4 Tasks AMASSC form each sales of the factory product in year 2001-2005

List	**year**				
	2001	**2002**	**2003**	**2004**	**2005**
Income tax			87,460	609,937	
Sales tax	863,253	850,011	1,141030	1,415,301	1,048,249

Source: AMASSASC finance dep.

3.5 Analysis of the development of the industry

3.5.1 Current consumption of AMASSASC products

The development of the industry related to the term production quiet often means the same as manufacturing. To carry out this process of manufacturing we need factors of production like man to do the job, equipment, material, money etc…

When the company established it were considered the growth in domestic requirements would increase and the company would produce with its maximal production capacity, like producing 13000 ton per year of Aluminum sulfate and 17000 ton per year of sulfuric acid and therefore the size of production facilities necessary to meet future local demand depends entirely on the establishment of industrial projects.

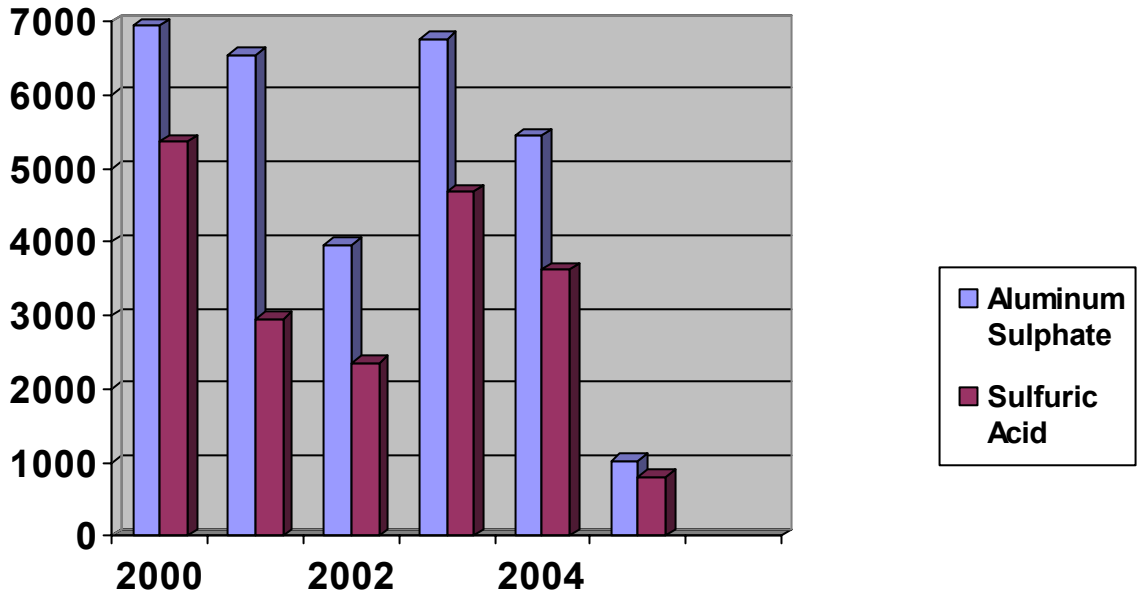
The current consumption of aluminum Sulfate in the year 2000-2005 in the country is to fall in the rage of 1000-6000 tones per year. The quantities demand/consumed by the end users and quantity available for consumption also reveals the same case as can be seen from Table 3.5 below.

New projects are currently being implemented which will provide a substantial increase in aluminum consumption in the municipal water treatment, textiles, beverages, leather and other sectors. Furthermore the company production is gradually decreasing its production due to poor market performance and lesser demand in the market as well as the low development of other industries which need the product contrary to the expectation. Generally, the tendency is towards a reduction in the consumption of Aluminum sulfate and sulfuric acid is seen in deferent sub-sectors. On Table 3.5 shows the optimal production in the year (2000-2005).

Table 3.5 shows current optimal production in ton from 2000-2005

Lists of products	Years					
	2000	2001	2002	2003	2004	2005
Aluminum Sulfate	6944	6550	3962	6768	5448	1028
Sulfuric Acid	5362	2952	2364	4678	3620	804

Fig.3.4 production of aluminum sulfate and sulfuric acid in the year 2000-2005



3.5.2 Previous consumption of AMASSASC product

As aluminum Sulfate is a coagulant used in the purification of drinking water and drinking water requirement is growing at a high rate; its demand was expected to increase. Recent changes in economic policy and structural adjustment also have affected the favorably of the product. Hence, this shows that the past trends cannot be the only basis for future demand in the year. On Table 3.6 shows Ethiopian aluminum sulfate consumption in the year 1988-1994 [6].

Sulfuric acid is the highest consumable inorganic chemical. In Ethiopia's requirement of sulfuric acid was solely met through imports, mostly from European countries. The import figures of sulfuric acid from 1987-1993 years are shown below in Table 3.6 [6].

Comparing the product with the current consumption, the previous consumption requirement for these products was: for Aluminum sulfate from 1988-1994 were in average 5,200-5,600. Compared to the recent years demand the company in not showing progress in the production and selling in the domestic market.

Table 3.6 Ethiopian Aluminum Sulfate consumption in the year 1988-1994

(TONNES/ANNUM)

No	**END USERS**	1988	1989	1990	1991	1992	1993	1994
1	AAWSSA	4242	4242	4242	4242	4242	4242	4242
2	Other cities	400	400	400	400	400	700	700
3	Textiles	69	69	45	51	38	30	54
4	Leather	105	105	88	68	97	55	103
5	Pulp & Paper	379	279	366	171	209	296	350
6	Others	64	64	61	59	58	57	57
	TOTAL	5259	5158	5202	4992	5044	5380	5548

SOURCE: AN updated market and financial study

Table 3.7 Ethiopian's import figures of sulfuric acid 1987-1993

Years	Import of sulfuric acid (tonne)
1987	504
1988	584
1989	2783
1990	2020
1991	210
1992	132
1993	840

SOURCE: AN updated market and financial study

Comparison:

The demand in almost all sectors was expected to increase due to the importance of the product**.** Ethiopia's requirement for aluminum sulfate was purchased abroad using foreign exchange, and imported.; establishment of an aluminum sulfate plant is to select the most appropriate technology, size the plant and associated facilities and determine its overall financial and economic viability, particularly in respect of savings in foreign exchanger. This sector has been identified as the key which will determine the national sulfuric acid requirement

Comparing the two periods consumption of AMASSASC products from 2000-2005 Table 3.5, shows current optimal production in ton on average it was 3296 ton of sulfuric acid and 5117 of aluminum sulfate. And from Table 3.6 Ethiopian aluminum sulfate consumption in the year 1988-1994 on average it was 6097 ton and Table 3.7 Ethiopian's import figures of sulfuric acid 1987-1993 is 1010 ton. From the above figures the consumption of both products are did not show much progress compared the company maximum production capacity of 13600 ton per year of aluminum sulfate and 17000 ton per year of sulfuric acid.

AMASSASC could not produce with its maximum capacity and could not sales all products to the customers well as it is seen from Table 3.6, Table 3.7. In AMSSASC there is only one time that the company exported to Sudan in 2003 30 ton of sulfuric acid and 10 ton aluminum sulfate. The market performance would be seen in detail in the next chapters.

It is seen from Table 4.5 and Table 4 .6 the consumption in different sectors were small compared to the basic contribution of the company to different sub-sectors.

Generally, the company is not developing in its production and selling which implies the industrial development in the country is not considerably seen in different sub-sectors related to the usage of this chemical products.

Summary

In Ethiopia, as is the case with most developing countries, the development and sub-sectors play great role in the production of aluminum sulfate and sulfuric acid of this consumption would contribute lot of advantages for the country. For direct use by other industrial sectors Sulfuric acid is one of the most important chemical products and could be used as raw material with multi-purpose uses like in active reactant in a number of chemical processes,. in the Production of salts, s Sulfate, phosphates, acids, fertilizers, pharmaceutical, dehydrating agent, catalyst, solvent, absorbent for bromine recovery from its salts, refinery, etc… The company has contribution for different sub-sectors by saving time, resource, manpower, and foreign exchange etc... Some of the companies which were importing these chemical were water supply authorities, pulp & paper industry, tannery sector, textile sector, agriculture sector. Integrated development of aluminum sulfate and sulfuric acid play great role in relation of company products to other sub-sectors. AMASSASC has contribution to the employment, direct and indirect taxes, saving foreign exchange etc… Regardless of these the company could not produce at maximum capacity and sell it product to the customers. Comparing the product the current consumption with the previous consumption requirement, the products were not showing progress in the product maximization and sale in the domestic market. The sub-sectors capacity of purchasing of the products is small.

Chapter Four

4. Market Performance of AMASSASC

4.1.1 Background information

AMASSASC has the capacity to satisfy the country's requirement of aluminum sulfate and sulfuric acid as well as it has potential to export the product to neighboring countries. Sulfuric acid being one of the most important chemical products in the world with a wide application in the chemical processing industries in particular in the manufacturing industries there is a market need for the product. In general demand of aluminum sulfate and sulfuric acid by many enterprises in the country is not increasing it can be said it is decreasing in the year 2000-2006 due to different reasons. Some of the basic reasons are: the main users of the products of AMASSASC are shifting to other alternative products, the sub-sectors usage capacity is not in large quantity, the product of the company is not exported, there are same types or alternative products are imported into the country etc…

The market performance of AMASSASC is relatively poor in aluminum sulfate compared to the company's capacity of production and the demand of the customers as shown in Table 4.1. Demand of aluminum Sulfate as water purification usage in the year 2005-2006 used in the purification of drinking water requirement is decreasing at high rate This is due to AAWSA is using alternative products that substitute aluminum sulfate, recent changes in economic policy, market policy and structural adjustment has also affected the company's maximum level of production and its market performance. There are different reasons why the company could not sell its product. Large-scale industries and large consumers of new projects are not fully implemented as well as imported material forced the company not to be competitive, resulting in lower volume of sales by AMASSASC.

The market performance of AMASSASC in the production of aluminum sulfate mostly depends up on the high consumer of the product, Addis Ababa Water and Sewerage Authority and regional water authorities. On the contrary; the market demands of these factories have changed to other alterative product, which presumably substitutes aluminum sulfate, like polyelectrolyte.

Sulfuric acid, the other product of the company also has a poor market sell. Most of the remaining consumers such as: leather factories, soap factories, textile factories, sugar factories, paper and pulp factories, battery charging, beverage industries, cement factories, mining industries, flower production firms, pharmaceutical factories, schools, transportation organization etc... are consumer of small amount of sulfuric acid compared to the company's capacity of production

4.2 Problems in market performance of AMASSASC

The company market performance in the foreign market is not growing. The existence of the company is only depend on one organization A/AWSA and some industries in the country. In AMASSASC the market performance is not interacting with other functions, for example, marketing and production determines price levels; marketing and human resources develop customer service policies and relationship which create and support the image of an enterprise the selling of the product to the customers. Marketing function doesn't encompasses most activities between the producer of a good or the supplier of a service and the consumers, it is not starting with the consumer from whose needs the product gets its service ideas and to whom it will sell its services. The company is dependent of its sells in Addis Ababa Water and Sewerage authority .

4.2.1 Major problems in the company market performance

The company has a major problem in selling its product in domestic as well as in near by countries market or to export. It does not produce at full capacity or sell the product that it produced. A company cannot survive today by simply doing a job or producing. The product has to be promoted and interacted to the environment to achieve the desired exchange outcome to the target market.

There are internal as well as external environment that has affected the company's market performance. Some of the major problems are:-

- The existence of the factory as a whole is entirely dependant on one organization. Addis Ababa water and sewerage Authority accounts for 66% of the sales of aluminum sulfate. (that is very serious problem now because in 2005 and 2006 Addis Ababa water and sewerage stopped buying the product)

- The company could not produce with its full capacity and sell its product fully due to poor integration with other sectors and with the responsible government bodies
- The organization that uses sulfuric acid and Aluminum sulfate such as: Leather, Soap, textile, Sugar, paper and pulp, flower production, mining areas, Pharmaceutical, etc... purchase small quantity of the company product even if it the company is considered to have large number of customers
- Major customer that purchase large number of quantity are shifting to other sellers and other alterative products example: Ethiopian water and sewerage authorities
- Some times production competitive dimension such as cost of selling of AMASSASC product is relatively higher than the competitors cost
- Some times those imported product of Sulfuric acid, Aluminum Sulfate are sold with lesser price than the company sells.
- There is machine idle time and failure
- Flexibility in the production and new product introduction speed is slow
- The company's selling price and production capacity is highly affected by external macro environment factors in which the firm operates such as: tax policy, employment laws, trade restriction and tariffs, political stability, interest and exchange rate, inflations rate etc...
- There hardly is a research work devoted to improve the industrial development, market performance and competitiveness that indicate that it is a neglected industry in the chemical sector.
- The company is not finding new user for its products, reducing variable cost of the present products and the fixed costs "being price oriented", does not analyze competitors product.

4.3 Result achieved

The market performances of Awash Melkesa depend on one firm, which is the highest consumer of aluminum sulfate, Addis Ababa Water and Sewerage Authority and regional water authorities. As a result of this, customers specially Addis Ababa Water and Sewerage Authority account for sell about of 66% of Aluminum sulfate of the company product have stopped buying. Because of this the company has long weeks and months of idle time, and keeps stock in the warehouse for longer time which is causing series problems in the existence of the company.

- Most of the remaining consumers of Aluminum Sulfate are paper industry, leather, textile and other effluent treatment units that purchases less than 6,500 tones of aluminum sulfate per year compared to 13,600 tones per year (tpy), the maximum capacity of the plant production.

Table 4.1 shows consumer of Aluminum sulfate product

	USERS Al2SO4	**2000**	**2001**	**2002**	**2003**	**2004**
1	A/AW.S.S.A.	2609.4	5090.6	4500	4200	4203.55
2	Oromia W.S.S.A.	70	255	122	388	700
3	Ethio. PULP&PAPER S.C	380	340.65	444	490	
4	Bargoba trading PLC -	-	-	-	20	
5	South W.S.S.A.	147	141.2	133	-	-
6	Amara W.S.S.A.	-	-	80	152.4	103.9
7	Ethio. tanary PLC	70	84	60	110.3	80
8	Fincha Suger Facotry 60	210	35	65	144	
9	Harir W.S.S.A	**152**	-	-	-	26.6
10	Muger cement Intr.44	**44**	66	66	88	
11	Tigray W.S.S.A	-	45	24	40	36
12	emada Textil	15	51.5	90	74	14.1
13	Alefora	-	20	-	10	10
14	Akaki Testile	18.2	22	12.9	11	13.3
15	Seba Tannery	-	-	-	-	1
16	Alico Awash Taneery 16	-	-	12	11	
17	Mersa Tannery	6	-	-	6	10
18	Bedele Bira PLC	-	-	-	-	7.5
19	Moha Leselas drink-	-	-	-	9.5	
20	Etho. Electirc Co.	-	-	-	-	10.5
21	Bahir Dar Textile	-	-	-	-	8
22	Awash water servic-	-	-	-	17.10	
23	Blue Nile Tannery	-	-	-	-	3

24	Dria Dewa Txtile	-	-	-	-	5.8
25	Gilegale Giba Hyro. Elc.-	-	55	101.4	20	
26	Others	54.9	80.1	41.75	35.2	5.45
27	Export to Sudan	-	-	-	10	-
	Total	3776.6	6286.05	5752.05	5836.5	5238.7

Source: AMASSASC marketing department

- When there is a bid other compactors win. The problems came at when AMASSASC set selling price considers all the expenses incurred such as: wage of employee, promotion, training, income tax or profit tax , sales tax, direct and indirect taxes, exchange rate, inflations rate, rent, transport etc...These and other conditions force the company to sell the products higher than the competitor's price. On the other hand the competitors are importing from Europe and Japan, which produce more than 300,000 tones per year which are capable of selling as bulk product.

- Sulfuric acid is used for different industries for different purpose. In Ethiopia there are small quantities of buyers of the product of AMASSASC relative to the capacity production that is 17000 tpy. The reason why there is low demand to purchase the product is slow industrial development in the county, which limits the AMASSASC capacity of production. This indicates that industries in Ethiopia, which use this product, have not developed yet. Sulfuric acid used in different sectors if the capacity and the industries expand like cotton, cola production etc…

Table 4.2 shows the amount of sulfuric acid usage data 2000-2005

	USERS of SO4	YEAR					
I	Direct use	2000	2001	2002	2003	2004	2005
1	Tannery	249	303	267	256	323	102
2	Textile	22	75	63	80	36	71
3	Beverage	28	51	32	37	45	39

4	Car Battery	13	25	21	25	30	53
5	Cotton farms	57	89	88	88	134	95
6	Flower farms	-	-	-	2	8	26
6	Cola products	8	17	-	2	12	33
7	Others	413	611	544	546	658	700
	TOTAL	790	1171	1015	1036	1246	1119

Source: AMASSASC marketing department

- The machine would be idle for some weeks or months for different reasons. Some of the reasons are:

    1. When there is less demand in the market or when there is large size of inventories. One of the machines is producing sulfuric acid which is corrosive, When the machine stops the acid corrode the parts of the machine and as a result it cause additional cost for replacing the corroded parts and there is maintenance cost too. Maintenance cost and spare part cost cause the price of the unite cost which would affects the competitiveness of the firm.

    2. When there is a machine failure parts should be purchased from aboard with foreign currency. This would be additional cost on the company's product and for professionals who maintains the machine

- It could be seen that there is poor market penetration. In order to make the customer, the company is not using means to penetrate to the market. Some of the penetrating means to the market is giving free training to the customer. Training in the company is not seen to be an essential factor ensuring a satisfactory order-book from the beginning and that can be achieved only if an earlier program of training in sales. In AMASSASC marketing and distribution basics has not created at least the nucleus of awareness campaign to encourage uses of the home-produced products which has the same quality as imported ones.

- In this company it can be easily seen that neglecting the market and its development by remaining production-oriented. It is also not noted the positive effects of an awareness

campaign of the type suggested in pulling through new enterprises and new uses of the home-produced products. There is no much training given to employees of the marketing department of AMASSC, and to customers considering alike is an essential part of such a program to develop a good working relationship that would help the country development.

- There is no flexibility in new product introduction. United Nation (UN) and other aid origination are buying thousands of water treatment small gram package called "WATERMAKER" for rural area in Ethiopia. One small package used for water treatment of 20 litter and these organizations are buying WATERMAKER form south Africa and other countries. Ethiopia is producing Aluminum Sulfate for water treatment; in order to expand the market new product is not encouraged in the company, which affects its market performance and competitiveness.

- The company selling price and production capacity is highly affected by external (macro-environmental) factors in which the firm operates.

4.4 Analyzing the market performance of AMASSASC

4.4.1 Market performance of AMASSASC in Aluminum Sulfate

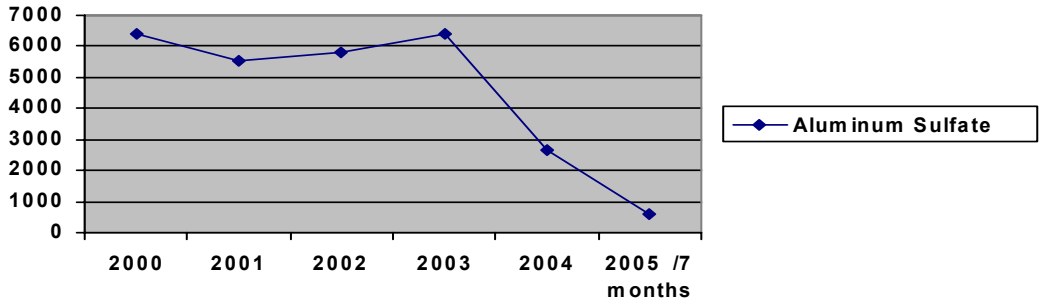
Aluminum sulfate, an essential water treatment chemical, is utilized for water Purification in Addis Ababa and many other large Ethiopian towns, by tanneries, printers, the textile industry, and the pulp and paper Companies. The demand in almost all sectors it was expected to expand considering the implementation of new projects since the establishment of AMASSASC. The market performance of this company is based on the small companies demand. Before the establishment of the AMASSSSC all of Ethiopia's requirement for aluminum sulfate were purchased abroad using foreign exchange, at this time Addis Ababa Water and Sewerage Authorities is importing substitute products for water treatment purpose. It can be said the existence of the factory as a whole is entirely dependant on one organization which has become a very serious problem now.

