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KENYA

DRAFT REPORT

ON

INDUSTRIAL BRANCH PROFILES

BY

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to the
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KENYA'S INDUSTRIAL BRANCH PROFILES

INTRODUCTION:

The write up of this report mainly follows the pattern of functional responsibilities of technical divisions in the Ministry of Commerce and Industry. The three major sectors under technical division are Agro-based industries, Chemical based industries and Engineering industries. The UNIDO guideline is also strictly followed. Main sources of statistical information are from Central Bureau of Statistics, Ministry of Commerce and Industry, Ministry of Environment and Natural Resources, and Ministry of Agriculture. In few cases up to-date data were either not available or confirmed to warrant their use in the report.

A. AGRO-INDUSTRIES

The share of agro-industry in the Country's manufacturing sector exceeds 68 per cent of the GDP contribution. Secondly 60% of over 4000 industrial establishments in Kenya are agro-based industries. This reflects the important role played by agro-industries in the process of Kenya's industrial development. Agro-industries have developed on the basis of traditional domestic resource activities, which include food processing, beverages and tobacco, leather, textiles and paper. This trend of development is likely to continue into the future, as the utilization of domestic resources still remains a primary objective in Kenya's development strategy.

STARCHY STAPLE FOODS

The Resource Base

The main food crops produced and consumed in Kenya are maize, wheat, rice, sorghum and millet. Others are root crops, beans and pulses. Maize is Kenya's widely consumed food item and accounts for nearly half of the calories and useable protein available to the population. The country has managed to achieve self-sufficiency from local production except during years of bad weather. Between 1963 and 1980 maize production increased at a growth rate of 2.5 per cent per annum and from 1980 to 1990 the rate picked up to reach 5.9 per cent per annum. However the above trend has changed over the last 5 years during which production has recorded a high negative growth trend of nearly -9.0 per cent per annum. Reduction in output

is attributed to unfavorable weather, decline in the use of fertilizer due to high prices and to some extent low quality seeds.

Wheat is the second most important cereal crop consumed in the country after maize. It has been grown in Kenya since the colonial times and production had principally been under large scale type of farms. The country however produces slightly less than 50 per cent of her wheat requirements and imports the rest. While domestic wheat output has exhibited very slow growth, consumption has increased rather rapidly mainly due to population growth and urbanization.

Rice production in Kenya occurs primarily under the small-scale type of farming and in two forms. The first form of production is through irrigation at Mwea, Ahero, Bunyala and West Kano schemes. The second form of production is under rainfed condition which is mainly concentrated in Western, Nyanza and Coast provinces. The two varieties being produced in Kenya are Basmati and Sindano. Rice production from irrigated schemes account for about 35,000 tonnes, while rainfed production accounts for about 6,000 tonnes.

Although sorghum and millet are traditional crops their consumption is declining. They have however been identified as potential cash crops in arid and semi-arid areas.

PRODUCTION AND CONSUMPTION OF MAJOR STAPLE FOODS

| PERIOD | MAIZE (MILLION-BAGS) | | WHEAT (MILLION-BAGS) | | RICE (TONNES) | |
|----------|----------------------|-------------|----------------------|-------------|---------------|-------------|
| | PRODUCTION | CONSUMPTION | PRODUCTION | CONSUMPTION | PRODUCTION | CONSUMPTION |
| 1988/89 | 31.4 | 27.6 | 2.78 | 5.00 | 34,170 | 61,700 |
| 1989/90 | 30.3 | 28.5 | 2.62 | 4.80 | 36,000 | 63,954 |
| 1990/91 | 35.0 | 29.5 | 2.95 | 5.10 | 35,500 | 66,195 |
| 1991/92 | 26.0 | 30.4 | 2.42 | 5.40 | 36,000 | 67,600 |
| 1992/93 | 25.0 | 30.9 | 2.20 | 5.50 | 40,000 | 70,725 |
| 1993/94* | 19.5 | 33.3 | 2.60 | 5.70 | 41,070 | 78,000 |

* Estimates

Source-Planning Division-Ministry of Agriculture and Livestock Development.

MAIZE

Past trends

Historically maize flour has been a major food item in Kenya's household consumption pattern. Consequently Maize milling has remained the largest industrial activity under grains and grain products subsector. The product of maize milling is sifted maize flour and the by-products are maize bran (used in animal feed), maize germ (used in oil extraction), and semolina used in breakfast foods and brewery.

INDUSTRIAL PRODUCTION OF GRAIN MILLING PRODUCTS IN METRIC TONS

| PRODUCTS | 1990 | 1991 | 1992 | 1993 | 1994 |
|----------------------|--------|--------|--------|--------|--------|
| Maize Meal | 241411 | 227350 | 119614 | 158123 | 233185 |
| Wheat flour | 171870 | 185545 | 222457 | 143068 | 191435 |
| Wheat offals | 31408 | 45156 | 51900 | 38124 | 49990 |
| Maize germ | 28335 | 35047 | 15110 | 19643 | 25535 |
| Maize offal and bran | 22537 | - | 11501 | 15603 | 16716 |
| Rice | 20004 | 15207 | 18206 | 13609 | 10999 |

Source: Central Bureau of Statistics (CBS)

Almost in all rural markets of Kenya there are milling facilities commonly referred to as "Posho Mills" which literally means flour mills. Most of them are operated by local entrepreneurs and self help groups or cooperative societies. There are however major maize millers such as Jambo Flour Millers, Nairobi Flour Mills, Unga Maize Millers, Bakery Millers, National Milling corporation, Mombasa Maize Millers and Kirinyaga Flour Mills in the Urban centres of the Country. Capacity Utilization of the mills improved in 1994 when Maize market was liberalised. Maize flour production went up from 120.0 thousand metric tonnes in 1992 to 233.2 thousand metric tonnes in 1994.

CONSTRAINTS AND PROSPECTS

In the past, price controls on maize hindered free market forces necessary for increased production of maize. After decontrol of prices in 1994 and liberalization of economy, the country was faced with cheap imports of maize. The Government intervened to protect local industry by imposing taxes on imported foodstuffs. It is expected that with the reduction of import duties on agricultural farm inputs, and the improvement of maize prices the milling industry will thrive.

WHEAT

Past Trends

Wheat has been grown in the country since independence in 1963 but despite the effort Government has put in providing credit support for increased production, the country is still a deficit producer. Products of wheat milling is sifted wheat flour and by products include bran, germ and pottard used in animal feed. The requirement for the bakery industry is 6 million bags and only 2 million bags are produced locally. The rest of the wheat requirement is met from imports which include all the durum type of wheat required for the manufacture of pasta products such as macaroni and spaghetti. The durum wheat is imported from Canada and the U.S.A. Analysis of the distribution of wheat according to the end uses is as follows: home-baking 64%, Breadmaking 32%, biscuits 3%, pasta products and baby foods 1%. Between 1991 and 1993 capacity utilization of bakery industries was on the average 63%. In 1994 bakery industries have improved on their performance as indicated by production figures in the table below.

INDUSTRIAL PRODUCTION OF BAKERY PRODUCTS

| PRODUCTS | UNIT | 1990 | 1991 | 1992 | 1993 | 1994 |
|----------|------|---------|---------|---------|---------|---------|
| Bread | MT | 99230 | 95944 | 95944 | 98773 | 156273 |
| Scones | MT | 152 | 228 | 228 | 272 | 231 |
| Cakes | KG | 167950 | 60849 | 60849 | 62552 | 91450 |
| Biscuits | KG | 2449075 | 3773305 | 2124940 | 2289668 | 3600153 |

Source: CBS

Constraints and Prospects

The major constraint is that Kenya is not self-sufficient in wheat production and has to import a substantial amount of wheat requirement which varies according to season. The imports range from 33% of wheat requirement to 66%. Another constraint facing the industry is increased cost of inputs used in domestic wheat production, such as fertilizers, imported machinery and their spare parts. It has also been observed that the reforms that favoured subdivision of land into smaller sizes soon after independence have been counter productive as far as wheat is concerned. Wheat farming is highly mechanized and as such large scale farming benefits from the economies of scale. Although small scale farming is on the increase it has been hindered by lack of appropriate technology. With the liberalization of pricing and marketing of wheat products and removal of duty on fertilizer it is expected that domestic production will improve.

BEANS AND PULSES

Past Trends

Beans and pulses form an important food item and source of cheap protein for a large population in both urban and rural areas. Current production of beans is about 443,000 metric tons while that of other pulses (pigeon peas, cowpeas and green grams) make up another 200,000 metric tonnes. Total national requirement is estimated at 684,500 metric tonnes which implies that Kenya requires about 41,000 more tonnes to cover the supply and demand gaps. Crop Forecast Surveys indicate that Kenya has been producing an average 2 million bags between 1990 and 1994.

ESTIMATED PRODUCTION OF SELECTED CROPS IN MILLION BAGS

BASED ON CROP FORECAST SURVEY

| CROP | 1990/91 | 1991/92 | 1992/93 | 1993/94 | 1994/95* |
|-------------|----------------|----------------|----------------|----------------|-----------------|
| Beans | 2.34 | 2.10 | 2.39 | 1.25 | 2.82 |
| Potatoes | 2.13 | 1.95 | 2.26 | 1.99 | 2.51 |
| Sorghum | 0.88 | 0.82 | 0.95 | 0.86 | 1.05 |
| Millet | 0.40 | 0.35 | 0.45 | 0.39 | 0.47 |

*Provisional

Source: Central Bureau of Statistics

Constraints and Prospects

It is expected that the incentives given to farmers by reducing prices of farm inputs and better pricing the production will increase to meet the demand. There is no large scale processing of beans.

ROOT CROPS

Past Trends

The main root crops are Irish potatoes, sweet potatoes, cassava and yams whose combined total production is estimated at 1.73 million tonnes. These crops form an important reservoir for a majority of rural people and have a cushion effect of drought as they are relatively more resistant to prolonged drought. Production of potatoes increased from 2.0 million bags in 1992 to 2.5 million bags in 1994 as indicated by Crop Forecast Survey conducted by Central Bureau of Statistics.

Constraints and Prospects

Change in eating habits of Kenyans have made the production of sweet potatoes, cassava and yams to drastically go down. Government is however encouraging farmers to increase the production to avoid hunger during drought period as they are resistant to drought. Irish potatoes are however used in hotel industry and for making crisps.

ANIMAL FEEDS

Resource Base

The raw materials are by-products of food processing industry and include grains and grain milling by-products, oil protein cakes from oil extraction industry, fish meal, root crops and dried green fodder such as lucerne meal, grass meal, premixes and clover meal.

Past Trends

The animal feed industry mostly serves commercial livestock production which is responsible for production of substantial quantities of eggs, milk, poultry, meat and pig meat. The entire

commercial livestock and pig farming is wholly dependent on commercial animal feeds divided into two broad categories i.e compound animal feeds and simple animal feeds.

Manufacture of compound of animal feeds is the largest activity with over 29 firms involved. Apart from fish meal, manufacturers of simple feeds are mainly human food manufacturers and the simple feeds are merely by-products.

PREPARED ANIMAL FEEDS

| | UNIT | 1990 | 1991 | 1992 | 1993 | 1994 |
|---------------------|------|-------|-------|-------|-------|-------|
| Cattle feeds | MT | 45470 | 46316 | 58926 | 40993 | 28514 |
| Pig feeds | MT | 8592 | 7638 | 7242 | 6586 | 10695 |
| Poultry feeds | MT | 84889 | 89411 | 79263 | 49318 | 5007 |
| Dog and Cat feeds | MT | 456 | 682 | 570 | 774 | 633 |
| Horse & other feeds | MT | 6537 | 6820 | 6820 | 4379 | 6258 |

Source: CBS

Some of the major compound animal feeds manufacturers include ABC foods-Nakuru; Arkay Industries-Mombasa and Nakuru; Unga feeds-Nairobi and Nakuru; United Millers-Kisumu etc.

Constraints and Prospects

Two main problems have been affecting the animal feed industry namely shortages of raw materials and poor quality of feeds. Due to high competition, shortages of raw materials especially for simple feeds and their high prices, most manufacturers resort to production of low quality feeds. To overcome the problem of shortage of raw materials Government is encouraging farmers to grow yellow maize, improve local production of oil crops and utilize cassava chips and pellets to substitute part of cereals.

FRUITS AND VEGETABLES

The Resources base

Kenya produces about 5 million tonnes of fruits and vegetables per year. The major products are pineapples, french beans, cut flowers, avocados and mangoes. Horticulture is the fourth largest foreign exchange earner in Kenya after Tourism, Tea and Coffee. In 1994 horticulture exports earned Kenya K£414.9 million. Exports are done either directly by investors or through Horticultural crop Development Authority (HCDA) whose share of exports in 1994

was K£246.8 million. Cutflowers are the biggest horticultural exports followed by French beans.

Past Trends

It is estimated that about 350,000 tonnes of fruits and vegetables are processed annually. Large proportion of the produce is consumed fresh. There are about 30 processing plants in which the largest is Del Monte with a captive plantation for 250,000 tonnes per year of the raw materials mainly pineapples. The main activities for processing food and vegetables include canning, dehydration, freezing, extraction of juice and manufacture of jams and marmalades.

The main industries and their activities are as follows:

- (i) Del Monte(K) Ltd- located in Thika and the largest food processing factory in the country produces all of its raw materials i.e pineapples. It processes pineapples - canning and juice extraction.
- (ii) Kenya Fruit Processors located in Thika extracts fruit juice from passion fruit and also makes passion juice concentrate, mainly for export.
- (iii) Njoro Canning Factory located in Njoro and canning French beans.
- (iv) Trufoods Ltd located in Nairobi and processes fruit juices and jams.
- (v) Kenya Orchards Ltd located in Machakos and canning fruits and vegetables and manufactures jams.
- (vi) Kabazi Cannery located in Nakuru and canning vegetables.

INDUSTRIAL PRODUCTION OF CANNED FRUITS AND VEGETABLES

| PRODUCTS | UNIT | 1990 | 1991 | 1992 | 1993 | 1994 |
|-----------------------------|------|---------|---------|---------|---------|---------|
| Jams and Marmalades | KG | 1124754 | 1125376 | 1098403 | 1233385 | 1309166 |
| Fruits and Vegetable Juices | KG | 5167892 | 5227249 | 5287367 | 5287367 | 5257367 |
| Squashes | LTS | 2736085 | 3354017 | 1448809 | 1347116 | 1252560 |
| Canned Fruits | MT | 209084 | 175016 | 180514 | 236510 | 204327 |
| Canned Vegetable | KG | 441965 | 479902 | 474145 | 291906 | 423707 |

Source: CBS

Constraints and prospects

The major constraint affecting the sector is lack of cooling facilities both at production areas and airports. The other constraints which make fresh produce not to effectively compete in international market are high freight charges and high quality standards in the world market. In processing, the purchasing price offered by the processors to the produces are lower than that of fresh market. Industries which rely on outgrowers for their raw materials do not receive adequate supply hence low capacity utilization. Quality of their supply are also low. In 1994 the Government announced production incentives which include providing enabling environment for putting up cold storage facilities, duty free importation of fertilizers and green house sheeting and intensification of research to improve quality of produce.

OIL SEEDS

Resource base

Kenya has a suitable climate to grow a wide range of oil crops such as sunflower, coconuts, groundnuts, simsim, cotton and soyabeans. However area under oil seeds production has been declining since 1987 with increased competition from cheap imported oils and low domestic prices. With the fall in production of oilseeds, the production of vegetable oils in Kenya has deteriorated over the past few years and currently dependence on imports is near total. The country imports over 95% of its edible oil requirement of about 200,000 tonnes and oilseed derivative such as oil meal and cake valued at 5 to 6 billion shillings annually.

