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DIAGNOSTIC STUDY

OF

MASAKA FOOD PROCESSORS
MASAKA, UGANDA

FINAL REPORT

BANGALORE - INDIA JUNE 1993

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REHABILITATION OF INDUSTRIAL ENTERPRISES IN EAST AFRICA

REPORT ON

MASAKA FOOD PROCESSORS

MASAKA, UGANDA

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DATE OF REPORT: JULY 1993

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SYNOPSIS

Masaka Food Processors Limited (MFP) in Masaka, Uganda was one of the units selected for study in consultation with the Ugandan Ministry of Commerce, Industries and Cooperatives. After 35 man-days of study, and rendering direct assistance, Amarnath Kamath & Co., Management Consultants, are of the opinion that presently the chances of rehabilitation of the unit are remote.

Factors that support this conclusion are:

1.0 MFP's dues to EADB are in excess of US$ 3.6 million (USh. 4.35 billion) whereas the present worth of its assets may be less than US$ 50,000.

2.0 EADB has already moved against Masaka Co-operative Union (MCU), the guarantors for the loan, for recovery of its dues from MFP since MFP has turned defaulter.

3.0 The plant at MFP requires major rehabilitation for which funds are not available with the unit.

4.0 MFP does not have the necessary management to take up major rehabilitation of the unit.

I. EXECUTIVE SUMMARY

Masaka Food Processors (MFP), a subsidiary of Masaka Cooperative Union (MCU), is located in the pineapple growing area of Kyabakuza (near Masaka), 130 Kms. from Kampala. Mather & Platt Limited supplied the machinery for the unit from India in 1983 but were able to erect and commission it only during 1987/88, due to political turbulence in Uganda in the intervening period. The machinery never performed to specifications due to a combination of factors like deterioration from open storage, poor design, inadequate post-commissioning preventive maintenance and poor operating practices.

MFP's financial problems were heightened when interest started mounting on the East African Development Bank (EADB) loan especially due to the continued deterioration of the Ugandan Shilling against the SDR. This situation drained MFP's finances and reduced its working capital. While the bankers have been helpful, the EADB has not been lenient towards the outstandings of approximately USh. 4.35 billion in the loan account as of November 30, 1992. Losses have wiped out the low equity base.

During the course of study, substantial improvements were introduced in the working of the unit: the yield in juice separation increased by 100%; improvements in plant maintenance, hygiene, sanitation, work methods and store keeping were made; a short-term plan for modifying equipment to improve the efficiency of plant and equipment was implemented, till longer term strategies were finalised.

There are no constraints either in the supply of raw materials or in the demand for fresh fruit juices, MFP being the only fruit processing factory in the co-operative sector in Uganda. The cost of procured fruit is quite low and the processed juice can compete well with other beverages. Operating at full capacity, MFP can employ upto 100 workers and operate a fresh fruit procurement programme involving about 300 farmers. MFP's performance in production and marketing has suffered mainly due to poor management.

MFP can make a major contribution to national development, encouraging the cultivation of orchard fruits (pineapples, passion fruits, oranges, etc.), and processing the same for sale. MFP's potential has been recognised by the Ugandan Government. The Ugandan President visited the factory and announced a grant of US$ 500,000 to write off a part of the outstanding loans. However, nothing has been heard on the subject for a long time.

There is no hope for the survival of MFP unless it is able to persuade EADB to write off a major portion of its outstandings and is also able to get substantial aid from donors. EADB, in a meeting with the consultants during their second visit, expressed their inability to either finance MFP any further or give any concessions to it either by way of writing off any portion of the outstanding loans or extend the time for repayment. In fact, EADB has moved for recovery of its outstandings.

II. PREAMBLE

On October 9, 1992, Messrs. Amarnath Kamath & Co., Management Consultants, signed contract no. 92/081 with UNIDO, to provide consulting services for a project on **"REHABILITATION OF INDUSTRIAL ENTERPRISES"** in the East African countries of Tanzania, Uganda & Zambia.

The objectives of the project are:

a) To advise the Government of each country and the selected enterprises, on short and medium term measures to rehabilitate the money losing enterprises selected and to provide direct assistance during the diagnostic analysis.

b) To encourage and define possibilities and means for enterprise to enterprise co-operation between the industrial enterprises audited and similar enterprises in India for transfer of technology and technical assistance.

The work evolving from these objectives are:

1. Objective (a)

i) To prepare diagnostic reports for the enterprises audited and extend direct assistance to them, and

ii) To provide direct assistance to improve management systems and productivity of manpower and equipment in the enterprises.

2. Objective (b)

A report is to be submitted containing:

i) the approach and procedures for maintaining enterprise to enterprise cooperation between the industrial enterprises in East Africa and industrial enterprises in India, and

ii) a list of opportunities for enterprise to enterprise co-operation identified during the implementation of the project.

A progress report and a draft final report have been submitted, documenting the activities of our consultants.

This is the final report submitted after the presentation of our findings and discussions of our recommendations with the officials of the Government of Uganda, UNIDO Country Director and the management at MFP, held in mid May 1993.

III. CONSULTING METHODOLOGY

MFP was selected for study after the Chief Executive of Messrs. Amarnath Kamath & Co. (AKC), the National Coordinator and the Senior Consultant (SC) visited the factory. Following their visit, the Team Leader, the Senior Consultant and two Technical Consultants spent 3, 10 and 5 weeks respectively, studying the operations in detail.

MFP's corporate history and operating details were collected from the Ministry of Industry and from the enterprise. The SC visited Masaka on 6 occasions, spending a total of 20 days at the plant. First few visits were spent on increasing the juice yields from pineapples, improving worker productivity, sanitary conditions, material movement and stores lay out. During this time, questionnaires were issued to each department for data collection.

The SC was able to get excellent cooperation from workers and staff of MFP. He also met senior officers from the Cooperative Union, the bankers and the financial institutions.

A detailed project proposal for obtaining additional funds to improve the operating conditions in MFP was prepared and forwarded to UNIDO.

Mr A. Kamath, Chief Executive, Messrs. Amarnath Kamath & Co., Bangalore, India and Mr C.R. Seetharam, Team Leader, returned to Uganda on May 14, 1993. They presented the draft final report to UNIDO and Ministry officials in Kampala on May 17, 1993 and to Masaka Food Processors Board members at Masaka on May 18, 1993. The updates, observations and comments received on the draft final report have been incorporated in this final report.

IV. BACKGROUND

1.0 BACKGROUND OF UGANDA

1.1 Demographic outline

Uganda is a landlocked country straddling the Equator, 2,000 Kms. inland from the Indian Ocean. The total area of the country is about 241,000 square Kms., which includes 44,000 square Kms. of inland lake. Preliminary results from the 1991 census measured the population at 16.6 million; UN estimates indicate a total of 18.8 million in mid-1990. Given a crude birth rate of 49 per 1,000 and a crude death rate of 18 per 1,000, the annual population growth rate exceeds 3 percent. Kampala, the largest city boasts a population of 773,400 followed by Jinja with 60,000. Ugandan society is mostly rural with only 11 percent of the population residing in urban areas. This population distribution reflects Uganda's agricultural potential. Rural densities are generally less than 100 per square Km. and they fall as low as 12 per square Km. in some areas, notably in the semi-arid Karamoja region in the north east. Population densities are concentrated in a wide band area around the shores of Lake Victoria, from the Kenyan border in the east to the Tanzanian and Rwandan borders in the south west, where the rainfall is highest and most reliable. Due to the unsettled political conditions in recent years, thousands of people have been displaced. Fertile areas (such as the Luwerol region) have yet to be resettled.

1.2 Structure of the economy

The economy is dominated by the agricultural sector which in 1988 accounted for 50 % of GDP, over 95 % of the value of exports, 40% of government revenues and employed over 89 % of the working population. Most farmers are engaged in subsistence production on very small holdings. The total output from these holdings is greater than the output from commercial agriculture.

Official data on the sectoral origin of GDP divides the economy into a "monetary" and a "non-monetary" sector. The latter includes subsistence agriculture, forestry, fishing and hunting and part of construction. The non-monetary sector's share of GDP has started to decline: it fell from 48 % to 46 % between 1983 and 1988. Table 1 shows the sectoral origin of GDP at factor cost for 1983 and 1988. In 1988, agriculture accounted for 27 % of GDP at factor cost followed by services at 24 % (including government expenditures). Manufacturing accounted for less than 5 per cent of GDP at factor cost.

A national survey of manpower conducted by the government of Uganda, with technical and financial support from UNDP and ILO, revealed that in January 1988, the formal sector of the Ugandan economy employed 378,227 persons, representing 5 % of the total working population. 53,000 persons are employed by industry.

Table 1: Sectoral origin of GDP at factor cost

Ugandan Shillings (in millions) at 1987 prices

	1983		1988	
	USh	%	USh	%
Monetary economy				
Agriculture	46794	27.30	49649	26.40
Forestry and fishing	1595	0.90	2007	1.10
Mining and quarrying	46	0.03	33	0.02
Manufacturing	7020	4.00	8267	4.40
Electricity	111	0.07	115	0.06
Construction	1550	0.90	1992	1.06
Commerce	18332	10.70	21571	11.50
Transport and communications	3818	2.20	5348	2.84
General Government	4121	2.40	4331	2.30
Miscellaneous services	422	0.20	536	0.28
Rents	3869	2.30	4780	2.54
Education and health	2047	1.20	3084	1.60
Total	89725	52.20	101713	54.10
Non-monetary economy				
Agriculture	76538	44.50	79456	42.22
Forestry, fishing & hunting	975	0.60	1546	0.82
Construction	235	0.10	269	0.14
Owner occupied dwellings	4455	2.60	5115	2.72
Total	82203	47.80	86386	45.90
GDP at factor cost	171928	100.0	188099	100.00

Source: **Statistical Bulletin** No. GDP/1, Gross Domestic Product Uganda 1982-88 (Statistics Department, Ministry of Planning and Economic Development, December 1989).

1.3 Currency

The value of the Ugandan Shilling (USh.) was severely affected by the political instability and economic mismanagement during the Idi Amin years. Between 1981 and 1986 the official exchange rate fell from USh. 78 = US$ 1.00 to USh. 1,450 = US$ 1.00, a devaluation of 2,000 per cent in five years.

In May 1987, a new currency unit was introduced with an effective devaluation of 76 per cent. The new Ugandan Shilling (NUSh.) has a domestic value of 100 old shillings (USh.). However, even at its initial rate of NUSh. 60 = US$ 1.00, the currency was still considerably overvalued. Further devaluations were forced upon the Government, progressively devaluing the currency to NUSh. 200.00 per US$ 1.00 in March 1989. Since then, under pressure from the International Monetary Fund (IMF), the rate has been adjusted regularly. An acute shortage of foreign exchange encouraged a buoyant parallel/black market in hard currencies, with rates typically three times higher than the official rate. To control the parallel market the government introduced authorised foreign exchange bureaus in June 1990. By April 1991 the difference between the official and parallel rates had fallen to 30%.

Table 2: Average exchange rate
(NUSh. per US$)

1983	1984	1985	1986	1987
1.54	3.60	6.72	14.00	42.80

1988	1989	1990	1991	1992
106.14	223.09	428.85	1300.00	1250.00

Source: IMF, International Financial Statics.

NOTE: All exchange rates are shown in terms of the NUSh. introduced in May 1987

1.4 General Macro-economic Conditions

The Government of Uganda is committed to liberalizing the economy through a structural adjustment programme agreed to with the IMF and the World Bank. Through its Economic Recovery Programme, the Government of Uganda has committed itself to three goals:

1. to enhance internal financial stability and lower the rate of inflation;

2. to reduce external account imbalances and

3. to promote economic growth.

The Government has taken several steps towards attaining these goals. In July 1990, the government legalized the parallel foreign exchange market by sanctioning private foreign exchange bureaus and is moving toward a unified market determined exchange rate. In 1991 the Government passed the Ugandan Investment Code to promote, facilitate and monitor both foreign and domestic investment in Uganda by rationalizing the various procedures for investment approval and introducing incentives for investors. The Uganda Investment Authority (UIA) was established as a "one stop shop" for investors, assisting potential investors identify and establish business ventures in Uganda, provide investors the needed investment information and offer them the facility to secure licenses, authorizations and permits.

1.5 Economic reforms

The economic reform programme has impacted the battle against inflation. The Kampala Consumer Price Index reveals that inflation fell from 243 percent in 1987/88 to 29 percent in 1990/91. As inflation fell, positive real interest rates were restored at relatively lower nominal rates. The impact of positive real interest rates on the structure of monetary assets holdings was remarkably strong, with time and savings deposits rising from 9.8 percent of broad money in June 1989 to 16.3 percent in June 1991. However, rising inflation during 1991/92 has led to some slippage in the policy of positive real interest rates.