Table 4.3 Quantity sold in the domestic market (ton)

List of product	Aluminum sulfate quantity sold in the domestic market in ton						
	2000	2001	2002	2003	2004	2005/7 ms	Average
Aluminum Sulfate	6423	5560	5801	6387	2653	606	4571.667

Source: AMASSASC marketing department

Fig.4.1 Quantity of Aluminum sulfate sold in the domestic market



It can be seen from the chart that the amounts of aluminum sulfate sold in the domestic market have decreased in the year 2000-2005.

4.4.2 Export Market in Aluminum Sulfate

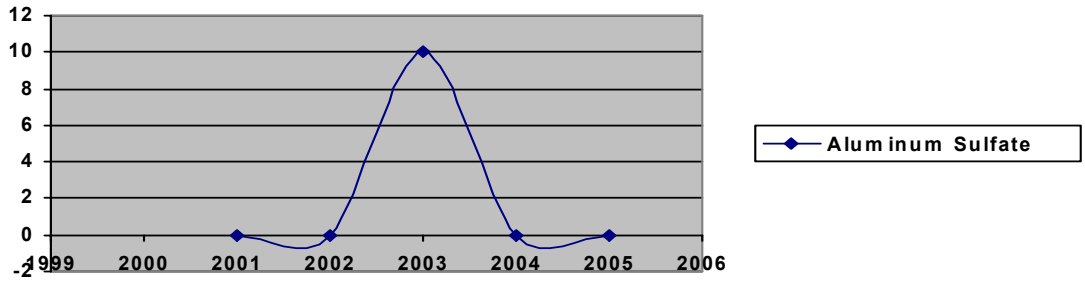
Exporting marketing performance function and related activities in an enterprise, advertising small or large, ensure that an enterprise have access to other areas. It can be seen for the collated data there is only one time that the company exported aluminum sulfate to Sudan from 2000-2005.

Table 4.4 Quantity sold in foreign market (ton)

List product	Aluminum sulfate quantity exported					
	2000	2001	2002	2003	2004	2005/7 months
Aluminum Sulfate	-	-	-	10	-	-

Source: AMASSASC marketing department

Fig 4.2 Quantity sold in foreign market (ton)



In the domestic and foreign market it can be seen that there were small amount quantity sold. There are Major Problems that the company have faced, some of the problems are:

- The company could not produce with its full capacity and sell its product fully
- The organization that uses sulfuric acid and Aluminum sulfate such as: Leather, Soap, textile, Sugar, paper and pulp, flower production, mining areas, Pharmaceutical, etc… purchase small quantity of the company product even if it the company is considered to have large number of customers
- Major customer that purchase large numbers of quantity are shifting to other sellers and other alterative products example: Ethiopia water and sewerage authorities have shifted to other alterative produce.
- In the exporting market other countries like China and India have highly controlled the market in most African countries, these counties have established major tread roots . In the case of AMASSASC have made little efforts to penetrate into the market. The company does not make much efforts by sending its market professional to the different near by countries in order to advertise its product

4.4.3 Market performance of AMASSASC in Sulfuric acid

Market of sulfuric acid in Ethiopia is very less relative to the company production capacity. One of the reasons comes from there are no large industries which use thi s product in large quantity, and there are only small quantity user of the company product. There is poor market penetration that the company has less effort for advertising its product.

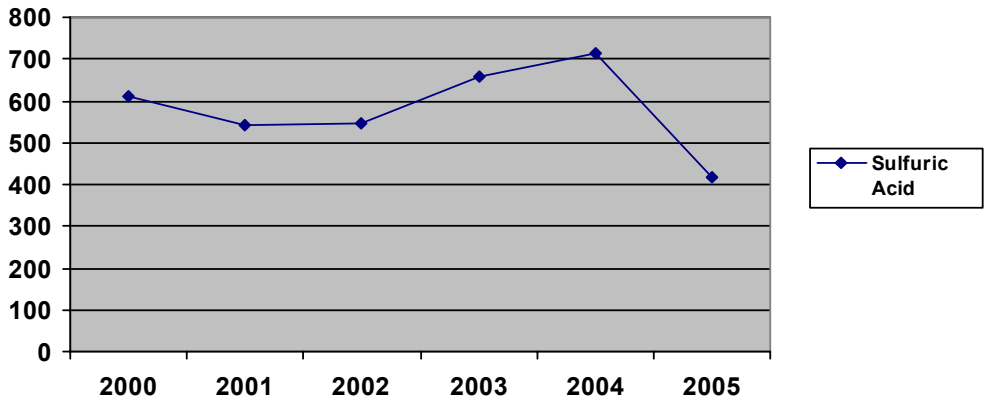
The other problem for its poor market performance is current police of the country which is agricultural focused. Even if some industries are emerging they are not large scale industries, and the company's customers are purchasing small quantities such as: leather factories, soap factories, textile factories, sugar factories, paper and pulp factories, battery charging, beverage industries, cement factories, mining areas, flower production, pharmaceutical areas, schools, etc…It can be seen form the data that less the 50% of the company production capacity is used.

Table 4.5 Shows the Sulfuric Acid sold in the domestic market from 2000-2005

List of product	Sulfuric Acid Quantity sold in the domestic in ton						
	2000	2001	2002	2003	2004	2005 /7 months	Average
Sulfuric Acid	611	544	546	658	715	419	582.116

Source: AMASSASC marketing department

Fig. 4.3 shows the Sulfuric Acid sold in the domestic market from 2000-2005



4.4.4 Export Market in Sulfuric acid

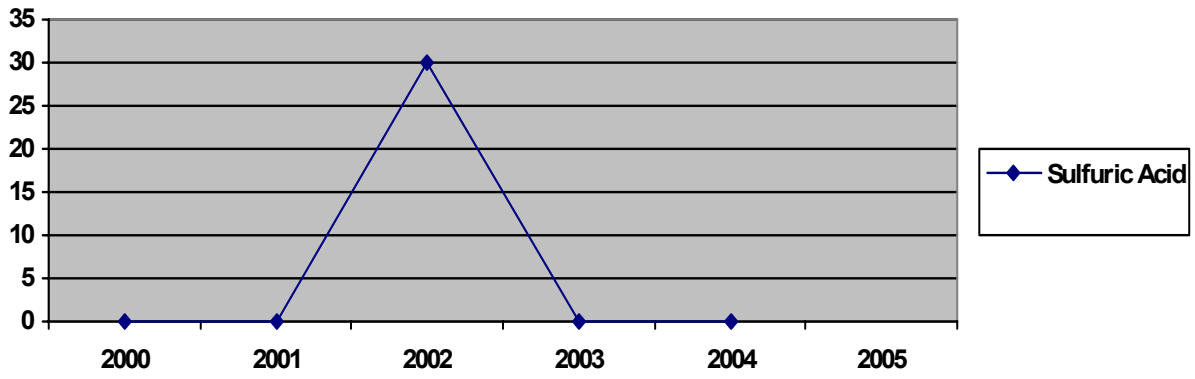
It can be seen for the collated that data there is only one time that the company exported. There are small efforts done in the exports market.

Table 4.6 shows the sulfuric acid exported from 2000-2005

List of product	Sulfuric acid quantity exported					
	2000	2001	2002	2003	2004	2005 /7 months
Sulfuric Acid	-	-	-	30	-	-

Source: AMASSASC marketing department

Fig. 4.4 Shows the sulfuric acid exported from 2000-2005



4.5 Analyzing internal factors affecting Market performance

Internal environmental analysis evaluates relevant factors in an organization in order to determine its strengths and weaknesses. There are an internal factor that affects the company market performance and competitiveness. Some of the internal factors that affect its market performance are type of marketing and distribution, applied technology, research and development, innovation or introduction of new product, training, applied technology, information management system, internal working condition, product/service quality, marketing capability etc…

4.5.1 Marketing and distribution

There are some problems in AMASSASC that affect its market performance and competitiveness in the marketing and distribution. As it was stated in the previous chapter two that the plant has the capacity to satisfy the country's chemical requirement as well as has good potential to export to neighboring countries. The factory, with such vital and necessary product to many other processes as raw material, should have been prosperous and profitable, by having a number of customers.

Even if the company distributes its product to the customers and brings its sells department to Addis Ababa and use its own transport to reach the product to the customers, and the marketing division had arrived on export activity, there is inconsistence to hold customers and to penetrate to the market and there still are problems in marketing and distribution.

Marketing department did not use the market opportunities considering Ethio-Sudan trade relationship and near by road transportation system to export its product to Sudan, with one of such chemical users who import about 7000 tone of aluminum sulfate and 200 tones of sulfuric acid from China. If the company is priced focused than product focused it would becomes competent with Chine, it will be prosperous in short time.

Marketing in AMASSAWC have not focusing on the new sectors like flower production, schools, and any organization, which uses AMASSASC's chemical at least in lab.

4.5.2 Applied technology

One of internal factors that affect the company market performance and competitiveness is applied technology. Generally Aluminum sulfate and sulfuric acid produce in the modern plant with respect to applied equipment and process. The plant uses modern high duty apparatuses and equipments produced using the special material resistance to many years work in the environment of sulfuric acid. The reason why market performance is affected by applied technology it nature of production system of AMASSAY.S.C is continuous for sulfuric acid and batch type for aluminum sulfate. During sulfuric acid production all chemical reactions are exothermic and

chemicals which go through the steps should be accompanied by hot Steam, which otherwise solidify rapidly the system is continuous.

When the machine stops working due to either lesser demand in the market or machine failure, since sulfuric acid is corrosive it would corrode surfaces in short time and it has an effect in the market performance in the short run. Replacement of seriously part damaged and maintenance have its own costs that affects the price adjustment against competitors. In the long run the efficiency of the machine decrease and there would be high cost for maintenance and replacing parts. Generally, the technology that the company uses with lesser capacity which is 13,600 tpy of aluminum sulfate and 17,000 tpy of sulfuric acid compared to imports source country like Chin which have production capacity of 300,000 tpy which would highly affects it market performance.

4.5.3 Research and Development

In AMASSASC there is no research work done in the company promote its market performance and competitiveness. The company does not have recent result of research to study in its market development and competitiveness. One of the problems that affects the market performance is there is only small research work done to improve the industrial development and the market of this company. Much consideration is not given for research work to improve its market performance and competitiveness.

These days it is appearing a number of alternative products as a substitute. As describe in chapter two, one of the intimate customer that account 66% of its sales shifted to the alternative product which cause the company not to produce at maximum capacity. Particularly researches the market performances have not yet opened up yet in the chemical products in order to product the need of customers. Even if the company does not give much attention for research and development there are cost the company invested for promotion, advertising is shown in Table 4.7, below. Table 4.7 The Company expense for promotion advertising and marketing

List	2001	2002	2003	2004
Promotion, advertising, marketing	68,622	21,430	49,644	15,363

Source: AMASSASC marketing department

The company does not consider recent market researches innovation of new product which is imported to Ethiopia like "WATERMAKER", in doing so; the company should allocate money for research work in order to:

1. Search for basic chemicals or physicals relationship of products and process
2. Improve their products
3. Develop new products (capitalize the first word)
4. Reduce cost of present product
5. Analyze competitors product
6. Find new user for their products
7. Find profitable use of by products
8. Increase its market performance and competitiveness

4.5.4 Innovation or Introduction of New Product

The company is not only giving attention for research and development but also does not make efforts for innovation of new product from the product it exists. Like some organization importing thousands of packages of "WATERMAKER" to ruler areas for drinking water treatment in Ethiopia.

4.5.5 Training

In AMASSASC one of an internal factor that affects the company market performance and competitiveness is not giving training for employee and for the customers. The percentage of the total employees trained in AMASSASC from 2001 to 2005 was 3% and the maximum length employee received on the job training for the past five year is for 2 month. There is no training given for the customers how they use their product, on the quality of the product etc...In order to improve good market performance and to be competitiveness training for the employees and customers should be seen as a part of the company process.

Customer training is seen to be an essential factor ensuring a satisfactory order-book from the beginning and this can be achieved only if an earlier program of training in sales, marketing and

distribution basics has created at least the nucleus for the market.

In a project of this type, the only chemical producer in Ethiopia it can be easily seen neglecting the market and its development by remaining production-oriented. The company is not aware of the important training that has positive effects of an "awareness" campaign. Also by giving training suggest in pulling through new enterprises and new users of the home-produced products. Training of employee and customers in AMASSASC is not seen as an essential part of a program to develop a good working relationship, initiate customers to be aware of the product. It is important that a senior manager be appointed inland and oversees sales, handling and distribution from an early stage, plan free training for customers in order to improve the market performance.

4.5.6 Information Management System

Today information is becoming the basic input for any organization. Information system, usually computerized ones, handles different data analysis and activities. Presently the factory has few computers and hence no such services are held in each department, even though there lot amounts of data's to be analyzed. Most the work are done manually. Recent information of the factory like inventory stock, spar parts stock, production level and capacity customers need, market performance and forecast of sell etc... In addition there is no sufficient information and communication in the neighboring country chemical requirement and demand. Without getting the required information supported by latest technology, the market performance could not reach all the direction to make decision for its product and sell.

4.5.7 Internal Working Condition

Internal working condition is one of the reasons that affect the company market performance and competitiveness. There are many reasons that the company could not be competent in the country as well as in the foreign market. Working environment, intimate relationship among each departments, consistence in the production in holding customers, commitment to improve its market performance and attract new customers, proposal preparation for the government in the implementation of new industries which use aluminum sulfate and sulfuric acid etc...Are some of

the internal factors that affect the company market performance knowingly or unknowingly

4.5.8 Product/Service Quality

Product/service quality has become a major issue in almost all market today. In AMASSASC product/service is to survive and grow it must be perceived in the marketplace as providing high quality relative to its price. In this light an evaluation should be undertaken to evaluate the quality of the firm's major products(s) and service(s) relative to that of the competition. AMASSASC is not developing direct feedback from customers, service and general customers acceptance are some of potential sources of that should be considered that reflecting product /service quality.

4.5.9 Marketing capability

Closely allied with an organization's product position, its marketing capability that is its ability to deliver the right product or service at the right place at the right time and at the right price. Areas that should be investigated regarding an organization's marketing capability include its distribution channels, the types of advertising and promotion used, and identification of the specific markets being targeted etc….. Significantly affect the market performance of the company. Related to this AMASSASC could not produce hydrated lime or does not work in cooperated with other industries to produce hydrated lime which have affected the sell of 66% for Addis Ababa Water and Sewerage authorities.

4.6 Analyzing external factors affecting Market performance

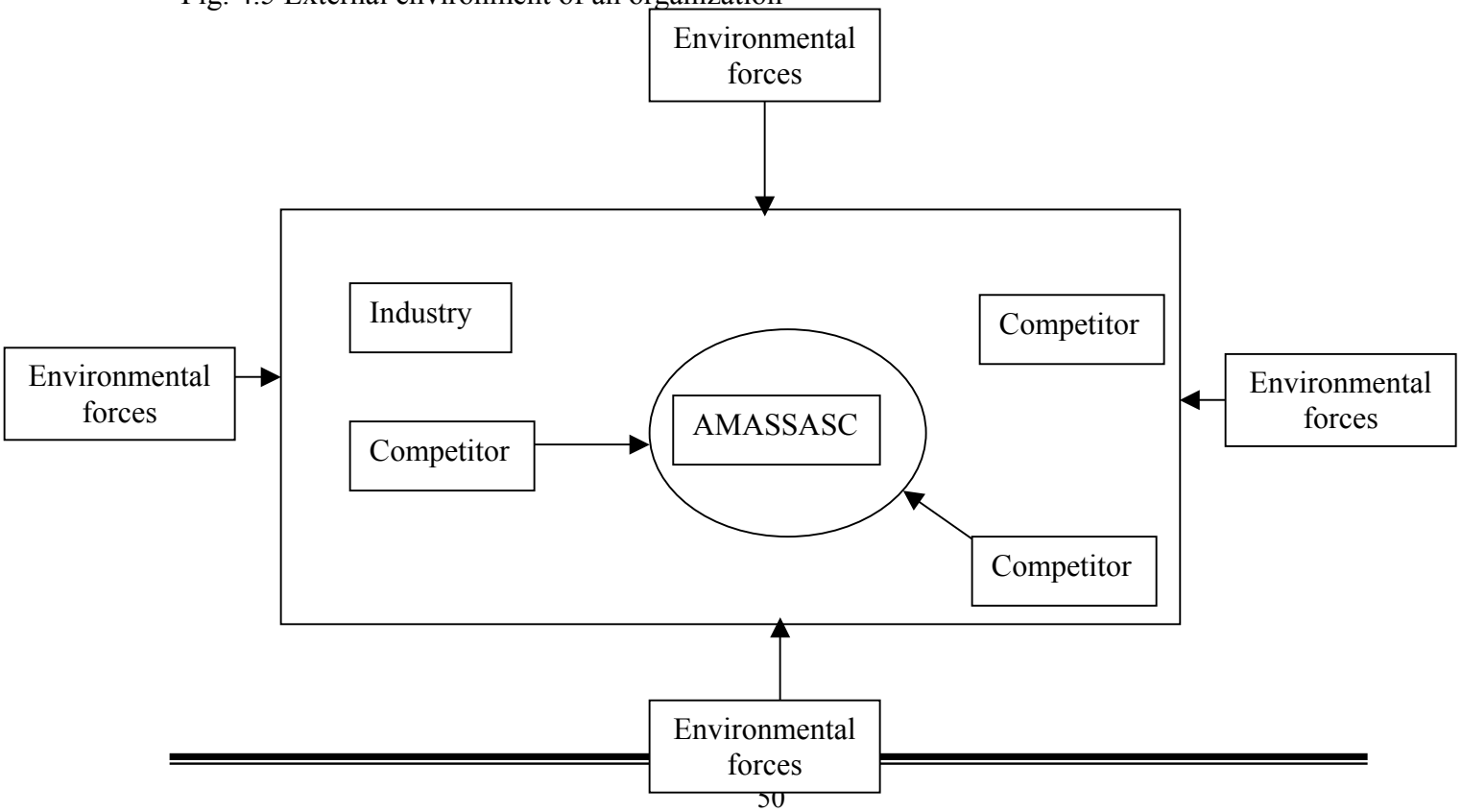
External factors or environmental analysis seeks to uncover relevant information, rather than extensive information. Furthermore, the process must be future-oriented to provide for adequate response time, whether the desired response it to capitalize on a trend or to influence its direction. These forces can be classified as economic, technological, social, and political (or regulatory). The nature of these forces varies with the geographical scope of the organization's operations [25].

External factors have significant effect in the market performance of AMASSASC as internal factors affects the market performance. For this there are many reasons that the company could not have good market performance and be competent in the country as well as in the foreign

market. Some of the external factors that affects the market performance of the company and does not make it competent are: the economy policy of the country ,employment laws, tax policy , economic growth, interest and exchange rate, inflations rate, the government subsidy.
In Ethiopian for this unique chemical industry there is no subsidy to the company to sell its product in the country as well as in the foreign market. For example in China most sectors have subsides for the country product and because of this the country is capable of competing in with lesser price in the foreign market. Countries such as China and India which produce 300,000 ton of sulfur per year compared to Ethiopian unique chemical company, AMASSASC, the maximum capacity of production 17,000 ton per year it is becoming hared to cover even its own expenses compared to the mass production of other countries and could sell it with lesser price.

Environmental analysis is a critical component of strategic management because it produces much of the information required to asses the outlook for the future. The environment is a significant source of change. Environmental analysis is concerned with examining those forces that are not under the direct control of the organization or its industry but which can profoundly influence the industry and organization within the industry [25].