PRODUCTION IN METRIC TONNES

| CROP | 1990 | 1991 | 1992 | 1993 | 1994 |
|------------|-------|-------|-------|-------|-------|
| Cotton | 37000 | 28400 | 31800 | 20749 | 28690 |
| Coconuts | 46947 | 50162 | 52900 | 53270 | 51960 |
| Sunflower | 12893 | 18700 | 10750 | 5570 | 9902 |
| Groundnuts | 16133 | 10233 | 9105 | 7460 | 8564 |
| Simsim | 855 | 997 | 967 | 1146 | 424 |
| Soyabeans | 308 | 409 | 238 | 185 | 352 |

Source: Planning Division Ministry of Agriculture and Livestock Development

Past trends

There are over 30 processing industries in Kenya engaged in processing different oilseeds, oil bearing materials and vegetable oils (oil milling, solvent extraction, refinery and hydrogenation). The current installed oil extraction capacity is about 265,500 tonnes per annum. About 342,000 tonnes per annum refining capacity is available mainly to process imported crude palm oil.

While oil extraction units were established mostly during the period of expansion of oil crops in Kenya, the refining capacity was created especially to process palm oil. Low international prices of edible oils rendered domestic processing of oils uneconomical and their capacity is grossly under utilized. However, contrary to the situation in oil milling/extraction industry, refining of imported crude palm oil attracted large investments in establishing modern refineries with latest technology and skilled manpower hence higher capacity utilization.

INSTALLED CAPACITY AND UTILIZATION OF PROCESSING FACILITIES - TONNES PER ANNUM

| Types of Facilities | Installed Annual Capacity (Tonnes) | Capacity Utilization |
|------------------------|------------------------------------|----------------------|
| Oil Milling (Expeller) | 217,500 | 15% |
| Solvent Extration | 48,000 | 25% |
| Refineries | 342,000 | 58% |

Source: F.A.O Agricultural Statistics, 1993

The major refineries based on imported palm oil are East Africa Industries Ltd, Kapa Oil refineries and Bidco Industries.

Constraints and Prospects.

The decline in oil crops production in Kenya as a result of competition from cheap imported oils coupled with low domestic producer prices is the major constraint in the development of the sector. Current import duty structure encourages import of crude oils. The duty on both

oil seeds and crude oils are the same at 20%. In order to protect the interest of edible oil refineries from imported refined oil the duty on import of refined edible oils has been placed at 45% i.e 25% higher than the crude oils. Secondly oil extraction industry in Kenya is highly fragmented and lacks integration. As a result most operations are done in either stand alone oil mill or solvent plant and refinery leading to low oil recoveries, high costs, poor quality product and low capacity utilization.

The ultimate solution for the growth of efficient edible oil processing industry in Kenya is availability of oil seeds through increased domestic production and imports. Imported oil seeds should be encouraged at preferential tariff. This will enable oil seed processing industries to increase their capacity utilization, revive the market for domestic oilseeds and increase availability of protein meal for animal feed. With the improvement of enabling environment through fiscal policies entrepreneurs will be encouraged to invest in oilseed processing industry particularly in rural areas using intermediate technologies.

ALCOHOLIC BEVERAGES

The Resource Base

The raw materials for beer production are mainly barley and hops. Kenya is basically self-sufficient in production of barley except for occasional shortfalls that necessitate importation. Hops are mainly imported although experiment on production of hops locally has been successful. The main raw material for local production of spirits is molasses a bye product of sugar manufacture.

Past Trends

Alcoholic beverages include beer, wines and spirits. Beer production is dominated by Kenya Breweries Ltd which has five breweries- three in Nairobi, one in Mombasa and one in Kisumu. Wines and spirits are produced by the Kenya Wine Agencies (wines), International Distillers Kenya Ltd. (spirits) and Mohan Meakin Ltd (spirit). The bulk of production of beer, wines and spirits is consumed locally, however, small amounts are exported mainly in the COMESA region. Production of beer decreased in 1994 as a result of stiff competition in the local market with imported beer from South Africa and Germany.

PRODUCTION OF SPIRITS AND BEER

| PRODUCTS | UNIT | 1990 | 1991 | 1992 | 1993 | 1994 |
|--------------|---------|---------|---------|---------|---------|---------|
| Beer & stout | 000 Lts | 331114 | 314005 | 368648 | 358866 | 325005 |
| Spirits | Lts | 1195917 | 1688302 | 1480323 | 2259130 | 1674000 |

Source: Central Bureau of Statistics

Constraints and Prospects

Kenya has in the past approved establishment of brewery projects but none has taken off mostly due to the monopoly Kenya Breweries has in the production of barley. Wine production has been hampered by inadequate production of grapes. It is recognized that utilization of local fruits offer potential for increased wine production. Already efforts to utilize other fruits are being intensified. For example papaya wine is produced from papaya fruits.

TOBACCO

Kenya is self sufficient in tobacco leaf production and the major company involved in the growth of the leaf production is BAT(Kenya). Tobacco is grown and sold to BAT Kenya by small scale farmers who number about 11,000 and who cultivate 6,000 hectares of land. Three main types of tobacco grown are fire cured, flue cured and burley. The other company involved in tobacco industry is Mastermind Ltd. but statistics are not available to quantify although its contribution in the industry is minimal. Information provided for the sector refer to BAT (Kenya).

CROP PRODUCTION IN TONS AND VALUE IN MILLION KSHS

| YEAR | PRODUCTION | VALUE |
|------|------------|-------|
| 1990 | 6414 | 119.0 |
| 1991 | 6424 | 128.5 |
| 1992 | 8406 | 179.3 |
| 1993 | 6057 | 183.6 |
| 1994 | 5183 | 260.1 |

Source: BAT Report

Past Trends

BAT is the largest agro-based industry involved in the growth of leaf tobacco, manufacture of cigarettes and other tobacco products, distribution and export activities. The local investors have 40% share while 60% is owned by the parent BAT company. Cigarette production has shown a rising trend, particularly, after liberalization of the economy in 1992 while production of tobacco manufactures has not been steady as shown in the table.

CIGARETTE PRODUCTION AND TOBACCO MANUFACTURES

| YEAR | VOLUME MILLION STICKS | VALUE KSHS MILLION |
|-------------|------------------------------|---------------------------|
| 1990 | 523 | 83.2 |
| 1991 | 525 | 107.0 |
| 1992 | 805 | 207.8 |
| 1993 | 1,256 | 513.4 |
| 1994 | 1,409 | 716.4 |

Source: BAT Report

Prospects and Constraints

Prior to decontrols BAT was affected by delays in processing import licences for importation of raw materials and scarcity of foreign currencies. After liberalization the company's capacity utilization has gone up and with the demand of Kenya cigarettes in the neighbouring countries exports are expected to go much higher.

SUGAR

Past Trends

The importance of the sugar subsector in the Kenya economy cannot be overemphasized. The industry provides employment to about 40,000 regular employees and about 80,000 small-scale farmers engaged in cane production as a cash crop. Sugar cane farming started in Kenya in way back in 1920s and the current two main producing zones are the Nyando belt and Western Kenya belt. The Nyando belt has three operating factories consisting of Miwani, Chemelil and Muhoroni with cane crushing capacities of 60,000 tonnes, 75,000 tonnes and 55,000 tonnes

per annum respectively. The Western belt has four operating factories consisting of Mumias, Nzoia, South Nyanza (Sony) and Western Kenya Sugar company with cane crusing capacities of 218,000 tonnes, 75,000 tonnes, 65,000 tonnes and 60,000 tonnes per annum respectively. There are also 13 small firms producing brown sugar known as jaggery factories. Their total estimated production capacity is 159.25 tonnes of jaggery per year.

Despite the long history of cane production in Kenya the country has never managed to achieve long term and sustained self sufficiency in sugar production and as such the national requirement is supplemented by imports. Sugar production performance and consumption figures are indicated in the table.

NATIONAL SUGAR PRODUCTION AND CONSUMPTION

| YEAR | PRODUCTION (TONNES) | CONSUMPTION (TONNES) |
|------|---------------------|----------------------|
| 1988 | 411,296 | 462,207 |
| 1989 | 441,261 | 489,544 |
| 1990 | 431,836 | 537,999 |
| 1991 | 433,713 | 493,945 |
| 1992 | 371,225 | 552,200 |
| 1993 | 384,800 | 580,847 |
| 1994 | 349,805 | 610,470 |

Source- Planning Division- Ministry of Agriculture and Livestock Development

Constraints and Prospects

The sharp decline in production has been caused primarily by inadequate investment in cane development in the sugar industry. The future of the industry lies in opening up more new areas, increased yields, rehabilitation of factories and expansion of their processing capacities and establishing of new sugar processing facilities. There are two factories which have been proposed for construction namely Siaya and Busia. Of these two, Busia sugar project has gone beyond the drawing board in that cane is currently being developed awaiting factory construction. In an attempt to stimulate sugar industry and raise productivity, Government has

been implementing policies aimed at increased production including liberalization of consumer prices, removal of import licensing, imposition of variable duty on cheap and subsidized imports, freedom to sell directly to consumers up to 20 per cent of each factories output and government guarantee to secure local and off-shore loans. It is hoped that all these measures will yield good result in the long run.

BEVERAGE CROPS

Past Trends

Kenya is one of the leading countries in the world in the production of Coffee and Tea. The two crops are the major agricultural commodities foreign exchange earners for Kenya. Coffee is amongst the earliest cash crops planted in Kenya and its is being produced by co-operative societies involving thousands of small holder farmers and large estate farms. The major type produced is Arabica. From 1990 production of coffee has been declining from 103,900 tonnes to 79,900 tonnes in 1994. The decline in production has been largely the result of the substantial drop in coffee agreement export quota system in 1989. Despite the decline in world coffee prices Kenya's coffee still enjoys a premium over world prices because of its high quality. Over 95% of coffee produced is exported and the leading market is EEC with Germany as a leading country. Coffee sub-sector plays an important role in the development of the country through its foreign exchange earnings and employment generation. The subsector earned the country over Kshs 4.4 billion in 1990 and over 13.0 billion in 1994. Tea in Kenya is produced by small scale farmers under the umbrella of Kenya Tea Development Authority (KTDA) which is a parastatal body and it owns over 30 tea factories scattered all over the tea growing zones. Finlay also manages a number of tea factories. Other producers are large private farms such as Brooke Bond and Finlay which have their own tea factories. Kenya produces black tea and its production rose from 197,000 tonnes in 1990 to over 209,00 tonnes, in 1994. The decline in 1992 was due to drought. The general good performance has been as a result of good maintenance of rural access roads, liberalization of the tea industry, introduction of forex retention accounts and good prices offered in the auction markets. Tea export earned the country Kshs. 6.3 billion in 1990 and Kshs. 16.9 billion in 1994. The major markets for Kenya tea are Pakistan and United Kingdom.

PRODUCTION BY AREA AND VALUE OF EXPORTS FOR TEA AND COFFEE

| YEAR | TEA | | | COFFEE | | |
|------|------------------------|----------------------------|--------------------------|------------------------|----------------------------|---------------------------|
| | Area (000 hectares) | Production (000 tonnes) | Exports (billion Ksh) | Area (000 hectares) | Production (000 tonnes) | Exports (Billion Kshs) |
| 1990 | 97.00 | 197.0 | 6.3 | 153.1 | 103.9 | 4.4 |
| 1991 | 99.80 | 203.6 | 7.5 | 155.4 | 86.4 | 4.4 |
| 1992 | 103.50 | 188.1 | 9.5 | 153.8 | 85.3 | 4.1 |
| 1993 | 104.86 | 211.2 | 18.7 | 158.2 | 75.1 | 11.0 |
| 1994 | 105.91 | 209.4 | 16.9 | 158.7 | 79.9 | 13.1 |

Source- 1995 Economic Survey and Export Promotion Council Report

Constraints and Prospects

Coffee subsector has been performing poorly over the last 4 years mainly because of the decline in world prices which made it uneconomical to produce. This exacerbated by delayed payments to farmers made some farmers abandon the crop. Sub-optimal applications of fertilizers and other chemicals due to high prices of these inputs normally affects the production of tea and coffee. With improved system of payments to farmers and expected privatization of tea factories, production of the crops will improve. Kenya is also looking into expansion of its markets with a view of avoiding over reliance on few markets.

ANIMAL HUSBANDRY

The Resource Base

The main objectives for livestock development in Kenya are to be self-sufficient in livestock production; to alleviate poverty through the creation of income generating employment at all stages of livestock development, and to produce sufficient animal proteins to ensure adequate nutrition for Kenyans. Kenya has not conducted animal census in the recent past but currently the estimates are 11.7 million cattle, 8.3 million sheep, 9.6 million goats, 96.2 thousand pigs and 25.2 million chicken.

Cattle rearing is predominantly an occupation of the small farmers. The Kenya beef cattle comes mainly from the Zebu cattle with the most popular type being the Boran Breed which occupies Northern Western plains and smaller masai humped Zebu found in the Eastern and Southern Plateau. There are also crossbred cattle as a result of successful artificial insemination service covering mainly the highland, the lake region and eastern plateau. The most popular types of sheep and goats found in Kenya are Galla, East African, Droper, Red Masai and Togenburg for meat and Romney marsh and Hampshire down breeds for wool. Poultry farming is practiced by about 90% of the rural population and they produce 75 per cent of total population. Pork meat is not very popular compared to beef, mutton or pork. Most of the pigs produced in Kenya are by small farm holders. In general Kenya is suitable for keeping many livestock species under varying degrees of intensification. While intensified livestock systems are practical in high rainfall areas, diseases controlled areas are suitable for expansive and nomadic pastoralization. The exotic cattle are concentrated in the high altitude, high rainfall areas while the indigenous animals are spread throughout the country.

Past Trends

The main activities under meat and meat products include slaughtering, dressing, curing, freezing and manufacture of meat products. Most of the meat consumed in the country is obtained from numerous slaughterhouses scattered all over the country. However major meat processing factories are Kenya Meat Commission with factories at Athi River and Mombasa, Farmers Choice, Kenchic and Uplands Bacon Factory. While marketing and pricing of white meat (chicken, pigs and fish) has always been under free market system, that of beef was controlled until 1987 when both pricing and marketing were liberalized. Since the decontrol, beef market prices have been responding to the supply and demand situation

Dairy is one of the major growth sectors since small holder dairy production made a break through after independence. The small holders contribute over 80% of all milk consumed in the country. Total milk production in Kenya includes milk from cattle, camels, sheep and goats. Cattle contributes over 80% of total milk and almost 100% of marketed milk. Annual milk production has more or less stagnated over the last five years around 2 billion litres while consumption has increased from 1.7 billion litres in 1988 to 2.0 billion litres in 1994. Milk

production in Kenya is based on forage or grass and for that reason displays seasonality associated with the vagaries of the rainfall patterns.

MEAT AND MILK PRODUCTION AND CONSUMPTION

| YEAR | MEAT ('000 MT) | | MILK (BILLION LITRES) | |
|------|----------------|-------------|-----------------------|-------------|
| | PRODUCTION | CONSUMPTION | PRODUCTION | CONSUMPTION |
| 1988 | 308.8 | 310.4 | 2.0 | 1.7 |
| 1989 | 320.9 | 322.2 | 2.3 | 1.9 |
| 1990 | 319.1 | 335.5 | 2.3 | 2.0 |
| 1991 | 404.3 | 350.1 | 2.4 | 2.1 |
| 1992 | 414.3 | 364.6 | 2.2 | 2.0 |
| 1993 | 423.3 | 383.4 | 2.0 | 2.0 |
| 1994 | - | - | 2.1 | 2.0 |

Source:- Planning Division Ministry of Agriculture and Livestock Development.