The annual inflation rate in June 1992 stood at 63 percent per annum on year-on-year basis. The inflation rate, as measured by the Kampala Consumer Price Index, steadily increased from 25 percent in October 1991, 29 percent in November 1991, 32 percent in December 1991, 41 percent in February 1992, 49 percent in March 1992, 59 percent in April 1992 and 66 percent in May 1992. Signs of a downturn in inflation are apparent, with marked reductions in monthly price increases in Kampala. The monthly increase in the Consumer Price Index for Kampala has been 1.3 percent in October 1991, 3.9 percent in November 1991, 3.0 percent in December 1991, 6.1 percent in January 1992, 6.6 percent in February 1992, 8.1 percent in March 1992, 10.5 percent in April 1992, 4.8 percent in May 1992 and minus 0.5 percent in June 1992. This downturn is also reflected in the Consumer Price Indices for Jinja and Mbale.

The Uganda Investment Authority which offers one-stop services to business investors (local and foreign) has become fully operational. Progress in attracting investors has been very encouraging. During the first eleven months of the Authority's operations ending in May 1992, a total of 647 applications forms were issued, of which 175 completed applications were returned to the Authority. 40 percent of the applicants were local investors, 20 percent were seeking joint ventures and 40 percent of the applicants were foreign business investors. 80 projects were approved with a planned investment value of US $200 million. Half of the approved projects are already being implemented. The Authority has also carried out a number of investment promotion seminars in Kampala, Jinja, Mbarara, Kabale, Kasese and Kabarole districts, aimed at creating investor awareness concerning the critical need for fresh investments.

1.6 Reform of Public Enterprises (PE)

The reform programme for industrial PEs must be seen against the background of multiple constraints facing the industrial sector, intensified since the era of political instability and economic mismanagement in the early 1970's.

Industrial PEs suffered from a combination of mismanagement and equipment failures due to lack of foreign exchange to import spare parts and raw materials. The situation further deteriorated and became more serious due to lack of skilled management.

To reverse the situation, an enterprise recovery programme was launched in 1982, aimed at rebuilding the industrial sector, through physical rehabilitation. Slight improvement was noted, but industrial activity continued to be slow. While the continued shortage of foreign exchange continued to plague the industrial PEs, scarce technical and managerial resources contributed most to the decline in productive output.

The poor performance of industrial PEs may also be attributed to:

a. organisation structures that incorporate many Government ministries, most without the necessary competence or capacity to exercise effective control;

b. the failure of the economic recovery programmes to address the scarcity of technical and management resources; and

c. the slow and difficult process of improving low worker morale.

The present enterprise reform programme is different from past attempts at complete physical rehabilitation. It involves a variety of strategies including divestiture, privatisation and strengthening of organisation structures.

However, the Ministry of Industry and Technology (MOIT) was handicapped without qualified staff nor the organisational capacity to properly assess the industrial sector, identifying enterprises with economic potential and financial strength. Moreover, the implementation of an enterprise rationalisation and rehabilitation programme demanded a wide range of diverse skills and expertise that MOIT did not possess.

In 1988, attempts to restructure Public Enterprise (PE) in Uganda gained further momentum through the launch of the Public Enterprise Project (PEP). Through this project, the Public Enterprise Secretariat (PES), Public Industrial Enterprises Secretariat (PIES) and the Uganda Development Corporation (UDC) were set up with a three pronged objective:

1. To initiate reforms in industrial policy and legislative framework, and strengthen sector administration and enterprise management;

2. To initiate an overall program of rehabilitation and rationalisation of all PEs; and

3. To implement a programme of restructuring, divestiture and/or liquidation of selected PEs.

PIES was established to provide MOIT with a top-level advisory body, to implement the reforms in the industrial parastatals (public sector enterprises).

2.0 BACKGROUND OF THE SOFT DRINKS INDUSTRY

2.1 Major participants

The beverage bottling industry is one of the most efficient in the manufacturing sector in Uganda, with capacity utilization averaging 43.7 % for beer and 60.9 % for soft drinks. It is dominated by two breweries (one each in Kampala and Jinja) and four soft drinks bottlers: 2 in Jinja and 2 in Kampala. Ingredients such as sugar, syrup concentrates, preservatives, malt and bottles are imported by these enterprises. MFP's position in the beverage bottling industry is unique as it

extracts juices from locally grown pineapples and passion fruit. Though raw material supplies are plentiful, there is very little scope for exporting fruit juice concentrate from Uganda, due to lack of processing technologies, paucity of process ingredients and shipping facilities.

2.2 Problems and prospects

Major problems facing food processors and beverage bottlers in Uganda include:

1. Severe shortage of foreign exchange, affecting the purchase of essential spares and ingredients.

2. Scarcity of locally-produced packaging materials.

3. Critical shortage of trained and experienced managers, food technologists and engineers, and

4. Lack of quality control facilities and mandatory standards.

To overcome the present problems and constraints, and plan for a healthy food processing and beverage bottling industry in Uganda, a national strategy should be developed to promote the cultivation of fruits. A single factory set up to produce fruit juice concentrate, handling 5 tonnes per hour of fresh fruit throughput, will require 31,000 tonnes of fresh fruit per annum: twice the present total output of Mpigi, Masaka, and Rakai districts combined. In developing a strategy for this industry, the Government should provide incentives for:

1. The commercial cultivation of a wide range of fruits.

2. Investing in aseptic packaging of processed fruit products juices and juice concentrates.

3. Developing a regional export presence and exploiting the growth in consumer markets in the East African region.

Table 3: Estimates of fruit production in districts of Mpigi, Masaka, and Rakai, 1988

(Qty. in tonnes)

Dist.	Pineapple	Mango	Papaya	Passion fruit	Total
Mpigi	4,500	800	1,000	700	
Masaka	5,250	600	800	280	
Rakai	1,500	1,500	400	140	
Total	11,250	2,900	2,200	1,120	17,470

Source: UNDP/FAO/UGA/87/003

3.0 BACKGROUND OF PINEAPPLE CULTIVATION IN UGANDA

The smooth cayenne variety of pineapple is grown throughout Uganda, primarily in Mukono and Masaka districts. Pineapple fields seen in the Masaka area appeared healthy and clean. Pineapples grown in Mukono district are sold in the Kampala market while those grown in the Masaka district are bought by MFP which consumes about 0.8% of pineapples grown in Uganda.

The fruit is generally grown on small family plots averaging two hectares (five acres) in size. A study conducted in 1990 by the Uganda Cooperative Alliance indicated that national pineapple production was 28,500 tonnes. As planned production at MFP was never realised, current national production of pineapples has fallen to 20,000 tonnes per annum.

Pineapples grown in Uganda are not suitable for canning as they are large and cannot go through the standard pineapple peeling machine. Thus, most of the pineapple grown in Uganda is consumed in its fresh form. The UN/FAO Agriculture Research Station at Kawanda operates an experimental farm, where pineapple planting configurations and its effect on the size of the fruit are being evaluated. The effects of the use of mulches, fertilizers and insecticides on the growth of pineapples are also being tested on these plots. This experimental farm is accessible to farmers so they can actually see the test results and make their own choices. The station also has an extension arm that carries pertinent information to the farmers. One farmer was found to operate his own test plots. MFP's own 4-acre demonstration plot near the factory is unfortunately not well maintained.

In 1975, the Masaka Cooperative Union started work on a 22 acre pineapple nursery at Kyabakuza to provide seedlings for its 400-acre farm at Kitoma, 15 Kms. away. The Kitoma farm was started in 1976 and by 1979 200 acres had been planted with pineapple. During the 1979 war, most of the pineapple plants at Kitoma were lost. Since the war, financial constraints and minimal demand have restricted the output from this farm. 10 acres have been restored with pineapple plants. The 400 acre farm, now overgrown and unproductive, is used as a cattle grazing farm for MCU members. Because of its proximity both to the factory and to a source of water, the production potential of the Kitoma farm could become a vital asset to MFP in the future.

4.0 BACKGROUND OF THE COMPANY

Masaka Food Processors (MFP), a subsidiary of Masaka Cooperative Union, manufactures bottled soft drinks and fruit squashes. MFP does not have any direct competition as it is the only processor of bottled beverages using local fresh fruits - all the others use imported syrups and concentrates.

4.1 Location

The factory is situated on the outskirts of Masaka, 130 Kms. from Kampala, just off the well metalled Kampala-Mbarara main road.

4.2 Startup problems

The existing equipment supplied by Mather and Platt Ltd. in 1983 was commissioned in November 1988. The machinery which arrived in Uganda in late 1983 was left in the open and suffered damage and loss during the civil strife at that time. Later inspection of the equipment revealed that it had been affected due to the long delay in commissioning.

4.3 Production input

The main production inputs are locally grown pineapples (10 % from MFP's own farm, the rest bought from other growers) and passion fruit (bought from local growers). Sugar is imported (supplied for some time from West Germany under a food aid package). Other ingredients like citric acid, sodium benzoate preservative, tatrazine colouring, printed and plain glass bottles, crown and roll-on caps and plastic crates are also imported, as is heavy furnace oil for the steam boiler and water treatment chemicals.

4.4 Production output

The factory has a bottling capacity of 1,000 crates of soft drinks and 2,500 bottles of squash per 8 hour shift. During the course of this study, factory output ranged between 2,000 and 11,000 crates per month. Production of processed pineapple drink represents 98 percent of the production; pineapple and passion fruit squashes account for the balance.

V. DIAGNOSTIC STUDY REPORT

1.0 RAW MATERIALS

It was noted that the supply of pineapples is not a constraint to the operations of the MFP factory. Pineapples procured by MFP are of good quality, colour and sweetness with an average Brix of 14.2 degrees and average acidity of 0.51%. It is generally accepted that the supply of pineapples would be plentiful.

The yield of pineapple juice was estimated through two experiments conducted earlier, the results of which are presented in Annexure-3.

In May 1993, production statistics indicate that juice yield during the first four months of 1993 averaged in excess of 50% as compared to 30-35% before the present study as shown below:

Table 1:

Figures for January 1993 to April 1993

showing production and average yield of pineapples

Month	Average yield %	Crates produced nos.
January	52	7503
February	51.3	5208
March	53.8	4621
April	44 *	4574

* During April pineapples were purchased from Bussi Island. These pineapples have low juice content.

2.0 PRODUCTION FACILITIES

2.1 Factory site

The plant is located in a valley in an area of active agricultural activity. The site plan and the layout of the main factory building are provided over-leaf. A 20 acre experimental farm (of which only 4 acres is used) borders the production area, only 10 metres away. It was noted that the farm serves as a breeding ground for rodents, reptiles and other pests. Its proximity to the factory is a serious health hazard.

2.2 Use of buildings

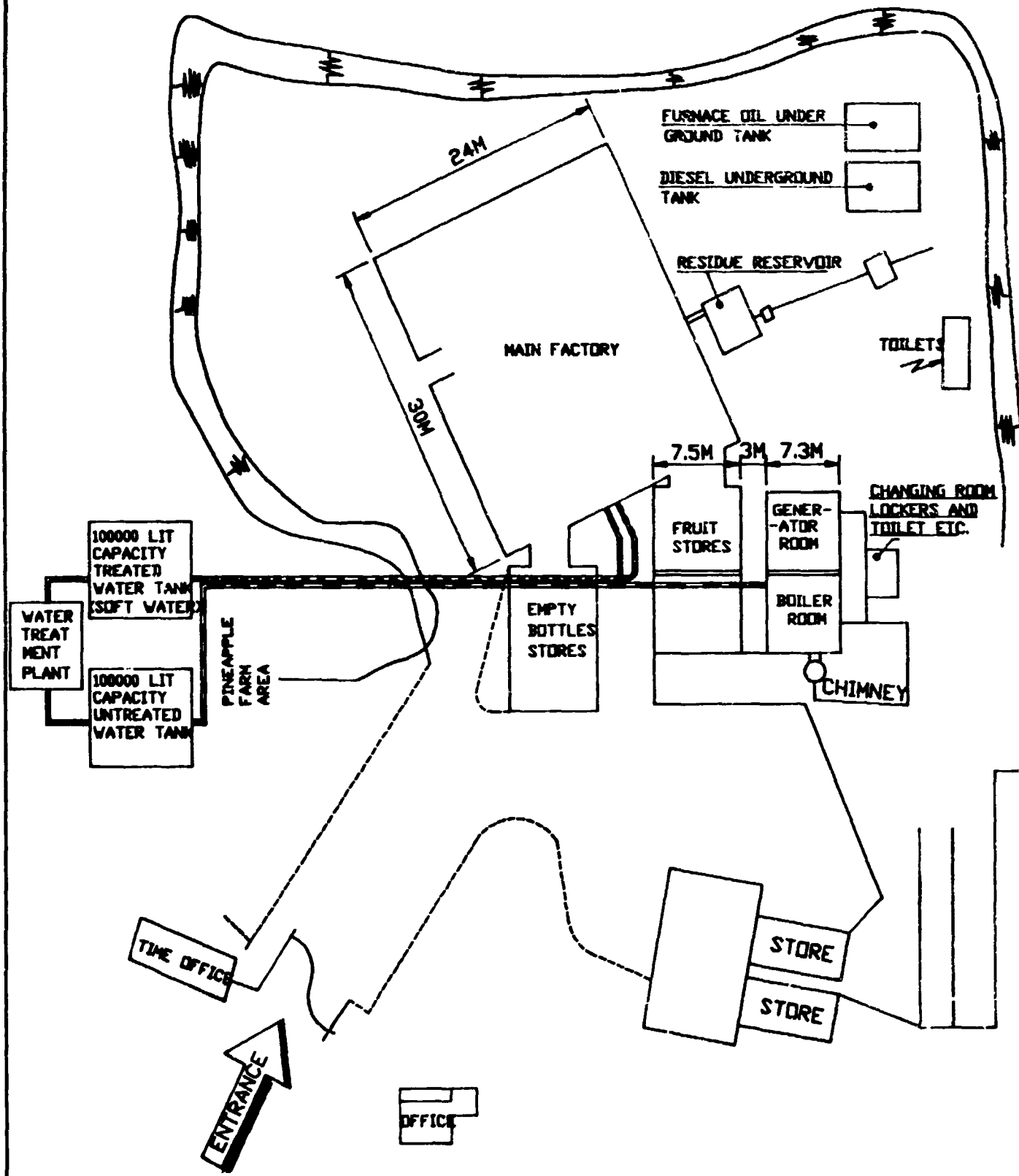
The following issues were noted relating to the facilities provided/ not provided and the use of the premises and buildings:

a. The factory building lacks essential storage facilities for fruits, chemicals, glassware & supplies. Untiled working surfaces are difficult to clean and breed fungi.

b. The space allocated to the laboratory is not sufficient to handle all testing.