Fig. 4.5 External environment of an organization



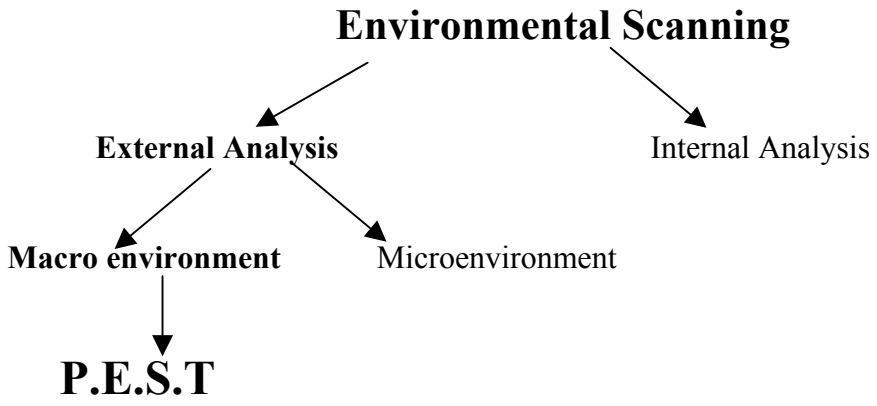
In order to see the external factor that affect its market performance and competitiveness, PEST analysis is used to see some of the external factors that affected the market performance of AMASSASC.

4.6.1 PEST Analysis

Using PEST analysis in this chapter try to see external Macro environment in which affect the market performance of AMASSASC operate, and help to see some of the external factors that affects the market performance.

A scan of external Macro environment in which the firm operates can be expressed in terms of the following factors [25]

1. Political
2. Economic
3. Social
4. Technology



4.6.1.1 Political Factors

Political factors include government regulations and legal issues and define both formal and informal rules under which the firm must operate. Some examples are:

- Tax policy
- Employment laws
- Environmental regulations
- Trade restriction and tariffs
- Political stability

From the above mentioned some of it is described blew how political factors would affects the market performance of AMASSASC.

4.6.1.1.1 Tax policy

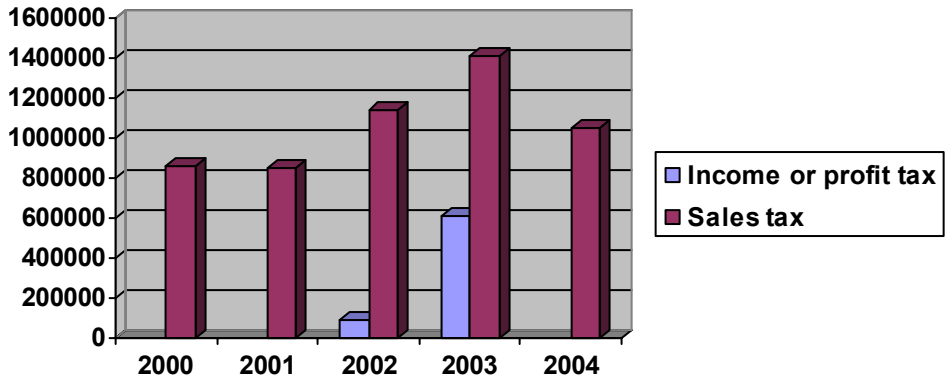
AMASSASC on the different stages of its market, there are different taxes it pay to the government as well as for imported raw material like sulfur. In all the stage the tax policy highly affects its market price. The company has different tax it pays, some of the taxation levels are: income tax or profit tax, sales tax, directs and indirect taxes are some of the tax policy that it affects the price of the goods and affect its market performance.

Table 4.8 shows some type and level of taxation the company pays in birr

List of taxation	Years				
	2000	2001	2002	2003	2004
Income or profit tax	-	-	87,460	609,937	-
Sales tax	863,253	850,011	1,141,030	1,415,301	1,048,249

Source: AMASSASC

Fig 4.6 shows type and level of taxation the company pays in birr



As it can be seen from the figure 4.6 sales tax is increasing up to 2004 each year. The company can not survive today by simply doing a job. This job has to be advertised and has to be interacted with the environment to achieve the desired exchange outcome with target market. In this interaction in the market tax policy highly affects the unit price of the product and directly affects the market performance of AMASSASC.

4.6.1.1.2 Employment laws

Employment laws have major effect in the company market performance. Human power planning, which management determines how the organization should move from its current man power position to its desired man power position, is the key department which strives to have the right number and the right place, at the right time doing things which result in both organization and the individual receiving maximum long term benefits. It deals with employment law calculation of human power requirements of the present state and in future considering various factors such as internal and external economics, social and political pressures, organizations policy available and suitability of manpower requirements have effects with the law of the employment.

The total number of the employees currently in AMASSASC is 239. In all the time the company has to pay to the employee regardless of stopping of the machine or even in ideal time that the machine stops for weeks or months. Personnel are a high cost element in an organization and must be planned like other functions of enterprise such as marketing and finance. This calls for proper determination of man power requirement, recruitment, selection, placement and replacement of personnel to match the abilities and potentialities of the personnel with the demand of various jobs condition considering the current market just have costs.

Formal and informal rules under which the firm operates merit rating is a systematic and orderly approach to assess the relative worth of an employee working in an organization in terms of his job performance, integrity, leadership, intelligence, behavior, etc…would affects the market performance of the company.

Employment law affects the cost of the company considering merit rating is commonly referred to as employee appraisal or staff reporting. It provides a record of the worth of the employees they therefore can be put on the most appropriate jobs depending upon their capabilities. In merit rating formal and informal rules under which the firm operates may help employee and thus helps in employee improvement.

These laws may include:

I. wage increase II. Promotion III. Training IV. Transfer, and V. Discharge

When consider in wage increase promotion training the company has expenditure .These and other factors employment law would affect the market performance and competitiveness.

Table 4.9 shows the different proportional distribution of professional, technician, staff percentage distribution

	List	Percentage distribution
1	Engineers (B.A or Above)	3.2%
2	Professional staff (B.A or above)	2.76%
3	Diplomas	1.8%
4	College/ university attending now	13.8%
5	vocational/technical	1.84%
6	Other level lower level	48%

As it seen from table 9 the number of proportion of the employees varies. There are some formal and informal employment laws that affect; wage increase, promotion, training, transfer, and discharge which will affects directly or indirectly the market performance of the company.

4.6.1.1.3 Trade restriction and tariffs

Trade restriction and tariffs have the major effects in the market performance of the company. These days Ethiopia is following free market system it is becoming challenging to compete with those which produce thousands of ton. Not only their mass production but also their government subsidy in the foreign market affected the Ethiopia market. Ethiopian's companies including AMASSASC getting hard to penetrate into the domestic as well as foreign markets due to imported goods.

These days on the chemical product like aluminum sulfate and sulfuric acid there are neither restriction to import to the country nor has restriction or higher taxation for those who import

aluminum sulfate and sulfuric acid to encourage the domestic product. Because of no trade restriction and tariffs in the country for imported chemical product, highly affects the market performance of the company product. There is a certain amount of cross-border trade in sulfuric acid, notably to Sudan. Ethiopia would not be in a position to be competitive as a supplier of small tonnages into markets within the region. Substantial subsidies would be required to enable Ethiopian product to be competitive in neighboring markets which would not justify larger scale production than recommended to meet the countries domestic requirements.

There is no trade restriction for importing this chemical product and could not sell its entire product even the cost base is too high to enable export from Ethiopia, and to be competitive with imports from low-cost sulfuric acid producers in Europe and Japan. High inland freight costs from Ethiopia to other countries would if anything also favors imports from outside Africa. The Preferential Trade Area currently imports around sulfuric acid, mainly from Western Europe. Even in Ethiopian market AMASSASC to sell it product, it has to compete with other importers in Ethiopia, which are importing sulfuring acid in lesser cost than AMASSASC sells. AS there are no trade restrictions to protect the domestic product, which would contribute higher means of income in foreign, contribution of the company product to other sectors, contribution to the employment market performance is affected.

4.6.1.1.4 Political stability

Political stability has an effect on the market performance of AMASSASC. When the company established there is different study were done in Derge regime. This sector has been identified as the key, which will determine the National sulfuric acid requirement; it is also assumed new projects would be implemented and provides a substantial increase in aluminum sulfate consumption in the municipal water/sewage treatment sector. Even if in the past years Addis Ababa water and sewage authority were using aluminum sulfate for water treatment it has stopped this year. When the company establish it had target on this projects and other projects that would be expand use AMASSASC product, but political stability and different market policy have an effect on company market performance. Similarly, the remaining regional water authorities, and have large scale expansions in water supply planned, which seem likely to be a

high national priority using the product of AMASSASC. These days the regions have their own authorities to buy the product in the free market policy. Thus, political stability has an effect on the market performance of the company product.

4.6.1.2. Economic Factor

Economic factors affect the purchasing power of potential customers and the firm's cost of capital. The following are some of factors in the macro economy:

- Economic growth
- Interest and exchange rate
- Inflations rate

From the above described there are description how economical factors would affects the market performance of AMASSASC below.

4.6.1.2.1 Economic Growth

Economic growth has an impact on the market performance of every company especially in AMASSASC. Economic growth directly or indirectly effect the powers of buyers .When buyer power is strong, the relationship to the producing industry is near and any amount of Aluminum sulfate for sulfuric acid produced it would be sold in the market. If the economic growth is low the buyer purchasing power would be less, and expansion and development of new industries would be slow and affects the market performance.

The economy growth of the country is slow and thus, there are no implementation of larger size industries, which consume aluminum sulfate and sulfuric acid in large size. The existing factories and industries are not developed much or they have lesser production capacity and are consuming small amount of the company product.

As shown in Table 4.10 the quantity that the industries or customers by sulfuric acid ton per year less as the economy scale or production capacity do not allow them to use sulfuric acid in large amount.

Table 4.10 shows the amount of Aluminum sulfate purchased ton per year

USERS	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
A/AW.S.S.A.	2609.4	5090.6	4500	4200	4203.55	1300
Oromia W.S.S.A.	70	255	122	388	700	N/A
Ethio. PULP&PAPER S.C	380	340.65	444	490	217	N/A
Bargoba trading PLC -	-	-	-	20		N/A
South W.S.S.A.	147	141.2	133	-	-	N/A
Amara W.S.S.A.	-	-	80	152.4	103.9	N/A
Ethio. tanary PLC	70	84	60	110.3	80	N/A
Fincha Suger Facotry 60	210	35	65	144		N/A
Harir W.S.S.A	152	-	-	-	26.6	N/A
Muger cement Intr.44	44	66	66	88		N/A
Tigray W.S.S.A	-	45	24	40	36	N/A
Alemada Textil	15	51.5	90	74	14.1	N/A
Alefora	-	20	-	10	10	N/A
Akaki Testile	18.2	22	12.9	11	13.3	N/A
Seba Tannery	-	-	-	-	1	N/A
Alico Awash Taneery 16	-	-	12	11		N/A
Mersa Tannery	6	-	-	6	10	N/A
Bedele Bira PLC	-	-	-	-	7.5	N/A
Moha Leselas drink-	-	-	-	9.5		N/A
Etho. Electirc Co.	-	-	-	-	10.5	N/A
Bahir Dar Textile	-	-	-	-	8	N/A
Awash water servic-	-	-	-	17.10		N/A
Blue Nile Tannery	-	-	-	-	3	N/A
Dria Dewa Txtile	-	-	-	-	5.8	N/A
Gilegale Giba Hyro. Elc.-	-	55	101.4	20		N/A
Others	54.9	80.1	41.75	35.2	5.45	N/A
Export to Sudan	-	-	-	10	-	

The economy growth encourages larger investment, as well as increase the purchasing power the industries. As it can be seen in Table 4.11 the industries are buying small quantity of aluminum sulfate.

4.6.1.2.2 Exchange rate

Exchange rate is one of the factors that affect the market performance of most companies including AMASSASC. In the past ten years from 1994 to 2006 there is a gradual increase of the exchange rate. The current exchange rate policy induces a bias against exports in favor of imports. Maintaining an overvalued currency has its benefit in terms of the repayment of foreign debt, but has a detrimental effect on the ability of domestic manufacturers to penetrate the international markets or to compete with "cheap" imports.

Exchange rate affects AMASSASC in different ways. As there are raw material like sulfur is imported, increase exchange rate affect the price of imported material and the price of shipments of these products and would also increase the freight cost. The company would be forced to increase the unit price which also affects the market performance of the company products. When there are failures to machine parts in order to maintain this machine some spare parts have to be imported. As the exchange rate increase the cost of the purchasing price increase and also affect the market performance of the company.

4.6.1.2.3 Inflation rate

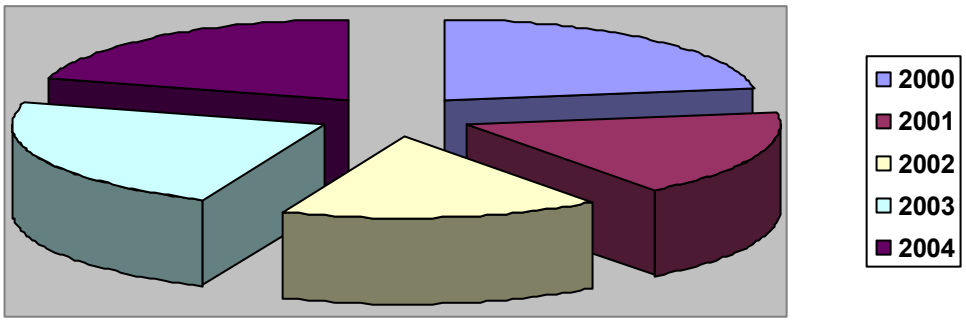
Inflation rate is another factor that affects the company market performance. The increase of price is affecting the selling price of AMASSASC. Before 2006 and still now there is a trend in the increase of the price of good, due to some economical or political factors in the world there is high inflation rate. Some of the raw material AMASSASC imports, like sulfur and spare parts price have increased, in which directly affect the production cost. These and other factors of inflation have affected AMASSASC market performance.

Table 4.11 shows price of sulfur for one ton in Birr

	List of raw material imported	Unit cost of raw material sulfur in Birr					
		2000	**2001**	**2002**	**2003**	**2004**	**2005**
	Sulfur	1949	1509	1444	2027	1783	-

Source: AMASSASC

Fig. 4.7 shows the price variation sulfur for one ton



4.6.1.3 Social Factors

Social factor is one of the reasons that affect the market performance of the company. Social factors include the demographic and cultural aspects of the external macro environment. These factors affect customer needs and the size of potential markets. Some of the social factors include:

- Health consciousness
- Attitude towards the product

4.6.1.3.2 Attitude towards the product

Attitude towards the product factor highly affect the company like AMASSASC. This is another problem that the company has faced. With the same quality and capacity of supply of the product the customers want to import the same product even with higher price than it is sold in the country, these attitudes of the customers cause AMASSASC not to be competing in the domestic market.

4.6.1.4 Technology

Technological factors can lower barriers to entry, reduce minimum efficient production levels, and influence outsourcing decisions. Europe and other developed countries product sulfuric acid as by-product in mass and selling the product with lesser price compared to AMASSASC limited capacity of production and lesser capacity of technology used which affects its competitiveness. Some technological factors include:

- Automation, rate of technological change, etc.....

4.6.1.4.1 Automation

Automation is another factor that affects the producer and the customers need. If there is continues production with large amount and there is a market and the company could sell its product relatively lesser price than those which product with the goods. Nature of production system of AMASSASC is continuous for sulfuric acid and batch type for aluminum sulfate. In AMASSASC there is continuous production of sulfuric acid the capacity of production is lower and small market boundary compared to other country which product continuously and have larger market boundary. Thus, automation affects its market performance of the company.

Summary

The market performance of AMASSASC relatively poor in aluminum sulfate compared to the company capacity of production and the demand of the customers. Demand of aluminum Sulfate in 2005-2006 used in the purification of drinking water requirement is decreasing at high rate, contrary to the company sell expected to increase. AMASSASC have faced problems due to not selling the entire product that it produced, and these days it is not possible for the company to produce with its full capacity. In Ethiopia there are small quantity buyers of the product of AMASSASC relative to the capacity production. Some of the users are: Leather, soap, textile, Sugar, paper and pulp, flower production, mining areas, Pharmaceutical, etc… purchase small quantity because of the limited capacity of production.

It could seen that there is poor market penetration, in order to win the customers the company is not using means to penetrate to the market like giving free training to the customer. There are an internal factor that affects the company market performance and competitiveness. Some of the internal factors that affect its market performance are type of marketing and distribution, applied technology, research and development, innovation or introduction of new product, training, applied technology, information management system, internal working condition etc…

External factors have significant effect in the market performance of AMASSASC as internal factors affects the market performance. Some of the external factors that affects the market performance should be in a scan of external macro environment in which the firm operate can be expressed in terms of the following factors: 1.Political , 2.Economic, 3.Social, 4.Techonolgy. Some of the external factors for the company could not be competent are: the economy policy of the country, employment laws, tax policy, economic growth, interest and exchange rate, inflations rate, the government subsidy etc...

Chapter Five

Competitiveness of AMASSASC

5.1 Back ground information

In AMASSASC there are different constraints that the company faced to be competitive in the domestic as well as foreign markets. AS a reason for customers not to buy the product of AMASSASC the price is seen as one factor. There are no alternative product the company product which makes company to be more competitive and there is poor flexibility in new product introduction. These times company is product oriented than reconsidering the selling price that is becoming more challenge the company to be competitive. On This chapter to analysis the competitiveness of the company SWOT analysis and cause and effect diagram and cost analysis are used.

5.2 Defining and measuring competitiveness

There are different measurement may be used to analysis the competitiveness to some industries, businesses, companies etc…The development potential of a country or an economy is determined by its ability to foster competitiveness and to generate, attract economic activities that will ensure Success in the developing income means. Given the choices that customers face today, how do they decide which product or service to buy? Different customers are attracted by different attributes. Same customers are primarily interested in the cost of the product and correspondingly some companies attempt to position themselves to offer the lowest price. The major competitiveness measure in the competitive dimension that forms the competitive positions of a company includes the following [11].

Cost- "*Make it cheap*" - although price is the competitive weapon used in the market place, profitability is related to the difference between price and cost. Therefore effect of location, product design, equipment used, labor productivity, and good inventory management and so on contribute to the resulting cost.

Quality-"*Make it good*"- the effect of this factor has been highlighted by Japanese marker dominance, where product quality has often been sighted as a reason for preferring the product purchased, customer and clients are often willing to pay more for or wait delivery superior products.

Other competitive dimensions are:-

Delivery speed -"*Make it fast*"

Delivery reliability -" *Deliver it when promised*"

Flexibility and new product introduction speed- "Change *it*" [11]

5.2.1 Definitions of competitiveness

There are different type definition of competitiveness given in different industries and sectors. Some of the definitions of competitiveness are:

Competitiveness is usually used to refer to firm performance. The discourse of firm competitiveness comes from two principal sources. The first of these is the discourse of the economics profession, where competitiveness is regarded as a somewhat abstract quality conferred upon successful firms by the markets within which they operate. Thus, 'the market is the impartial and ultimate arbiter of right behavior in the economy and competitiveness simply describes the result of responding correctly to market signals'

Competitiveness has thus become inescapably associated with ideas of fitness and unfitness, and these in turn with the implied premise of merit, as in 'deserving to live' and 'deserving to die'. Secondly, competitiveness is also the discourse of the business community where it represents the fundamental external validation of a firm's ability to survive, compete and grow in markets subject to international competition. This provides a pervasive and powerful means of explaining almost any behavior i.e. a firm 'must do X in order to be competitive' [13].

5.2.2. Competitive advantages

When a firm sustains profits that exceed the average for its industry, the firm is said to possess a competitive advantage over its rivals. The goal of much of business strategy is to achieve sustainable competitive advantages *[12]*.

Some to the competitive advantages are:

i) Cost advantage ii) Differentiation advantage

A competitive advantage exists when the firm able to deliver the same benefits as competitors but at a lower cost (cost advantage). Deliver benefits that exceed those of competing products (differentiation advantage).