The main activities under dairy and dairy products include milk cooling, processing (pasteurization and ultra heat treatment), milk dehydration, manufacture of cheese, cream, butter and fermented milks (mala & yoghurt). Kenya Co-operative creameries (KCC) is the largest industrial conglomerate and operates 10 factories and 7 milk cooling centres in various parts of the country. After KCC comes the cooperative owned factories and private dairies. There are also public institutions such as Egerton University, University of Nairobi and Naivasha Dairy Training School which have dairy processing facilities and do process milk, cheese, butter, yoghurt, cream, ice cream etc.

Three years after the liberalization of dairy industry 10 mini dairies have come up in different parts of the country with most of them located in rural areas and this is expected to boost development in rural areas. Their daily production capacity ranges between 3000 and 25,000 litres. The small dairy manufactures produces and packs a wide range of products with fresh milk topping the list.

INDUSTRIAL PRODUCTION OF MEAT AND DAIRY PRODUCTS

(a) MEAT PRODUCTS

| COMMODITY | UNIT | 1990 | 1991 | 1992 | 1993 | 1994 |
|---------------------------|--------|--------|--------|--------|--------|--------|
| Beef | MT | 8985 | 7911 | 8330 | 12337 | 9951 |
| Pig (Pork) | MT | 1159 | 1003 | 1241 | 2187 | 1454 |
| Sheep Lamb and Goats | MT | 69 | 81 | 81 | 81 | 81 |
| Sausage | MT | 2662 | 2492 | 2785 | 2812 | 2632 |
| Hides and Skins | MT | 53385 | 122002 | 128102 | 134507 | 130794 |
| Processed Chicken | MT | 1977 | 2396 | 2167 | 2284 | 2282 |
| (b) DAIRY PRODUCTS | | | | | | |
| Liquid Milk | 000Lts | 485893 | 429220 | 198389 | 191607 | 170456 |
| Cheese | Kq | 552219 | 594112 | 329794 | 607940 | 331208 |
| Butter | MT | 3248 | 3024 | 2181 | 2233 | 2382 |
| Baby foods | Kq | 325677 | 237637 | 460139 | 670948 | 412960 |
| Ice Cream | Lts | 618708 | 701449 | 701449 | 822679 | 756846 |

Source: Central Bureau of Statistics

Constraints and Prospects

Under meat and meat products the closure of Kenya Meat Commission in 1991 has affected the processing in the industry. The factory has the capacity to meet EEC health standards and can produce high quality products and therefore its closure has denied the country much needed foreign exchange. Second the area available for beef cattle is decreasing as a result of subdivision of large high potential farms and group ranches in arid and semi-arid areas. It is also recognized that disease control with respect to chemicals, drugs and vaccines used is expensive.

The constraints in the dairy industry mainly relate to the production of milk. The problems experienced include inadequate forage supply, poor pasture, low supply of quality breeding heifers, low quality and quantity of compound daily fees, irregular and unreliable payments

to farmers, few cooling facilities and poor use of small cooling facilities, poor infrastructure little research on fodder and by product and poor management. Kenya dairy industry has however a bright future. What is required is improvement of dairy cattle feeding and reducing calving intervals. This is possible by improving nutrition together with farm level management skills and genetic makeup of the dairy herd. Such improvements calls for injection of capital into the industry particularly having processing plants and coolers located near milk production areas. In a country where the agricultural sector is an important component of the economy the trend in milk industry is favourable for small scale producers who account for 75% of the entire population.

Meat processing can be improved by privatizing Kenya meat commission, building modern slaughter houses in areas producing cattle and by promoting small scale and medium scale meat processing projects to supply quality beef products and venture into export.

FISHING

Resource Base

The largest source of fish in Kenya is fresh water mainly from Lake Victoria which produces over 90 per cent of fish in Kenya. The dominant species from the lake is Nile Perch (*Lates niloticus*) that forms about 50% of the catch followed by 'Omena' (*Engraulicyprus rastreneobola*) a tiny silvery fish mainly used in the animal feeds industry. The third important fish species is tilapia which is popular for human consumption and rarely reach the filtering industries. Lake Turkana is the second largest fresh water lake for fish catching.

Although Kenya has got a significant proportion of the Indian Ocean, the fish landings from marine waters are very modest. There are three types of fish farming in Kenya i.e warm water fish farming carried out mainly for Tilapia, cold mountain area fish farming done for trout and coastal/saline water Fish farming carried out mainly for prawns

Past Trends

The total fish landings in 1994 was estimated to be 184,724 metric tonnes. The major sources were Lake Victoria with 174,348 metric tonnes followed by Marine with 5,194 metric tonnes. Fishing in Lakes Victoria and Turkana is done by artisanal fishermen who form a fishing effort of about 27,000 fishermen with about 6,000 fishing boats. For fish farming, there are about

6,000 fish ponds in the country with the yield of about 1800 metric tonnes in 1994.

Since 1990 Marine catches have shown downward trend. Most of the marine catches are got by artisanal fishermen who operate on shallow waters and they catch mostly rabbit fish, scavenger, snapper, parrot and rock cod. Trawling is done in areas North of Malindi and the catch are prawns, lobsters, snaks and exertions. The fishing sector employees about 30,000 fishermen and 6,000 persons in the processing industries.

QUANTITY AND VALUE OF FISH LANDED, 1990-1994

| | 1990 | 1991 | 1992 | 1993 | 1994* |
|------------------------|---------|---------|---------|---------|---------|
| Quantities-Tonnes: | | | | | |
| Freshwater fish- | | | | | |
| Lake Victoria | 185,101 | 186,366 | 151,216 | 174,829 | 174,348 |
| Lake Turkan | 3,180 | 1,078 | 1,543 | 871 | 805 |
| Lake Naivasha | 223 | 299 | 138 | 109 | 211 |
| Lake Baringo | 380 | 130 | 255 | 37 | 215 |
| Lake Jipe | 110 | 107 | 112 | 101 | 121 |
| Fish Farming | 973 | 1,009 | 1,017 | 1,014 | 1,848 |
| Other areas | 1,339 | 2,109 | 1,676 | 1,895 | 1,452 |
| TOTAL | 191,806 | 191,098 | 178,856 | 178,856 | 179,000 |
| Marine fish | 9,031 | 6,434 | 6,276 | 3,823 | 5,194 |
| Crustaceans | 733 | 766 | 573 | 373 | 403 |
| Other marine products | 208 | 264 | 345 | 141 | 127 |
| GRAND TOTAL | 201,778 | 198,562 | 163,251 | 183,193 | 184,724 |
| Value-K£'000: | | | | | |
| Freshwater fish | 80,174 | 83,306 | 162,277 | 180,446 | 202,132 |
| Marine fish | 6,824 | 3,765 | 5,914 | 4,807 | 6,696 |
| Crustaceans | 3,189 | 3,019 | 3,108 | 2,829 | 3,106 |
| Other marine productis | 345 | 536 | 850 | 202 | 211 |
| TOTAL | 90,532 | 90,626 | 172,149 | 188,284 | 212,145 |

*Provisional

Source: Fisheries Department

Fish processing is a new feature in Kenya's economy. Most fish processing plants started operating after 1985. In 1993 there were slightly over 25 factories of which in 1994 only 11 fish processors had their "fish processors" licence renewed. The rest did not have the necessary fish processing equipment such as sufficient water, and water treatment facilities. The major fish processors are Kenya Cold storage, Samaki Industries, Wananchi Marine Products and Victoria Nile Perch with installed capacities as per 1993 of 4,800,3600,2000 and 2,200 metric tonnes per year respectively. Important products include frozen fillets; dried salted and smoked fish. Production of prepared and preserved fish has shown a downward trend from 310142 kg in 1990 to 180768 kg in 1994. The local fish markets include landing beaches, open air markets where fish is sold by artisanal fish traders and urban markets with refrigeration facilities. Most of fish sold in all these markets is unprocessed (whole) and not frozen. Fish exports earns the country about Kshs 700 million a year. The exports are normally destined to Europe, Israel, Australia, Japan, Hong Kong, U.S.A. and some regional countries in Africa. Some fish and fish products such as canned fish, and oysters are imported.

SURVEY OF INDUSTRIAL PRODUCTION FOR PREPARED AND PRESERVED FISH 1990-1994

| | Unit | 1990 | 1991 | 1992 | 1993 | 1994 |
|--|---------------|---------------|----------------|----------------|----------------|-----------------|
| Prepared and Preserved Fish | Kg | 310142 | 316345 | 282382 | 225937 | 180768 |
| Exports of Fish, Sea Animals and Preparations | K£'000 | Nil | 35274.2 | 39179.9 | 86392.7 | 95306.91 |

Constraints and Prospects

The problems that face the fish processing industry are many and range from those related with raw material acquisition, infrastructure, marketing, and policy issues. The major constraints are:-

- (i) High cost of transporting fish to the factories which are located far-from the landing beaches and connected by untarmacked roads which are impassable during rainy seasons.

- (ii) Lack of fish handling and storage facilities at the landing beaches. This results in high post harvest losses.
- (iii) Lack of affordable fishing boats with cold storage for artisanal fishermen who are scattered.
- (iv) Inadequate data on fishery resources. Fishery data are essential for government policies planning and resource management. Currently the data available is scanty.
- (v) Unconfirmed fear that Lake Victoria is over fished is being strengthened by the fact that fishermen are now landing less than before. In Lake Victoria water hyacinth weed is also affecting fish.
- (vi) Absence of information on foreign markets, and
- (vii) Poor management of fisheries cooperatives.

Though the earnings in fishing sector is modest, the importance of the sector in terms of employment cannot be over emphasized as it employs over 30,000 fishermen and 6,000 employees in the processing factories. Considerable scope for the expansion of fishing subsector exists in Kenya with improved infrastructure, marketing information, setting up of new processing plants and cold storage facilities in areas close to the sources of fish.

TEXTILES AND CLOTHING

Resource Base

Kenya's textile industry uses both locally and imported raw materials and inputs. The domestic fibres are cotton, wool and sisal while the imported ones are nylon, polyester, acrylic, jute, linen and cotton. All other auxiliary inputs such as dyes, chemicals and resins are imported.

Cotton growing was introduced in Kenya in 1900 and is grown in drier areas under irrigation and rain fed conditions. Its potential stands at 350,000 hectares in Nyanza, Western, Coast and Rift Valley provinces. Out of this potential only 49,188 and 76000 ha were used in 1993 and 1994 respectively. The increase in 1994 is as a result of liberalization of cotton market in 1992. However cotton production in Kenya has been declining over the years due to low seed quality, delayed delivery or non-availability of inputs, delayed and poor payments to the farmers. This has made Kenya to import the shortfall to meet domestic demand since 1984. Kenya's wool production is around 885 tonnes per annum. The main wool producing areas

are Nyandarua, Narok, Nakuru, Elgeyo Marakwet and West Pokot which accounts for about 60% of the wool produced. There is potential of expanding wool production to meet the high demand of wool and woollen garments. In average sisal production is about 30,000 tonnes per annum. Sisal is used in Kenya for the manufacture of gunny bags, making ropes and twine and matting. The main sisal producing areas are Kilifi, Kwale and Taita-Taveta.

Past Trends

The textile industry is the second biggest manufacturing activity in Kenya after food processing. The textile sub-sector has been in existence since the second half of 1950's with the establishment of most textile mills dominated by Asians of Indian origin. There are 52 textile mills producing a total of 83 million square metres of fabric excluding blankets and garments of yarn. The knitting mills alone have a capacity equivalent to 28.8 million square metres. These production figures are far below their installed capacity which is in the region of 115 million square metres of fabric and can satisfy 66% of local demand estimated at 180 million square metres per year.

Textile mills, are grouped into three categories namely vertically integrated that is spinning weaving or knitting and finishing; independent spinning mills; and non-intergrated weaving/knitting mills. There are also 350 garment making units distributed all over the country with highest concentration in urban centres.

Out of the 52 mills, Government was represented in the sector by eight firms which have either now been sold or in the process of it. The rest are owned by Asian Community.

There are about 40 cotton ginneries in the country with a ginning capacity of 100,000 bales per year but annual production is only 40,000 bales against an annual consumption of about 90,000 bales. Most of the ginneries are owned by Cotton Board and Co-operative Societies.

Kenya's textile exports consists of yarn fabrics and ready made garments. Exports of yarn and fabrics are done by textile firms in the country. The recently introduced Manufacturing Under Bond (MUB) and Export Processing Zone (EPZ) factories which are mainly garment factories have boosted exports for the sector. The products from MUB and EPZ factories are exported mainly to USA, UK and smaller portion to COMESA countries.

Constraints and Prospects

Prior to import liberalization in 1993 textile industry in Kenya was highly protected through quantitative and tariff restrictions. The local manufacturers were thus comfortable and concentrated on the domestic market only. In some cases the manufacturers took little consideration of quality and pricing. With liberalization of imports, the importation of textile has increased enormously and in particular apparel fabric from far East and ready made garments classified as "second hands". The manufacturers have therefore to compete with these imports in the domestic market. Some of the factories are now threatened with closure as a result of stiff competition from those imports.

Kenya is also faced with a new problem of quota system imposed by U.S on exports of shirts and pillow cases. Whereas Kenya has installed capacity to produce 1.0 million dozen of shirts, quota system allowed in USA market is only 360,000 dozens. This requires diversification of markets to other European countries.

The textile subsector is characterized by capacity under utilization resulting in frequent operating losses. The main causes have been identified as inadequate supply of raw materials outdated technologies, mismanagement and competition from imports. Until 1990 production of cotton was under the jurisdiction of Cotton Marketing Board whereby the Board provided farmers with credit in the form of inputs to grow for it cotton and at the same had monopoly in buying cotton from farmers. The Board was very poor in paying farmers for delivered crops and that led to poor cotton production. With the removal of the monopoly from Board the in 1990, private sector has moved into the cotton production and marketing system and introduced efficiency which will stimulate the production. The Government also is expected to introduce measures of rehabilitating and expanding cotton growing schemes such as Bura and Hola.

Kenya textile industry has a mixture of old obsolete machinery and modern state of art equipment. As a result of this some firms produce high quality products that competes in the export market while the others produce poor quality products. It is therefore necessary for ginning facilities to be modernised and change obsolete technology that hamper development of new products in a fast moving and changing market condition.

In the current Kenya's Development Plan (1994)-96) the Government has underlined policies

for future development of textile sector. These include:

- (a) Continued government disinvestment with a view of withdrawing completely from the sector. Most of the mills which were being mismanaged were parastatals.
- (b) Development of MUBs and EPZs for enhanced export growth for the sector.
- (c) Upgrading of technical skills through revitalization of the Kenya Textile Training Institute.
- (d) Promoting and establishing small and medium garment making factories to produce high quality and affordable garments in the rural areas.
- (e) Ensuring payment of duties on imported fabrics and second hand clothes; and that imported ready made garments meet the required Kenya standard.