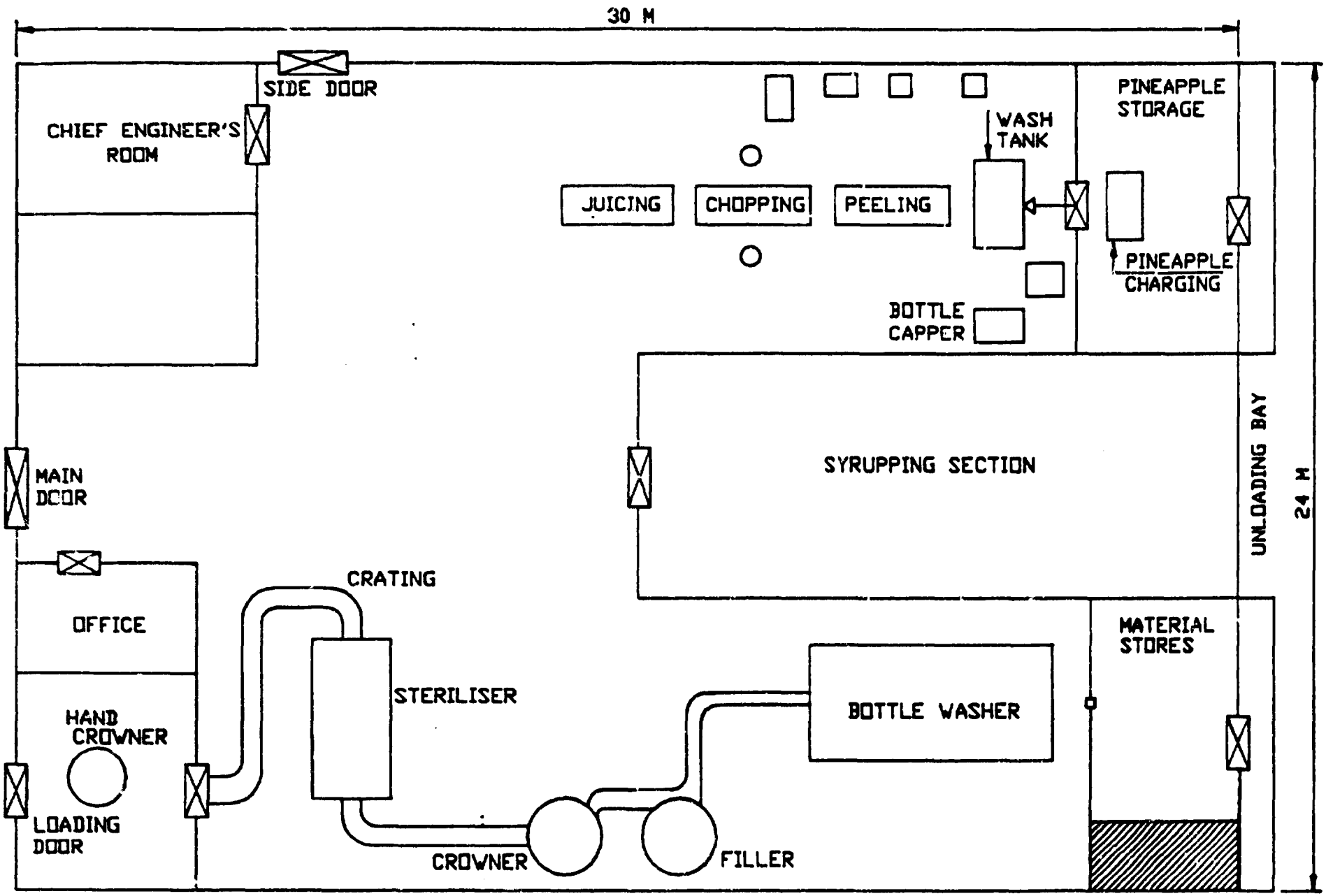
c. The condition of toilets and changing rooms do not satisfy basic sanitary conditions. Due to the absence of lockers, workers' keep their clothes and belongings near the production area.

d. The raw material stores and receiving area is being used as a store for dirty and uncleaned packaging material like returned bottles. Residue of juice in the uncleaned bottles attracts and enhances prolific breeding of pests, which in turn infest the production area and the product.



SITE PLAN OF MASAKA FOOD PROCESSORS,MASAKA,UGANDA

LAYOUT OF MAIN FACTORY BUILDING.



MASAKA FOOD PROCESSORS,MASAKA, UGANDA

e. Floor conditions are bad. The floors are rough and show signs of extensive wear due to the operating conditions. Several cracks may be seen along with pools of stagnant water. Products are packed on the floor with juice spilling onto the floor, encouraging the breeding of flies. The floor in the fruit reception area is not cleaned properly. The floor is tainted with juice and is host to a carpet of mould growth. Pools of stagnant water on the floor pose a serious threat of contamination to the end product. Cleaning the floors is difficult. The floor is not graded to allow easy drainage of stagnant water.

f. Many doors and windows are not screened and some screens are torn. Most doors are left open, providing easy access for rodents, insects and pests.

g. The wall mounted ventilation and air curtains near main doors are not operational.

h. The poor layout of the bottle washing and filling section makes the movement of material hazardous.

i. The walls are cracked and are host to patches of unsightly fungal and algae growth. Walls and ceilings are extensively covered with cob-webs, and are dull and dirty.

j. Ventilation is unsatisfactory: none of the 10 ventilator fans are working. Lighting in the production area is satisfactory. Lighting in the inspection area of the bottling line is diffused and ineffective.

k. Wash basins in the toilets are discoloured. Workers have not been provided with soap to ensure proper washing. Washing hoses or showers have not been provided in the wash rooms.

1. Installation of water closets below floor level poses serious hygiene problems.

2.3 Factory water supply and quality analysis

It was noted that:

a. Municipal water supply is the factory's only source of treated water. Supply is not reliable; during the period under study, water supply broke down for 5 days.

b. The water treatment facilities consist of a settling tank, a reservoir for treated and chlorinated water (each of 40 cubic metre capacity), an electrolytic chlorinator (which is not functioning at present), an alum doser, a system of filters and a water softener (which is not working satisfactorily).

c. Water received from the municipal source is simultaneously charged with 0.5 kg of calcium hypochlorite powder made into slurry with 2 litres of water. The chlorine content of the hypochlorite is 30%. A solution of 2 kgs. of Alum to 20 litres (10%) is prepared in the doser for water treatment.

d. Municipal water is treated after pumping the water from a sump into a tank where it is aerated, dosed with alum and pumped into a settling tank before filtration and chlorination takes place. Residual chlorine is 0.3 ppm.

e. 40 cubic metres of water is charged as above and pumped into the settling tank and left for 12 hours. It is dosed with 3.75 ppm of chlorine. Residual chlorine, as measured by the chlorotex test, should be 0.3 ppm - 0.5 ppm.

f. The quality of water from the municipal supplies should normally be determined prior to any further treatment at the plant level. This practice is not followed regularly. Residual chlorine level in the treated water which is pumped to the factory for processing is also not determined for want of chlorotex, used for this test.

g. Given the facilities present at the factory it was not possible to test for bacteria content in the water used in juice processing. However, samples of municipal water, softened water and blow down water were tested in Kampala. The results showed normal chlorine level: blow down water, however, had high iron content.

h. The proper functioning of the water treatment plant is further hampered as it is supervised by a plumber who does not have any previous experience or exposure to water treatment operations. His limited training at a polytechnic does not equip him to understand water chemistry, or the importance and sensitive nature of his job.

2.4 Waste disposal and pollution control

It was noted that the waste disposal system is highly inadequate.

a. Plant effluent made up of dissolved organic wastes is discharged into a trench, nearby.

b. The discharged effluent remains stagnant in this trench without further treatment. Occasionally the effluent overflows into the adjacent valley where extensive farming activity takes place.

c. The proximity of the effluent to the factory creates serious environmental pollution caused by the anaerobic activity of micro-organism on the effluent materials.

3.0 PROCESS, PLANT AND PRODUCTION

3.1 Process

The process flow chart for the MFP factory may be seen in Annexure-4. While the plant layout is generally good, problems in fruit washing, beverage sterilisation, water treatment and boiler fuel systems are known to exist. It was noted that:

a. Pineapples emerging from the washing conveyor drop into the concrete trough, splashing water on the personnel and the cutting tables. The water in the trough is stagnant, not chlorinated and contains high levels of dissolved impurities, dirt and micro-organisms. This poses a serious health hazard to food safety and the hygiene of personnel at this work station. The bottom of the trough showed signs of profuse fungal growth stemming from improper cleaning.

b. Juice Extractor/Strainer: This equipment, consisting of two screw press units in parallel, cannot be easily dismantled for cleaning after production. Even though the top of the casing of the screw presses can be opened and cleaned with difficulty, the bottom part is inaccessible for effective cleaning and is therefore likely to harbour particles of pulp.

c. The water treatment plant is ineffective. However, the factory gets good quality water from municipal sources.

d. The poor quality of furnace oil used for the boiler chokes the burner nozzle. We have suggested that the main fuel tank be heated to reduce viscosity, allowing dirt particles to settle. The oil should also be filtered before being fed into the burner. The outlet pipe from the main fuel tank should be raised 7" to 8" from the bottom.

3.2 Plant & machinery

A number of studies have been conducted on the quality of the plant supplied by Mather & Platt Ltd. The present state of each equipment is given in Annexure-5. The machinery items found unsuitable for rehabilitation are:

* Corers & sizers
* The fruit mill
* The screw type juice extractor
* The colloid mill
* The 5-station rotary crown corking machine
* The halving machine
* The head rosing machine
* The brush washer
* The hand operated pilfer proof capping machine

3.3 Plant layout

It was noted that:

a. The factory is very congested: there is very little clearance between machines resulting in many areas being inaccessible for effective and thorough cleaning.

b. Material/personnel flow is not properly planned, resulting in criss-crossing across the factory floor.

3.4 Plant maintenance

Scheduled preventive maintenance is not done on plant and equipment. Some part of the deterioration of plant and equipment may be attributed to the shortage of spares. Untrained operators and poor preventive maintenance practices are both significant causes for plant breakdowns. Though the Plant Engineer is competent and experienced in plant maintenance, this activity is neglected.

3.5 Production - Process control

Process control activity at MFP covers the entire process including extracted juice. It was noted that:

a. Sampling plan/Raw material control: A highly skilled and experienced employee contributes to the very efficient system of inspection and sorting of incoming fruits.

b. Incoming fruits are assessed to determine the juice content of the product. Standardised data on pineapple/passion fruit grades or quality is non-existent.

c. Physical and chemical tests are conducted to determine initial Brix and acidity, which are on an average, 14 degrees and 0.4%, respectively. Sensory evaluation is not conducted.

NOTE: Our Technical Consultant informed MFP technicians that sensory evaluation was very important at the initial fruit grading stage, and should be given the seriousness it deserves. Brix/Acid ratio, a measure of maturity of the fruit should also be noted. A well matured fruit is estimated to have a Brix/Acid ratio between 36 and 38.

d. In the blending section, specified doses of colour and preservatives are metered. The strength of the blending syrup is checked after preparation. Clarity is checked after filtration. Brix and acidity as well as taste are checked after blending.

e. De-aerator and pasteurisation conditions were not monitored. Gauges and indicators performed erratically. Temperature at the juice discharge point was not recorded.

NOTE: Our Technical Consultant impressed upon the blending room Supervisor the need to monitor the temperature and the pressure of pasteurisation and stressed the need for proper daily records to be kept and furnished to the laboratory to assist in quality control.

f. Regular servicing and re-calibration of all indicators, gauges and instruments is not conducted and should be given serious attention.

g. Checking the temperature of juices filled in bottles, the cleanliness of the bottles, and the final temperature of the beverage (which should not exceed 35 degrees C.) is not conducted regularly. Daily and up-to-date records of this information should also be kept.

h. As the bottle capping machine does not function properly, broken bottle chips often fall into the beverage.

i. Bottles are not pre-sorted according to height, lending to the problems at the capping stage.

j. Flow meters and counters are not located at strategic points to measure and control production input, output & throughput.