Thus, a competitive advantage enables the firm to create superior value for its customers and superior profits for itself.

Cost and differentiation advantages are knows as positional advantages since they describe the firm's position in the industry as a leader in either cost or different [7].

5.3 SWOT Analysis

In AMASSASC there are different dimension of competitiveness in the domestic as well as foreign market. This time the company concern is not how much to produce, but how and where to sell its products. By using SWOT analysis it is seen the strength, weakness, opportunities and treats of the company and see the competitive advantages the company has.

The SWOT matrix shall be developed in such a way that to analysis the strength, weakness, opportunity, and treats of AMASSASC. Moreover, in this section it is described strength-opportunity, weakness-opportunity, strength-threats, and weakness- threats. In this section critical areas to be looked in are Weakness-opportunity and weakness-threats [9].

5.3.1 Strength

- Has modern e technology and machineries for the production of aluminium sulfate and sulphuric acid
- Availability of free area in the compound for construction of other related chemical(s) producing plant(s)
- Sole producer of aluminium sulfate and sulphuric acid in the country
- Becoming competitiveness in the market with imported products
- Give transportation service to the customers to deliver the products to their sight.

5.3.2 Weakness

- Not able to produce at maximum capacity of sulphuric acid and aluminium sulfate
- Occurrence of technical problems due few months production (especially sulphuric acid unit) and repeated start-up and shut down periods
- Under usage of steam energy obtained from the sulphuric acid plant due to limited period of production
- High production cost that lead to negative response for aluminium sulfate and sulphuric acid market demand inland and abroad
- Repeated technical problems in addition to raised costs, lead to maintenance expense high and make the factory uncompetitive. This also has brought lessening product quantity and that leads to idle period facoty expense
- Skilled manpower is one of the possible weakness problems identified in the area of limited specialists in production, and market area.
- Lack of more trained manpower, laboratory facility and equipment for introduction of new product
- Lack of information on available technological options and size of the market,
- Poor access to information and technology due to this lack of access to international buyer information
- Unstable local market and lack of price stabilisation mechanism.
- Lack of market information on price, quality, supply, exports etc...

- Under developed research capacity and uncoordinated research work for developing the market performance , competitiveness, studying the neighbouring country chemical need quantity, and buying price .
- lack of advise & technical assistance in the production and market
- Lack of access to the key distribution channel near by countries like Sudan, Kenya,
- Lack of proper attention by researcher in the company production of aluminium sulfate and sulphuric acid
- Not able to develop new products
- Remaining only production-oriented
- Lack of information on available technological options, size of the market etc…
- In the company training customers is not seen as essential part of market performance and to develop competitiveness and to have good customer's relationship.
- Under capacity utilization of existing plants
- Shortage of research inputs and out puts, in general inadequate attention from concerned bodies. The company doesn't have a development strategy in the alternative chemical production
- Shortage of trained manpower
- More idle factory expense
- Poor access to information and technology and lack of access to international buyer information
- High price of company product compared to the low purchasing power of customers

5.3.3 Opportunities

AMASSASC's products are a critical element for manufacturers sectors to achieve the necessary increasing in production. Increased market sizes should hinge on two elements, firstly, strengthening and joining regional market groupings and, secondly, exploiting market access opportunities. Some of the opportunities for AMASSASC are listed below

- Future industrial developments in the country create more market opportunities for the company's product. AMASSAC products would be used as a source of raw material for

other sub-sectors. There are product diversification in the company production to produce:

- ✓ Sodium Sulfate, magnesium Sulfate (from dolomite and sulphuric acid)
- ✓ Aluminium hydroxide (from soda ash and aluminium sulfate)
- ✓ Single super phosphate (ssp) from animal bone and sulphuric acid

- The small domestic market makes it difficult to achieve economies of scale and to invest to achieve the required goal these days. Future expansion of in larger size potential industries and market, and larger sub-sectors my help AMASSASC to produce at its full capacity.
- Removal of international trade barriers, globalization could create opportunities to sale its products in different countries
- Aluminum sulfate and sulfuric acid plant have been designed for production capacity of 13,600 & 17,000 tones per year
- Expansion of sub-sectors and availabilities of new technologies
- Unfulfilled customers needs
- Raw material Kaolin is produced in Ethiopia
- In Ethiopia, as is the case with most developing countries, water and effluent treatment form by far the largest sub-sector of alum consumption
- Introduction of foreign technology and innovative methods to improve productivity and implementation of new project
- The factory, with such vital and necessary product to many other processes as raw material, by having a number of customers and future expansion of the sub-sectors would create an opportunity for AMASSASC. For example organizations which use these products are:-

- ✓ Leather, soap, textile, sugar, paper and pulp cement factpries
- ✓ Battery charging – Tele
- ✓ Beverage industries, mining areas
- ✓ Flower production, pharmaceutical areas, schools, Transportation organization etc
- ✓ Water treatment
- ✓ Any organization which uses chemical at least in lab

- In addition to the major applications, aluminum sulfate can be use in a variety of industrial processes including tanning, dyeing, fire extinguisher materials, and pharmaceuticals and electroplating.

5.3.4 Threats

- Technology and economies scale in Ethiopia is not playing critical role in establishing large scale industries which use chemical product of AMASSASC and reducing production costs particularly in the chemical industries

- Emergency of substitute product
- Dependability of spare parts on specific origin (country) and thus being under the cost of the supplier power
- All the spare parts are bought from abroad by foreign currency
- There has not been much progress in terms of upgrading technology and improving the production structure of the sub-sector
- Small domestic market makes
- A lack of cost-competitive infrastructure is one of the most critical factors constrain. This can remain a constraint well into the future as most infrastructure resources are expensive to create and require significant economies of scale to reduce the user costs to acceptable levels and take time to plan and implement. Although, utilities / infrastructure such as electricity, roads and ports are the current focus in Ethiopia, all resources should be viewed holistically and are treat for AMASSASC
- The company production capacity and the customers demand do not much. As it stands now, the industry has a maximum production capacity of 13,600 ton of aluminum sulfate and 17,000 ton of sulfuric acid. But it is using less than 50% of the capacity production.
- Other country production capacity of not less thank 300,000 ton per year as by product and sell their product in Ethiopia market. From the point of view the production of AMASSASC is quite small compared to competitors, and market in Ethiopia to sell its product in competitive price may get harder.

- Increase of taxation in the country may affect factories earning and selling price. This heavy tax burden has two adverse effects either it may create high constrains the resource available for industrial development and investment, and it puts extra wedge on competitiveness especially in the export market.

- Foreign countries competition in Ethiopia using the opportunities in the free market policy, producers in the European and Asia countries may enjoy economies of scale in production could become more suppliers of aluminum sulfate and sulfuric acid at reduced prices to areas that are taken for granted as secured trade domains of Ethiopian chemical company, including domestic markets.

- AMASSASC not yet establish trade line in neighboring countries. Some Europe and Asia countries selling there products to the neighboring countries of Ethiopia due to long time establishing trade line in which Ethiopia could use this opportunity due to its nearness and market agreement in Sudan Kenya etc…. Failure to confirm to international standards is also a potential threat to win markets.
- Slow industrial development in the country
- Despite the country's great potential in developing different sub-sectors, there are many constraints that limit the company production and selling. Some of the major ones are: -
    - Shortage of skilled manpower and training institutions.
    - Shortage of research inputs and out puts, in general inadequate attention from concerned bodies. The country doesn't have a development strategy and policy for the chemical sectors.
    - High price of production equipment compared to the low purchasing power of the customers, poor infrastructure for exporting the product.
    - General absence of policy to assist the development of the sub-sector
- The potential for exporting aluminum sulfate into neighboring countries is negligible where there is domestic sulfuric acid production or where distribution of European and Asia products has been long established so far
- Element sulfur as a raw material imported thus, it is purchased on the world market at a predicable price, there might be inflation in the price

- Poor infrastructure and low support industries and services and charging/taxation in the marketing chain and price of raw materials and spare parts imported
- Not sure on the quality of raw material imported and lack of access to the best natural resource
- Strong competition in the export market and declining price trends and financial constraints and Shortage of trained manpower and training institutions
- Sifting of customers desire away from company's product
- There are number of local importers in the country which import Aluminum Sulfate and sulfuric acid. Some of lists of computers are:

Table 5.1 list of competitor year from 2000-2005

No.	List of compactors which imports aluminum sulfate	List of compactors which imports Sulfuric Acid
1	Genera; chemicals	Meleka Trading
2	Ajeca	Ghin Industrial and chemical
3	Waldosa International	Zeki Iaris
4	Tinsa International	Iydetco PLC
5	Tamba International	
6	Tech. Plc	
7	Integrated Solutions	
8	Gift Trading	
9	Trade Path	
10	MGK Ethiopia	
11	Benyasi Chemical Engineering	
12	Afro-German chemical	

Source: AMASSASC

5.4 Evaluating AMASSASC by using SWOT matrix

In this section critical areas to be looked in are Weakness Opportunity and Weakness Threats AMASSASC. Identifying opportunities and treats in industry and competitive analysis and environmental scanning are useful in defining the company's opportunities and threats. Opportunities are favorable conditions in the company's external environment, industry, or competitive dynamics. Threats are unfavorable trends in the environment, industry, or competition [25].

To develop strategies that take into accounts the SWOT profile, a matrix of these factors can be constructed the SWOT matrix [9].

Table 5.2 SWOT matrix

	Strengths	Weakness
Opportunities	S-O strategies	W-O strategies
Threats	S-T strategies	W-T strategies

S-O strategies: pursue opportunities that are a good fit to the company's strategies

W-O strategies: overcome weakness to pursue opportunities

S-T strategies: identify ways that the firm can use its strength to reduce its vulnerability to external threats

W-T strategies: establish a defensive plan to prevent the firm's weaknesses form making it highly susceptible to external threats[10].

5.4.1 W-O strategies

In AMASSASC there are weaknesses that make the company not to be competitive and have opportunities. In this section we look in weakness and opportunity of the company.

Table 5.3 Weakness and Opportunities (W-O) strategies

Weakness and opportunities of AMASSASC	
Weakness	***Opportunities***
• AMASSASC not able to produce sulphuric acid and aluminium sulfate at maximum capacity • Occurrence of technical problems due few months production (especially sulphuric acid unit) and repeated start-up and shut down periods	➢ Future industrial developments in the country create more market opportunities for the company's product. ➢ AMASSAC products would be used as a source of raw material for many sub-sectors. ➢ Product diversification in the company production to produce: ✓ Sodium Sulfate ✓ Magnesium Sulfate (from dolomite and sulphuric acid) ✓ Aluminium hydroxide (from soda ash and aluminium sulfate) ✓ Single super phosphate (ssp) From animal bone and sulphuric acid ➢ Arrival of new technologies

Cont. **Weakness**	**Opportunities**
• Unstable local market & Lack of price stabilisation mechanism • Lack of information on available technological options, size of the market is a constraint to enter into different industry. • Poor access to information and technology and there is lack of access to national and international buyer information	• The factory, with such vital and necessary product to many other processes as raw material, by having a number of customers and future expansion of the sub-sectors would create an opportunity for AMASSASC. For example organizations which use these products are:- ✓ Leather factories ✓ Soap factories ✓ Textile factories ✓ Sugar factories ✓ Paper and pulp factories ✓ Battery charging – Tele ✓ Beverage industries ✓ Cement factories ✓ Mining areas ✓ Flower production ✓ Pharmaceutical areas ✓ Schools ✓ Transportation organization etc ✓ Water treatment ✓ Any organization which uses chemical at least in lab

Cont. Weakness	Opportunities
• Not considering the production and price, related to domestic and foreign demand	➢ Raw material Kaolin is produced in Ethiopia and the removal of international tread barriers
• Lack of market information on the area of advertising the product, promotion, price, quality, supply exports. There is no introduction of new product like "WATERMAKER" small packages for water treatment, not able to develop new products etc...	➢ Introduction of foreign technology and innovative methods to improve productivity and implementation of new project. In Ethiopia, as is the case with most developing countries, water and effluent treatment form by far the largest sub-sector of alum consumption
• Under capacity utilization	➢ Future expansion of in larger size potential industries and market, and development of larger sub-sectors, which would help AMASSASC to produce at full capacity. There are unfulfilled customers needs. And the plant have been designed for production capacity of 13,600 & 17,000 tones per year aluminum sulfate and sulfuric acid respectively

Proposal: as it is seen on Table 5.3 there are weaknesses that the company has and also there are Opportunities Company faces. By using W-O strategies overcome weakness to pursue opportunities

5.4.2 W-T strategies

In AMASSASC there are weaknesses that make the company not to be competitive and have opportunities in which the company could. In this section we look in weakness and treats of the company establish a defensive plan to prevent the firm's weaknesses.

Table 5.4 Weakness and Threats (W-T) strategies analysis

Weakness and Treats of AMASSASC	
Weakness	***Threats***
• Shortage of skilled manpower is one of the possible weakness identified in the area of limited specialists in production, and market area.	➢ Despite the country's great potential in developing different sub-sectors, there are many constraints that limit the company production and selling. Some of the major ones are: ✓ Shortage of skilled manpower and training institutions. ✓ Shortage of research inputs and out puts, in general inadequate attention from concerned bodies. The country doesn't have a development strategy and policy for the chemical sectors. ✓ High price of production equipment compared to the low purchasing power of the customers, poor infrastructure for exporting the product. ✓ General absence of policy to assist the development of the sub-sector

Cont. **Weakness**	***Threats***
• High production cost that lead to high selling price create negative response for aluminium sulfate and sulphuric acid market inland	➢ A lack of cost-competitive infrastructure is one of the most critical factors constraining. This can remain a constraint well into the future as most infrastructure resources are expensive to create and require significant economies of scale to reduce the user costs to acceptable levels and take time to plan and implement. Although, utilities / infrastructure such as electricity, roads and ports are the current focus in Ethiopia, all resources should be viewed holistically.
• Poor market access to the key distribution channel near by countries like Sudan, Kenya etc… and lack of advice & technical assistance. Under capacity utilization of existing plants	➢ Strong competition in the export market and declining price trends. The capacities the company produce and the customers demand do not much.. From the point of view the production of AMASSASC is quite small, and market in Ethiopia to sell its product is very narrow.
• Not much effort is done on the company to convince the government in order to improve the company sells	➢ In general inadequate attention from concerned bodies about the market policy. Lack of information on available technological options, size of the market. Shortage of research inputs and out puts. Country doesn't have a development strategy in the chemical sectors

• Remaining only production-oriented.	➢ Foreign countries competition in Ethiopia is increasing using the opportunities in the free market policy. Producers in the European and Asia countries such as the China, India that enjoy economies of scale in production could become more suppliers of aluminum sulfate and sulfuric acid at reduced prices to areas that are taken for granted as secured trade domains of Ethiopian chemical company, including domestic markets. These countries exporting to the neighboring countries due to long time establishing tread line in which Ethiopia could have used this opportunity due to its nearness and market agreement in Sudan Kenya etc…. Failure to confirm to international standards is also a potential threat to win markets. ➢ Dependability of spare parts on specific origin (country) and thus being under the cost of the supplier power. There is an increase in taxation, tax burden has adverse effects. It constrains the resource available for development and investment, and it puts extra wedge on competitiveness especially in the export

	market. All the spare parts are bought by foreign currency Increase the price of company equipment compared to the low purchasing power of customers. Industrial developed countries Increasing their production of Aluminum Sulfate and sulfuric acid as by product and sell the product at low price
• Limited specialists in production, and market area and lack of trained manpower, laboratory facility and training institutions for introduction of new product.	➢ Emerging of substitute product, Shifts of customer's desire away from company's product.
• Under developed research capacity and uncoordinated research work for developing the market performance , competitiveness, studying the neighbouring country chemical need, and buying price .	➢ More technological development, and more research work in the world for production of alternative product
• Training customers is not seen as essential part of market performance and to develop competitiveness and to have good customer's relationship.	➢ Lack of proper attention by researcher in the company production of aluminium sulfate and sulphuric acid

• Repeated technical problems and dependence of spare parts from foreign country and lack of access to international buyers of the product	➢ Increase of local importers in the country which import aluminum sulfate and sulfuric acid.
• High production cost	➢ Not sure on the price of raw material imported. Price of raw materials and spare parts purchased from abroad. Goods are purchased on the world market Are not at a predicable price, there might be inflation in the price

Proposal: as it is seen on Table 5.4 there are weaknesses that the company has and also there are theats the company faced. W-T strategies the company should establish a defensive strategies prevent the firm's weaknesses from making it highly susceptible to external threats.

Table 5.5 step-by-step summery of a SWOT analysis

Step 1	*Step 2*	*Step 3*	*Step 4*
Broad external environment analysis	**Competitive analysis**	**Internal environmental analysis**	**SWOT analysis**
Areas for analysis	***Areas for analysis***	***Areas for analysis***	***Areas for analysis***
1. political 2. Economical 3. Social 4. Technological	1. industry structure 2. importer competitor	1. Product/service position 2. .Product/service quality 3. Marketing capability 4. Research and development capability 6. Condition of facility and equipment	1. Strength 2. Weakness 3. Opportunities 4. Threats
Procedure	***Procedure***	***Procedure***	***Procedure***
1. Identify the key forces that are most likely to affect the organization. 2. Monitor information on the key environmental forces 3. Select the method to be used in forecasting these forces 4. Identify the threats to and opportunities for the organization on the basis of the forecast of these	1. Analyze the competitive nature of the industry 2. Identify and analyze competitors 3. Identify key strength and weakness of the organization as compared to those of its competitors 4. Identify the threats and opportunities for the origination	1. Analyze each of the above areas 2. Identify the internal strength and weakness as a result of the analysis	1. Assess the attractiveness of the organization situation 2. Draw conclusion responding for need for strategic action

5.5 Qualitative analysis on AMASSASC competitiveness using cause and effect diagram

The cause-and-effect diagram is also called the Ishikawa diagram (after its creator, Kaoru Ishikawa of Japan), or the fishbone diagram (due to its shape). It was created so that all possible causes of a result could be listed in such a way as to allow a user to graphically show these possible causes. From this diagram, the user can define the most likely causes of a result. This diagram was adopted by Dr. W. Edwards Deming as a helpful tool in improving quality [15].

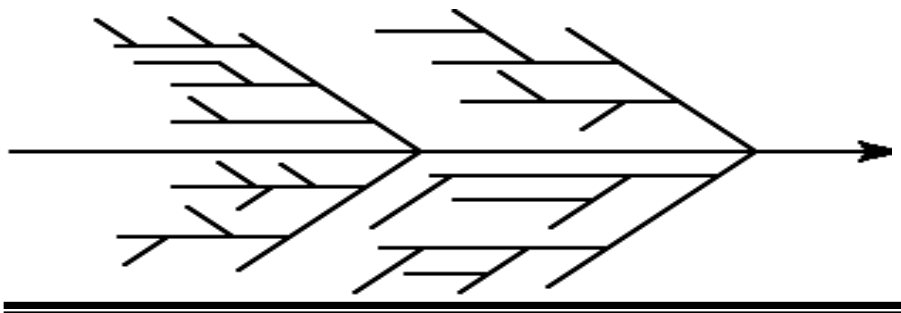
The cause and effect diagram is used to explore all the potential or real causes (or inputs) that result in a single effect (or output). Causes are arranged according to their level of importance or detail, resulting in a depiction of relationships and hierarchy of events. This can help you search for root causes, identify areas where there may be problems, and compare the relative importance of different causes.