FOOTWEAR

Resource Base

It is estimated that Kenya has 12 million cattle, 9 million goats and 8 million sheep. The availability of raw hides and skins directly depends upon the number of animals slaughtered and hence 'off-take' rate per annum becomes relevant. On the basis of off-take rates the availability for hides is in the region of 1,540,000 million pieces of raw hides and 4.5 million pieces of raw skins which should be available to tanneries. Other raw materials such as P.V.C polyurethane, rubber and other shoe accessories are imported.

1992 LIVESTOCK POPULATION

| | CATTLE | SHEEP | GOATS |
|---------------------------|---------------|--------------|--------------|
| Livestock | 11.7 million | 8.3 million | 9.6 million |
| Off-take rates | 8.2% | 28.1% | 41% |
| Estimated hides and skins | 1.5 million | 2.5 million | 2.0 million |

Source: UNIDO Report US/RAF/92/200 - RALFIS

The installed tanning capacity for the 14 tanneries in the country far exceed domestic supply for hides and skins. The installed capacity for hides is 3.3 million while for skins is 8.3 million pieces. In 1992 tanneries in operation processed 920,000 cattle hides and 6.5 million

skins. With the liberalization of the economy exports of hides and skins have increased and this has brought severe shortage of raw hides and skins to the local tanning industries which now on average operate at 50% of installed capacity. Majority of tanneries capacity is geared towards processing of hides and skins up to wet blue stage for export which accounts for more than 60% of the total leather produced in the country. 25% is processed up to crust stage and 15% to finished stage mainly for local consumption by the local footwear industry. Exports of leather earned Kenya K£68.2 million in 1994 compared to K£35.4 million in 1991.

Past Trend

The largest consumer of leather is footwear. The sector has industries ranging from small scale semi mechanized to medium and large scale fully mechanized firms. There are in total 30 formal factories manufacturing both leather and synthetic footwear. Apart from the formal ones there are hundreds of informal shoe manufacturing units scattered all over the country. The biggest shoe manufacturing firm is Bata Shoe Company with installed capacity of about 9,000,000 pairs per year.

The trend in production for the last 5 years show that there has been marginal increases in the production of leather shoes. It is estimated that the demand for footwear in Kenya is approximately 7.5 million pairs per year. Local production satisfy low income group whereas middle and upper income are supplemented with imports. Of late some of the footwear industry are either working at under capacity or closing as a result of competition with imports which are cheaper than the local products. Export earnings have increased from K£ 1.0 million in 1991 to K£36.3 million in 1994. Volume of export for hides and skins tremendously went up to 2704 tonnes in 1994 compared to 410 tonnes and 748 tonnes in 1992 and 1993 respectively.

INDUSTRIAL PRODUCTION OF LEATHER AND FOOTWEAR

| | UNIT | 1990 | 1991 | 1992 | 1993 | 1994 |
|--------------------|-------|---------|---------|---------|---------|---------|
| Finished leather | Msq | 7637 | 12693 | 15408 | 18703 | 56056 |
| Unfinished leather | Msq | 1367093 | 1153541 | 1897533 | 217795 | 150609 |
| Sheep ad goat skin | Nos | 581217 | 5369935 | 3413955 | 1004764 | 68162 |
| Sole Leather | Kq | 86924 | 82330 | 81828 | 81391 | 81391 |
| Sporting balls | Nos | 77440 | 83956 | 86478 | 86478 | 47267 |
| Leather shoes | Pairs | 1605343 | 1189906 | 1480009 | 1570728 | 1774299 |
| PVC leather cloth | Msq | 1795 | 1741 | 1235 | 1329 | 1272 |

Source: Central Bureau of Statistics

Constraints and Prospects

The future of the performance of footwear industry depends on how existing investors are going to adopt to the changes brought by liberalization of the economy and the policy environment put in place for promotion of the sector. The installed tanning capacity far exceeds locally available raw hides and skins and yet exports of the items have shot up rendering some industries to close or work under capacity as a result of lack of raw materials. Secondly dumping of cheap imported shoes from Asian countries have contributed to the poor performance of the sector.

The Government policy is to create an enabling and conducive environment for the local industries to develop. This is especially so with the leather industry as it uses the locally based resources, hides and skins which are replenishable, as its major raw materials. The industry does not only create a far reaching backward and forward integration by absorbing products from the agricultural sector but also guarantees an effective longterm economic development in Kenya through trade and transport among others.

WOOD AND WOOD PRODUCTS

Resource Base

Kenya's wood industry is categorised into mechanical wood industry and the pulp and paper industry. Major sources of industrial wood are forest plantation which cover 170,000 hectares. The area is expected to decline because replanting is lagging behind felling and this threatens the long-term supplies of industrial wood. The projected demand of industrial wood in Kenya for 1995 is estimated to be 1058 thousand cubic metres and this is expected to rise to 1209 thousand cubic metres by the year 2000. The supply in 1995 is projected to be 3184 thousand cubic metres and will rise to 3702 cubic metres in the year 2000. In order to have a higher survival rate of young trees the Government has introduced a new scheme known as Non-resident cultivation scheme in some parts of the country where landless are allowed to grow subsistence crops and Forestry Department Plants tree seedlings which the farmers are expected to tend along with their crops.

WOOD-RELATED LAND USES IN 1992

| Land Use | Area ('000ha) |
|---|-----------------|
| Indigenous forests | 1310.0 |
| Woodland, Bushlands and wooded grasslands | 37,590.0 |
| Farmlands and Settlements | 9,540.0 |
| Forest Plantations (Out of 170,000ha) | 164.0 |
| TOTAL | 48,604.0 |

Source: Kenya Forestry Master Plan

Wood harvesting in Kenya is based on a licensing system which is given only to industries that are engaged in wood processing, such as sawmilling, plywood, furniture and joinery industries.

The raw materials of the sawmills consists of locally produced softwoods estimated at around 2835 thousand cubic metres of wood and the balance of about 10% is imported from Tanzania, Uganda and Zaire. As for plywood mills, pine accounts for about 80 per cent of input followed

by cypress. About 771,672 cubic metres of timber is used in furniture and fixture industry while wood carving uses 600 tons per year of hard indigenous wood.

PROJECTED DEMAND FOR MECHANICAL WOOD PRODUCT

| TYPE | 1995 | 2000 | 2005 | 2010 | 2015 | 2020 |
|----------------|-------|-------|-------|-------|-------|-------|
| Sawn Softwood | 193.7 | 239.7 | 297.5 | 352.3 | 407.7 | 491.4 |
| Sawn Hardwood | 18.7 | 23.1 | 28.7 | 34.0 | 39.3 | 47.4 |
| Plywood | 35.5 | 44.1 | 55.1 | 56.2 | 75.4 | 91.2 |
| Fibreboard | 7.1 | 9.1 | 11.8 | 14.5 | 17.3 | 21.4 |
| Particle board | 6.9 | 8.9 | 11.6 | 14.3 | 17.0 | 21.1 |

Sources: Kenya Forestry Master Plan

Past Trends

There are about 494 sawmills in Kenya with installed capacity of about 400,000 cubic metres of timber per year but produces around 200,000 cubic metres a year. Of the 494 sawmills, fifteen large mills account for 50% of the sectors output. The sawmills use small-sized low quality logs and a lot of waste is generated as only 37% of the logs is recovered as a product. All the timber produced is consumed locally.

Plywood production is relatively new as it was started in early 1980s and now there are three plywood mills with installed capacity of 40,000 cubic metres a year. The products produced are interior grades of plywood having thickness ranging from 3 to 25mm. The mills are intergrated with a sawmill and in addition one has a particle board mill and the other a fibreboard mill which makes raw material utilization maximized.

Furniture and fixtures subsector consists of about 1200 formal firms and thousands of small scale entrepreneurs in the informal sector commonly referred to "Jua Kali" operators. They produce structural timber products, furnitures, joinery and miscellaneous wooden articles.

Constraints and Prospects

The major constraint in mechanical wood industry is the use of old and obsolete machinery. Secondly poor infrastructure in forest areas hinder regular supply of logs to the sawmills. The sector therefore requires modernization and enhancement of skills to improve productivity and product quality and decrease wastage of wood raw materials. Cheap and affordable technologies for using saw dusts and wood wastes in making briquettes, wooden toys, sugar dishes etc should be developed through existing research institutions.

PULP AND PAPER

Resource base

All the six paper mills in Kenya use waste paper as their major raw material apart from Pan African Paper Mills which manufactures from both the wood pulp and the waste paper. The quantities of the raw materials do not meet the demand of the mills and consequently they import. Almost all industrial wood come from plantations. Under Kenya Forestry Master Plan, more wood products will be produced to reduce the cost of imports as indicated in the charts. As earlier indicated wood harvesting is based on a licensing system. For Pan African Paper Mills it has a 31 year license from 1973 to 2003 for wood harvesting. There is also agreement in which (PPM) replants trees in areas where it has felled trees.

Past trends

There are six paper mills in Kenya with a total capacity of 145,000 metric tonnes per year against the country's demand of 220,000 tonnes per year necessitating importation to meet the demand. Of the six paper mills the biggest is Pan African Paper Mills in which the Government has 51% share and Birla Group of India and International Finance Corporation 49% share. The other mills are owned by Kenyans

KENYA'S INVESTMENT IN PAPER INDUSTRY IS AS FOLLOWS:

| NAME | Year of Establishment | Value of Investment (Kshs) | Installed Capacity (tonnes) |
|-----------------------------|-----------------------|----------------------------|-----------------------------|
| Pan African Paper Mills Ltd | 1975 | 7.4 billion | 110,000 |
| Kenya Paper Mill | 1957 | 100 million | 9,000 |
| Madhupaper Kenya Ltd | 1977 | 85 million | 8,600 |
| Chandaria Industries | 1983 | 20 million | 8,400 |
| Kisumu Paper Mill | 1982 | 45 million | 8,000 |
| Highlands Paper Mill | 1980 | 20 million | 2,000 |

At the time of establishment of Pan Paper Mills it was expected that it will only engage in manufacture of paper from wood pulp when it had one mill. However it has since then invested in 3 mills with the third one being de-inking plant. This de-inking plant which has a capacity of 36,000 tonnes per year can manufacture paper from all types of printed waste paper including newspapers. Pan Paper Mills produces various ranges of unbleached and bleached grades of papers such as kraft liner multiwall national sack kraft, TP kraft paper, writing paper, newsprint, computer bank, offset printing etc. The other five mills produces different types of papers from the ones manufactured by PPM. They are tissue papers, chip boards, facial tissues, straw boards, cover paper etc. The trend in the production of the paper during the last 5 years is indicated in the table.

INDUSTRIAL PRODUCTION OF PAPER PRODUCTS

| ITEM | UNIT | 1990 | 1991 | 1992 | 1993 | 1994 |
|-----------------------------|------|---------|---------|---------|---------|---------|
| Kraft Paper Board | MT | 7439 | 6591 | 7259 | 6390 | 5918 |
| Wrapping Paper | MT | 29901 | 27762 | 36643 | 41519 | 41087 |
| Newsprint | Kq | 431638 | 435754 | 443598 | 443598 | - |
| Toilet Paper rolls | Kq | 3461 | 4396 | 6937 | 5635 | 5203 |
| Exercise Books | Doz | 4955801 | 7037319 | 7346852 | 7432688 | 3489031 |
| Envelopes | Doz | 144675 | 132828 | 88969 | 77006 | 145745 |
| Paper bags and sacks | MT | 7596 | 7684 | 10783 | 8945 | 9392 |
| Corrugated Paper Containers | MT | 10695 | 10422 | 9108 | 8125 | 6860 |
| Paper Corks | Doz | 33025 | 26299 | 37651 | 33443 | - |
| Teleprinter Rolls | No | 48933 | 279250 | 419071 | 628900 | 112376 |

Source: Central Bureau of Statistics

Manufacture of paper and paper products have been declining in general due to cheap imports. Most of the papers produced are consumed in the domestic market. In the last two years however Pan African Paper mills have been able to export small quantities of its products to the neighbouring countries.

Constraints and Prospects

At present there is inadequate production of pulp as the area under trees is comparatively small. For this reason Pan African Paper Mills is currently setting up fourth plant to utilize bagasse as a raw material for paper production. Before liberalization of the economy paper industries could not get enough waste paper in the domestic market and hence they operated at less than 50% of their installed capacity. The constraint is now over and it is expected that with importation of high quality waste paper the industries will be able to produce high quality papers for both domestic and export markets. Since in East African countries there is only one paper manufacturing plant in Tanzania, expansion of our mills will go along way in meeting the demand of papers for our neighbouring countries.

The issue of pollution of environment by paper manufacturers has been of concern. However

all the paper manufactures have established affluent treatment ponds for treatment of waste materials and also re-cycle the water back for re-use.

PRINTING AND PUBLISHING

Resource Base

Paper which is the major raw material in printing is obtained locally from Pan African Paper Mills. Other raw materials which are also locally available are inks, glues and pins. However high grade type of papers such as conqueror brand, croxley, proost paper, onion skin etc are imported.

Past Trends

Printing is basically a service industry. In Kenya there are about 220 establishments with concentration in Nairobi (120 firms) and Mombasa (30 firms). The service provided by the industry includes printing of books, wedding cards, business cards, advertising materials, letter heads and receipt books.

Printing and publishing are fast growing industries estimated at 5% per annum as a result of drastic changes in education system and increased school enrolment brought about by increased population growth. The size of industry varies from a single unit with only one machine to highly mechanised with many modern printing machines like Rolland 80 which can print as many as six colours on a single process. The major printing industries in Kenya are Kenya Litho, Colour Print, Jomo Kenyatta Foundation, Kenya Literature Bureau, Government Press, Oxford Printing Press and printers for daily newspapers.

Constraints and Prospects

Most of the printing firms are small consisting of proprietor, machine operator, and a binder. They have old machines that can only do one colour job at a time yet they are restricted on expansion and modernization because of lack of collateral needed to get finance from banks. Undercutting by middlemen often referred to as broker who act between, the printers and consumers is another problem to the small printers who get paid after these agents have deducted their commission. If the industries in this sector are encouraged to integrate backward by investing in small scale high quality paper mills and at the same time have

modern machines then the industry will flourish to meet the demand of ever increasing population.

PAPER PACKAGING

Resource base

The basic raw material is kraft paper or paper sacks obtained mainly from Pan Africa Paper Mills with few high quality being imported.

Past Trends

Paper packaging industry in Kenya is divided into packaging for fluids and solids. Fluid packaging is done for milk, fruit juices and other forms of drinks. There is only one firm supplying paper packaging for fluids and that is Tetrapak Ltd. In paper packaging for solids there are 8 major companies manufacturing various line products such as corrugated cartons, wrapping paper, grocery bags and envelopes. The major firms are East Africa Paper Bags, East African Packaging, Print Pak, Kenya Paper Bags, Dodhia Packaging, United Bag Manufacturers and Mafuko Industries. Their overall installed capacity is in excess of 50,000 tonnes per annum and actual production is about 20,000 tonnes per annum.

The products are mostly consumed in the domestic market but there are few firms which export to neighbouring countries.

Constraints and Prospects

Kenya is developing a demand for high quality packaging for both exported and local commodities. Kenya's packaging is of low quality owing to unavailability of quality packaging materials especially in the area of paper and paperboard. The low quality and high prices offered by the packaging convertors to the end users is a problem brought by dependence on few suppliers and hence lack of competition. However import of quality paper which used to be restricted are now liberalised and this is hoped to encourage investment in paper converting for user industries. The recycling of packaging materials is a major area for future investment. Currently there are a few firms dealing with recycling of waste and since this is a growth industry, there are opportunities in this area for user industries which require cheaper

but high quality packaging material.