3.6 Standard labelling requirements

Reviewing the labels used on the production output from MFP it was noted that:

a. The product labels appear dull and poorly presented on sub-standard paper. They meet all the statutory requirements except date-marking and lot identification, which are absent. These markings would contribute greatly to shelf-life analysis of the product.

b. Available evidence shows that MFP's pineapple drink does not have a shelf life beyond two months at best.

3.7 Plant capacity utilisation

MFP's pineapple extraction plant can handle a throughput of 1.5 tonnes per hour of fresh whole trimmed fruit. Generating 50% juice yield, this throughput should yield 6,000 litres of pineapple juice per shift. At the start of this study, the actual yield of pineapple juice was only 3,000 litres (25% juice yield), due primarily to the poor condition and design of the extraction equipment.

MFP's operating performance is well below industry standards, with plant capacity utilisation between 10 and 20 % only. Production is centered around the bottling of the pineapple drink; very small quantities of pineapple squash, passion fruit drinks and squash are produced. As a result the slicing machine used for oranges and passion fruit, the reaming machine for citrus fruit halves, the two stainless steel boiling pans for squash preparation and the associated bottle filling and roll-on capping machine are grossly under-utilized.

The bottling operation including washing, filling and crowning can handle 1,000 crates (24,000 bottles) in a 8 hour shift. However, the output is not more than 500 to 600 crates per shift due to the poor performance of the crowning machine. The crown cork was being fed by hand since the auto feeder had been dismantled. An analysis of the down time has been done for the latest 280 working days and the results are shown in graph form, over-leaf. It is evident that most of the breakdowns are non-equipment related. Only 15% of the time lost is due to equipment failure (mainly the capping machine, boiler and juice extractor). Even though the plant personnel were ever ready to blame the equipment for the poor performance of the unit, bad planning and poor management are responsible for a major part of the production loss.

The production details for three years are shown, over-leaf. Average monthly production ranges from 4,000 to 6,000 crates: 20% of the single shift capacity of 25,000 crates per month.

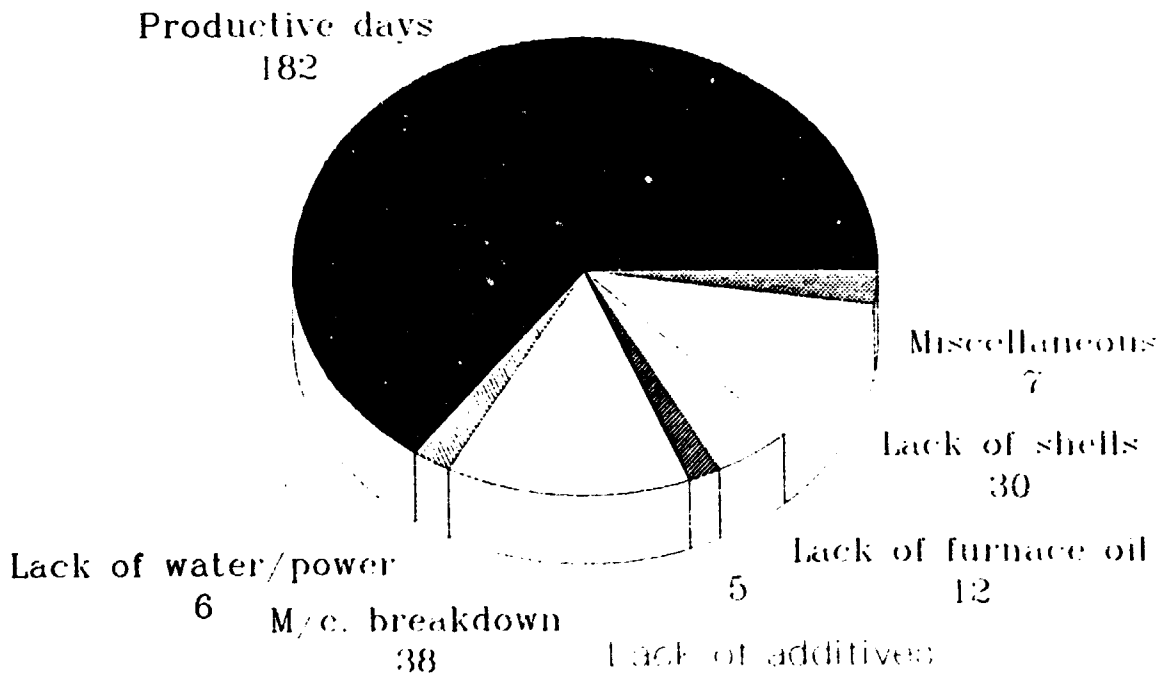
4.0 MARKETING

4.1 Industry background

The beverage & brewery industry in Uganda comprises of two large breweries and 4 soft drink bottling plants (2 each in Jinja and Kampala) and MFP. The estimated production from these plants are:

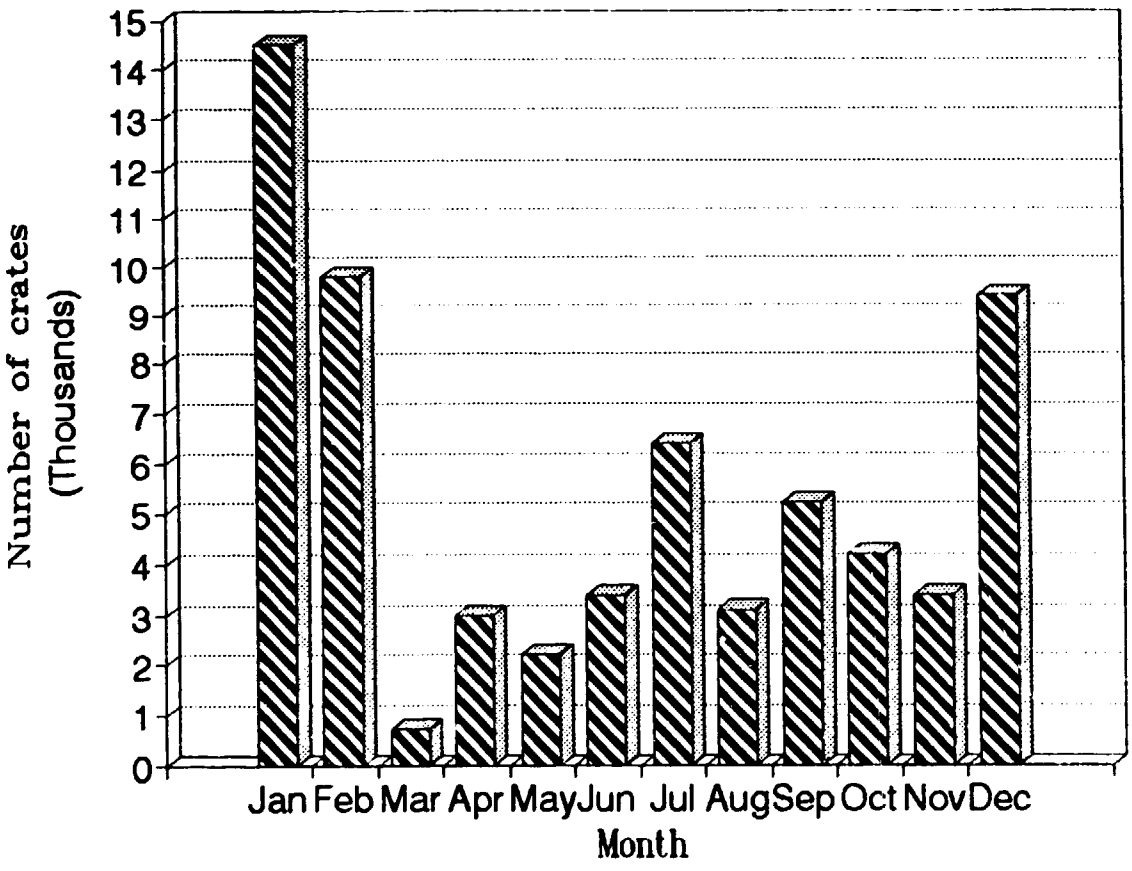
Beer	4,000 crates/day (25 bottles/crate)
Soft drinks	7,000 crates/day (24 bottles/crate)
MFP	400 to 700 crates/day (24 bottles/crate)

FACTORY DOWNTIME ANALYSIS FOR THE PERIOD
NOV. 2, 91 – DEC. 10, 92 (280 WKG. DAYS)