Causes in a cause & effect diagram are frequently arranged into four major categories. While these categories can be anything, you will often see:

- manpower, methods, materials, and machinery (recommended for manufacturing)
- equipment, policies, procedures, and people (recommended for administration and service)

The C&E diagram is also known as the fishbone diagram because it was drawn to resemble the skeleton of a fish, with the main causal categories drawn as "bones" attached to the spine of the fish, as shown below[16]

Fig. 5.1 fish bone diagram



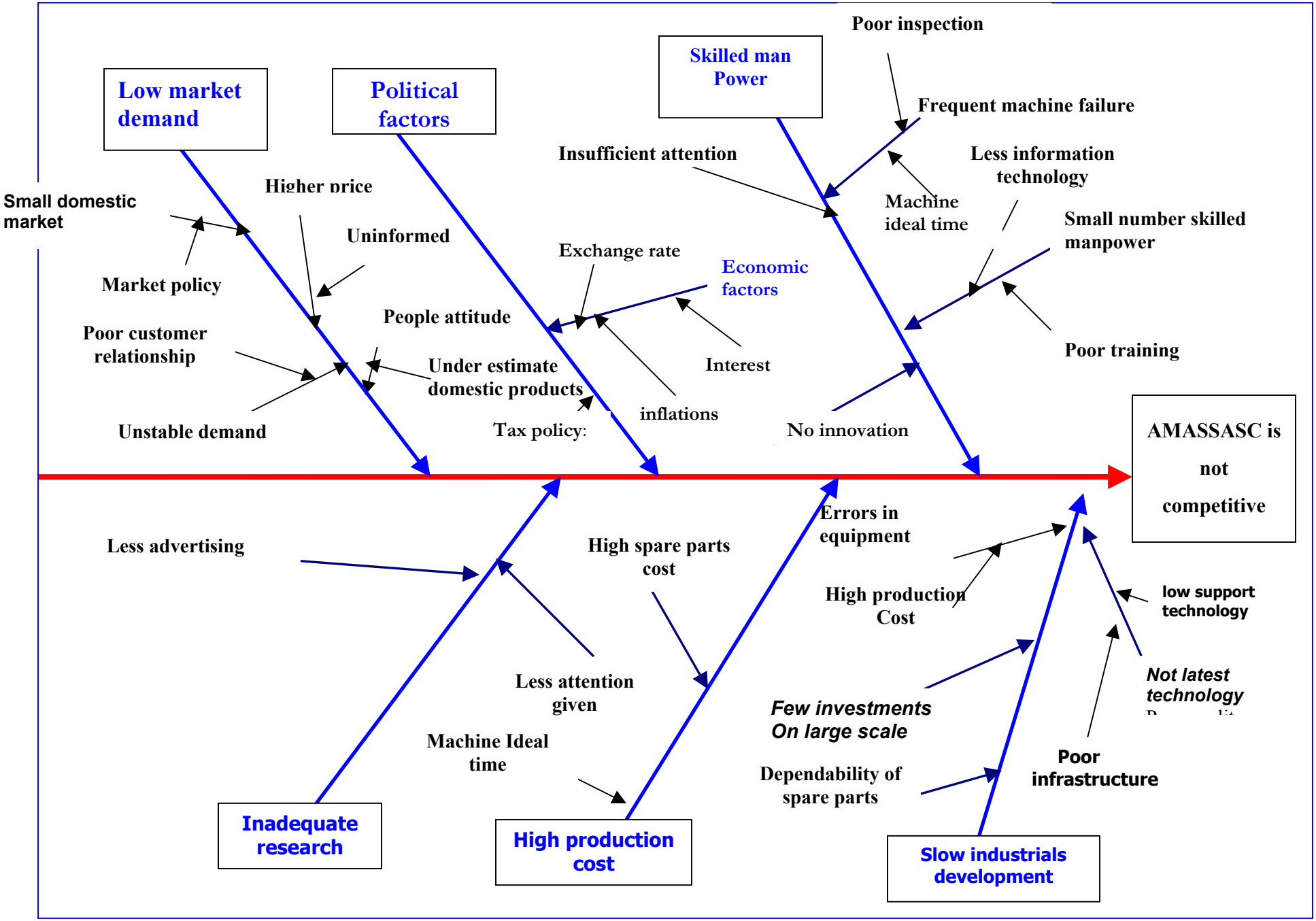
5.5.1 Measuring competitiveness of AMASSASC by using cause and effect diagram

As it is mentioned in chapter four there are many factors that affected the market performance and competitiveness of the company. By using cause and the effect diagram as the first step in problem solving it is possible to generate list of possible causes. In developing the cause and effect diagram the possible causes that AMASSASC is not competitive are collected from various possible sources.

Different sources are used in order to make the cause and effect diagram. Some of the sources used for making cause and effect diagram are: observations of the company working processes, interviewing marketing, finance and personnel departments and it is also considered from the collected data of different departments. Finally interviewing customers are taken into consideration.

Some of the possible causes for AMASSASC not to be competitive are listed in the cause and effect diagram.

Fig. 5.2 Shows cause and effect diagram


Low market demand
Political factors
Skilled man Power
Inadequate research
High production cost
Slow industrials development
AMASSASC is not competitive
Small domestic market
Higher price
Uninformed
Market policy
Poor customer relationship
People attitude
Unstable demand
Under estimate domestic products
Exchange rate
Economic factors
Interest
inflations
Tax policy:
Insufficient attention
Poor inspection
Frequent machine failure
Machine ideal time
Less information technology
Small number skilled manpower
Poor training
No innovation
Less advertising
Less attention given
Machine Ideal time
High spare parts cost
Errors in equipment
High production Cost
Few investments On large scale
Dependability of spare parts
low support technology
Not latest technology
Poor infrastructure

5.5.2 Interpretation of Cause-and –Effect Diagram

It is seen in the cause and effect diagrams that the main causes for the company not to be competitive. It is observed that low market demand, High production cost , slow industrial development in the country, skilled man power, people attitude to the domestic product, inadequate research done on the market performance and competitiveness are the main cause for the company not to be competitive. Other causes that make the company not competitive are: small scale industries, political factors, and market condition and market policy are the main causes for the company not to be competitive.In the company there are signs that show something has gone wrong and the company has more cost in different stages of production and does not produce at its fully capacity and sell its entire product. The main causes that made the company not to be competitive are explained below, some of the main causes that made the company less competitive are as flows:.

I. Low market demand

Market itself has caused the company not to not to produce at full capacity and sell its product fully. The main cause the company to other expenses is Addis Ababa Water and Sewerage authorities which account 66% of its sell. Some of the reasons that the company is not buying the product is due to cease of the production of hydrated lime which would be used with aluminum sulfate. In year 2006 there is low demand in the market and does not sell it product and due to this aluminum sulfate production machine has stop producing. Idle period of machine cause sulfuric acid machine to be corroded the parts. This corrosion needs maintenance and replacement of parts, in which the parts would be bought with high price in foreign currency which cause high production cost.

People attitude is another factor that cause low market demand this days people prefer to buy the imported product. Also there is no much efforts done in the government and private sectors encouraging buying the domestic product. In case of AMASSASC even if produce the same quality compared to the imported chemical, the customers buying the imported product in foreign currency. There are also other factors related to the low market demand that affect th competitiveness of the company, some of the factors are:

a. Poor coordination between the company and the customers
b. Small domestic demand due to small scale industries and the same type of product imported with lesser price than the company selling price
c. Market policy which allows the free market system which forces the company to compete with imported product from developed countries
d. Unstable demand due to poor customer relationships that does not make the customers consistence
e. Company selling price, etc…

II. High Production cost

High production cost is another factor that made the factory not to be competitive in the market. Due to long machine ideal time, less working hours, and also due to its ideal time the parts become exposed to corrosion and crate for another damage on the machine parts. In addition, there are high spare parts costs the company has in order to replace the corroded parts which would add on the unit cost of production to sell its product higher than the competitors. These and other conditions make the company not to be competitive in the market.

III. Political factor

Political factor is another cause that affects the company production and selling price. Some of these factors are:

- Increase of utility good, tax policy on different materials in which the company uses which forces the company to increase the unite price
- Economic factors such as :

✓ Higher exchange rates that make AMASSASC imported raw material and spare parts price to increase. This also indirectly affects the company selling price
✓ Inflation also cause the company working material to increase in price and force the company selling price to increase relative higher than the compactors selling price.

IV. Inadequate research

On of the reasons for the company not to be competitive is that there is inadequate research done to improve the marketing department to promote the product. Insufficient attention given for research work have influence in identifying where the weakness and the strength of the company in order to sell its product. Emergency of substitute product, Shifts of customers desire away from company's product should have been studied with adequate research. Because of not giving good attention for research activities, the company could not identify which areas would affects its market performance and the competitiveness. In addition, under developed research capacity due to improper attention given and uncoordinated research work for developing the market performance, competitiveness, studying the neighbouring country chemical need, and buying price in the company is poor are the main causes.

V. Skilled man power

Skilled man power is one of the causes that affect the competitive of the company. In the company the percentage of employees who are engineers (B.A or above) are 3.2%, Professional staffs (B.A or above) are 2.76%, Diplomas 1.8%, these percentage ratios indicate that there are relatively small number of skilled man power as compared to the company production and goal. There is also less than 5% training given to the employees in the past 5 years from 2001-2005 which would affect the working condition as well as its competitiveness in the market. There is hardly found information and communication technology to study the market demand in the country well as in the foreign market.

There are frequent machine idle time due to either market demand or working condition which would affects the competitiveness of the company. There are insufficient skilled man power to give attention to the market condition and to analysis the market performance and propose to concerned bodies or to the government the ways that helps the company to increase the market sell in the country as well as in foreign market.. This and other factors related with skilled man power have affected competitiveness of the company.

VI. Low industrial development

Slow industries development in the country is other factors that affect the competitiveness of the company. Even if there are large numbers of customers of AMASSASC, the customers are buying in small quantity compared to the company production capacity. Because of few larger investments in large scale industries established in the country the purchasing power of the customer is small.. And also there are lesser technology in the country that demand less quantity of the company product, which affects the sales, production capacity of the company and its competitiveness. These and other factors such as: human errors in the operations, faults in operations, idle time of the machine, changes in the market environment, errors in monitoring equipment, measuring tools cause the company production cost and its competitive.

5.6 Pareto Analysis

In order to determine the vital few and trivial many that made the company not competitive, there Are some reasons described. Some of the reasons that hinder the company not competitive are: Market, political factors, skilled man power, inadequate research, people attitude, small scale industries etc…In order to determine the vital few and trivial many that made the company not competitive it would be used Pareto analysis.

Pareto Principle 80/20 Rule

The Pareto Principle states that only a "vital few" factors are responsible for producing most of the problems. This principle can be applied to quality improvement to the extent that a great majority of problems (80%) are produced by a few key causes (20%). Or 80% of world resources are consumed by 20% of world population [14].

Identifying the vital few causes that are responsible for AMASSASC competitiveness are analyzed. Data taken from the response of different section in AMASSASC is considered and the response was summarized on Table 5.6

Table 5.6 lists of causes that make the company not competitive

Lists of causes	**Total Points**
Low market demand	41
High Production cost	20
Low industrial development	14
Skilled man Power	10
Political factors	7
Inadequate research	5
others	3

List of causes observed in these data summarized from the questioner.

Major causes identified that affected competitiveness of the company are:

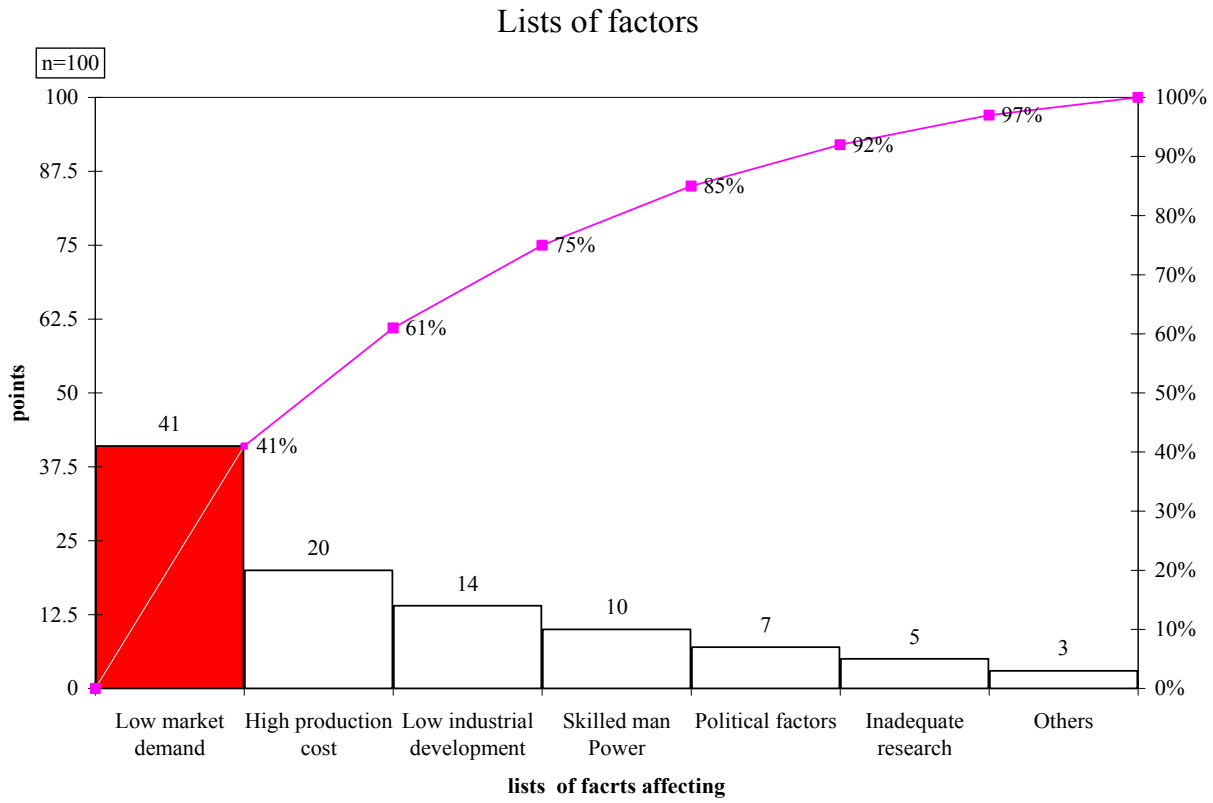
- Market demand: Small domestic market, higher selling price, unstable demand, Poor coordination, market policy, people attitude in under estimate domestic products, favoring imports
- High Production cost: Machine Ideal time, high spare parts cost
- Slow industrial development: not latest technology, few investments on large scale, High production Cost, dependability of spare parts, poor infrastructure
- Political factors: Tax policy, economic factors, inflations, exchange rate
- Inadequate research: Less attention given, less advertising
- Other**s:** working hour, efficiency of the machine, efficiency of workers

In order to analysis using Pareto analysis tool frist it is arranged from the main causes to the possible list causes then cumulative total, individual percentage and cumulative percentages are calculated.. The major causes that made the company not competitive are listed on Table 5.7.

Table 5.7 Parato data analysis

Causes that make not to be competitive					
Se. No.	**Causing not to be competitive**	**Points**	**Cumulative Total**	**Individual Percentage**	**Cumulative Percentage**
1	Low market demand	41	41	0.41	.41
2	High production cost	20	61	0.2	.61
3	Low industrial development	14	75	0.14	.75
4	Skilled man Power	10	85	0.1	.85
5	Political factors	7	92	0.07	.92
6	Inadequate research	5	97	0.05	.97
7	Others	3	100	0.03	1

Fig 5.3 Parato analysis diagram



5.6.1 Interpretation of the Pareto analysis

Pareto diagram used for identifying major problems and their main causes for not to be competitive. Great majority of problems (80%) are produced by a few key causes (20%), the same holds true as above on the diagram.

From the analysis and the Pareto Diagram it is observed that the few most vital problems, which comprise about 75% of the trouble, cause by the first three factors. The major factors that make the company not competitive are as a result of few types of factors such as: low market demands, high production cost, small scale industries, contribute the totals as:

Low Market demand	41 %
High production cost	20 %
Low industries development	14 %

In the case of Pareto diagram used for identifying major causes and their main causes for the company not to be competitive, the same holds true as above. If the company is able to improve market system and promote and advertise its products, and create communication with responsible bodies, it can solve about 75% of the cause that makes it not to be competitive.

The major problems the company not to be competitive are s is as a result of few types of problems. So focusing on these few but vital problems by investigating their root causes, will resolve 75% of the market problem and its competitiveness.

5.7 Cost analysis

In the AMASSASC there are operational costs in different years of production. Some of the operational costs are under fixed and variable cost and also there is operating cost.

Lists of costs are:

- ✓ Fixed costs are: maintenance (labor and material), operating labor, laboratory costs, supervision, plant overheads, capital charges, rates and insurance are some of them.
- ✓ Variable cots are: raw material cost, miscellaneous operating material, utilities or services are included.
- ✓ Operating expense which includes general overheads, research and developments costs, sales expense etc….

On Appendix IVA and Appendix IVB shows all the costs of goods statement for the year 2002/03, 2003/04, 2004/05

A. Variable Cost

Table 5.7 Costs of AMASSASC in three consecutive years

Lists of Variable Cost	**2002/03**	**2003/04**	**2004/05**
Raw Materials used	3,880,644.01	7,013,490.92	4,480,651.08
Production employees' Benefits	155,518.68	321,555.91	206,812.48
Indirect labor	564,527.23	798,672.47	651,007.16
Depreciation _ Factory Machinery & Bldg.	1,998,098.62	2,428,521.45	2,345,143.42
Heat, Light, Power & Other energy.	1,820,928.27	2,302,533.14	2,546,242.11
Factory supplies used	473,504.25	699,441.22	351,601.55
Add - Finished Goods Inventory (Beginning of the year)	3,276,547.64	471,113.36	1,027,624.73
Idle period factory expenses	**3,988,819.93**	**2,468,477.84**	**3,892,185.07**
TOTAL	**16,158,588.63**	**16,503,806.31**	**15,501,267.60**

Source: AMASSASC

IDLE PERIOD EXPENSES DETAIL	2002/03	2003/04	2004/05
Factory supplies	55,316.69	478.28	716.58
Indirect labor	699,992.71	419,889.77	503,655.57
Supervisory and labor	-	147,237.50	54,412.73
Employees' benefits	176,484.03	147,237.50	154,664.94
Heat, light, power	142,667.75	116,463.74	197,930.81
Depreciation expenses	2,140,253.27	1,403,587.05	2,025,870.43
Miscellaneous expenses	774,105.48	355,873.50	954,934.01
	3,988,819.93	**2,590,767.34**	**3,892,185.07**

B. Fixed Cost

Lists of Fixed Cost	2002/03	2003/04	2004/05
Direct labor.	285,521.42	417,364.24	378,005.31
Supervisory labor Costs	151,939.33	164,978.43	
TOTAL	**437,460.75**	**582,342.67**	**488,772.92**

C. Operation Expenses

Lists of Operation Expenses	2002/03	2003/04	2004/05
Miscellaneous overhead costs	645,459.00	1,207,882.31	1,297,502.26
TOTAL	**645,459.00**	**1,207,882.31**	**1,297,502.26**

	2002/03	2003/04	2004/05
Direct production cost = A+B =	**16,596,049.38**	**17,086,148.98**	**15,990,040.52**
Annual production cost=A+B+C=	**17,241,508.38**	**18,294,031.29**	**17,287,542.78**

By subtracting In-Process Inventory and Finished goods Inventory the final cost of the company in three consecutive years were:

	2002/03	**2003/04**	**2004/05**
Total Company costs were	**18,342,209.99**	**16,621,605.39**	**11,946,493.47**

Considering all the e costs of the company the net sales given below on table 5.8

Table 5.8 show the net sales of the company in consecutive years

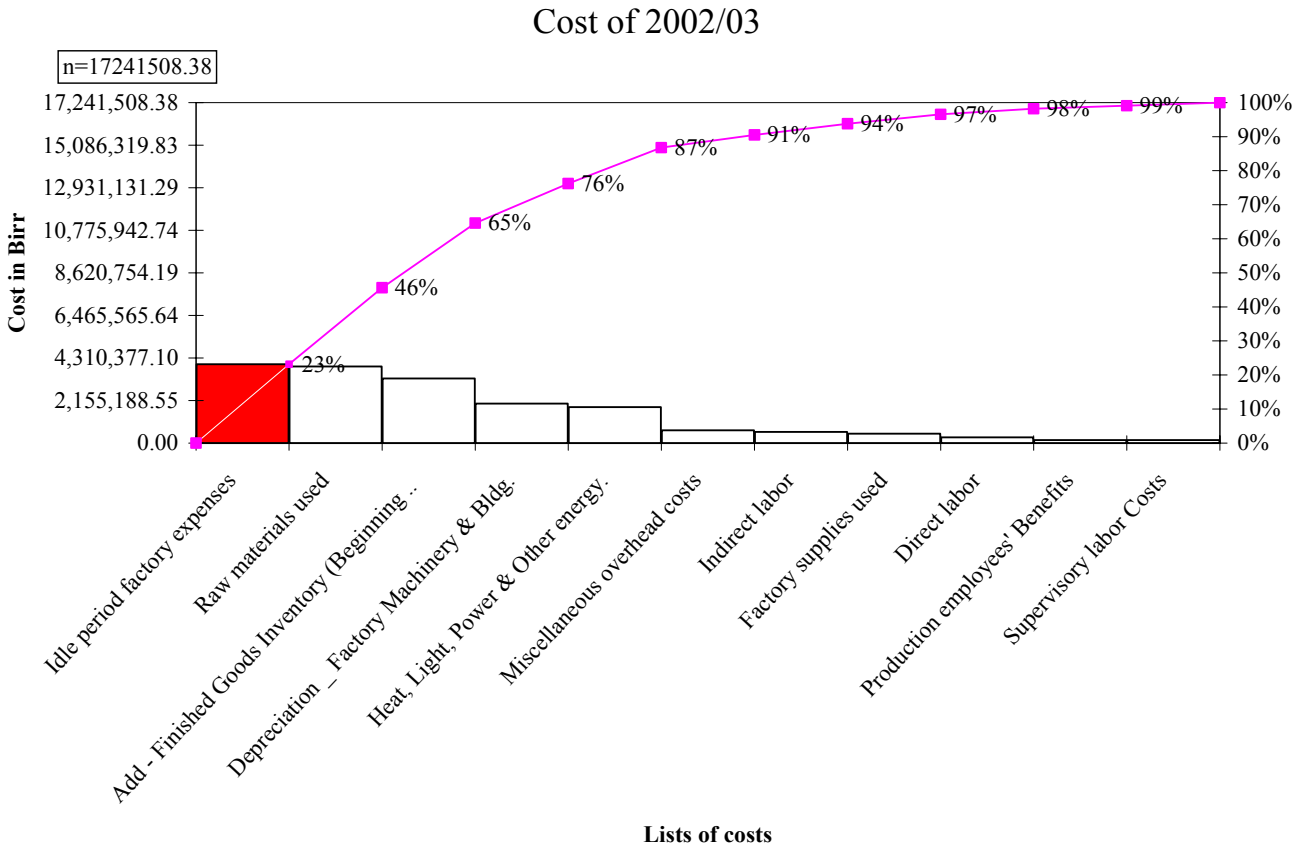
years	2001	2002	2003	2004	2005
Sales	21,569,082	20,116,234	21,093,061	21,566,974	10,458,123

By analyzing all the costs of the company, it is observed that the company has higher cost compared to the net sale in consecutive years.