B. CHEMICAL BASED INDUSTRIES

PETROLEUM REFINING

Past Trends

Kenya has only one refinery of crude petroleum located in Mombasa known as Kenya Petroleum Refineries Ltd. The then East African Oil Refinery Limited was established to provide petroleum products to Eastern Africa including Zaire, Sudan, Rwanda and Burundi. It started its refining operations in 1963 with an initial annual capacity of 1.9 million tonnes crude processing. In 1974, the annual capacity was increased by 1.4 million tonnes by building a second almost identical product line, thus increasing refinery capacity to 3.3 million tonnes of Crude Oil a year. All the raw materials used in the Refinery are imported from the Middle East and Europe and they are classified as Crude Oils, Base Oils and Chemicals. The refinery is 50% Government owned. The remaining ownership is split amongst the four oil companies: BP 12.75%, ESSO 12.75%, SHELL 12.75% and CALTEX 11.75%. It processes Crude Oil, formulates greases and does product storage handling. Other oil Companies are: Agip, Kobil and Total.

KPRL processes Crude Oil for the Oil Companies and other users as per processing agreement which obliges the refinery to receive an agreed quantity of Crude Oil, process and deliver the products to agreed period. The users pay the KPRL a processing fee.

KPRL has facilities for the production of among others Liquefied Petroleum Gas (LPG), Premium and Regular Petrol, Kerosene, Automotive Gasoil, Industrial Diesel, Jet Fuel, Bitumen, Fuel Oil and Grease. The bulk of its products - 64% is delivered via the Pipeline Corporation to Western Kenya. The Coast takes 28% while 7% leaves the refinery to other destinations by sea.

There are two major products from crude petroleum oil:-

- White products (mainly transportation fuels) including Kerosene and LPG.
- Black products (mainly heavy fuel Oils e.g heavy Oils, residual Oils, Lubricating Oil, hatching Oil, etc.

The Crude Oil is mainly of two types:-

- Very light, Low-Sulphur content e.g Zakum and Murban which accounts for 80% of refinery intake.
- Heavey Crudes, high-sulphur content e.g. Arabian Heavy, Quata, Marine, Burkhan, Kuwait, etc. Whereas in principle, the refinery can process any crude, the heavy crudes lead to a huge surplus of fuel oil (black products) which has low demand.

There are 3 Lube oil blending plants in operation in Kenya having blending capacity of 55,55,and 30 thousand metric tonnes for the Caltex, Shell B/P and Esso Plants respectively.

There is also one company in Kenya known as Optimum Lubricants Limited which operates oil recovery plant with a capacity of 3.5 thousand metric tonnes but only handles 500-600 metric tonnes due to shortage of feedstock.

The Kenya Petroleum Refinery Ltd also manufactures different grades of blown bitumen and it has installed capacity of 45 thousand metric tonnes per annum. There are also about 10 firms which manufacture bitumen but receive their raw bitumen from the Refinery.

Performance of petroleum industry in Kenya during the last five years is indicated in the tables given. The year 1991 recorded the lowest imports of crude and refined petroleum products. The exports of petroleum products went down significantly in 1994 as a result of decline in demand from neighbouring countries.

FINISHED PETROLEUM PRODUCTS 1990 - 1994**

'000 tonnes

| | 1990 | 1991 | 1992 | 1993 | 1994* |
|--|---------------|---------------|---------------|-------------|----------------|
| Output | | | | | |
| Liquefied Petroleum gas | 28.4 | 26.4 | 28.3 | 27.4 | 29.5 |
| Motor gasoline premium | 143.9 | 145.8 | 161 | 152 | 164.4 |
| Motor gasoline regular | 190.9 | 182.3 | 186.9 | 176 | 164.1 |
| Illuminating Kerosene and Jet/turbo fuel | 492.2 | 420.5 | 454.7 | 426 | 421.1 |
| Light diesel Oil | 533 | 512.1 | 553.8 | 500 | 516.2 |
| Heavy diesel Oil and Marine diesel Oil | 30.1 | 29.9 | 26.4 | 29 | 22.4 |
| Fuel Oil | 411.3 | 391.7 | 437.3 | 500 | 491.4 |
| Export Residues | 258.2 | 256.7 | 233.4 | 164 | 138.2 |
| Bitumen | 31.2 | 24 | 26.5 | 9 | 19.6 |
| Intermediates | 4.2 | -3.8 | 3 | 6 | 5.7 |
| Refinery Usage | 101.1 | 91.9 | 119.4 | 101 | 96.7 |
| THROUGHPUT = TOTAL OUTPUT | 2224.5 | 2077.5 | 2230.7 | 2092 | 2,069.3 |

- * PROVISIONAL
- ** Excludes Lubricants

PETROLEUM SUPPLY AND DEMAND BALANCE

| Demand | 1990 | 1991 | 1992 | 1993 | 1994* |
|------------------------------------|----------------|----------------|----------------|----------------|----------------|
| Liquefied petroleum gas | 27.4 | 25.0 | 27.4 | 25.1 | 28.4 |
| Motor Spirit (premium and regular) | 339.9 | 339.3 | 346.8 | 352.0 | 352.2 |
| Aviation spirit | 7.1 | 6.8 | 7.7 | 8.5 | 7.2 |
| Jet/turbo fuel | 302.4 | 253.5 | 312.5 | 342.8 | 474.4 |
| Illuminating Kerosene | 184.2 | 174.5 | 175.1 | 164.8 | 173.1 |
| Light diesel oil | 555.4 | 559.9 | 571.1 | 554.2 | 539.8 |
| Heavy diesel oil | 36.5 | 30.5 | 27.9 | 23.0 | 24.3 |
| Fuel Oil | 377.4 | 365.6 | 370.9 | 355.9 | 409.4 |
| TOTAL | 1,830.3 | 1,755.1 | 1,839.4 | 1,826.3 | 2,008.8 |
| Refinery usege | 101.1 | 91.9 | 119.4 | 101.9 | 96.7 |
| Total Demestic Demand | 1,931.4 | 1,847.0 | 1,958.8 | 1,928.2 | 2,105.5 |
| Exports of petroleum fuels | 534.2 | 635.2 | 642.8 | 600.5 | 447.3 |
| Total Demand** | 2,465.6 | 2,482.2 | 2,601.6 | 2,528.7 | 2,552.8 |
| SUPPLY | | | | | |
| Imports:- Crude oil | 2,178.3 | 2,059.4 | 2,235.3 | 2,274.2 | 2,173.2 |
| Petroleum fuels | 132.6 | 35.1 | 93.0 | 311.1 | 314.3 |
| TOTAL | 2,310.9 | 2,094.5 | 2,328.3 | 2,585.3 | 2,487.5 |
| Adjustment*** | 154.7 | 387.7 | 273.4 | -56.6 | -65.3 |
| TOTAL SUPPLY | 2,465.6 | 2,482.2 | 2,601.7 | 2,641.9 | 2,552.8 |

*Provisional

**Difference is due to rounding.

***Adjustment for inventory changes and losses in production.

Source: Economic Survey 1995

Constraints and Prospects

The major constraint in Kenya's Refinery is its inability to process heavy crude oils and that makes the country import lighter and more expensive crude oils such as Zakum and Urban with very low sulphur. The equipments at the Refinery are also outdated and hence constant breakdowns resulting in low capacity utilization. Exports to neighbouring countries has shown a decline as they have resorted to direct imports of refined petroleum products as the Kenyan-refined products are expensive due to imposed taxes.

Prior to the deregulation of the oil sector in late October 1994, the management of the KPRL had proposed refinery modernization projects estimated at Kshs. 2 billion. The projects covered the following units:-

- Replacement of Pneumatic Instrumentation for the process control of the refinery with electronic data transmission.
- Increased LPG production and storage facilities.
- Product up-grading facility to provide a cracking plant for more gas oils, Kerosene and LPG from fuel oil and heavy Crudes.

The modernization projects was expected to include a gasoline improvement plant to reduce the quantity of Lead needed in gasoline, and gasoil desulphurization plant to reduce the amount of Sulphur in gasoil. Facilities were planned to reduce the amount of Sulphur dioxide that is emitted from the refinery fuel gas and also to remove odour and oil from refinery effluent water.

Following the deregulation, the proposed capital intensive project has not won the support of private shareholders and the Government has also remained non-committal.

With the liberalization of petroleum sector in 1994 the refinery has to be modernized to provide a new cracking plant to make more gasoil LPG and Kerosene from fuel oil if it has to meet the demand. The increase in demand for petroleum products requires new facilities and plant to refine both heavy crudes and light crudes. Other potential projects are recycling of waste lubricants and production of carbon-black used in rubber products, plastics, paints, inks and polishes.

FERTILIZERS

Resource Base

There are two main fertilizer industries in Kenya namely: KEL Chemicals Limited which manufactures single super Phosphate and MEA Limited importing and blending NPK fertilizers. There are also other companies manufacturing foliar feeds. KEL Chemicals Ltd uses sulphuric acid from their plant as a raw material in the manufacture of single super phosphate. The filler materials such as limestone are available locally whereas rock phosphate are imported from Tanzania. MEA limited imports manufactured fertilizers in bulk and blends them in their plant. The foliar feed manufacturers also import already formulated foliar feeds.

Past Trends

The use of fertilizer in Kenya dates back to early 1920s. At the time of independence in 1963, fertilizers were mainly used by large scale farmers most of whom were Europeans. After independence fertilizer usage was advocated and small scale farmers started using it to increase yields. Since then fertilizer usage has grown steadily with increased area of food and cash crops.

Until recently all fertilizers used in Kenya were imported through commodity aid by donors and through commercial importers. Kenya's overall demand for mineral fertilizers is about 253,000 tonnes per year and it is projected that it would be over 335,000 tonnes by the year 2000. The most commonly used mineral fertilizers include Diammonium Phosphate (DAP), Triplesuper Phosphate (TSP) Calcium Ammonium Nitrate (CAN), Nitrogenous phosphate and Potassic Fertilizers (NPK) etc. The products from the fertilizer industries in Kenya include single superphosphate, NPK fertilizers and foliar feeds. Kel Chemicals which manufactures single superphosphate has installed capacity of 45,000 tonnes per year. The NPK are produced by MEA Ltd in their blending plant which has installed capacity of 50,000 tonnes but they have not achieved this. The foliar feeds are produced in small quantities and the amount produced depends on the demand

Fertilizer Importation 1989-1994

| Year | K£ MILLION |
|------|------------|
| 1989 | 69.4 |
| 1990 | 33.3 |
| 1991 | 62.0 |
| 1992 | 75.1 |
| 1993 | 166.6 |
| 1994 | 170.6 |

Source: CBS

Constraints and Prospects

Lack of local resources such as rock phosphate and natural gas is a major hindrance to the development of fertilizer industries in Kenya. Secondly fertilizer production is a highly capital intensive industry and very few investors are willing to undertake them. There is however potential for the following projects.

- (i) Establishment of a biofertilizer plant in Western Kenya to utilize bagasse and wastes from Lumber industries,
- (ii) Establishment of a fertilizer plant to manufacture DAP, CAN, NPK using imported raw materials.
- (iii) Production of Nitrogen fixing micro-organisms such as Rhizobium which can be used in leguminous plants to increase crop yields.

Proposals were forwarded to UNIDO and Japan Consulting Institute to assist in conducting more detailed studies which would specify the technologies and incentives to encourage the establishment of a fertilizer industry.

PESTICIDE

Resource Base

The pesticide industries in Kenya consist mainly of firms formulating and repacking pesticide materials. The only raw materials available locally are pyrethrin extracted from pyrethrum flowers, kaolin, soap stone, calcium carbonate, and wattle bark (for tanning extract).

| | UNIT | 1990 | 1991 | 1992 | 1993 | 1994 |
|-----------|------|------|------|-------|-------|------|
| Pyrethrum | MT | 8969 | 9942 | 12452 | 17710 | 1994 |

Source Ministry of Agriculture and Livestock Development

Past Trends

There are above 11 firms manufacturing and/or selling various pesticide products in the country. Most of them import active ingredients and semi finished products which they formulate and pack. There are a few companies manufacturing insecticides and fungicides e.g copper oxychloride. Other types of pesticides formulated and marketed in the country include herbicides, miticides plant growth regulators, insect repellents and soil sterilants.

The majority of pesticide industries are multinational with their subsidiaries in Kenya. In 1994 their investment was estimated at Kshs 182 million but it was not easy to have a clear distinction as some of them are engaged in pesticides, pharmaceuticals and industrial chemicals. Examples are Rhone-Poulenc which handle both pesticides and pharmaceuticals, Twiga Chemicals handles industrial chemicals and pesticides.

Constraints and Prospects

Kenya as an agricultural country needs a lot of pesticides to boost the agriculture output. Domestic demand as well as export to neighbouring counties continue to increase. It is therefore recommended that pyrethrin available locally and other imported ingredients should be used to manufacture insecticides and fungicides for both domestic and export markets. In the past anomaly existed where duty was paid for raw materials used in the pesticide industries while most of the finished products were imported duty free and this discouraged investors. High cost of putting effluent treatment plants has also hindered the development of these

industries. There is however prospect in the manufacture of fungicides and insecticides in small scale using pyrethrum as one of the active ingredients available locally.

CEMENT

Resource Base

Available raw materials in Kenya for the manufacture of cement are limestone, Kunkur, Iron Ore and Tuff. Gypsum is imported from Spain for the manufacture of export cement.

Past Trends

In Kenya there are two factories producing cement namely East African Portland Cement Company (EAPCC) and Bamburi Portland Cement Company Limited (BPCC). The EAPCC is located in Athi River some 25kms from Nairobi was incorporated in 1957 and started cement manufacture in 1958 using the wet process with installed capacity of 120,000 tonnes per year. The plant later went through modification raising the capacity to 350,000 tonnes per annum. Bamburi Portland cement company Ltd which is situated in Mombasa was commissioned in 1954. Since then additional production lines have been installed and it has now installed capacity of 1,200,000 tonnes per year. Thus the current total capacity for cement in Kenya is 1,550,000 tonnes per year. During the last 2 years production of cement averages 1.4 million tonnes per year while consumption has been declining from 1.1 million tonnes in 1992 to 858 thousand tonnes in 1994.

While EAPCC concentrates on supplying part of local market, BPCC deals with both local and export market. Export is both in form of clinker and bulk cement to Mauritius, Re-Union, Seychelles and in bagged cement to the Comoro Islands, Uganda, Somalia and Sudan etc.

CEMENT PRODUCTION AND UTILIZATION 1990-94

'000 tonnes

| YEAR | PRODUCTION | IMPORTS | CONSUMPTION AND STOCKS | EXPORT TO | |
|------|------------|---------|------------------------|---------------------|---------------------|
| | | | | Uganda and Tanzania | All other Countries |
| 1990 | 1511.5 | 0.0 | 1182.0 | 44.6 | 288.0 |
| 1991 | 1422.6 | 1.5 | 1119.2 | 54.1 | 250.8 |
| 1992 | 1507.3 | 2.7 | 1118.2 | 54.1 | 337.7 |
| 1993 | 1416.2 | 0.1 | 894.2 | 132.7 | 389.4 |
| 1994 | 1452.3 | 1.9 | 858.5 | 182.8 | 412.9 |

*Provision

Source: Central Bureau of Statistics

Constraints and Prospects

The two plants in Kenya are using old and medium technologies which result in high production costs. BPCC takes a lot of foreign exchange for the purchase of spare parts while EAPCC is affected by its use of the wet process' technology which requires more fuel oil and with the current high costs of fuel oil the process is very expensive. The problem of cement supply and demand is compounded by the fact that BPCC plant is running down suffering breakdown of the basic plant that have outlived their productive life. The second problem facing the industry is transportation. Cement being bulky commodity requires a lot of transport for both raw materials and the finished products. Although the bulk of raw materials is available locally, it has to be transported from the quarries to the factory e.g limestone has to be transported over 100 km from quarries to EAPCC. Bamburi has to transport its finished products to distances over 1,000 km from the factory and all these costs are included in the pricing structure.