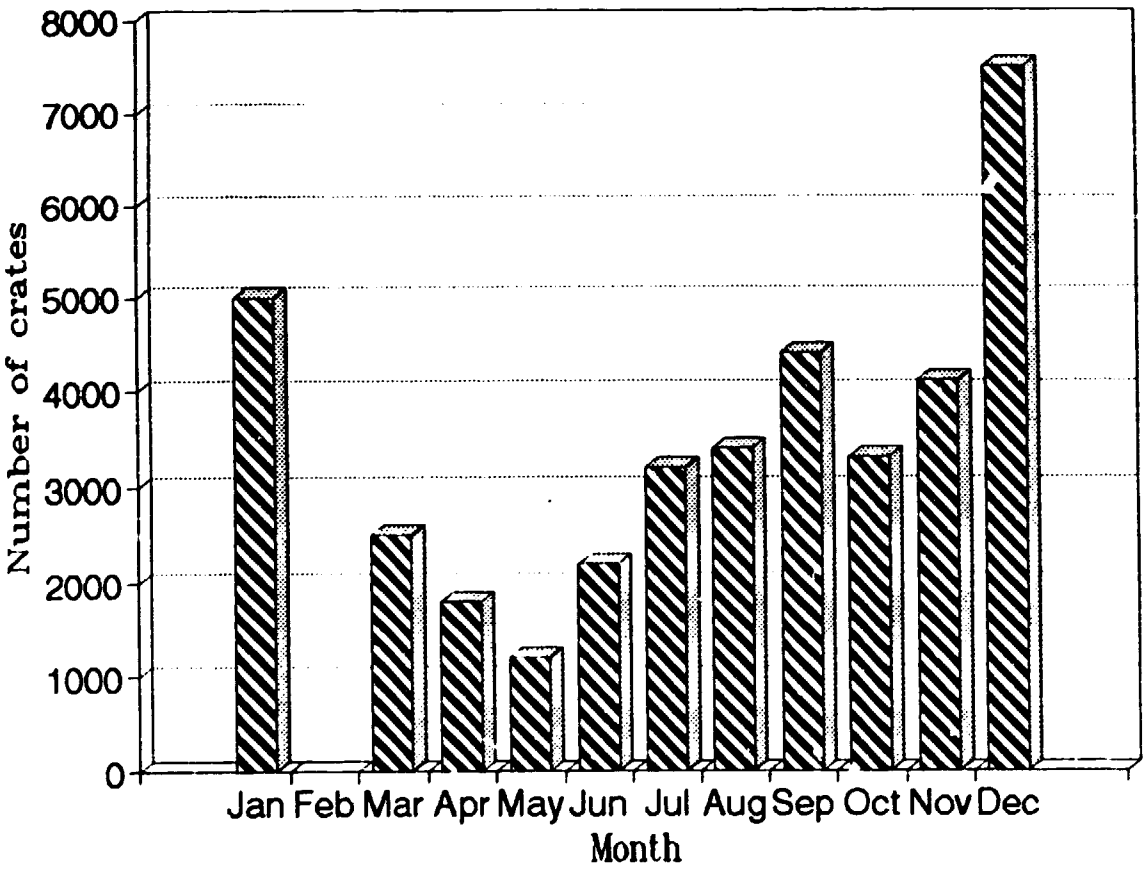


FIGURES IN DAYS

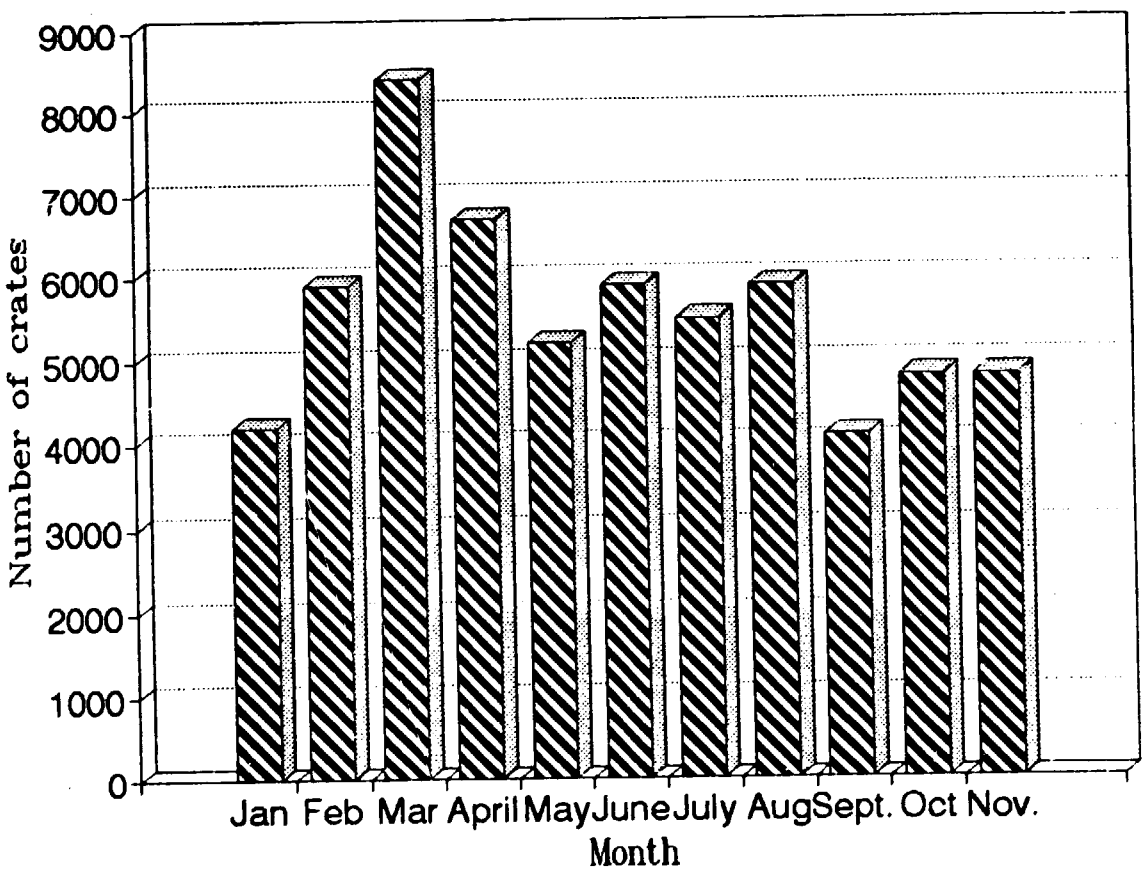
Prodn. of pineapple beverage in 1990



Production of pineapple beverage 1991



Prodn. of pineapple beverage for 1992



MFP has 3-4% market share of the total beverage market (beer and soft drinks). The comparative prices for each case/crate are:

Beer	USh./crate:	21,000 (500 ml. bottles)
Soft drinks	USh./crate:	6,500 (300 ml. bottles)
MFP	USh./crate:	5,500 (200 ml. bottles)

Managers at MFP informed us that they keep prices low to attract customers.

4.2 Market penetration

MFP's bottled pineapple drink is available only in Kampala, Masaka, Mbarara and Jinja, supplied through two depots, one in Masaka and the other in Kampala. The distribution chain extends from the factory, to depots, to stockists, to retailers. In Masaka the distribution is different: it extends from the factory, to the depot, to retailers.

MFP circulates 300,000 bottles (12,500 crates) through approximately 200 outlets. This is insufficient for higher production and will handicap efforts for greater market penetration.

4.3 Product promotion

Sporadic sales promotion efforts have been conducted, and now discontinued. Programmes included promotion through radio and local T.V.; printed T-shirts and bags were also given away.

Sales during the last four years are shown below:

Year	Crates sold	UShs.
1988/89	84,925	167,008,920
1989/90	52,126	131,070,890
1990/91	32,432	102,037,560
1991/92	51,052	266,528,100

Source: Company records

NOTE:- 75% of the quantities above were sold in Kampala, 20% in Masaka; the rest were sold in Mbarara and Jinja.

- Sales are the highest during the months of December, January, February, March, and June, July and August (the hot and dry period).

- Monthly sales graphs for 1990, 1991 & 1992 are provided in Charts 5 to 7, over leaf.

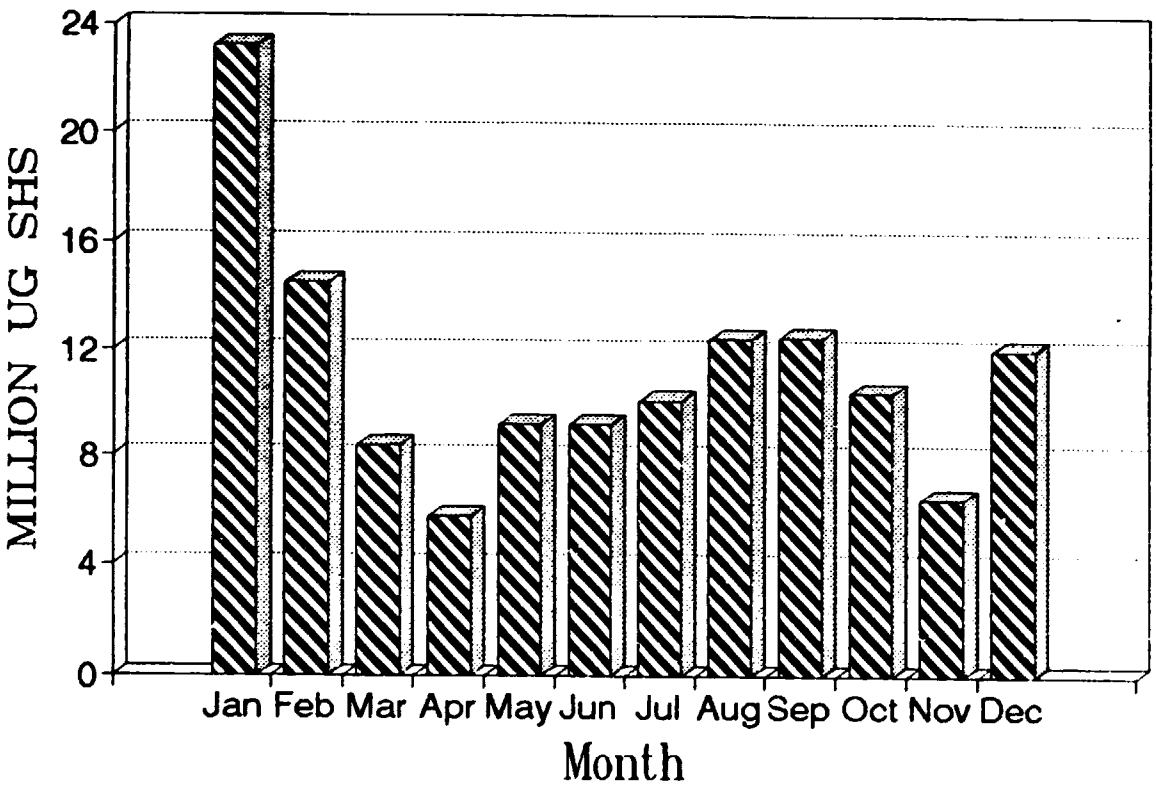
The major markets for MFP's pineapple beverage (CREPS) are:

The Central region	90%
The Western Region	8%
The Eastern region	2%

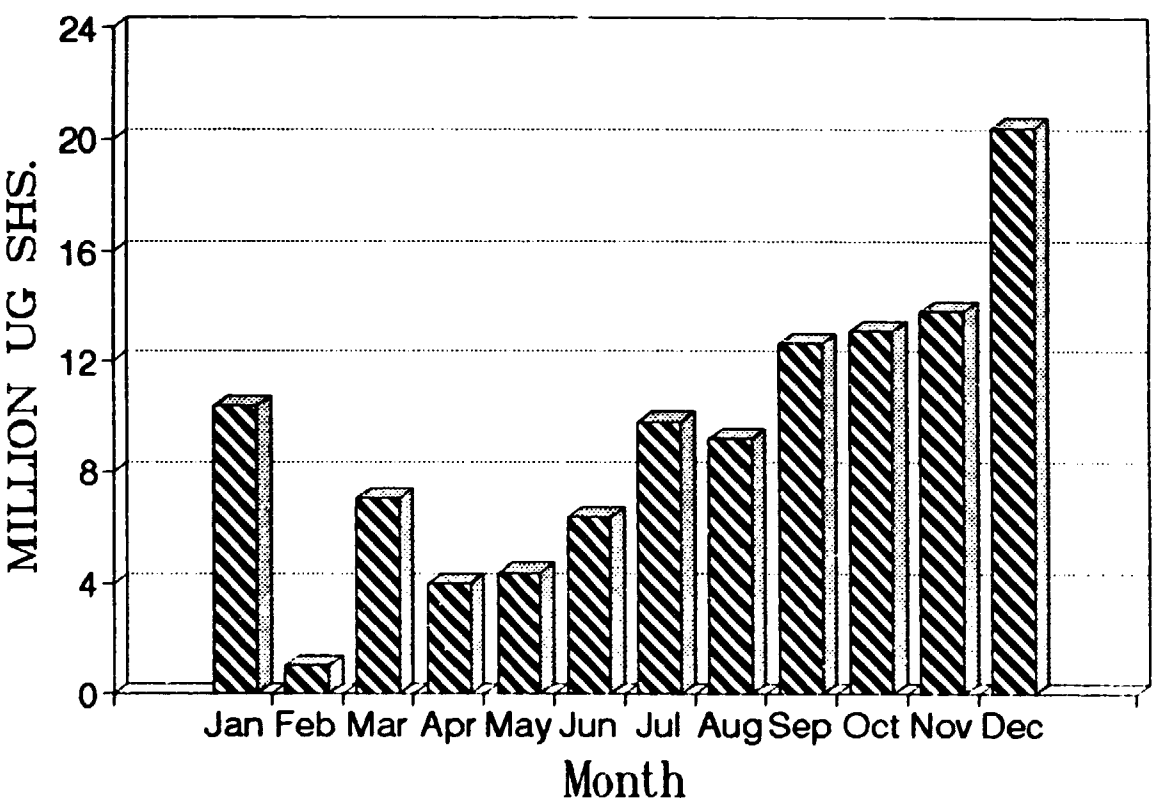
Major buyers are restaurants, hotels, petrol stations, etc. MFP does not allow credit sales. The product does not have any competition in the market except from imported/smuggled canned juices.

Sale of pineapple beverage

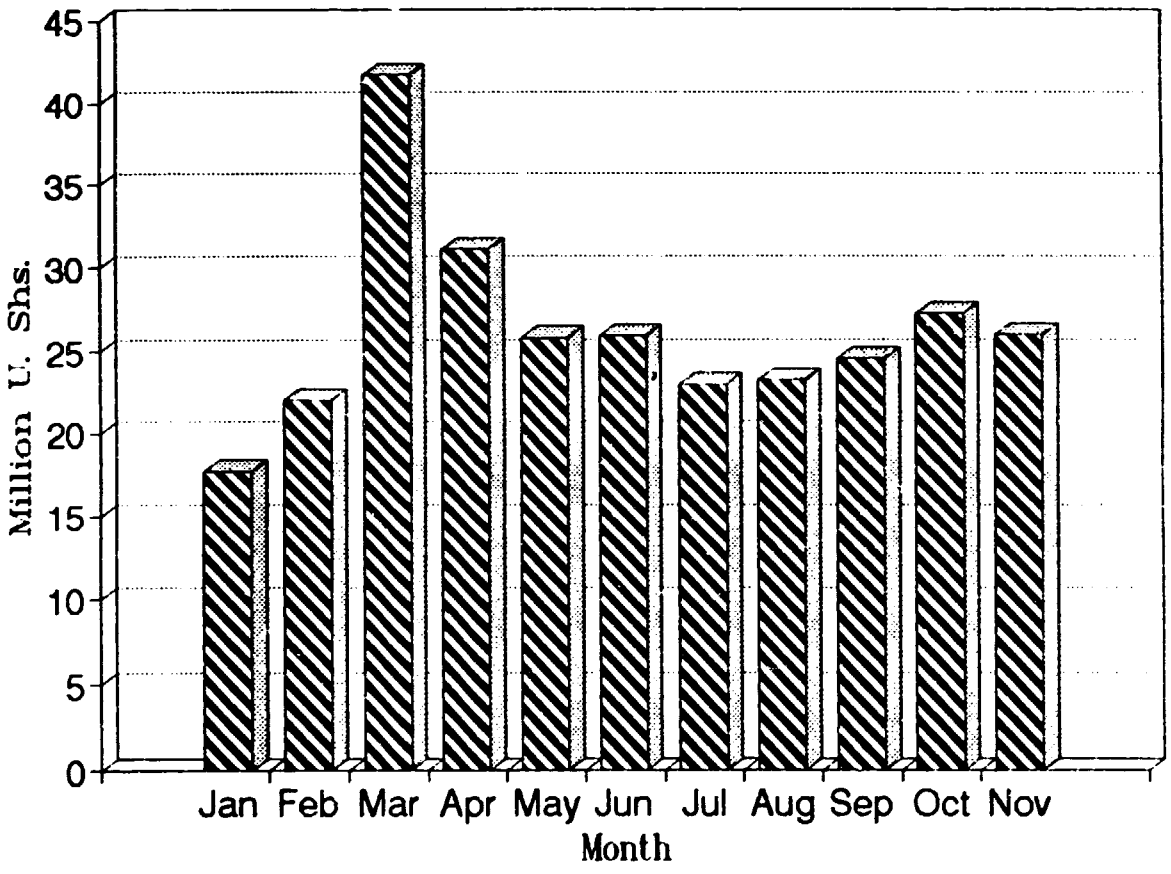
For the year 1990



Sale of pineapple beverage
for the year 1991



Sale of pineapple beverage in 1992



Price movement for MFP's pineapple beverage (CREPS) crates of 24 bottles, each during the last three years has been as follows:

Year	USh.
1990	1,950 to 2,700
1991	2,700 to 4,000
1992	4,000 to 5,500

Source: Company records.