5.7.1 Cost Analysis using Parato Chart

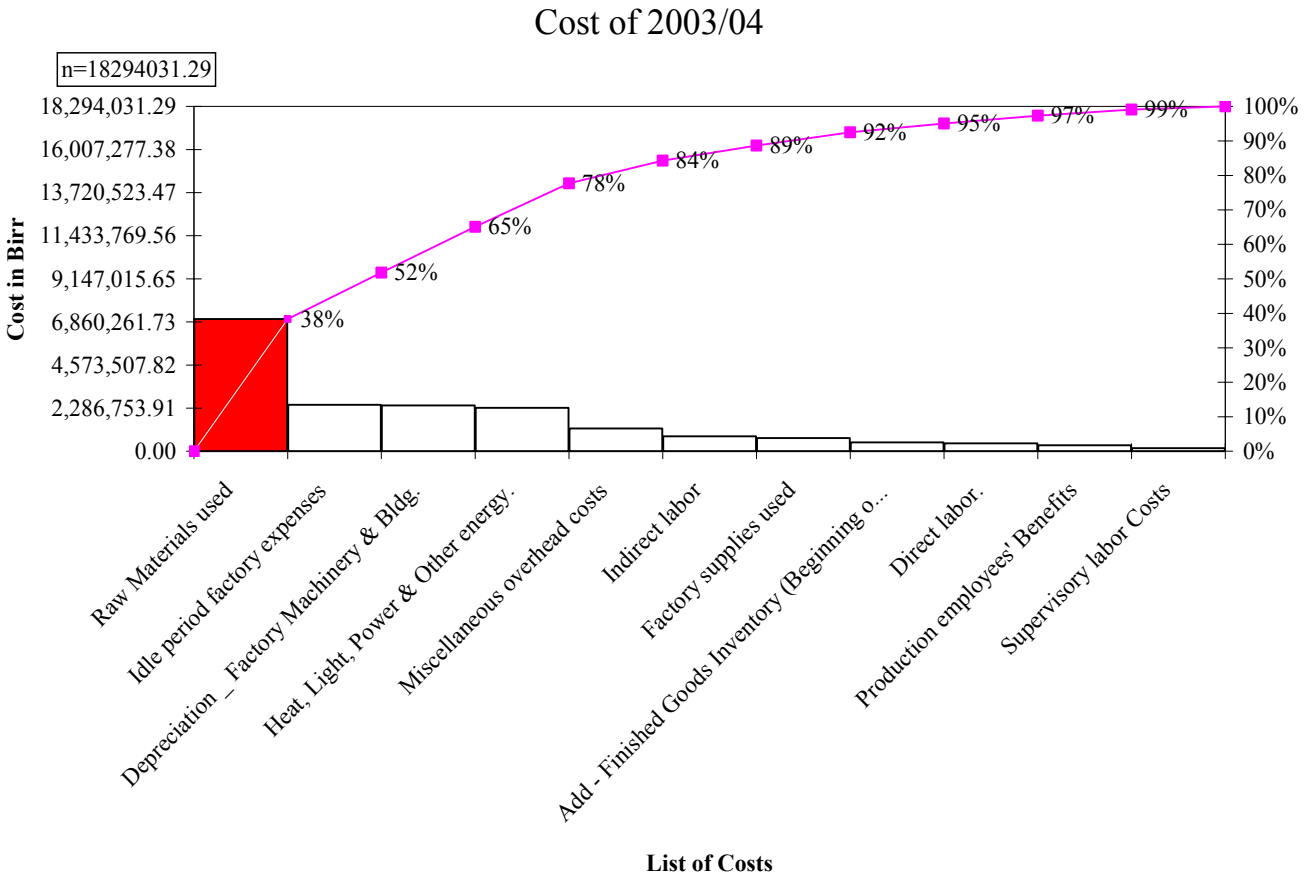
Case I year 2002/03

No.	List of all costs	2002/03	Cumulative total	Individual percentage	Cumulative percentage
1	Idle period factory expenses	3,988,819.93	3,988,819.93	23.13	23.13
2	Raw materials used	3,880,644.01	7,869,463.94	22.51	45.64
3	Add - Finished Goods Inventory (Beginning of the year)	3,276,547.64	11,146,011.58	19.00	64.64
4	Depreciation _ Factory Machinery & Bldg.	1,998,098.62	13,144,110.20	11.59	76.23
5	Heat, Light, Power & Other energy.	1,820,928.27	14,965,038.47	10.56	86.79
6	Miscellaneous overhead costs	645,459.00	15,610,497.47	3.74	90.54
7	Indirect labor	564,527.23	16,175,024.70	3.27	93.81
8	Factory supplies used	473,504.25	16,648,528.95	2.75	96.56
9	Direct labor	285,521.42	16,934,050.37	1.66	98.21
10	Production employees' Benefits	155,518.68	17,089,569.05	0.90	99.11
11	Supervisory labor Cost	151,939.3	17,241,508.38	0.88	100.00



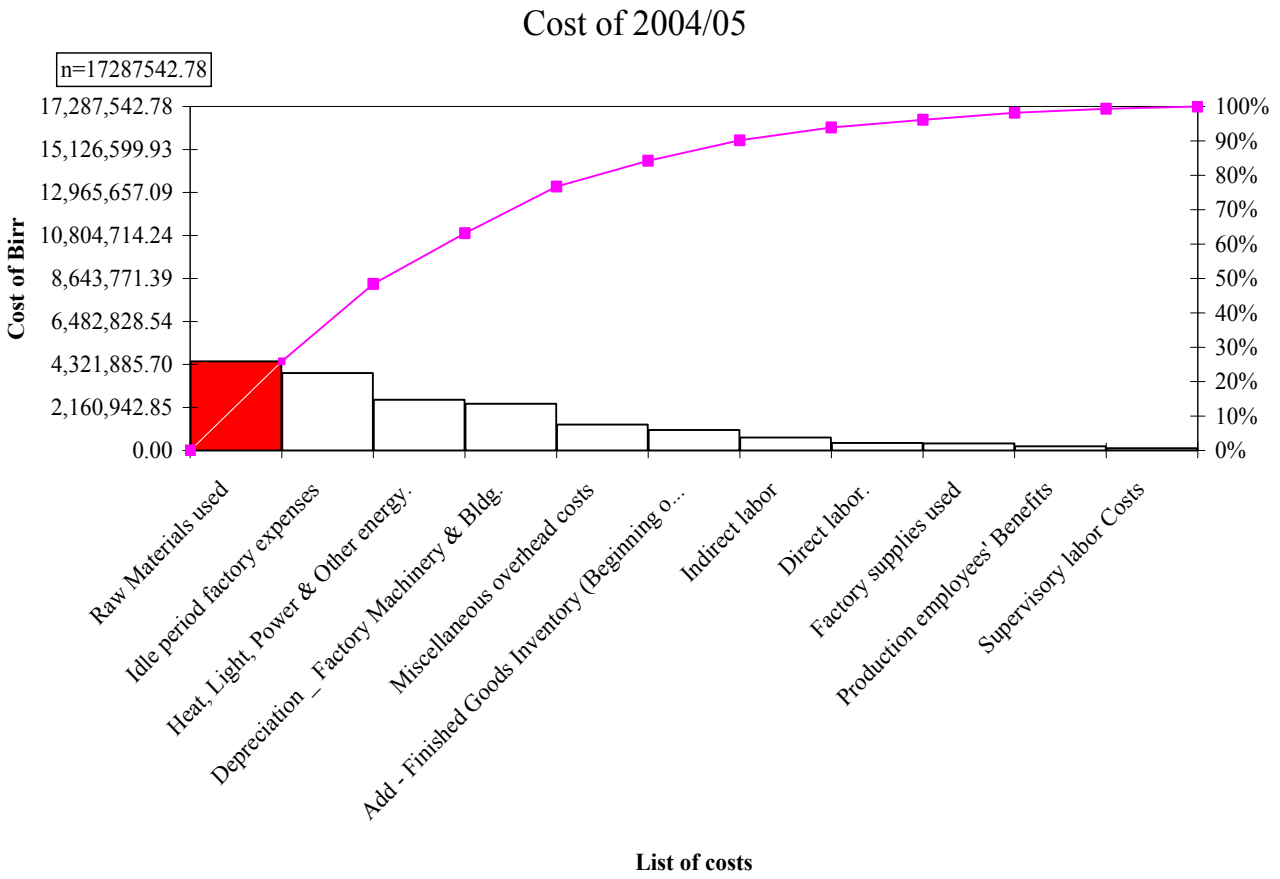
Case II Year 2003/04

No.	List of all costs	2003/04	Cumulative total	Individual percentage	Cumulative percentage
1	Raw Materials used	7,013,490.92	7,013,490.92	38.34	38.34
2	Idle period factory expenses	2,468,477.84	9,481,968.76	13.49	51.83
3	Depreciation _ Factory Machinery & Bldg.	2,428,521.45	11,910,490.21	13.27	65.11
4	Heat, Light, Power & Other energy.	2,302,533.14	14,213,023.35	12.59	77.69
5	Miscellaneous overhead costs	1,207,882.31	15,420,905.66	6.60	84.30
6	Indirect labor	798,672.47	16,219,578.13	4.37	88.66
7	Factory supplies used	699,441.22	16,919,019.35	3.82	92.49
8	Add - Finished Goods Inventory (Beginning of the year)	471,113.36	17,390,132.71	2.58	95.06
9	Direct labor.	417,364.24	17,807,496.95	2.28	97.34
10	Production employees' Benefits	321,555.91	18,129,052.86	1.76	99.10
11	Supervisory labor Costs	164,978.43	18,294,031.29	0.90	100.00



Case III Year 2004/05

No.	List of all costs	2004/05	Cumulative total	Individual percentage	Cumulative percentage
1	Raw Materials used	4,480,651.08	4,480,651.08	25.92	25.92
2	**Idle period factory expenses**	**3,892,185.07**	8,372,836.15	22.51	48.43
3	Heat, Light, Power & Other energy.	2,546,242.11	10,919,078.26	14.73	63.16
4	Depreciation _ Factory Machinery & Bldg.	2,345,143.42	13,264,221.68	13.57	76.73
5	Miscellaneous overhead costs	1,297,502.26	14,561,723.94	7.51	84.23
6	Add - Finished Goods Inventory (Beginning of the year)	1,027,624.73	15,589,348.67	5.94	90.18
7	Indirect labor	651,007.16	16,240,355.83	3.77	93.94
8	Direct labor.	378,005.31	16,618,361.14	2.19	96.13
9	Factory supplies used	351,601.55	16,969,962.69	2.03	98.16
10	Production employees' Benefits	206,812.48	17,176,775.17	1.20	99.36
11	Supervisory labor Costs	110,767.61	17,287,542.78	0.64	100.00



5.7.2 Interpretation of the cost using Pareto analysis

In three cases on the above Pareto diagram it is identified the major costs of the company. On Case I, year 2002/03 by solving the three problems idle period factory expenses, raw materials used and finished goods inventory the company can solve 65% of the problem. On Case II year 2003/04 the major two costs of the company were raw materials used and idle period factory expenses by solving this problems it can solve 52% of the problem. On case III year 2004/05 the major three costs raw materials used and idle period factory expenses, and heat light power and other energy by solving this 63% of the problem could be solved.

It is observed that the major costs of the company; are high cost in raw material which causes in tied up capital in the idle period which also cause inventory cost, and the company ideal period expense which holds highest cost and few most vital problems, which comprise highest value. Idle factory period expense which is the caused by low demand for AMASSASC's product, that made the company not to produce continuously. The main reason why it has highest cost in idle period factory expenses such as: factory supplies, indirect labor, supervisory, employees' benefits, heat, light, power etc. is due to consumer of aluminum sulfate, Addis Ababa Water and Sewerage Authorities (A/AWSA) has stopped buying high quantity of aluminum sulfate. Great majority of problems are produced by a few key causes, not selling the product to A/AWSA. By solving this vital cause the company would solve the major problems.

The company costs associated with preventing, finding, and correcting idle period factory expenses which is the highest cost the company has, based on improvement in the promotion of the product and the company could solve vital problem these costs that is huge. These costs can be significantly reduced or completely avoided. There are costs in the AMASSASC due to poor capacity utilization to produce during a given time period, with an upper limit imposed by the availability of space, machinery, labor, materials, or capital. It is seen from the cost analysis that the company has high production cost in different stages of production. Ideal time cost contribute higher cost in the company overall cost analysis.

Full recommendation is given on chapter 6

Summary

The company has its strength, weakness, opportunities and threat thus, at the list of its weakness and opportunity should overcome weakness to pursue opportunities. And also by studying the possible weakness and threats should establish a defensive plan to prevent the firm's weaknesses form making it highly susceptible to external threats, to develop strategies the company should take into accounts the SWOT analysis. By using cause and the effect diagram as the first step in problem solving the possible problems were generated by list of possible causes. In developing the cause and effect diagram the possible main causes for the company not to be competitive is observed. Some of the problems are low market demand, High production cost, slow industrial development in the country, few skilled man power, people attitude to the domestic product, inadequate research done. By using Parato analysis the possible problems are identified are: low market demand which include small domestic market, higher selling price, unstable demand, poor coordination with other sub-sectors, market policy, people attitude in under estimate domestic products and favoring imports are the main problems identified. There are also other problems identified that cause problems in the competitiveness of the company. Some of the problems are: high production cost which include machine ideal time and high spare parts cost, slow industrial development in the country, political factors like tax policy, economic factors, inflations, exchange rate, and inadequate research done to improve the market performance etc are some of the points that are identified.

Chapter Six

6. Recommendations

- The market performance of AMASSASC in the production of aluminum sulfate mostly depend up on the high consumer of the product, Addis Ababa Water and Sewerage Authority and regional water authorities. On the contrary; the market demands of these factories have changed to other alterative product which presumably substitutes aluminum sulfate, like polyelectrolyte. AAWSA need hydrated lime. The company should co-work with the producer of hydrated lime which would be needed for additional chemical for water treatment used with aluminum sulfate. The company should work in coordination with other companies to produce hydrated lime that Addis Ababa Water and Sewerage authorities and other regional water authorities put as prerequisite to use aluminum sulfate for water treatment. AMASSAC should put consistence effort on other product which the customers put as per- requisite to use AMASSASC product. One of the major customer specially Addis Ababa Water and Sewerage Authority consumer of 66% of aluminum sulfate needs other product in order to use Aluminum Sulfate. Thus, AMASSASC should encourage other sub-sectors and make efforts to contact with the responsible bodies for the production of hydrated lime that customer's per-requisite product in order to improve the market performance and competitiveness.
- Low market demand for both aluminum sulfate and sulfuric acid which are the main products of the company. The plant should endeavor towards maximizing sales in order to substitute imports of similar products completely. Accordingly a good advertisement program and direct contact with end users is highly recommended. The plant should organize itself in such a way that it can sell its products to all large scale and small quantity users both at factory gate and at Addis Ababa, which is the best center for distribution all over the country
- In order the company to produce at full capacity and sale its product completely, the company should develop customization the product and develop one- to-one relationship with the customers. AMASSASC can not survive today by simply producing and waiting

the customers to come and by the product. Its job has to be advertised and has to be interacting with the environment to achieve the desired exchange outcome with target market. In this competitive market customers are not expected to look for a firm's product rather, the firm has to look for them. Thus, success of AMASSASC is not determined only by producing good product, it should advertise its product, go to customers and create one-to-one relationship, and to some extent giving free service, training for the customers concerning the company product and different activities etc..

- AAWSSA is the major consumer of the product. The main thrust of the factory would, therefore, be to provide aluminum sulfate at a competitive price to win AAWSSA from using substitute chemical which are imported
- The company should establish or strengthen the existing standardization bodies through the provision of training, setting up of sub-sectors encourage using domestic product in order to sell its product fully and to penetrate into the market.
- The company should develop defensive strategy to external treats and also try to reverse a negative trend or to overcome a crisis or problems situation. Consequently, defensive strategies usually are chosen as a short-term solution.. The company shoud providing alterative products, working with coordination with the government and other sub-sectors and should encourage the production of hydrated lime, in order to improve its sells
- The company should choose the channel to distribute the products at lower price and should be flexible in the price comparing competitor's price. The company should hold customers, especially in areas of comparative advantage in the long run.
- The company should give attention and make reforms considering different customers are attracted by different attributes. AMASSASC customers are primarily interested in the cost of the product offered the lowest price. Cost- "*Make it cheap*", Quality-"*Make it good*", Delivery speed -"*Make it fast*", Delivery reliability -" *Deliver it when promised*". Thus, the company should hold customers and attract new customers by considering the cost, quality, and delivering speed.