In order to reduce production costs, rehabilitation and modernization is being undertaken at EAPCC. The project is funded by the Government of Japan and it involves changing technology from wet process to dry process and also increase installed capacity from 350,000 tonnes per year to 550,000 tonnes per year with possibility of further increasing it to 700,000

tonnes per year. Kenya Government is also encouraging establishment of additional two cement plants. At the present level of production of cement by the two existing factories and the estimated growth rate of 7% in domestic consumption of cement, possibilities are that Kenya will be compelled to import cement by the year 2000 if new cement plants are not established. Investigation has been done along the Kenya South Coast and there is a possibility of having a cement factory around Shimoni area with planned capacity of 600,000 tonnes per year. The Industrial and Commercial Development Corporation (ICDC) are the promoters of this project whose feasibility study was a joint venture between Japanese and Kenya Governments involving Japan Consulting Institute (JCI), Tomen corporation, Osaka Cement of Japan and ICDC. Another investigation has also been done in Western Kenya to establish a cement factory with installed capacity of 300,000 tonnes per annum. The project is being promoted by Kerio Valley Development Authority but no commitments have been signed towards the implementation of the project. There are also possibilities of establishing mini plants in places where raw materials quantities might not support a big plant. Government has given priority for the establishments of mini plants and the investors are encouraged to take up the venture. Although gypsum is available in Kenya it is being imported from Spain. Studies are currently underway by KenSwiss Company Ltd to look into possibility of producing high quality gypsum. There is also need for local fabrication of spare parts for cement plants using available facilities at Kenya Railways Workshop and E.A foundry Works. These measures if implemented fully will improve cement production in Kenya. Although Kenya is endowed with vast deposits of building stone, quarrying industry is not well developed as it has outdated soil moving machinery and stone cutting equipments. There is urgent need to promote this sub-sector to facilitate acquisition of building stone at affordable rates.

CERAMICS

Resource base

Kenya is endowed with ample cheap resources for the production of ceramics. The raw materials are clay, soapstone, feldspar, dolomite and silica sand. Glaze is the only item being imported from Italy.

Past Trends

There are 5 firms in Kenya involved in the ceramics subsector and are also indirectly involved in mining and quarrying for their raw materials. The three major ceramic ware producers are Saj Ceramics based in Athi River, Ceramic Manufactures Ltd in Nairobi and Atlantics Ceramics Ltd. Ceramic manufacturers formerly Ceramic industries (EA) Ltd started operating in 1968 to manufacture crockery only. In the 1980's the company introduced two other lines to manufacture ceramic sanitary ware and bathroom wall tiles. The company now produces sanitary ware, crockery, wall and floor tiles for the domestic market. In 1991 Saj Ceramics Ltd was incorporated in Kenya and its operations began in 1992. It is the newest Kenya ceramic firm and specializes in the production of glazed wall and floor tiles. The firm offers tiles with various colour combinations to suit needs of customers. Atlantics ceramics produces wall and floor tiles, crockery and sanitary ware. The three ceramic factories have combined capacities of 2.1 million pieces of crockery, 7.7 million pieces of tiles (wall & floor) and 60,000 thousand pieces of sanitary ware. Saj ceramics operates at 100% capacity and produces 600,000m² of tiles per annum in two sizes (6" x 6" and 8" x 8") in the ratio of 1400m² and 1100m² per 24 hours working day respectively. In the past the three factories have been selling their products in the domestic market but with the liberalization of the economy the firms are exploring possibilities of exporting their products to COMESA Countries.

PRODUCTION OF CLAY AND NON METALIC PRODUCTS

| PRODUCTS | UNIT | 1990 | 1991 | 1992 | 1993 | 1994 |
|----------------------|------|---------|---------|---------|---------|---------|
| Floor and Wall tiles | MT | 6688156 | 1960105 | 2309894 | 4394586 | 1835148 |
| Roofing tiles | MT | 6581 | 12240 | 7141 | 8002 | 3552 |
| Cement | MT | 151540 | 1422633 | 1507285 | 1416523 | 1469625 |
| Clinker | MT | 988459 | 1000153 | 1092967 | 1092767 | 1175860 |
| Limestone | MT | 21771 | 12083 | 9931 | 11534 | - |

Constraints and Prospects

Ceramic Industries in Kenya do not meet the domestic demand leading to imports. In the past the Industry was plagued with poor management skills and lack of technical know-how which contributed to the collapse of Ceramic Industries (EA) Ltd before it was sold and the name changed to Ceramic Manufacturers.

Offering training in ceramic technology will go along way in disseminating technological capability to cope with challenges of the subsector in terms of product quality and quantity. With the liberalization of the economy, the local industries are competing in their home market with high quality imports. The quality of product therefore becomes vital for the local industries to retain even domestic market. It is therefore recommended that training of ceramists should be given priority for future development of the industry.

GLASS

Resource Base

Kenya has large quantities of raw materials for glass manufacture. The materials include Silica Sand, Soda Ash, Dolomite, Feldspar and Salt Cake.

Past trends

There are three container glass industries in Kenya, namely Central Glass Industries, EMCO and Mohan Meakin Glass Works. Impala Glass works is engaged in moulding and cutting vehicle windscreen using imported sheet glass. All the firms are privately owned and they have invested billions of shillings in the form of plant machinery, building and transport equipment. The installed capacity of container glass industry in Kenya is 55,500 tonnes per annum while the local demand is about 38,000 tones per annum. Central Glass Works Operates at full capacity while Mohan Meakin and EMCO are operating at under capacity. The products of the subsector include lantern globes, water glasses and jars, and glass bottles such as those used in beer and soft drink industries.

The country exports glass containers, but has to import small glass containers (60 mls and lesser volume) for the pharmaceutical and cosmetic industries. In addition the country relies on imports for all her sheet glass requirements. The most common thickness of sheet glass used in the building and construction industry is 3 mm.

PRODUCTION OF GLASS PRODUCTS

| PRODUCT | UNIT | 1990 | 1991 | 1992 | 1993 | 1994 |
|---------------|------|-------|-------|-------|-------|--------|
| Glass bottles | NT | 21825 | 4899 | 19333 | 21572 | 33572 |
| Wind screens | NO | 45532 | 41168 | 54195 | 93476 | 114084 |

Constraints and Prospects

Lack of a sheet glass manufacturing plant is a major constraint in the development of glass industry as building and construction subsector rely wholly on imports for her sheet glass needs. Although reason advanced for lack of sheet glass manufacturer is that the small domestic markets estimated at 16000 tonnes per annum does not amount to even the smallest economic size of the venture, investors should consider taking advantage of cheap ample raw materials in Kenya and take into consideration the potential to export the product in the region. Sheet glass should be viewed as a core industry whose reliance on imports could be adverse should trade embargo befall the country. It is therefore recommended that feasibility study on sheet glass manufacture which was carried out in 1990 by Japan Consulting Institute based on 'Foucault Process' should be revisited based on 'Floats Process'.

RUBBER

Most of the raw materials used in rubber industry are imported and the only locally available ones are Zinc Oxide, Aluminium Silicate, Whiting and Kaolin.

Past Trends

There are about 41 rubber manufacturing firms which mainly deal in tyre manufacturing retreading, production of shoe soles, hoses, mats, repair materials and industrial rubber products. Capacity utilization differs depending on the type of the firm and product.

The demand for rubber products is high and consequently to meet domestic demand for tyres the imports have been increasing yearly. In general rubber products are mainly sold in the domestic market and to COMESA countries.

INDUSTRIAL PRODUCTION OF RUBBER PRODUCTS

| PRODUCTS | UNIT | 1990 | 1991 | 1992 | 1993 | 1994 |
|-------------------|------|---------|---------|---------|---------|--------|
| New M.W. tyres | NO | 494632 | 462116 | 493067 | 456134 | 478407 |
| New M.V. tubes | NO | 493843 | 466843 | 407429 | 415751 | 406672 |
| New bicycle tyres | NO | 272752 | 255322 | 344866 | 243735 | 96390 |
| Retread tyres | NO | 318165 | 327104 | 288088 | 26712 | 329446 |
| New bicycle tubes | NO | 318904 | 310762 | 393084 | 354113 | 179391 |
| Rubber shoes | NO | 7690930 | 5045287 | 3177654 | 4046286 | 134306 |
| Rubber soles | NO | 40297 | 1326 | 1062 | 1036 | 1704 |

Constraints and Prospects

The major constraint is lack of natural rubber as a raw material. Since rubber plant is a tropical crop, future development depends on how successful Kenya can develop the growing of the plant.

PHARMACEUTICAL INDUSTRY

Resource Base

Kenya's pharmaceutical industry heavily relies on imported raw materials. Over 95 % of the raw material inputs are imported. The locally available packaging materials include plastic bottles, plastic caps, cartons, insulations, labels, leaflets, gumtapes, metal tins, glue and aluminium tubes.

Past Trends

The pharmaceutical industry in Kenya has tremendously grown since independence. At independence there were only two pharmaceutical firms while to-day there are about 30 registered pharmaceutical companies producing a wide range of products. The sector has expanded and diversified in product manufacture to become one of the largest in COMESA region. Nearly half of the COMESA pharmaceutical industry is located in Kenya and most of the industries manufacture generic essential drugs.

The major pharmaceutical manufactures in Kenya are Dawa Pharmaceutical Ltd, Smith Kline Beecham Ltd, Boots Phamaceuticals, Glaxo/Welcome (K) Ltd, Elys Chemical Industries Ltd, Cosmos Ltd, and Laboratory and Allied Ltd. 'Dawa Pharmaceutical was formed in 1978 as a joint venture between Kenya Government and Yugoslavian Government. Majority of other pharmaceutical industries are locally owned by Kenyan Asians. While the industries can produce over 90% of essential drug list, overall capacity utilization stands at around 40%.

The Government is a major institutional buyer of locally manufactured drugs and is responsible for health care provision for approximately 12 million Kenyans (roughly 50 % of population), Non Governmental Organizations (NGO's) cater for 10.8 million (app. 45%) and the remaining 5% pay for their health care in private institutions.

INDUSTRIAL PRODUCTION OF DRUGS AND MEDICINES

| | UNIT | 1990 | 1991 | 1992 | 1993 | 1994 |
|-------------------------|------|---------|---------|---------|---------|---------|
| Drugs(tablets/capsules) | Kq | 1711747 | 1369664 | 1140527 | 1197950 | 1127687 |
| Drugs (liquids) | Kq | 501225 | 141519 | 1383431 | 1383431 | 640332 |
| Pharmaceuticals | Kq | 103650 | 27506 | 315195 | 389574 | 92182 |

Source: Central Bureau of Statistics

Constraints and Prospects

The Kenyan pharmaceutical industry heavily relies on imported raw materials estimated to be costing over US \$ 30 million per annum. The source of these raw material inputs is generally Asia but imported through Europe which makes them very expensive. The end result is that the locally manufactured finished products in most cases are more expensive than imported products. It is therefore difficult for local pharmaceutical industry to compete with imported finished formulations which are normally manufactured under mass production basis.

Currently the average capacity utilization of pharmaceutical industry is 40% which can be improved with aggressive strategies to secure export markets and thus utilize idle capacities. The Research and Development (R&d) work on locally available raw materials should be

promoted and supported by relevant authorities in order to reduce imports on raw materials.

The potential projects in this area are:-

- Manufacture of Quinine by extraction from Cinchona and subsequent purification and synthesis to Quinine Sulphate
- Extraction of Hecogenin from Sisal Waste and Synthesis of betamethasone from Hecogenin.

However, it should be noted that growing of more Cinchona trees and rehabilitation of sisal farms should be encouraged in the initial stages of implementation of these projects. Other raw material inputs which are locally available but **NOT** in pharmaceutical grade include sugar, salts, glucose and ethanol. There is also need to promote the production of basic bulk drugs like paracetamol and Aspirin. These are currently imported in large quantities by the local pharmaceutical companies mainly from Europe and Asia. Such a project will enhance Technology Transfer in this specialised field and promote inter-states trade in region. There is no such a project in this region and if located here, Kenya would stand a good chance of also exporting the products into the neighbouring COMESA Region.

SALT

Resource Base

The bulk of Kenya's salt is obtained by evaporation of sea water which explains the reason why most salt manufacturers are located along the Coast except for Magadi Soda Company which extracts its salt from Lake Magadi Water. Locally available raw materials are calcium carbonate and Brine. Imported chemical additives are potassium ferrocyanide and potassium iodate.

Past trends

There are 7 registered companies manufacturing salt with annual production capacity of 180,000 tonnes per year. The major manufacturers are Salt Manufacturers Ltd which has a capacity of 60,000 tonnes per year and produces iodised refined table salt; Fundisha Salt Works with a capacity of 45,000 tonnes per year and produces coarse salt, dried crushed salt, pure vacuum refined salt and cattle salt and Magadi Soda Company with capacity of 40,000 tonnes per year and produces coarse salt. There are also salt packaging industries such as

Limuru Industries Ltd. Animatic Feeds Ltd Pack Industries etc.

The local demand for salt is about 110.000 tonnes per year which leaves a balance of 70.000 tonnes per year for export to the COMESA countries.

Constraints and Prospects

Bad weather such as during rainy and cloudy days result into low salt harvest. Secondly algae has been found to invade salt harvesting ponds. Another problem is the encroachment of salt harvesting ponds into the mangrove swamps which are important ecosystems.

It is recommended that to maintain self-sufficiency, salt harvesting should be maximised during favourable weather condition. Potential project in this sector is the establishment of an industry to purify Sodium Chloride to be used in the manufacture of Saline Solutinos.

SOAPS, DETERGENTS, DISINFECTANTS, PERFUMES AND COSMETICS

Past trends

In recent years this subsector has expanded and diversified to become one of the foreign exchange earner for Kenya. It is a subsector where micro/small enterprise manufacturing industries have played a key role in the development of the national economy. The small industries and the informal sector are mainly found in the manufacture of laundry bar soap, liquid detergents and disinfectants where the technology is simple and affordable while raw materials are easily available. There are about 43 registered firms in this subsector. Classification of the firms by product is as follows-16 for soap; 3 for powder detergent 13 liquid detergent production; 16 cosmetics and perfumes; 7 firms for scouring powder and 2 for toothpastes. In short some industries are diversified and can make soap cosmetics perfumes, dentrifices etc. There are also many small scale industries involved in the manufacture of soap.

SOAPS

Raw materials for the manufacture of soap are vegetable oils (such as coconut oil, castor oil, palm oil, olive oil, etc), acid oils, tallow, caustic soda and pigments and perfumes used mainly in toilet soaps. The process of making soap involves saponification and moulding. The most common forms of soap found in Kenya are bar soap used for domestic laundry, cake forms for toilet soaps, flakes used in baby laundry and miniature forms used by hotels for bathing needs.