5.0 FINANCE

The Balance sheet and the Profit and Loss Statements of MFP for three years are presented below:

5.1 PROFIT & LOSS ACCOUNT

	Year ended Nov. 30, 92 USh.	Year ended Nov. 30, 91 USh.	Year ended Nov. 30, 90 USh.
INCOME:			
Turnover	318,886,519	111,333,684	79,640,398
Interest earned	109,019	10,584	104,268
Excise duty & sales tax refund	-	85,496,434	-
	318,995,538	196,840,702	79,744,666
EXPENDITURE:			
Material consumption & processing expenses	183,545,050	50,197,851	112,057,688
Loss on pineapple operations	3,967,000	58,950	855,833
Administration	46,958,798	29,955,264	38,082,936
Selling	40,802,150	20,097,992	29,117,844
Interest	743,384,582	303,324,605	178,203,395
	1,018,657,580	403,634,662	358,317,696
Cash loss on operations	699,662,042	206,793,960	278,573,030
Depreciation	590,656,675	245,565,264	151,621,847
LOSS FOR THE YEAR	1,290,318,717	452,359,224	430,194,877

5.2 BALANCE SHEET

	As at Nov. 30, 92 U. Shs.	As at Nov. 30, 91 U. Shs.	As at Nov. 30, 90 U. Shs.
Assets:			
Fixed assets:			
Land	56,000,000	56,000,000	56,000,000
Building	260,649,888	271,510,300	282,823,229
Plant & machinery	2,304,731,643	1,637,200,000	975,929,862
Furniture & fittings	9,453,412	2,566,340	2,932,961
	2,630,834,943	1,967,276,640	1,317,686,052
Current assets:			
Stock	34,800,320	40,580,025	19,798,385
Debtors	28,397,847	21,648,321	20,881,425
Deposit for lorry	2,900,000	-	-
Income Tax Deposit	548,000	-	-
Bank balances	6,260,573	3,788,506	3,801,962
Cash in hand	615,996	75,075	228,916
	73,522,736	66,091,927	44,710,688
Total assets (A)	2,704,357,679	2,033,368,567	1,362,396,740
Liabilities:			
E.A.D. Bank loan	3,614,839,138	2,075,023,473	999,813,043
U.D. Bank loan		6,252,688	4,434,468
Current liabilities	782,688,083	354,943,231	308,640,830
Total liabilities (B)	4,397,527,221	2,436,219,392	1,312,888,341
Net worth (A - B)	- 1,693,169,542	- 402,850,825	49,508,399
Represented by:			
Share capital	25,000,000	25,000,000	25,000,000
Capital reserve	553,495,573	553,495,573	553,495,573
Profit & loss account	- 2,271,665,115	- 981,346,398	- 528,987,174
	- 1,693,169,542	- 402,850,825	49,508,399

5.3 VARIABLE/FIXED COST ANALYSIS

	Year ended Nov. 30, 92 U.Shs.	%	Year ended Nov. 30, 91 U.Shs.	%	Year ended Nov. 30, 90 U.Shs.	%
A. Juice processing cost:						
Raw material cost	116,638,848		29,916,775		61,163,546	
Variation in opening & closing values of finished goods	12,362,250		(13,175,498)		6,022,048	
	129,001,098	8.0	16,741,277	2.58	67,185,594	13.17
Buying expenses	13,683,063	0.9	3,191,378	0.49	5,700,863	1.12
Processing expenses	54,271,301	3.3	30,265,196	4.66	39,171,231	7.68
	196,955,462	12.2	50,197,851	7.73	112,057,688	21.97
B. Loss on pineapple farm operation	3,967,000	0.3	58,950	0.01	855,833	0.17
I. Total variable cost (A + B)	200,922,462	12.5	50,256,801	7.74	112,913,521	22.14
C. Administration	48,022,151	3.0	29,955,264	4.61	38,082,936	7.47
D. Depreciation	576,182,910	35.8	245,565,264	37.83	151,621,847	29.73
E. Selling	40,802,150	2.5	20,097,992	3.10	29,117,844	5.71
F. Interest	743,384,582	46.2	303,324,605	46.72	178,203,395	34.95
II. Total fixed cost (C + D + E + F)	1,408,391,793	87.5	598,943,125	92.26	397,026,022	77.86
TOTAL COST (I + II)	1,609,314,255	100.0	649,199,926	100.00	509,939,543	100.00

5.4 PAYMENTS TO EMPLOYEES

		For the Year ended Nov. 30, 1992 USh.	For the Year ended Nov. 30, 1991 USh.	For the Year ended Nov. 30, 1990 USh.
Salaries & wages:				
For processing		10,247,088	6,125,496	9,230,970
For buying		1,708,657	881,960	850,863
For pineapple farms		4,479,493	2,295,441	2,866,544
For administration		10,244,913	6,736,256	7,148,217
For selling		2,259,498	1,659,929	2,472,098
	A	28,939,649	17,699,082	22,568,692
Staff welfare & benefits:				
For processing		7,045,786	2,649,801	4,049,989
For buying		202,561	85,477	187,857
For pineapple farms		25,880	-	18,424
For administration		4,341,539	2,271,180	753,565
For selling		2,625,077	883,146	2,649,906
	B	14,740,843	5,889,604	7,659,741
Total (A) & (B)		43,680,492	23,588,686	30,228,433

5.5. DETAILS OF ASSETS

Type of asset	Book value as at 01.12.91 USh.	% of total assets as at 01.12.91	Accumulated depreciation as at 30.11.92 USh.	Net value as at 30.11.92 USh.	% of total assets as at 01.12.92
Land at Kyabakuza	17,000,000	0.46		17,000,000	0.46
Land at Kitoma	39,000,000	1.06		39,000,000	1.06
Buildings	299,590,862	8.18	38,940,974	260,649,888	7.11
Plant & machinery	3,296,843,038	89.92	992,111,395	2,304,731,643	62.87
Furniture, fittings & equipment	13,965,505	0.38	1,512,993	9,453,412	0.26
	3,666,399,405	100.00	1,035,564,462	2,630,834,943	71.76

Particulars of depreciation claimed:

Period ended Nov. 30, 1989	47,720,676
Year ended Nov. 30, 1990	151,621,847
Year ended Nov. 30, 1991	245,565,264
Year ended Nov. 30, 1992	1,035,564,462
	1,480,472,249

Fixed assets are depreciated approximately to the extent of 18.44%

5.6 PARTICULARS OF CURRENT ASSETS

	As at Nov. 30, 92 U. Shs.	As at Nov. 30, 91 U. Shs.	As at Nov. 30, 90 U. Shs.
Stocks	34,800,320	40,580,025	19,798,385
Debtors	31,845,847	21,648,321	20,881,425
Bank balances	6,260,573	3,788,506	3,801,962
Cash in hand	615,996	75,075	228,916
	73,522,736	66,091,927	44,710,688
Details of stocks:			
Sugar & chemicals	3,026,884	6,487,782	3,341,647
Growing fruits	4,991,161	3,513,048	2,941,000
Finished products	2,791,350	15,153,600	1,978,102
Packing materials	23,990,925	15,425,595	11,537,636
	34,800,320	40,580,025	19,798,385

5.7 An analysis of MFP's financial performance reveals the following:

A. OPERATING EXPENSES ANALYSIS

	Year ended Nov.30, 92	Year ended Nov.30, 91	Year ended Nov.30, 90
% of processing expenses to sales	197.70	247.42	239.00
% of selling & distribution expenses to sales	12.80	18.05	35.56
% of administrative expenses to sales	15.10	27.24	48.34
% of payments to employees to sales	13.70	21.19	37.96
% of interest charges to sales	232.90	272.06	221.71

	As at Nov. 30, 92	As at Nov. 30, 91	As at Nov. 30, 90
B. Current ratio			
Current assets/ Current liabilities	0.093	0.186	0.145
C. Financial leverage:			
Debts to assets:			
Total debts/ Total assets	1.370	1.198	0.963
D. Long term debt:			
EADB	3,614,839,138	2,075,023,473	999,813,043
UDB	-	6,252,688	4,434,468
	3,614,839,138	2,081,276,161	1,004,247,511
EADB int. payable	735,779,048	296,101,112	172,760,967

It must be noted that the interest liability has crossed USh. 62 million per month in 1992 as compared to USh 27.59 million in 1991/92. Calculations above show that the interest burden is higher than the possible turnover.

D. Equity:

MFP's equity has eroded over the last three years as shown below:

Year	1989	1990	1991	1992
USh.	479,703,276	49,508,399	(402,850,825)	(1,693,169,542)

6.0 HUMAN RESOURCES

MFP comprises of five departments with a total of 79 employees:

- Engineering
- Quality control
- Food technology
- Accounts
- Sales & marketing

Each of these departments is presided by an officer who reports directly to the General Manager.

MFP employs 56 permanent employees in the following departments:

General Manager's Office	3
Engineering	9
Quality Control	4
Food Technology	11
Accounts	21
Marketing	8
TOTAL	56

MFP's organisation chart is presented in Annexure-6.

VI. MANAGEMENT INTERVENTION & TURNAROUND PACKAGE

With the help of three Technical Consultants (TCs) and in the limited time available to the consultants, the SC focused on studying the operations at MFP, in detail, and took action in those areas which were determined as critical. The ares of concern and the changes suggested or acted upon are:

1.0 The Kitoma pineapple farm

The SC visited the farm on December 10, 1992 accompanied by MFP's General Manager. The farm, 17 Kms. from Masaka covers an area of 400 acres. Pineapples are cultivated on 10 acres only; the rest of the farm is used by the Masaka Co-operative Union (MCU) for cattle grazing. A larger area has not been brought under pineapple cultivation as:

* MFP does not have the working capital to finance pineapple cultivation.

* Close supervision is required just prior to and during harvesting, to avoid pilferage and to get better yields. Being a large farm, a horticulture specialist should be on duty at all times. Both the supervisory talent and the technical talent of a horticulturist are not available.

* Considering MFP's present overheads, it will cost more to grow pineapples than purchase them from farmers. It was decided not to grow pineapples on the farm.

Other decisions taken but not implemented till late January 1993:

* To restrict cultivation of pineapples to the present 10 acres and use it for demonstration purposes.

* The remaining land can continue to be used for cattle grazing after approach roads and fencing are installed. The General Managers of MFP and MCU have agreed that this would be the best possible alternative and would be placing the suggestion before the Board of the Co-operative Union for approval.

2.0 Procurement of pineapples

Pineapple crushing and juice extraction is done sporadically. MFP pays USh. 85 per Kg. of pineapple. To encourage farmers to grow pineapples and not change over to any other crop it was suggested that the procurement prices of pineapples should be increased. At present, cost of pineapples constitutes only 3-4% of the cost of production.

3.0 Pineapple receiving and storing

Pineapples are unloaded from the trucks in a haphazard and rough manner, damaging the fruit. The workers were taught to handle the fruits properly through demonstration courses, and to transfer them in containers and store them on their crowns, systematically, in rows. Proper airing of stored fruits is difficult as the exhaust fans have broken down. We have recommended that the pineapple storage room be redesigned.

4.0 Washing of pineapples

The pineapples are washed on a conveyor belt and dropped into a concrete trough filled with water for further cleaning. As the water in the trough is not recycled/replaced regularly, it contains a lot of organic particles which breed bacteria.

Excessive quantities of pineapples are dumped into the trough, making cleaning difficult. Efforts should be made to match the cleaning speed with the manual peeling and slicing operations.

Suggestions have been made to:

* Line the tanks and troughs with glazed tiles.

* Drain dirty water from the base of the trough, continuously.

* The pressure of the water spray used to wash the pineapples should be increased by:

  - frequent cleaning of the spray nozzles, and
  - installing a small spray pump.

* Manually inspect the pineapple's surface to ensure that mud and dirt have been removed.

* Dry the pineapples individually using an air spray.

5.0 Cutting, sorting, peeling, chopping

Workers in this section were carelessly slicing off large portions from the top and bottom of the pineapple, before peeling. The SC demonstrated ways to reduce the loss of fruit by using better slicing and peeling methods. Sizing pineapples through slicing and peeling is very important for proper performance of the juicer.

The SC suggested that the coring machine be moved away from the process line, reducing congestion and giving workers extra space.

6.0 Conveyor, hammer mill and extractor

Chopped pineapples are not charged at regular intervals on the conveyor. This overloads the hammer mill and reduces the efficacy of pulping in the hammer mill. Of the two extractors, only one is working for want of a spare sieve.