- The company should have flexibility in new product introduction speed. The company should produce new product using its final product which produce. As it its mention in pervious chapters in ruler areas in Ethiopia, aide organizations are buying WATERMAKER for water treatment in small packages in thousand of dollar, this in which the company product Aluminum Sulfate for water treatment. The company should give consideration in producing this product and distribute it with lesser price. When aiming producing this product there needs additional laboratory study and investment for the new product. This would help the company to have product diversification and helps to sell it product and help to maximize production capacity.
- Instead of expecting the customers to come and ask for the product, the marketing department should create new customers by going to the companies and advertising the product.
- The company should take time to identify its strength, weakness, opportunity, and Treats. The company should seriously give attention for its strength, weaknesses, opportunities and treats. By looking at the list of its weakness and opportunity should overcome weakness to pursue opportunities. And also by studying the possible weakness and threats should establish a defensive plan to prevent the firm's weaknesses form making it highly susceptible to external threats.
- Some times production competitive dimension such as cost of selling of AMASSASC product is relatively higher than the compotators cost. In order to overcome this problem the company should not be product focused but price focused. Especially in the bid by selling its product occasionally lower than the competitor's price and discourage the competitors through time to knock them out of the market.

- In order to penetrate into the market, the company should giving free training to the customer about its quality, how they use the product etc... AMASSASC should seriously take training the customers is an essential factor ensuring a satisfactory order-book from the beginning and this can be achieved only if an earlier program of training in sales take place.

- The company should create marketing function encompasses most activities between the producer of a good or the supplier of a service and the consumers. Also it should include planning and executing the conception, pricing, promotion, and distribution of ideas to the customers need and services to create exchanges that satisfy customers and organizational objectives.
- In the company R&D is not coordinated with production and development programs, little use is made of R&D results. Studies results end up merely as reports or as published articles in periodicals and journals. The company should establish R&D programs to discover the reasons why it lacks of competitiveness. And research coordination should develop a clear mechanism for activities in order to improve the market sell and its competitiveness.
- The company should strengthening of the relationship between the private sector and research institutions with reference to its productivity and how the company use its full potential to sell its product in the competitive domestic as well as international market.
- Both the Government and the company should consider undertaking joint marketing and research activities that how it would sell its product in the domestic market as well as in the foreign market. Study investment plans that use the company's product.
- The company should increased market sizes center on strengthening cities and regional market and exploiting market access opportunities in foreign market by advertising, promotion etc…
- Those industrial sectors, customers of AMASSASC, where future growth is very much affected by restrictive measures, as in the case of Aluminum Sulfate And Sulfuric Acid company in Ethiopia the government polices in the market area has big impact in the productions of this company and in its selling price. Protection of the sector by the government, lifting the excise tax imposed on the raw material etc… are some of the condition that the government should take measure in order AMASSASC to be competitive in domestic as well as international market.

Proposed Actions:

Allow the real exchange rate to depreciate to a slightly undervalued (or competitive) level; and

Manage the real exchange rate to remain at a competitive level once achieved

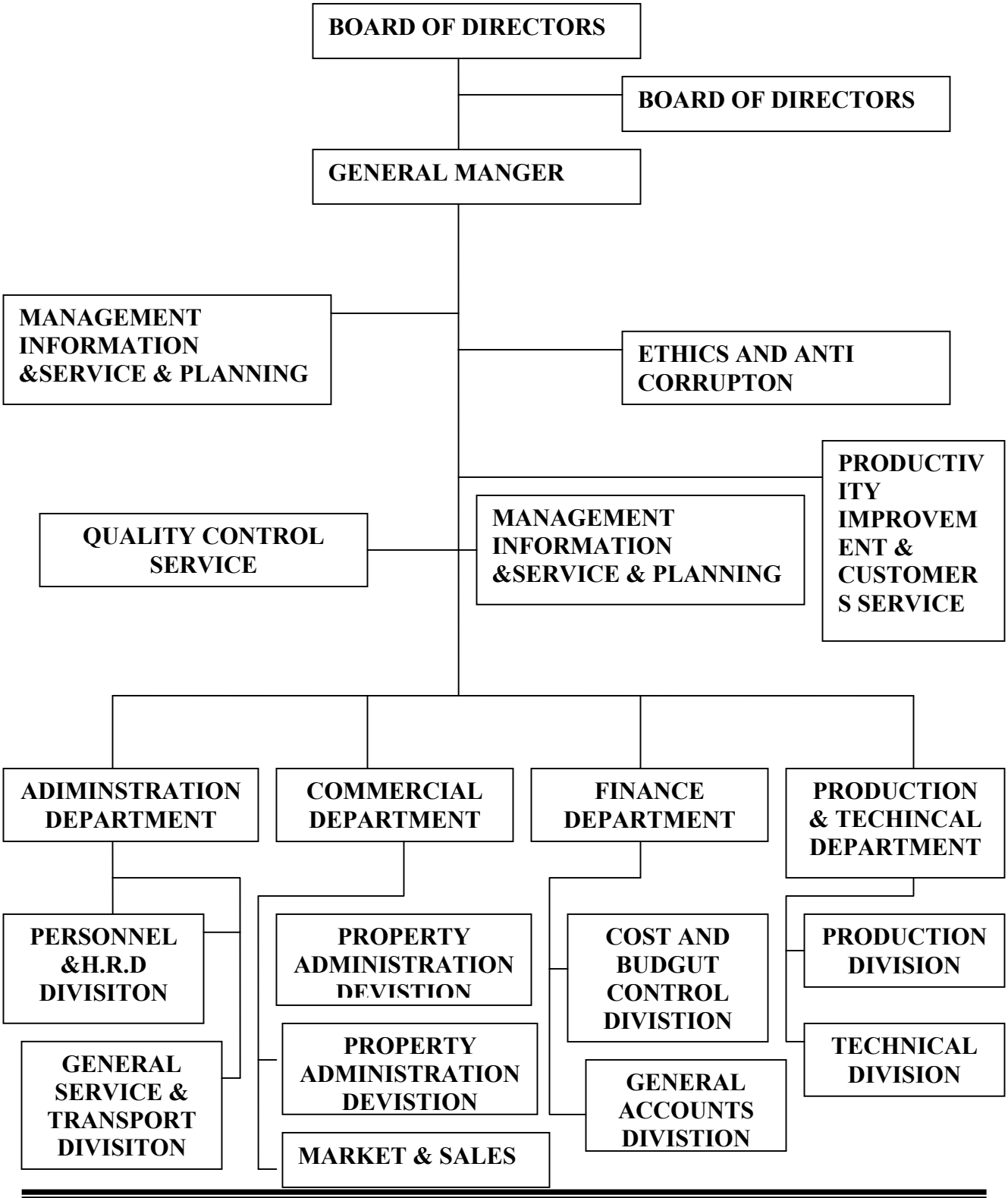
- Measures should be taken in the government to assist this chemical company achieve appropriate means of selling in the global competitiveness as any other countries do, to encourage the domestic producer, the government should encourage giving different opportunities in order it would able to compete in global market.
- The Government should consider tax policy reforms, as well as incentives and protective measures aimed at facilitating the domestic product development. Introduce various incentive mechanisms for the production of industrial raw materials like sulfuric acid.
- The government should give consideration to market investment opportunities for domestic product that they may be able to penetrate especially the newly industrialized countries especially in the neighboring countries. Thus there is a need to expand the capacity of Ethiopian plants or sub-sectors.
- In the country there should develop large scale industries which us aluminum sulfate and sulfuric acid. Thus, foreign investors are sensitive to political instability, and the business environment should be perceived as being conducive to sustainable economic growth and industrial development. The government should be determined to promote larger scale industries that use Aluminum sulfate and sulfuric acid that leads to industrial development.
- AMASSASC to sell its product to the neighboring country there should be improvement in the infrastructure. Thus, there is a need to strengthen the infrastructure for transporting the product inside the country as well as neighbor's country, as well as other support services to improve the price selling relative to competitors products.
- AMASSASC should be aware of perspective of globalization, related production and services are looking for worldwide outsourcing and supply opportunities in a continuous quest for increased competitiveness. In this environment, only the most efficient and productive businesses can survive. AMASSASC should make efforts to enhancement

competitiveness though restructuring, upgrading, and continuous improvements, trying to get customer that account more than 66 % of it sells by providing pre-request product like hydrated lime thus constitute the foundations for success. Additionally, developing the company to achieve higher levels of productivity through the use of modern management techniques and technologies and exploit economies of scale or identify targeted market. In line with this, the company should reveal for the government that it is developing the countries economies by saving the foreign exchange and in transition need to be assisted further to gain access to value chains or production systems, and to encourage and support the use of modern industrial linkages as a means of promoting further economic development, and competitive on a global basis.

APPENDIX

APPENDIX I

ORGNIZATION STRUCTURE



APPENDIX II **Chart 1**

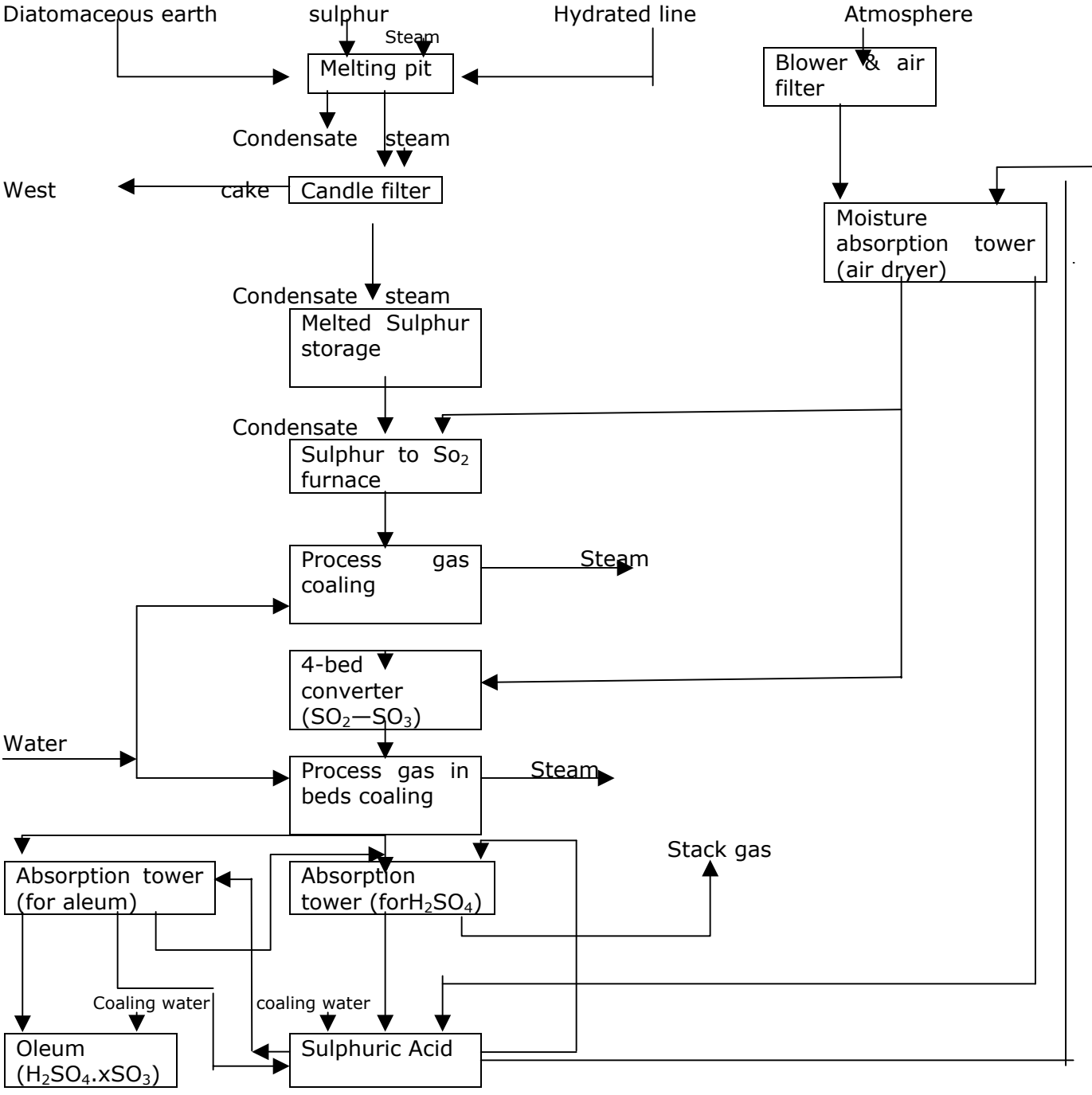
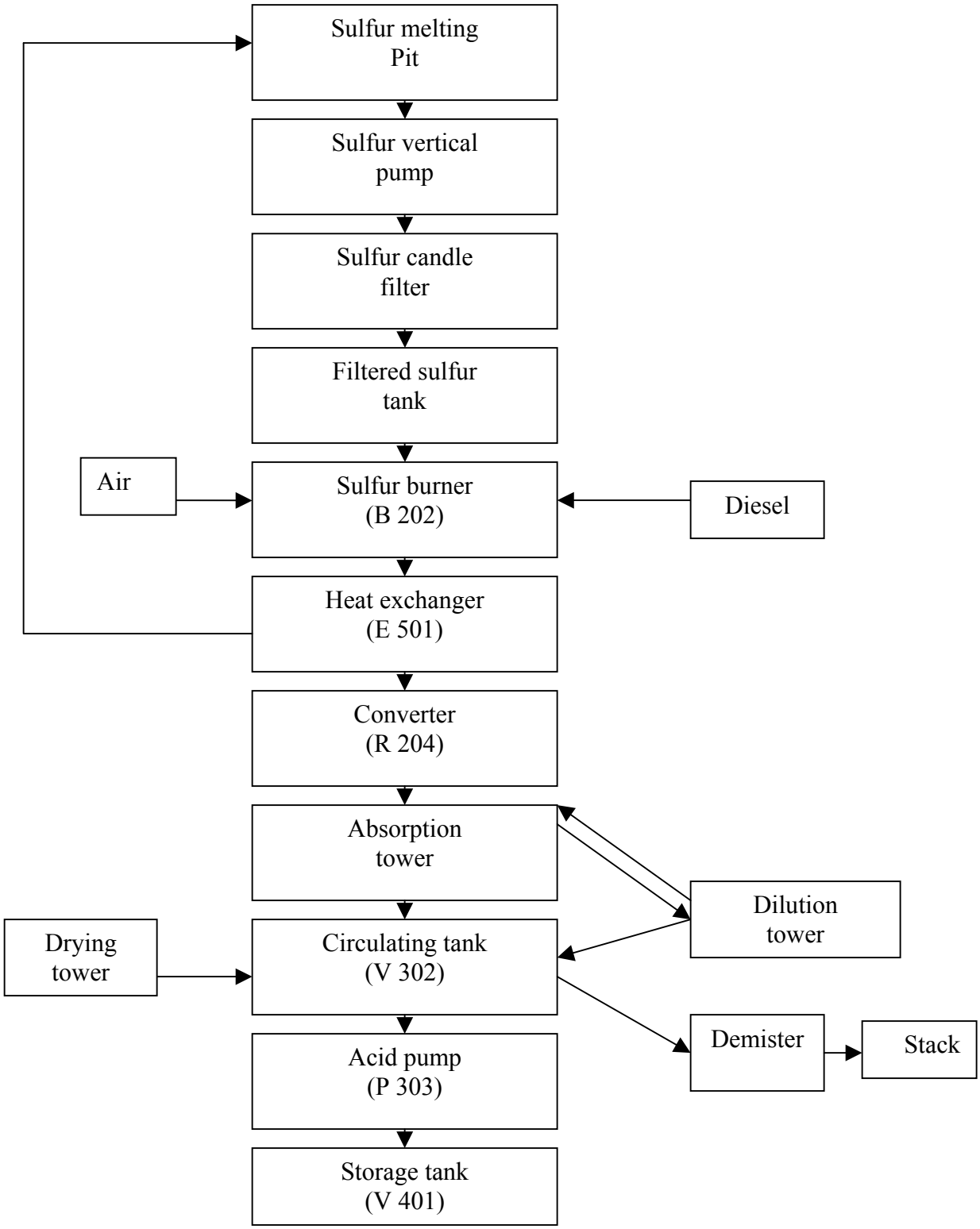
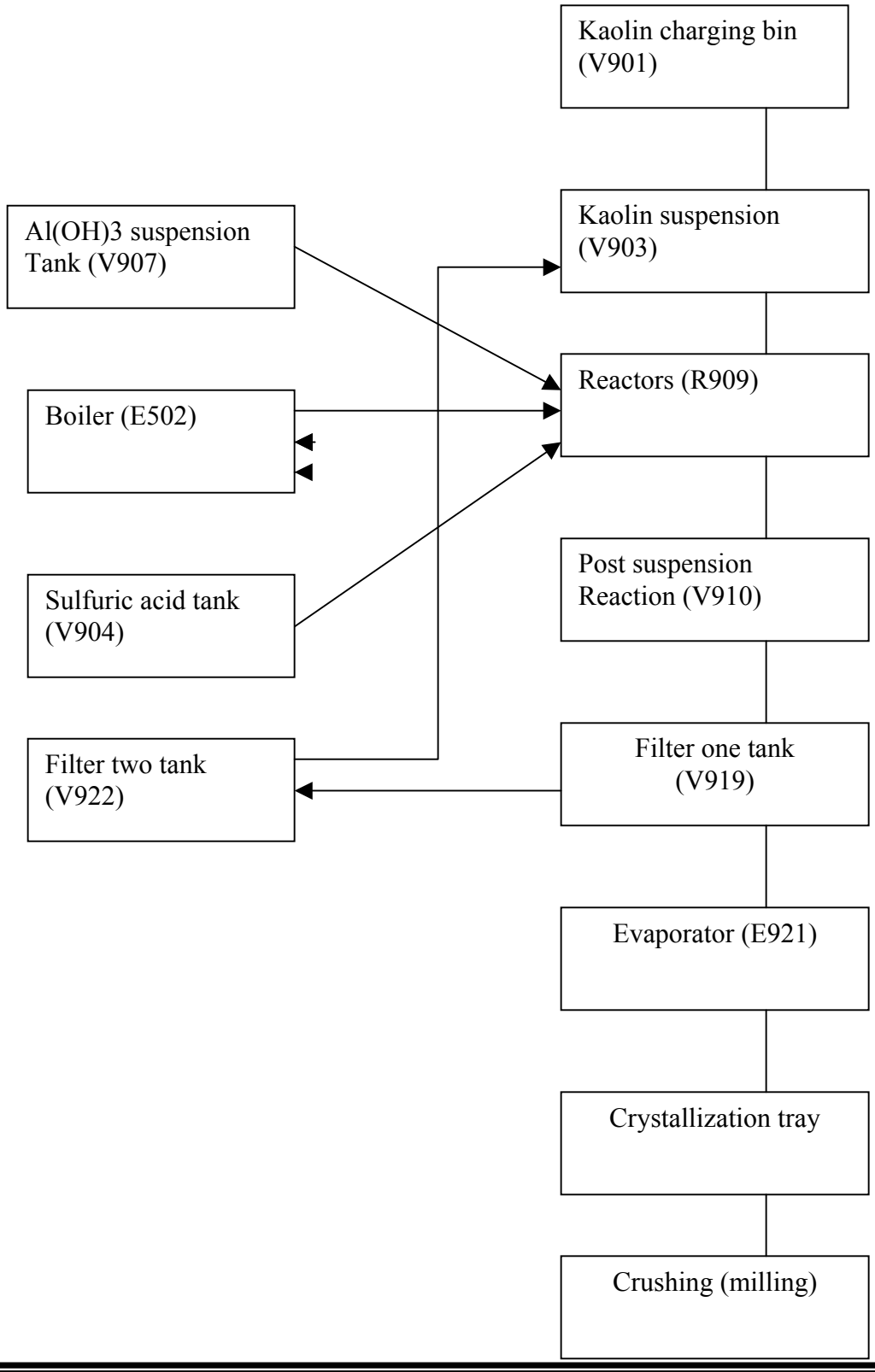


Chart II

Process Flow Diagram of sulfuric acid plant



Process Flow Diagram of Aluminum Sulfate plant



Appendix III A

AWASH MELEKAS ALUMUNUM SULFATE AND SULPHURIC ACID SHARE COMPANY (AMASSASC)

STUDY QUESTIONNAIRE

Objective

The purpose of this questionnaire is to obtain information which will be used to analysis industrial development market performance and competitiveness of AMASSASC. Therefore, respondents are kindly requested to fill the requited information as accurately as possible. The information required is for the period of 2001 to 2005.