DETERGENTS

The major raw materials are surfactants, builders, fillers, soil suspenders, foam boosters and bleach. The products manufactured are powder detergents used in domestic laundry chores, liquid detergents for industrial and commercial laundry, cake or bar detergents and paste detergents. The 3 industries making powder detergents are East African Industries Ltd, Kapa Oil Refineries Ltd and Orbit Chemical Industries Ltd with combined production capacity of 120,000 tons per year.

SCOURING POWDERS

The inputs used are mostly imported and the major ones are basic alkalis, phosphates, silicates and surface active agents. The products manufactured are used in the cleaning of floors, walls, metal surfaces, china ware and marble.

COSMETICS AND PERFUMES

Approximately 95% of the raw materials used are imported. The types of perfumes and cosmetics being made in Kenya are skin care creams and lotions, hair tonics, hair gels and pomades- petroleum jellies and sheens, shampoos, talcum powders, lipsticks and nail polishes, anti perspirants and deoderant sprays. However a survey of the cosmetic and perfumes products in the market indicates that imported products far out number the local varieties especially in the area of perfumes.

DESINFECTANTS/DENTRIFICES

The common raw materials are imported. The increased awareness on the importance of quality hygiene has increased the use of disinfecting preparations. These formulations which are anti-bacteria are essentially required for home use, industries, milking parlours, hospitals etc. There are 5 registered manufactures with an average capacity utilization of 42%

In Kenya toothpaste is the most common dentrifice and currently there are two large scale industries making toothpaste.

INDUSTRIAL PRODUCTION OF SOAP, CLEANSING PREPARATIONS AND MISCELIANEOUS CHEMICAL PRODUCTS

| PRODUCTS | UNIT | 1990 | 1991 | 1992 | 1993 | 1994 |
|-----------------------------|-------|----------|----------|----------|----------|----------|
| Laundry soap | Kg | 22699323 | 24806993 | 23011326 | 24236342 | 32711000 |
| Washing soap | Kg | 14503130 | 13964118 | 15789883 | 15740008 | 15048000 |
| Detergent (powder) | Kg | 36211279 | 24067054 | 21146662 | 21949821 | 16366000 |
| Tooth Paste | Lit | 1484437 | 1805249 | 1953125 | 1914675 | 1777000 |
| Detergent (liquid) | Lit | 439364 | 543595 | 454451 | 483073 | 490000 |
| Cream lotions | Lit | 1315282 | 1575561 | 2052357 | 1729648 | 1850000 |
| Hair Oils and tonics | Lit | 69961 | 95171 | 85785 | 216298 | 216298 |
| Liquid Praffin & castor oil | Lit | 217383 | 218617 | 213524 | 215494 | 207746 |
| Cosmetics | Lit | 833359 | 761279 | 1185288 | 1229057 | 1111696 |
| Matches | Boxes | 287278 | 276541 | 369894 | 283064 | 279966 |
| Shoe polish | Kg | 896832 | 888800 | 1156040 | 1150144 | 750002 |

Source: CBS

Constraints and Prospects

Kenya spends huge sums of foreign exchange to import raw materials for this sub-sector while alternatives which can provide lasting solution remain unexploited. The following proposals have been made to provide raw materials locally.

- (1) Production of Caustic Soda using Sodium Chloride by electrolysis or using magadi soda (Na_2CO_3) and lime.
- (2) Growing of coconut seed and extraction of coconut oil for use in soap and cosmetic industries.
- (3) Development of essential oil crops such as Geranium, Jasmine, Tagette, Vettiver etc to provide essential oils for cosmetics, perfumes and pharmaceutical industries.
- (4) Development of an effective Tallow collection to provide more tallow for the soap industry.
- (5) Development of pine trees to provide pine oil and turpentine oil for disingectants and consmetics industry.

BASIC INDUSTRIAL CHEMICALS

Resource Base

Some of the raw materials available locally are Carbon Dioxide, Hydrogen, Acetylene, Silica, Fluorspar, Sodium Chloride etc. The imported raw materials are sulphur, Aluminium Compounds, Ammonium nitrate, Chemical Compounds which can be formulated into various products etc.

Past Trends

This subsector consists of industries manufacturing chemicals which are mainly used in other industries as chemical inputs. The industries mainly manufacture sulphuric Acid, Soda Ash, Sodium Hydroxide, Sodium Sulphate, Alcohol, Chloro-Alkalis, Industrial Gases and Carbon Dioxide.

The industries are about 20 located in various towns in Kenya with estimated capacity utilization of 60%. Majority are private owned with an exception of Fluorspar which is wholly owned by government. Magadi Soda Company is the biggest and produces soda ash. Most of the chemicals are consumed in the domestic market with some being exported to the COMESA Countries. Soda Ash and fluorspar are mainly produced for export to Europe, South African, Asia and Middle East Countries.

PRODUCTION OF BASIC INDUSTRIAL CHEMICALS

| PRODUCTS | UNIT | 1990 | 1991 | 1992 | 1993 | 1994 |
|--|------|---------|---------|---------|---------|---------|
| O ₂ , N ₂ , H ₂ | M3 | 4490015 | 3450759 | 3313689 | 3321707 | 3701737 |
| Acetylene | M3 | 318789 | 310554 | 316965 | 305889 | 266061 |
| Electrodes | -" | 532322 | 543793 | 648718 | 698614 | 576795 |
| Wattle extract | MT | 7321 | 10793 | 10793 | 5089 | 2510 |

CONSTRAINTS AND PROSPECTS

Some of the industries use inappropriate technologies which lead to environmental degradations. For example companies manufacturing sulphuric acid tend to cause environmental pollution due to emissions of sulphur compounds into atmosphere especially when scrubbers are being cleaned. Future prospect is for the use of clean technologies which are environmental friendly.

The chemicals being exported from Kenya such as Soda Ash and floursphar are in crude form and hence fetch very little price in export market. It is recommended that crude materials being exported should be processed locally and be exported as finished/semi finished products. There is also prospect in establishing a sodium hydroxide plant to use soda ash as a raw material.

PLASTICS

Resource Base

Most inputs for the plastics industries are imported mainly from Europe and Asian countries. The only plastic raw materials which are manufactured locally are the plastic dyes but the ingredients for manufacturing these plastic dyes are imported.

Past Trends

There are over 100 plastic industries in Kenya and most of them are located in Nairobi and Mombasa. The subsector has continued to grow as a result of increased demand for plastic products. It provides cheap affordable products which are gradually replacing expensive metal, rubber, ceramic products etc especially in the building industry and consumer

household products.

Although in 1993 the sector grew by 10.4% , in 1994 it recorded marginally growth of 1.5 as a result of a decrease in production of P.V.C floor tiles. In 1991 and 1992 the sector recorded growth rates of 15.3% and 9.1% respectively.

The major products produced in Kenya are PVC pipes and fittings, polythene packaging bags, plastic crates and bottles, plastic shoes, floor tiles, household plastic wares and plastic containers for domestic and industrial use.

Due to broad spectrum of products manufactured, capacities for various firms differ but most of them utilise about 50% of their installed capacity. This under capacity utilization can be attributed to the stiff competition among the manufacturers for a small domestic market. There is indication that new firms are investing in plastic industry and this will require aggressive market research in the regional countries.

Constraints and prospects

The major problem of plastics industry is lack of raw materials locally as almost all raw materials are petroleum based. This calls for double effort in the existing oil exploration in the country. In summary, it is recognised that plastics industry is well developed in the country. However Kenya lags behind in the production of electrical appliances like sockets, plugs etc and automotive plastic spares. There is therefore prospect for establishment of these types of industries in Kenya.

C. ENGINEERING INDUSTRIES

IRON AND STEEL

Resource base

Raw materials used in iron and steel industry are scrap metal, billets, hot rolled coils, wire rods, limestone, iron ore etc. Most of these items are imported from Zimbabwe, Japan Belgium and South African except scrap metal which is sourced locally.

Past trends

Kenya's Iron and Steel industry is classified into five categories in accordance with the products manufactured. These are Steel Making and Hot Rolling, Wire and Wire Products, Galvanised and Cold rolling steel coils, Pipe manufacture and castings.

The major products under steel making and hot rolling process are pencil ingots billets, wire rods, rounds, section channels and reinforcing bars. The major industries involved in the production of the items are ROLMIL (K) Ltd, EMCO Steel Works Ltd, City Engineering works Ltd, Kenya United steel company and steel Billet castings Ltd. The total steel rolling capacity is 500,000 metric tonnes per year while total smelting capacity is about 95,500 metric tonnes.

There is only one industry, Special Steel Mills, which produces wire rod and wires that are used by about nine industries for further processing into other wire products such as nails rivets, nuts, bolts, barbed wire, chicken wire mess, fencing wire and other related wire products. The installed capacity for wire and wire products is about 286,000 tonnes per annum.

The products from the galvanising and cold rolling steel coils are galvanised corrugated iron sheets, steel drums window louvres, wheel barrows, gutters, water pipes etc. There are two cold rolling plants with installed capacity of 204,000 tonnes per annum. The two firms are Mabati Rolling Mills Ltd and Standard Rolling mills Ltd.

Under pipe manufacture there are six firms which produces large and small diameter circular and square pipes for use in water distribution, sewage disposal and furniture manufacture among others. Products under castings are man-hole covers, sanitary fittings, pumps castings and impellers, pulleys, sugar crashing rollers etc. There are about 16 major foundries with a total installed capacity of 8,500 tons per year.

Most of the products in iron and steel industry is consumed in the domestic market with a small percentage being exported to the countries in the region mainly COMESA Countries.

INDUSTRIAL PRODUCTION OF METALIC PRODUCTS

| PRODUCTS | UNIT | 1990 | 1991 | 1992 | 1993 | 1994 |
|------------------------|------|-------|-------|-------|-------|-------|
| Galvanised Iron Sheets | MT | 54996 | 88276 | 69706 | 72355 | 75249 |
| Iron rods and bars | MT | 45582 | 46703 | 43932 | 41454 | 37768 |
| Sufurias | MT | 1050 | 1230 | 1398 | 883 | 792 |
| Nails | MT | 17764 | 17760 | 15046 | 14026 | 26046 |
| Wheel barrows | NO | 31028 | 30186 | 24663 | 24473 | 25952 |

Source: CBS

Constraints and prospects

The problems facing iron and steel industry in Kenya include power interruptions, under-utilization of installed capacity, limited source of scrap material and scarcity of specialized personnel in the field of steel technologists and metallurgists.

For future development of the sector, there is need to establish the quantity and quality of iron ore in the country. It is also recommended that rehabilitation of steel industries be carried out in the same way UNIDO assisted ROLMIL (K) Ltd and thus increased their production from 7,000 tonnes per year to 12,000 tonnes per year.

NON-FERROUS METALS

Resource Base

None-ferrous metals include all other metals used in engineering works apart from iron and steel. In Kenya non-ferrous industry rely on locally sourced scrap as the main source and imported scrap and ingots.

Past Trends

There are about 40 non-ferrous scrap dealers and scrap smelters with a total installed capacity of 10,000 tonnes per year. In Kenya the industry is divided into 4 categories:-

- (i) Factories using scrap as raw materials to produce sheet metals eg Kalu-works, Rolling Mills Ltd, Narcol rolling Mil's etc
- (ii) Factories using scrap as a raw materials to produce coatings eg Kens metal Ltd, Ribbon Ltd etc.
- (iii) Factories using scrap and ingots to produce wire products eg Aluminium extruders, Booth manufacturers etc, and
- (iv) Factories in the downstream producing various non-ferrous products eg E.A Cables, Associated Batteries etc.

Aluminium scrap is the most commonly used non-ferrous scrap with installed capacity utilization of 4,340 tonnes per year. The main generators of aluminium scrap in Kenya are Kenya Power and Lighting Co, especially the scrap aluminium wire, Aluminium engine blocks from motor vehicles, aluminium section and extrusions from automobiles, old buildings etc and old discarded domestic aluminium metals.

The copper scrap consists of pure waste copper such as electrical grade and copper alloys scrap i.e bronze and brass. The copper and copper based alloys are used in the manufacture of copper oxy-chloride which is a fungicide in coffee and horticultural farming, copper lighting arrestors, household electrical fittings, copper nuts and bolts, bronze brushes, brass, gas burners etc. Capacity utilization of copper and copper based alloys scrap is 1070 tonnes per year. The major generators of copper scrap are Kenya Power and Lighting Co. Ltd, Kenya Posts and Communication Corporation and spent bullet casings.

The main source of lead scrap is battery lead that has been used in automotive industry. It is added in the manufacture of motor-vehicle batteries. The capacity utilization of lead scrap is between 3500-4000 tonnes per year.

There are two types of Zinc scrap i.e zinc ash and zinc dross. However there is no technology in the country to re-process zinc ash and therefore the zinc waste is also exported. The zinc dross is supplied to the local zinc oxide manufacturers and galvanizing plants.

Magnesium based scrap occurs in the form of engine blocks, parts of machinery and

equipment. Since there is no industry in the country using this type of scrap, all of it is exported.

Most of the products from non-ferrous industry is consumed in the domestic market. However Kenya goods have penetrated regional market and are very competitive. Some items have also penetrated markets in Britain, Australia, Belgium and Netherlands.

Constraints and Prospects

Non-ferrous industry has to be developed to march iron and steel industry. For Example any form of iron and steel can be welded in the country but non-ferrous welding is almost non existence. Secondly, in PVC manufacture the dyes used in the mould are chromium plated and ones they are worn off the parts cannot be replated as there is no chromium plating in the country. To foster growth in the sector the country should invest in the training of personnel in non-ferrous welding and in chromium plating.

OTHER NON-FERROUS METALS

Resource Base

Kenya is endowed with numerous minerals but the major ones being exploited commercially are Soda Ash, fluorspar, gemstones, Diatomite and Gypsum. Others are Gold, Copper, Chromite, Galena, Cinnabar, Manganese Minerals and Fluorite.

SODA ASH

Soda Ash is produced at Lake Magadi in the Rift Valley by Magadi Soda Company. The plant has a capacity to produce 900 tonnes of soda ash daily. The annual production data are indicated in the table. The low figure in 1992 was as a result of temporary closure of the plant following marketing problems due to worldwide recession.

Magadi Soda Company exports 90% of its soda ash, the bulk of which goes to the Far East, including the Philippines, Thailand, Indonesia and Singapore. African Countries which import Kenya Soda are Cameroon, Burundi, Ethiopia, Mozambique, Uganda and lately South Africa. The domestic market accounts for nearly 10%.

Gemstones

Mining of gemstones is concentrated in Taita Taveta District in Coast Province. Exports of gemstones earn the country over Kshs100 million annually. Most of the exports are destined for Thailand, West Germany, USA, Hongkong and India. Kenya has a great potential as a gem-exporter and more effort is needed to make it a reality. There is therefore need to increase investment in the mining of gemstones to guarantee sufficient supply of the mineral. There is also potential for establishment of a local gem culting industry.