The hammer mill and the extractor do not function properly. As a result, juice is extracted manually by squeezing the pulp in a fine cloth strainer. This is a dirty and an inefficient process. Through close supervision and training, the juice yield was increased by 100%, from 30% to 60%, over 2 days. Further modification to the plant stabilised juice extraction at 60%.

After discussions with the factory engineer, the Technical Consultants have suggested that further modification of the extraction process would be necessary. Two options have been suggested:

* To redesign the hammer mill and extractor sections and set up a separate plant, or
* Use the present plant, but install a hydraulic drum extractor in the final stage to enable complete removal of the juice.

7.0 Storing pineapple juice

The raw pineapple juice is normally stored in steel drums till the mixing tank receives sugar syrup. Quite often excessive quantities of pineapple juice are stored in jerry cans. This practice should not be allowed as the juice in the jerry cans deteriorates through oxidation.

8.0 Bottle washer

The bottle washer operates adequately except when feeding in the bottles, when the mouth of the bottles are chipped. The spray nozzles and water spray cycle should be carefully checked.

9.0 De-aerator, beverage holding tank and bottle filler

The performance of the de-aerator is still not satisfactory as it leaves traces of air in the juice, which accelerates deterioration of pineapple juice, reducing shelf life. The bottle filling line should be refurbished with a new set of rubber spares and high-wear parts.

10.0 Bottle capping machine (Crowning)

The performance of the bottle capper is not acceptable. The machine destroys expensive bottles, beverage and crown caps. The problem is further compounded by the manual feeding of crown caps, which is a waste of manpower.

11.0 Material handling in the factory

Unloading, loading and stocking in and out of crates, of empty returned bottles, washed and cleaned bottles and filled bottles, comprises most of the material handling operations in the factory. The factory has lost 25 to 30 days production in 1992 due to a shortage of plastic crates

We have suggested the use of wooden crates as plastic crates are very expensive (USh. 8,500). MFP will investigate the sourcing of wooden crates from The Masaka Co-operative Union's carpentry training school.

12.0 Plant cleanliness, sanitation and personal hygiene

During the course of this study, the factory equipment and buildings were cleaned, under the close supervision of the SC. It was suggested that the workers wear caps and gloves at all times during their shift. The plant premises should be sanitised fortnightly with a hot water and chlorine solution.

A sanitary and cost effective waste disposal and pollution control system should installed.

13.0 Investigating alternate uses for pineapple pulp

The thick juicy waste from the present malfunctioning juice extractor can be used for manufacturing pineapple jam. Factory personnel have agreed to experiment with this.

This measure is temporary and will generate additional revenues from material that is presently discarded. When the juice extractor is replaced, dry pulp instead of the thick juicy waste will be discharged. This dry pulp from the juice extraction process may be sold as cattle feed or as fertiliser.

14.0 Planning stocks of consumables

Stock-outs of crown caps, sugar and pineapples happen often, due to shortage of working capital. While MFP does not entertain credit sales, funds management is poor. Cash flow is further reduced by the weekly repayment of USh. 1.0 million of the outstanding EADB loan. MCU assists MFP with temporary cash injections from time to time.

15.0 Marketing, distribution and advertising

The shortage of working capital has forced MFP to curtail spending on marketing and advertising. The present distribution network is insufficient. The marketing and distribution network in Kampala (where 95% of sales take place) is not adequate.

If production is increased, MFP's distribution network may not be able to handle the additional volume. We have suggested that distribution be offered to private dealer networks, thereby increasing the number of distribution outlets. This should be done after production quantities have stabilised and dealers/ agents are assured of regular supplies.

16.0 Quality assurance

MFP does not have facilities to regularly and continuously check:

- the quality of water used
- the quality of juice extracted, and
- the syrup and the beverage produced.

The laboratory needs facilities to undertake microbiological tests and basic beverage quality tests. Testing the beverage over time (1 month, 2 months, 3 months) for microbiological growth and for taste is essential and vital for marketing success. The shelf life test is very important as it is a reflection on the quality of the production facility.

17.0 Human resources

MFP employs well trained production and quality control personnel. The plant engineer has the experience and training to operate and maintain a plant like this. It was observed that workers are motivated and willing to learn.

However, MFP lacks visionary managerial leadership, not only to lead the unit to a bright future, but to manage and guide it through the present problems of cash/funds management, loan negotiation/restructuring, plant and building maintenance (encouraging proper preventive maintenance procedures) and the like. The unit must come out of its present "fire fighting" attitude (ignoring the issues till they become problems). Product and market development activities should be given prominence, to assure the unit's future.

VII. CONCLUSIONS

There is no hope for the survival of MFP unless it is able to persuade EADB to write off a major portion of its outstandings and is also able to get substantial aid from donors.

EADB, in a meeting with the consultants during their second visit, expressed their inability to either finance MFP any further or give any concessions to it either by way of writing off any portion of the outstanding loans or extend the time for repayment.

It may be mentioned that:

1.0 MFP's dues to EADB are in excess of US$ 3.6 million (USh. 4.35 billion) whereas the present worth of its assets may be less than US$ 50,000.

2.0 EADB has already moved against Masaka Co-operative Union (MCU), the guarantors for the loan, for recovery of its dues from MFP since MFP has turned defaulter.

3.0 The plant at MFP requires major rehabilitation for which funds are not available with the unit.

4.0 MFP does not have the necessary management to take up major rehabilitation of the unit.

The Ugandan President visited MFP factory about a year ago and announced a grant of US$ 500,000 to write off a part of the outstanding loans. However, nothing has been heard on the subject for a long time. An application for a special project grant has been submitted to UNDP for the refurbishing of building, plant and machinery, and the strengthening of working capital.

ACKNOWLEDGEMENTS

There are a few persons whose unstinted support throughout the course of the diagnostic study has been of immense value, without which it would not have been possible to complete the study within the prescribed time scheme. We wish to place on record the assistance received from -

Mr. G.W. Kisenyi - General Manager

Mr. Peter K. Ssebalamu - Plant Engineer

Mr. David Ssegwanyi - Quality Controller/Chemist

Our gratitude is also due to the members of staff and workers of Masaka Food Processors Ltd., who gave their time and assistance whenever required.

Our sincere appreciation, for the continuous guidance and encouragement given by the UNIDO Country Director, Mr. George Tabah and Programme Officer, Mr. Koenraad Goekint.

Grateful thanks are due to many of the officials in Government and financial institutions whose cooperation and assistance has contributed significantly in getting the information required for the preparation of this report.

July 1993

AMARNATH KAMATH & CO.

ANNEXURES

LIST OF ANNEXURES

ANNEXURE-1

ACKNOWLEDGEMENTS

LIST OF PRINCIPAL ORGANIZATIONS, COMPANIES AND PERSONS CONTACTED BY M/S AMARNATH KAMATH & CO.

Between 7 November 1992 and 23 January 1993

Organization/Company	Person(s) met
I. Government departments:	
Ministry of Planning and Economic Development	Mr. E. Tumusiime-Mutebile Permanent Secretary
Ministry of Industry and Technology	Ms. Kinalwa Permanent Secretary
	Mr. T. Langoya, Commissioner for Industry
	Mr. Martin Onyach Olaa Senior Indl. Officer
UNDP/UNIDO	Mr. T. Teshome Resident Representative
	Mr. George Tabah Country Director
	Mr. Koenraad Goekint Programme Officer
Masaka Food Processors Limited	Mr. G.W. Kisenyi General Manager
	Mr. Peter K. Ssebalamu Plant Engineer
	Mr. David Ssegwanyi Quality Controller/Chemist
	Mr. R. Mutambuza Food Technologist
	Mr. J. L. Mukasa Accountant
Masaka Co-operative Union Limited	Mr. E.S. Ssenyonga Chief Accountant
	Mr. Edward C. Sseruima General Manager
	Mr. Lukyamuzi Personnel/Administration Offic

ANNEXURE-2

REFERENCE LIST

1. UNIDO Industry Sector Programming Mission to Uganda, UNIDO, Project: PPD/R.36 , May 23, 1990.

2. Technical and Financial Assessment of Investment Options, Masaka Food Processors Ltd., by R. Russell Read, Agro-processing specialist, Uganda Co-operative Alliance, July 9, 1991.

3. Final report on the evaluation of Plant operations, Raw product, Plant modification, by Robert W. Fures, Food Processing Specialist, VOCA, April 13, 1992.

4. Budget Speech, delivered at the meeting of the National Resistance Council in the Parliamentary Buildings on June 30, 1992, by the Minister of Finance.

5. Industrial Development Review Series, UGANDA, Indl. Investigation and Revitalization, PPD.230, October 9, 1992.

6. Ministry of Planning & Economic Development, Background to the Budget, 1991-1992, Republic of Uganda, June 1991.

7. World Bank, Uganda: Public Indl. Enterprise Restructuring Study, April 10, 1987.

8. Uganda Investment Authority, A Guide to Investing in Uganda, September 1991.

9. The Economist Intelligence Unit, Country Profile - 1991-92: UGANDA, LONDON, EIU, 1992.

10. Brief on 'The Public Industrial Enterprises Secretariat', January 1992.

11. Mission report on Quality Control Programme by Joshua Glover-Tay, Quality Control Consultant, FAO TCP/UGA/8955, December 1989.

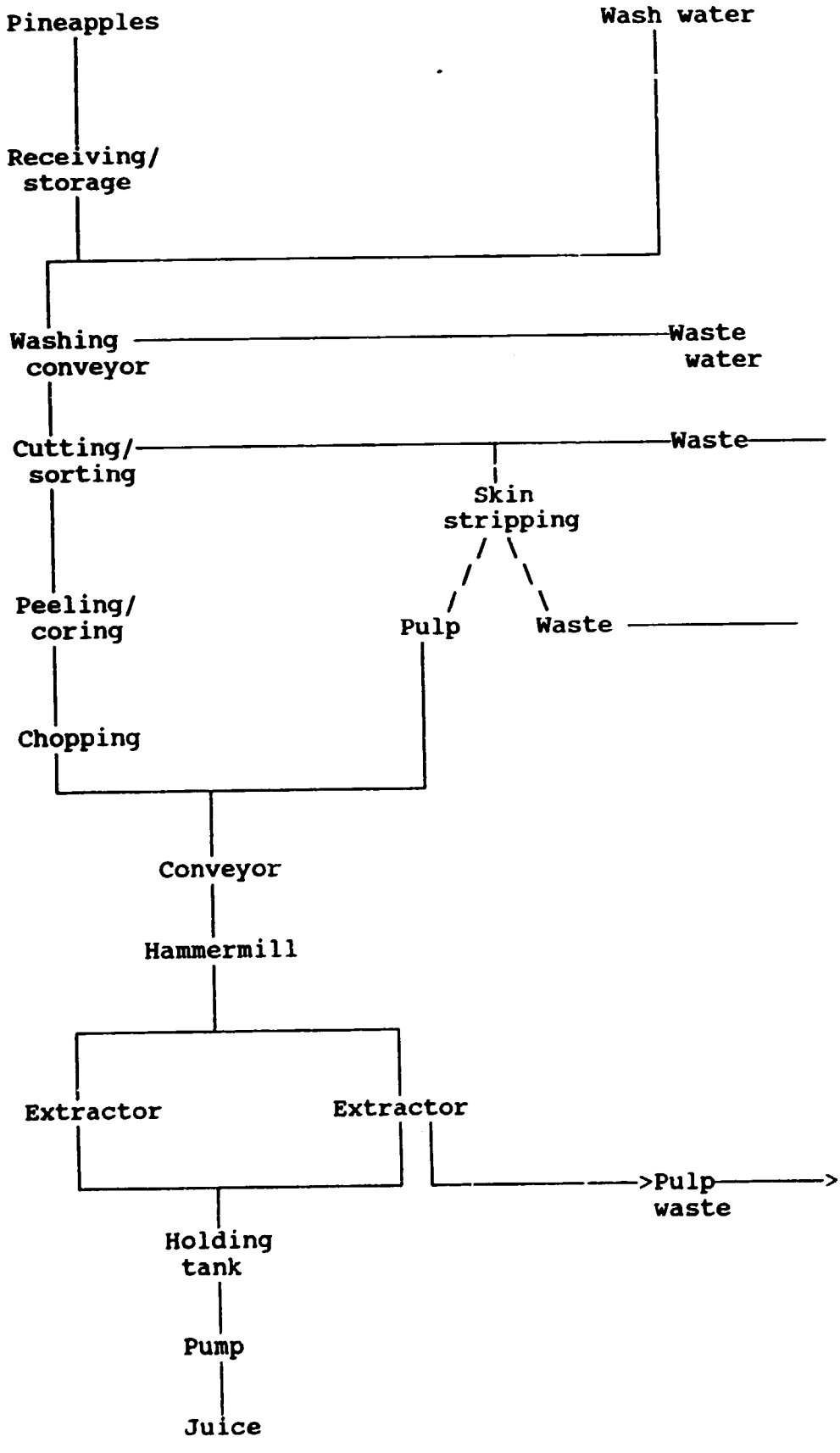
ANNEXURE-3

JUICE YIELD ON PINEAPPLES

Details of experiment	Manual peeling and maximum extraction of all the juice from the whole fruit.	Manual peeling, Maximum extraction of juice from cylinder and using the skin stripper
1. Mass of pineapple with crown	5237 gms.	5458 gms.
2. Mass of pineapple without crown	4628 gms. (whole fruit)	4824 gms. (whole fruit)
3. Mass of crowns	609 gms. (not paid for)	634 gms. (not paid for)
4. Mass of offcuts and peels	1984 gms. (43% of whole fruit)	2087 gms. (43% of whole fruit)
5. Mass of cores	249 gms. (5% of whole fruit)	173 gms. (4% of whole fruit)
6. Mass of cylinder	2275 gms. (49% of whole fruit)	2412 gms. (50% of whole fruit)
7. Mass of juice from cylinder	1795 gms. (39% of whole fruit)	1930 gms. (40% of whole fruit)
8. Mass of juice from offcuts plus peels	1174 gms. (25% of whole fruit)	539 gms. (11% of whole fruit)
9. Mass of juice from cores	179 gms. (4% of whole fruit)	105 gms. (2% of whole fruit)
10.Total mass of juice	3148 gms. (68% of whole fruit)	2574 gms. (53% of whole fruit)
11.Total residue to waste	1343 gms. (29% of whole fruit)	2125 gms. (44% of whole fruit)
12.Mass defect	137 gms. (3% of whole fruit)	125 gms. (3% of whole fruit)