General information

- Name and mailing address of firm

  _____

  _____

  _____.

- Location

  _____

  _____

- Position title of the respondent

_____

_____

- Qualification of the respondent (indicate the highest educational level attained)

  _____

- Date of filling the questionnaire

  _____

Annex III A – Questionnaire for:

Analyzing industrial development, competitiveness and market performance survey

1) Name of enterprise/company: _____

2) Location: - city/region: _____

3) Date of establishment _____

4) Total number of employees: _____

5) Products of the company: _____

_____

6) Current optimal capacity of production:

List of product	2000	2001	2002	2003	2004	2005

7) Ownership structure

Privately owned	**State and private** (Indicate percentage private ownership)	**State**

8) Percentage of state ownership:	%
9) Percentage of foreign ownership	%

2. Efficiency of the plant and size

1) The nature and quality of the raw materials and production process employed

01. High quality	
02. Medium quality	
03. Low standard	
04. Not known	

2) Is there disruption of production process due to machine and equipment breakdown.

01. Often	
02. Sometimes	
03. Rarely	

3) If is there is no timely repair of machinery what are the reasons?

(Please rank them in order of importance from 01 to 04)

	Rank
01. Luck of skilled technicians	
02. Problem in getting spare parts.	
03. Machine is old to permit quick maintenance	
04. Bureaucratic procedure	
05. Other (specify) _____	

4) What is the approximate rate of capacity utilization of the machine in the last six years?

Year	2000	2001	2002	2003	2004	2005	2006
Capacity in percentage (%)							

5) Is the capacity utilization decreasing?

01. Yes ☐ 02. No ☐

6) If yes, what are the reasons for the decrease of the capacity utilization?

01. Due to the capacity of the machine	
02. Frequent machine failures	
03. Lower demand	
04. Shortage of raw material	
06. Shortage of skilled manpower	

07. Other (specify) _____

_____

7) If your enterprise had been working less than full capacity , which of the following are the primary causes?

(Please check the appropriate degree of cause)

No.	reasons	Primary	Secondary	minor
01	Due to less market condition			
02	Due to less competitiveness in the market.			
03	Due to less market performance			
04	Shortage of supply of raw material			
05	Competition from Smuggled substitutes			
06	Competition from legally imported substitutes			
07	Due to lesser technology usage			
08	Shortage of specialized skills			
09	Frequent machine break-down			
10	Lower demand			
11	Skilled labour shortage			
12	Semi/unskilled labour shortage			
10	Other specify _____ _____			

3. Skilled man power on all job categories and finance

1) Total number of employees currently? ☐

2) Is there a problem of hiring new employees at the right time to fill an open Vacancy?

01. Yes ☐ 02. No ☐

3) If yes, what are the reasons? Please rank them as 1,2 etc. in order of importance inform of the applicable box.

01. Length of employment process ☐
02. Shortage of qualified candidate ☐
03. Unattractive salaries and wages ☐
04. Un-conducive work environment ☐
05. Other (specify) _____

_____.

4) Are employees receiving on-the-job training for the last 5 years, how long?

01. Yes ☐ 02. No ☐ .

How long? _____

5) If yes, what percentage of the total employees was trained? ☐ %

6) What is the proportional distribution of your professional, technical, staff of education of employee in percentage?

Engineers (B.A or above)	%
Professional staff (B.A or above)	%
Vocational / Technical	%
On-the job trained technicians	%

7) Does the factory face financial shortages in order to train the employees?

01. ☐ Yes ☐ 02. No

8) If the factory has faced financial shortage, what are the most important reasons for the problem? (Please Mark in the box)

01. Unreliable supply of raw materials causing under utilization and unrecoverable costs	
02. Ageing machinery and equipment frequent breakdowns and high maintenance cost	
03. Failure or delay of payment for inter-factory credit sales	
04. Excessive stock of finished goods and raw material	
05. Rising cost of raw materials	
06. Heavy reliance on the quantity of production than Cost of production as a measure of enterprise performance	

07. Other (specify) _____

9) Sources of capital for training (indicate % of total)?

Own savings	**Funds from government**	**Bank loan** (local or international)	**Loan from a money lender**	**Others (specify)**

4. Market performance

1) what factors are likely limit your capacity to sale your product fully ?

(Please mark in the box)

01. Insufficient demand for products	
02. Cost of credit	
03. Lack of credit	
04. Tax structure	
05. Access to raw materials	
06. Lack of financial resources (Internal reserves)	
07. Lack of managerial skills and investment support	

2) Does your enterprise usually sell on credit?

01. Yes ☐ 02. No ☐

3) What are the sources of the raw materials in your company?

01. ☐ Domestic ☐ 02. Foreign ☐ 03. Both

4) If it is from Both what is the percentage o the raw materials used in your company from each sources?

01. ☐ % Domestic ☐ % 02. Foreign

5) Does your company face usually rising cost of raw materials?

01. Yes ☐ 02. No ☐

6) If it faced a rise of raw materials, what are the reasons for the rise? *(please put marks)*

01. Rise of price in international market
02. Rise of government tax
03. Problem of transport to move from the port
04. Problem related to storage facilities
05. Other (specify) _____

7) What is the normal reaction of the enterprise management to such conditions?

(Please rank as their importance)

01. Rising selling prices of the products
02. Use of available substitute raw materials to off set the cost
03. Generate sufficient reduction in other controllable costs to absorb the rising cost
04. Deal with the customer on the price
05. Keep the price as others seller
06. Others (specify) _____

8) Stock of finished goods and raw materials at the end of the year ?

Year	Finished goods		Raw materials	
	Total product	Year end stock	Estimated requirement	Year end stock
2001				
2002				
2003				
2004				
2005				

9) If the stocks have the tendency to increase overtime, what so you think are the reasons? (*Please Mark in the box*)

01. Poor market performance	
02. Lesser demand in the market	
03. Of poor quality of production	
04. Of high prices of products	
05. of Low capacity of distribution of organization	
06. Of low customer contact	
07. Average domestic sale price per unit of production is high	
08. Access of the market information is poor	
09. Average export sale price per unit of production	
10. Other _____	

5. Competitiveness

1) How do you measure the company performance in competitiveness of the market?

01. By the quantity of production that sold in the market	
02. By measuring the capacity utilization	
03. By the cost it is produced and sold	
04. On the size of the domestic market	
05. By selling price	
06. Other (specify) _____	

2) What are the sales in Birr in this in these consecutive years?

Years	2000	2001	2002	2003	2004	2005
Sales						

3) What is the cost to your company for the following list within these 5 years?

Lists	year				
	2001	2002	2003	2004	2005
Market Research					
Rent					
Electricity					
Other energy (fuel, gas etc.)					
Transport					
Telephone and IT services					
Promotion, advertising and marketing					
Maintenance and repairs of plant & equipment					
Raw materials					
Salaries and wages					
Training					

4) Type and level of taxation to enterprise (Birr)

Lists	Year				
	2001	2002	2003	2004	2005
Income tax					
Import duties					
Sales tax					
Excise tax					

Other direct taxes					
Other indirect taxes					

5) What are the net profits in listed years?

Year	2000	2001	2002	2003	2004	2005
profit						

6) Is transportation a problem to curtail the timely distribution of industrial production to the market?

01. Yes ☐ 02. No ☐

7) Do you think that there is inadequacy of warehouse facilities?

01. Yes ☐ 02. No ☐

8) If yes, at what level

01. At factory l ☐ 02. At market ☐ 03. Both ☐

9) Whose task is to transport products of the factory to the market area?

01. The company ☐ 02. Customers ☐ 03.Others _____

10) How are the prices decided?

01. Based on the cost of production ☐

02. Based on demand condition ☐

03. Others (specify)

_____

11) Is revision made of prices usually depending on circumstances?

01. Yes ☐ 02. No ☐

12) Please indicate the circumstances responsible for the revision of prices in the past?

01. The rise of the cost of raw material
02. The rise in the cost of labor
03. Market demand
04. Due to competitor sales with lower price than you do
05 Due to increase taxation
06. Others (specify) ----------

13) Do you export the factory's production?

01. Yes ☐ 02. No ☐

14) If yes, please writer the annual average value contribution of exports to the total sale for the last 6 years.

Birr _____ and in % of the total _____

15) Do you devote any part of your annual investment expenditure to market research and development?

01. Yes ☐ 02. No ☐

16) Please give your approximate average annual expenditure for the market research and development of total expenditure in the space provided.

- Less than 1%
- 1% to 5%
- 6% to 10%
- 11% to 15%
- Over 15%

17) Quantity of Product sold in the market

List of products						
	2000	2001	2002	2003	2004	2005

18) Total Revenue in Birr

List of products						
	2000	2001	2002	2003	2004	2005

19) List of Customers who are buying the products Aluminum Sulfate

01) Quantity Aluminum Sulfate that the customers bought

Lists of customers	2000	2001	2002	2003	2004	2005

20) List of Customers who are buying the products

01) Quantity Sulfuric acid that the customers bought

Lists of customers	2000	2001	2002	2003	2004	2005

21) List of competitors

Lists of competitors					
2000	2001	2002	2003	2004	2005

22) Comments:

_____
_____
_____
_____
_____
_____
_____
_____.

Thank you Very much for you cooperation

APPENDIX III B

Questioner to make Parato Analysis, cause and effect diagram

Q. 1 List the possible causes that make the company less competitive in percentage.

Please give the points as in the level they are affecting the competitiveness:

Very highly ***5***

Highly ***4***

Medium ***3***

Low ***2***

Very low ***1***

Lists of causes	**points**
People attitude on the product quality	
Due to less infrastructure in the country	
small scale industries	
Skilled man Power	
Political factors	
Inadequate research	
Efficiency of workers	
Low market demand	
Internal management system	
Less attention given by concerned body	
High Production cost	
Others	

Please list if there any other things that affects the market performance and competitiveness of the company

_____

_____.

APPENDIX IV A

AWASH MELKASSA ALUMINIUM SULPHATE & SULPHURIC ACID S.Co.

COST OF GOODS STATEMENT, FOR THE YEAR ENDED 2004

	Alum. Sulfate from Kaolin (Actual)	Alum. sulfate from Alu.Hydr. (Actual)	Sulfuric Acid (Actual)	2003/04 TOTAL	2002/03 TOTAL
1. Goods in- process inventory (Beginning of the Year)					1,571,814.97
2 Raw Materials used	3,792,607.48	415,233.08	2,805,650.36	7,013,490.92	3,880,644.01
3. Direct Labour.	302,160.67	26,856.57	88,347.00	417,364.24	285,521.42
4. Production employees' Benefits	215,362.90	15,327.81	90,865.20	321,555.91	155,518.68
5. Indirect Labour.	589,106.37	52,957.20	156,609.90	798,673.47	564,527.23
6. Depreciation _ Factory Machinery & Bldg.	1,635,528.15	144,786.23	648,207.07	2,428,521.45	1,998,098.62
7. Supervisory Labour costs.	112,441.04	20,134.94	32,402.45	164,978.43	151,939.33
8. Heat, Light ,Power & Other energy.	1,940,144.88	186,693.04	175,695.22	2,302,533.14	1,820,928.27
9. Factory supplies used	306,977.84	27,830.01	364,633.37	699,441.22	473,504.25
10. Miscellaneous Overhead costs	848.975.45	60,799.80	298,107.06	1,207,882.31	645,459.00
11. Total cost of Goods In- process (during the year)	9,743,304.78	950,618.68	4,660,517.63	15,354,441.09	11,547,955.78
12. Less Goods In- process Inventory. (End of the year)	531,060.91	-	113,741.26	644,802.17	
13. Cost of Goods Manufactured/Produced/	**9,212,243.87**				

		950,618.68	**4,546,776.37**	**14,709,638.92**	**11,547,955.78**
14. Add - Excise Tax	-		-	-	
15. Total Cost of Goods manufacture/Produced/	**9,212,243.87**	**950,618.68**	**4,546,776.37**	**14,709,638.92**	**11,547,955.78**
16. Add - Finished Goods Inventory (Beginning of the year)	44,353.53	43.56	426,716.27	471,113.36	3,276,547.64
17. Cost of Goods (products) Available for Sale	9,256,597.40	**950,662.24**	**4,973,492.64**	**15,180,752.28**	**14,824,503.42**
18. Less: Finished goods Inventory (End of the year)	-	81,402.39	946,222.35	1,027,624.73	471,113.36
19. Cost of Goods (Products) sold	9,256,597.40	**869,259.86**	**4,027,270.29**	**14,153,127.55**	**14,353,390.06**
20. Add : Idle period factory expenses	1,383,655.94	-	1,084,821.90	2,468,477.84	3,988,819.93
21. Total factory expenses	**10,640,253.34**	**869,259.86**	**5,112,092.19**	**16,621,605.39**	**18,342,209.99**
IDLE PERIOD EXPENSES DETAIL					
Factory supplies	239.14	-	239.14	478.28	55,316.69
Indirect labour	298,415.60	-	146,422.17	444,837.77	699,992.71
Employees' benefits	97,482.79	-	49,754.71	147,237.50	176,484.03
Heat, light, power	58,231.87	-	58,231.87	116,463.74	142,667.75
Depreciation expenses	774,251.03	-	629,336.02	1,403,587.05	2,140,253.27
Miscellaneous expenses	155,035.51	-	200,837.99	355,873.50	774,105.48
	1,383,655.94	-	**1,084,821.90**	**2,468,477.84**	**3,988,819.93**

APPENDIX IV B

AWASH MELKASSA ALUMINIUM SULPHATE & SULPHURIC ACID S.Co.

COST OF GOODS STATEMENT FOR THE YEAR ENDED 2005				
	Alum. Sulfate from Kaolin (Actual)	***Alum. sulfate from Alu.Hydr. (Actual)***	***Sulfuric Acid (Actual)***	***2004/05 TOTAL***
1. Goods in- process inventory (Beginning of the Year)	531,060.91	-	113,741.26	644,802.17
2 Raw Materials used	1,646,343.84	810,220.16	2,024,087.08	4,480,651.08
3. Direct Labour.	283,103.28	24,525.42	70,376.61	378,005.31
4. Production employees' Benefits	116,481.63	9,821.87	80,508.98	206,812.48
5. Indirect Labour.	439,647.36	44,396.15	166,963.65	651,007.16
6. Depreciation _ Factory Machinery & Bldg.	1,553,319.44	224,034.67	567,789.31	2,345,143.42
7. Supervisory Labour costs.	66,619.55	12,852.65	31,295.41	110,767.61
8. Heat, Light ,Power & Other energy.	2,068,920.99	354,164.62	123,156.60	2,546,242.11
9. Factory supplies used	270,542.58	43,639.29	37,419.68	351,601.55
10. Miscellaneous Overhead costs	1,080,589.76	42,093.56	174,818.94	1,297,502.26
11. Total cost of Goods In- process (during the year)	8,056,629.24	**1,565,748.39**	**3,390,157.52**	13,012,535.15
12. Less Goods In- process Inventory. (End of the year)	585,966.86	-	-	**585,966.86**
13. Cost of Goods Manufactured/Produced/	**7,470,662.38**	**1,565,748.39**	**3,390,157.52**	**12,426,568.29**
14. Add - Excise Tax	-	-	-	-
15. Total Cost of Goods manufacture/Produced/	**7,470,662.38**	**1,565,748.39**	**3,390,157.52**	**12,426,568.29**
16. Add - Finished Goods Inventory (Beginning of the year)	-	81,402.38	946,222.35	1,027,624.73
17. Cost of Goods (products) Available for Sale	**7,470,662.38**	**1,647,150.77**	**4,336,379.87**	**13,454,193.02**

IDLE PERIOD EXPENSES DETAIL				
Factory supplies	358.29	-	358.29	716.58
Indirect labour	354,150.95	-	149,504.62	503,655.57
Supervisory & Labour	38,360.97	-	16,051.76	54,412.73
Employees' benefits	79,108.61	-	75,556.33	154,664.94
Heat, light, power	98,965.40	-	98,965.41	197,930.81
Depreciation expenses	1,069,283.27	-	956,587.16	2,025,870.43
Miscellaneous expenses	665,945.19	-	288,988.82	954,934.01
	2,306,172.68	**-**	**1,586,012.39**	**3,892,185.07**

APPENDIX IVC

FIXED ASSETS				
COSTS	**Balance at 30/06/2003**	**Additions**	**Transfers/Adj (disposals)**	**Balance at JUNE 30, 2004**
	Birr	**Birr**	**Birr**	**Birr**
Building	43,193,889.83	-	-	43,193,889.83
Other Civil Construction	656,741.73			656,741.73
Plant Machinery & Equipment	56,077,380.08	1,818,288.32		57,895,668.40
Machinery Not Installed	829,423.93	-		829,423.93
Furniture,Fixture & Fittings	624,329.07	11,566.40		635,895.47
Office Equipments	531,376.50	41,865.74		573,242.24
Specialized Equipments	3,174,468.34	61,340.97		3,235,809.31
Motor Vehicles	5,828,036.88	90,805.45	276,726.43	6,195,568.76
Small Tools	364,489.76	15,358.52	-	379,848.28
Construction in progress	-	-		-
Capital goods in transit	276,726.43	773,313.07	(276,726.43)	773,313.07
Total	**111,556,862.55**	**2,812,538.47**	**-**	**114,369,401.02**
DEPRECIATION				

Building	16,889,417.23	2,159,694.50		19,049,111.73
Other Civil Construction	394,241.43	32,837.09		427,078.52
Plant Machinery & Equipment	48,844,939.51	1,547,500.95		50,392,440.46
Furniture,Fixture & Fittings	492,079.79	29,249.00		521,328.79
Office Equipments	412,895.01	36,143.42		449,038.43
Specialized Equipments	2,258,638.10	190,199.11		2,448,837.21
Motor Vehicles	4,796,264.65	255,358.70		5,051,623.35
Small Tools	323,248.05	11,240.91		334,488.96
	74,411,723.77	**4,262,223.68**		**78,673,947.45**
NET BOOK VALUE	**37,145,138.78**			**35,695,453.57**

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APPENDIX IV D

FIXED ASSETS				
COSTS	**Balance at 30/06/2004**	**Additions**	**Transfers/Adj (disposals)**	**Balance at JUNE 30, 2005**
	Birr	**Birr**	**Birr**	**Birr**
Building	43,193,889.83	-	-	43,193,889.83
Other Civil Construction	656,741.73			656,741.73
Plant Machinery & Equipment	57,906,136.18	53,601.42	818,956.15	58,778,693.75
Machinery Not Installed	818,956.15	-	(818,956.15)	-
Furniture,Fixture & Fittings	635,895.47	15,678.37	-	651,573.84
Office Equipments	573,242.24	100,053.02	-	673,295.26
Specialized Equipments	3,235,809.31	15,156.56		3,250,965.87
Motor Vehicles	6,195,568.76		716,593.07	6,912,161.83
Small Tools	379,848.28	600.00		380,448.28
Construction in progress	-	11,620.57	-	11,620.57
Capital goods in transit	773,313.07	4,284,880.40	(921,274.96)	4,136,918.51
Total	**114,369,401.02**	**4,481,590.34**	**(204,681.89)**	**118,646,309.47**

DEPRECIATION				
Building	19,049,111.73	2,159,694.50		21,208,806.23
Other Civil Construction	427,078.52	32,837.09		459,915.61
Plant Machinery & Equipment	50,392,440.46	1,925,940.16		52,318,380.62
Furniture,Fixture & Fittings	521,328.79	21,804.11		543,132.90
Office Equipments	449,038.43	36,046.60		485,085.03
Specialized Equipments	2,448,837.21	189,164.89		2,638,002.10
Motor Vehicles	5,051,623.35	369,385.36	(126,987.20)	5,294,021.51
Small Tools	334,488.96	9,093.43		343,582.39
	78,673,947.45	**4,743,966.14**	**-**	**83,290,926.39**
NET BOOK VALUE	**35,695,453.57**			**35,355,383.08**

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