QUANTITY AND VALUE OF MINERAL PRODUCTION

| Mineral | 1990 | 1991 | 1992 | 1993 | 1994 |
|--------------------|--------|--------|--------|--------|--------|
| Quantities-Tonnes | | | | | |
| Soda Ash | 231900 | 219500 | 181330 | 216890 | 224200 |
| Fluorspar | 80529 | 77402 | 80360 | 78725 | 89155 |
| Salt | 70318 | 72449 | 72494 | 74669 | 75757 |
| Limestone Products | 35733 | 32017 | 30656 | 30349 | 30469 |
| Other | 39388 | 39963 | 40150 | 40553 | 40934 |
| TOTAL | 457868 | 441331 | 404990 | 441186 | 460515 |
| Value-K£'000 | | | | | |
| Soda Ash | 34900 | 42453 | 48425 | 69514 | 88299 |
| Fluorspar | 8018 | 7849 | 8117 | 14000 | 13422 |
| Salt | 3938 | 4057 | 4426 | 5400 | 5644 |
| Limestone Products | 1556 | 1394 | 1449 | 1536 | 1483 |
| Other | 1951 | 1979 | 2029 | 2090 | 2129 |
| TOTAL | 50363 | 57732 | 64446 | 92540 | 110977 |

Gold

Past Trends

Reports are conflicting concerning the date when gold was first discovered in Kenya. One report mentions gold being found at Loggorien some 40 miles south of Kisii, as early as 1892 and other mentions it being discovered at an unspecified locality in South Kavirondo in 1902.

Between 1922 and 1923 there was a minor gold rush to the country lying south and south-east of Kisii which led to the discovery of several payable reefs. In 1931 Kakamega Goldfield was discovered. A rapid expansion of the industry ensued from 1932 onwards and by 1939 there were 53 operating mills treating the ore. There was also South Nyanza Goldfield which include Migori Gold Belt, Masara Mine and Macalder Nyanza Mine.

Gold recovered as a by-product accounted for approximately 90% of gold produced in Kenya up to 1966 when the mine closed on exhaustion of economic ore. At present there are small producers in the goldfields at Nandi and Sigalagala which together account for almost all the remaining gold production. Minor occurrences of gold are known at several localities in Kenya such as Cherengani Hills, West Polot, Kitui, Machakos and near Lokitaung in Northern Turkana.

GOLD PRODUCTION

| Year | Troy oz | ValueK£ |
|-----------|---------|-----------|
| 1926-1930 | 4,669 | 18060 |
| 1931-1935 | 73,226 | 368183 |
| 1936-1940 | 385,768 | 2,405,710 |
| 1941-1945 | 252,813 | 2,150,145 |
| 1940-1950 | 118,298 | 1,135,459 |
| 1951-1955 | 55,713 | 701,389 |
| 1956-1960 | 46,773 | 584,415 |
| 1961-1965 | 56,312 | 718,174 |
| -1966 | 11,898 | 149,490 |
| -1967 | 33,366 | 420,118 |
| -1968 | 31,989 | 448,009 |
| -1969 | 17,903 | 273,821 |

NB Quantities were measured as unrefined ounces up to 1939 and as refined ounces for later years.

Source: Ministry of Environment and Natural Resources.

Prospects

The future of gold in Kenya is clearly a subject of great interest and importance to the economy of the country. From past experience there is little doubt that the large goldfields of Western Kenya offer the most attractive position for future development. By world standards the greatest depths reached in working there cannot be considered to be sufficient to have exhausted the deposits. Deeper mining involves higher costs and capital resources beyond the reach of most small workers, consequently many small miners were forced out of business when their mining costs approached their profit margin. As a long-term policy government is looking into ways of establishing a new industry or reviving the old one. Government has approached UNDP for assistance in this area.

COPPER

Production of copper concentrates from ores mined in Kenya started in 1951 at the Macalder Mine in South Nyanza District and precipitated on cement copper, together with gold and silver, was produced at the same time between 1956 and 1960, when the working closed on exhaustion of payable ore. By 1966 when underground working ceased, the mine had produced 20,000 long tons of copper worth more than K£5,300,000. A small production continues to be made by circulating water from the flooded mine over iron scrap to recover copper leached out from the abandoned stopes.

Outside Nyanza and Western provinces several further copper deposits are found as disseminations in regionally metamorphosed rocks of the Basement System. Several scattered copper indications have been recorded in Northern and Central Kenya, the copper mineral occurring either as disseminations in gneisses and migmatites, or as small segregations in basic igneous rocks and on all cases so far recorded are present in uneconomic quantities.

Outside those occurrences recorded from the Nyanzian and Basement System, the only other copper mineralization known in Kenya is at Vitengeni approximately 48 miles north of Mombasa where chalcopyrite is found in subsidiary amounts with galena and zinc-blend in quartz-barytes veins emplaced in thin-bedded sandstones and mudstones of the Duruma formation of Triassic age.

COPPER PRODUCTION

| YEAR | LONG TONS | VALUE K£ | YEAR | LONG TONS | VALUE K£ |
|------|-----------|----------|------|-----------|----------|
| 1956 | 859 | 188,980 | 1963 | 2,212 | 504,652 |
| 1957 | 1679 | 344,020 | 1964 | 2,044 | 654,662 |
| 1958 | 1988 | 383,684 | 1965 | 1,938 | 868,281 |
| 1959 | 1982 | 458,174 | 1966 | 780 | 426,270 |
| 1960 | 1756 | 412,660 | 1967 | 11 | 5500 |
| 1961 | 2524 | 583,043 | 1968 | 37 | 14654 |
| 1992 | 2191 | 505,033 | 1969 | 76 | 40444 |

Source: Ministry of Environment and Natural Resources.

CHROMITE

This is the chief ore of chromium, a hard silver-blue metal used extensively in chromium plating to give a protective coating to metals such as steel which are susceptible to rusting or other forms of corrosion. Its main use, however, is in the manufacture of corrosion-resistant alloys of which stainless steel is one example.

Several chromite deposits are known in Kenya, but none are exploited. They are found in the serpentine rocks of Debal, Dudat and Raboli about 40 miles south-east of Moyale. Another chromite deposit is situated at Kangura, two miles west of the Baragoi- Barsaloi road at a point 20 miles from Baragoi. Chromite is also known from Boji Hill north-east of Isiolo and at South Horr in Marsabit District.

GALENA

This is lead sulphide and constitutes the chief source of the metal which is used in the manufacture of storage batteries, water pipes, roofing sheets, solders and coverings of electric cable.

Deposits of galena occur in Coast Province in association with zinc, copper, manganese and barytes. They are emplaced in upper members of the Duruma Sandstone Series, mostly in

Mazeras Sandstones. Prospecting in these areas began in 1892 but was abandoned. The only occurrence that was exploited in the past was at Vitengeni, 22 miles north-west of Kilifi. It is estimated that up to 1929 between 7000 and 8000 tones of rock and ore were extracted, yielding 209 tons of concentrates which were exported to Europe. Recent prospecting by geochemical methods and diamond drilling, has proved an orebody at Kinango Hill to the north-east of Mazeras and some 14 miles north-west of Mombasa. Indicated reserves are a minimum of 930,000 tons at a grade of 8.9 per cent lead, 0.58 per cent zinc and 4.25 oz/ton silver. Exploitation of the deposit started in 1970.

In view of the considerable distance over which traces of galena are found in the Coast Region it is by no means certain that all the deposits of potential economic value have been discovered. There is certainly scope for further prospecting in the area, particularly for example two miles east of Kiwara Hill where limestone is reported to carry lead mineralization.

MACHINERY, TRANSPORT EQUIPMENT AND CAPITAL GOODS

Resource Base

The major resource available in Kenya for the development of capital goods industry is trained middle level manpower and innovative entrepreneurs in the small enterprise sector. The development of capital goods industry is mainly done by private sector. Government has in the past involved international organisations to undertake studies for establishing capital goods industry but these have not yielded positive results.

MACHINE TOOLS

Past Trends

In various policy documents, Kenya Government has emphasized the need to develop machine tool industry since the sector comprises basic industries which form the foundation for the development of other industries. Its strategic significance is the multiplier effect it has in both upstream and down stream industries. For the last five years the only major firm which is involved in manufacture of machine tools is E.A Foundry works Ltd. It started in 1986 with the manufacture of metal cutting machine and now specializes in various complete equipment and spares. The products include posho mills, maize grinders, rice millers, gears, shafts,

hammer mills, treaders, sugarcane crushers and spares etc.

The other modern plant is the Numerical Machining Complex at the Kenya Railways which has the latest manufacturing and design hardware. There are also many small firms specializing in making spares and complete machinery for coffee, tea, sugar and transport industries. Some wood working machines are manufactured in the micro/small enterprise sector commonly known in Kenya as 'Jua-Kali Sector'.

Constraints and Prospects

Data on the industrial capital equipment in the country has yet to be compiled. Most capital goods are imported and hence there is proliferation of all types of equipment. Without information on the technology so as to know types of spares required by various firms and the firms which can produce them, development of machine tools industry and spares becomes difficult.

The neighbouring countries i.e Ethiopia and Tanzania have established machine tool manufacturing industries. This has reduced Kenya's market share locally and in the region. It is recommended that future development of machine tools and spares require compilation of information to find out in which area Kenya has comparative advantage for investment in the sector.

TRANSPORT

Generally transport industries include all industries involved in the manufacture and assembly of transport equipment used in various modes of transport like road, railway, air, pipeline, water including spares and components for servicing. However the status of transport industry in Kenya can only be reflected by growth and development activities in the motor vehicle industry. The others like railway, air, pipeline and water transport are not well established due to huge initial capital investment required.

MOTOR VEHICLE AND AUTOMOTIVE COMPONENTS

Resource Base

The major resource available is cheap labour of personnel ranging from highly trained to unskilled. Other inputs are imported either as finished components or intermediate inputs requiring further processing before use.

Past Trends

The motor-vehicle industry in Kenya is divided into four areas namely Motor Vehicle Assembly, Auto Ancillary Sector, Franchise holders and Informal motor vehicle sector.

Motor vehicle assembly was initially established to assemble commercial vehicles only. However due to under utilization of the installed capacity, the passenger vehicle were included in 1985. There are three motor vehicle assemblers in Kenya namely Kenya Vehicle Manufactures Ltd (KVM), Associated vehicle Assemblers (AVA) and General Motors Ltd (GM).

All the assembling is done on contract except General Motors Ltd who assembles its own vehicles as well. The contracts are given by franchise holders such as Toyota (Kenya) D.T. Dobie Ltd, Marchalls E.A (Ltd) etc who have franchise rights to import completely knocked down (CKD) kits which they deliver to assemblers at agreed fee. The finished vehicles are handed over to the franchise holders for distribution and marketing. Franchise holders also import completely built up (CBU) units.

MOTOR VEHICLE ASSEMBLY

| TYPE | UNIT | 1990 | 1991 | 1992 | 1993 | 1994 |
|--------------------|------|-------|------|------|------|------|
| Assembled Vehicles | No | 14056 | 7750 | 8506 | 6862 | 7076 |
| Coaches and buses | No | 228 | 274 | 191 | 177 | 400 |
| Lorry bodies | No | 363 | 315 | 310 | 310 | 428 |

Source: CBS

There are also over 80 small and medium scale auto ancillary industries manufacturing and reconditioning motor vehicle spare parts. The informal motor vehicles sector is composed of importers of reconditioned or new vehicles and Jua Kali garages.

The total installed capacities of the three motor vehicle assemblers is 22,300 units per annum

on a one shift basis with AVA, 12000 units GM 4500 units and KVA 5800 units per annum. With the onset of liberalization, most auto-ancillary industries are running much below their installed capacity since franchise holders can now import 100% CKD.

The registration of new vehicles in the country is the indicator of the volume of motor-vehicle market. Between 1990 and 1993 there was decline in new registration. However in 1994 there was an increase mainly as a result of increase in importation of new and reconditioned saloon vehicles and station wagons under a liberalised economy.

NEW REGISTRATION OF ROAD VEHICLES, 1990-1994

| Type of Vehicle | 1990 | 1991 | 1992 | 1993 | 1994* |
|---------------------------|--------|--------|--------|--------|--------|
| Saloon Cars | 4,703 | 4,124 | 4,247 | 4,542 | 6,309 |
| Station Wagons | 2,452 | 2,558 | 2,081 | 1,828 | 2,428 |
| Panel Vans, Pick-Ups, etc | 4,996 | 3,943 | 3,728 | 2,510 | 2,840 |
| Lorries/Trucks | 1,611 | 1,272 | 1,105 | 750 | 1,091 |
| Buses and Coaches | 914 | 762 | 718 | 519 | 319 |
| Mini Buses | 525 | 394 | 447 | 295 | 347 |
| Special Purposes Vehicles | 35 | 39 | 37 | 20 | 14 |
| Trailers | 149 | 423 | 299 | 291 | 439 |
| Rollers, Graders, Cranes | 42 | 49 | 68 | 55 | 39 |
| Wheeled Tractors | 1,127 | 700 | 687 | 474 | 430 |
| Crawler Tractors | 10 | 6 | 1 | 2 | 8 |
| Motor and Auto Cycles | 1,188 | 1,246 | 1,364 | 1,133 | 1,348 |
| Three wheelers | 1 | 0 | 2 | 1 | 1 |
| All Vehicles | 18,023 | 15,516 | 14,784 | 12,420 | 15,613 |

*Provisional

Source: Economic Survey 1995

ELECTRONICS AND ELECTRICAL APPLIANCES

Resource base

Kenya has abundant qualified manpower at the level of engineers, technicians and skilled personnel required at the entry level in the sector. However employment opportunity in the areas electronics is small and as such many graduates find it difficult to be employed directly after graduation.

Past trends

The electronics industry in Kenya was first established in Kenya in 1968 by the company known as SANYO ARMCO which was a joint venture between Sanyo of Japan with local private as well as Government of Kenya interests. Phillips of the Netherlands was established in 1973 followed by two locally owned companies in 1974. In 1982 there were seven firms assembling electronic products such as radios, televisions and stereos. At the initial stages when the industry was protected through tariffs the firms flourished in business. From mid 80's there was influx of imported radios from south East Asia which made assembly of radio to decline. After 1992 the assembly of both radios and TVs have drastically been reduced although there are 13 firms under consumer electronics which assemble radios, TVs, videos records, public address equipments, electronic watches imported as SKD AND CKD Kits.

Assembly of computers and telecommunications equipment was started in Kenya in 1987 and 1986 respectively. Kenya Micro Computer (KMC) has a licensing agreement with US company Harvard Computers to assemble their brand from SKD kits. There are however over 50 firms dealing with computers and allied equipment, software packages and industrial computer control equipment but are not classified as industries.

Telecommunication equipment are manufactured at Gilgil manufacturing Complex which is a production unit within Kenya Posts and Telecommunications Corporation (KPTC). The products manufactured are manual and semi-manual switch-boards, cable forms, telephone instruments secretarial telephone system, single and multi-channel radios, private automatic branch exchanges (PABX) and MDF metal frames.

There are also other firms which manufacture electric and electronics components. The items

manufactured are switch gear, regulated power supplies, relays, AC/DC convertors, RF fillers and telecoms power supplies. In this area of instrumentation and industrial electronics, there are two firms with one very specialised called Industrial Automation Ltd undertaking the building of industrial control- according to customer needs. The two companies have CAD facilities.

The largest market for electrical and electronic industries is domestic. Export market goes to COMESA region with the posts and telecommunication electronics leading. However Kenya has a large trade deficit in electronics with imports increasing from Kshs 6783 million in 1990 to Kshs 7118 million in 1993 while exports increased from Kshs 90 million to Kshs 299 million during the same period.

Constraints and Prospects

The development of electronic industry globally has been so fast that a dynamic policy is required if the local industry is to keep pace with global technological changes. With the recent change of the industrialization strategy in Kenya towards market economy and private sector growth, the policies should provide enabling environment for the growth of the sector by improving physical and social infrastructure, looking at the control mechanisms for imported goods, tariff structure and activities for research and development including improvement of statistical data on electronics. It is therefore recommended that for future development of electronic industry in Kenya the proposal for establishing Electronics Design and Development Centre should be implemented.

D. ANNEX

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