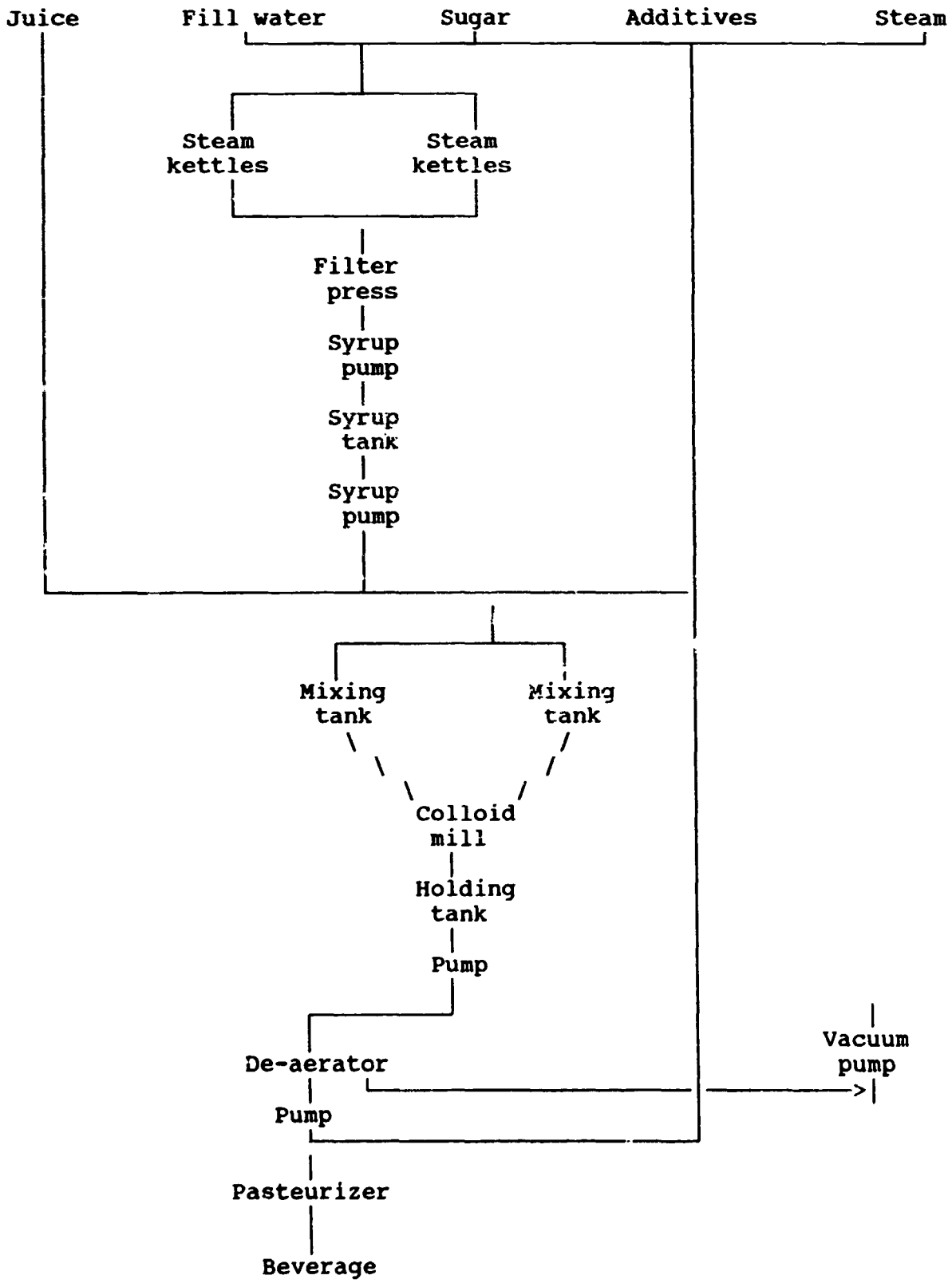
ANNEXURE-4

PREPARATION AREA FLOWCHART



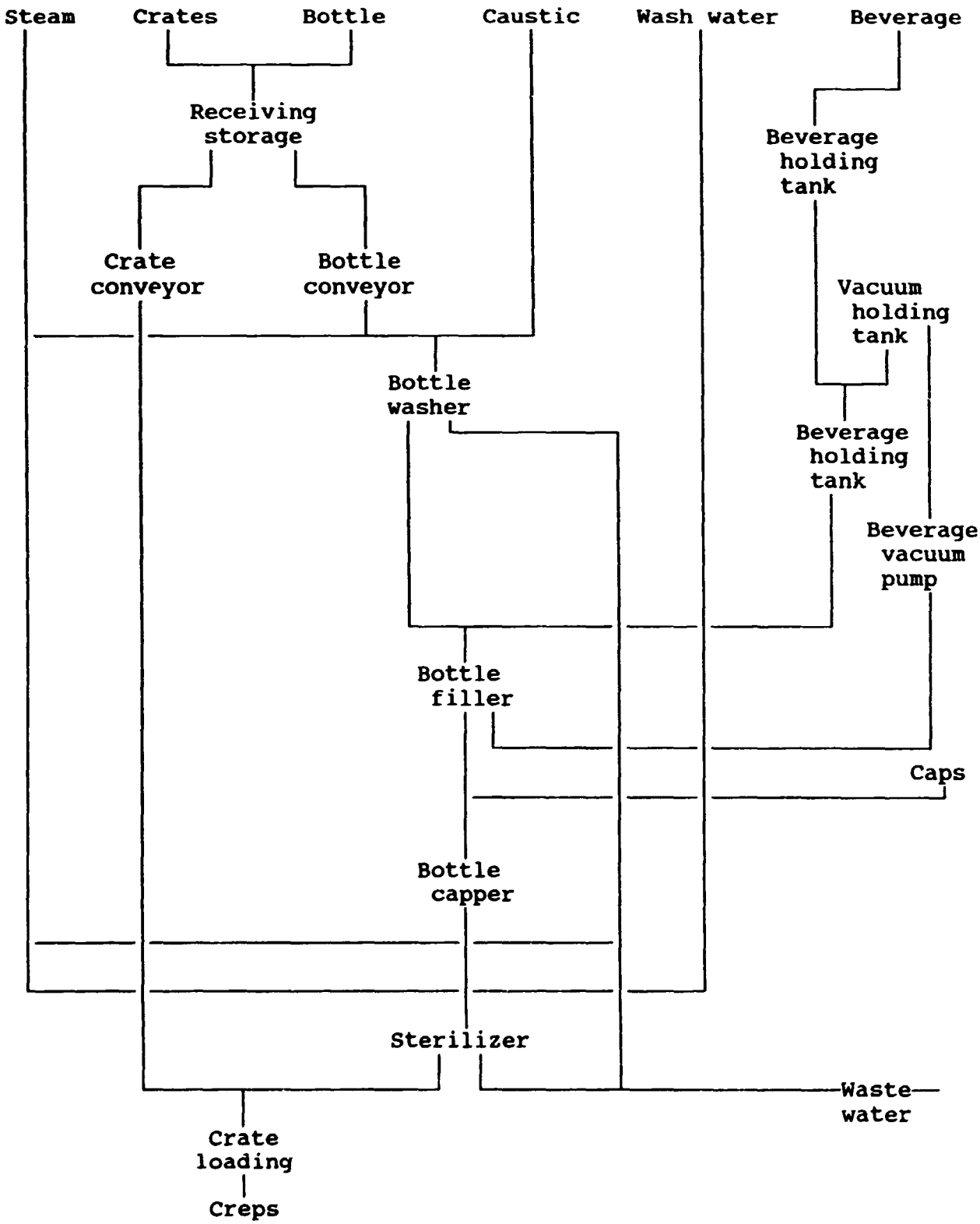
ANNEXURE-4 (Contd.)

BLENDING PROCESS FLOWCHART



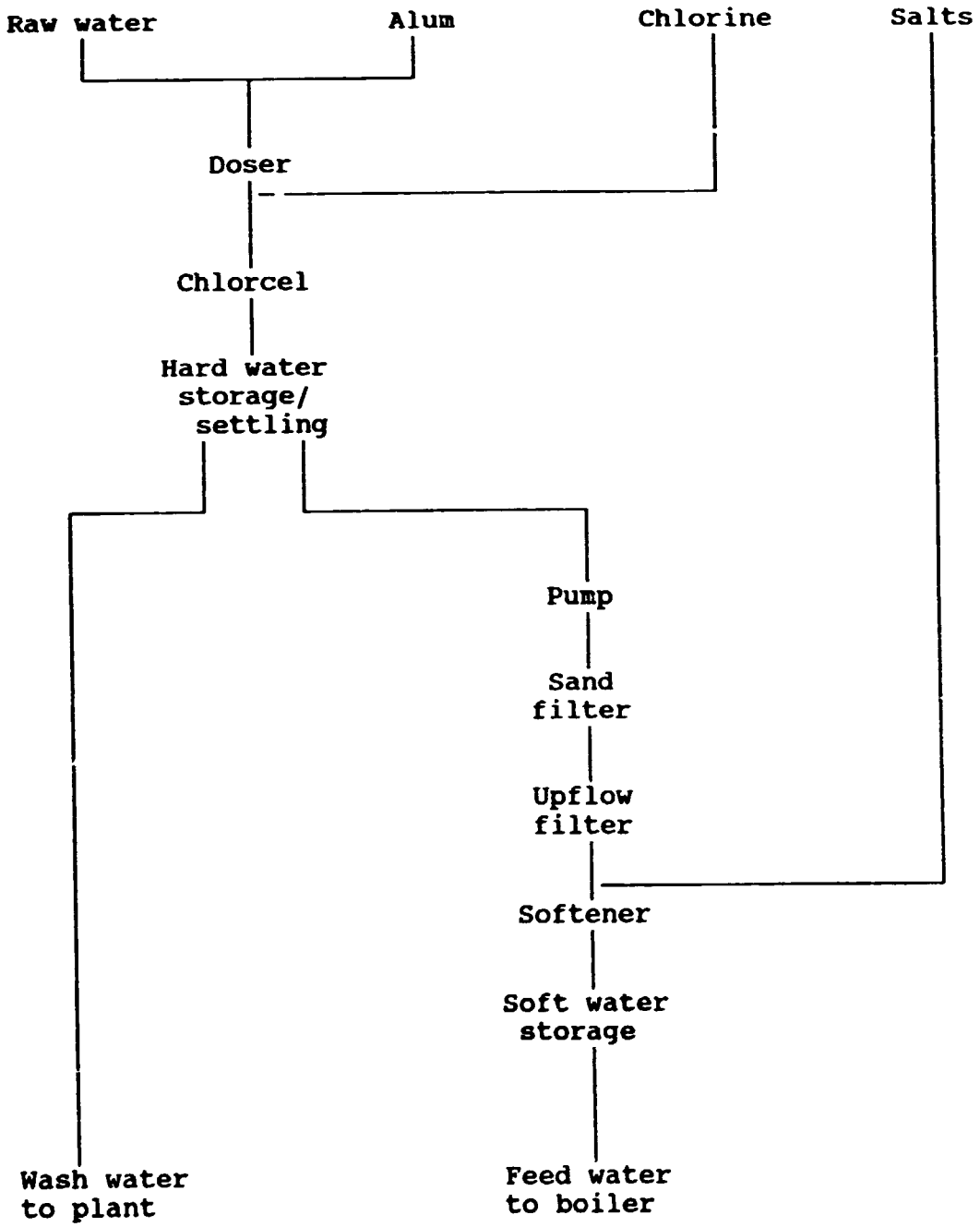
ANNEXURE-4 (Contd.)

BOTTLING AREA FLOWCHART



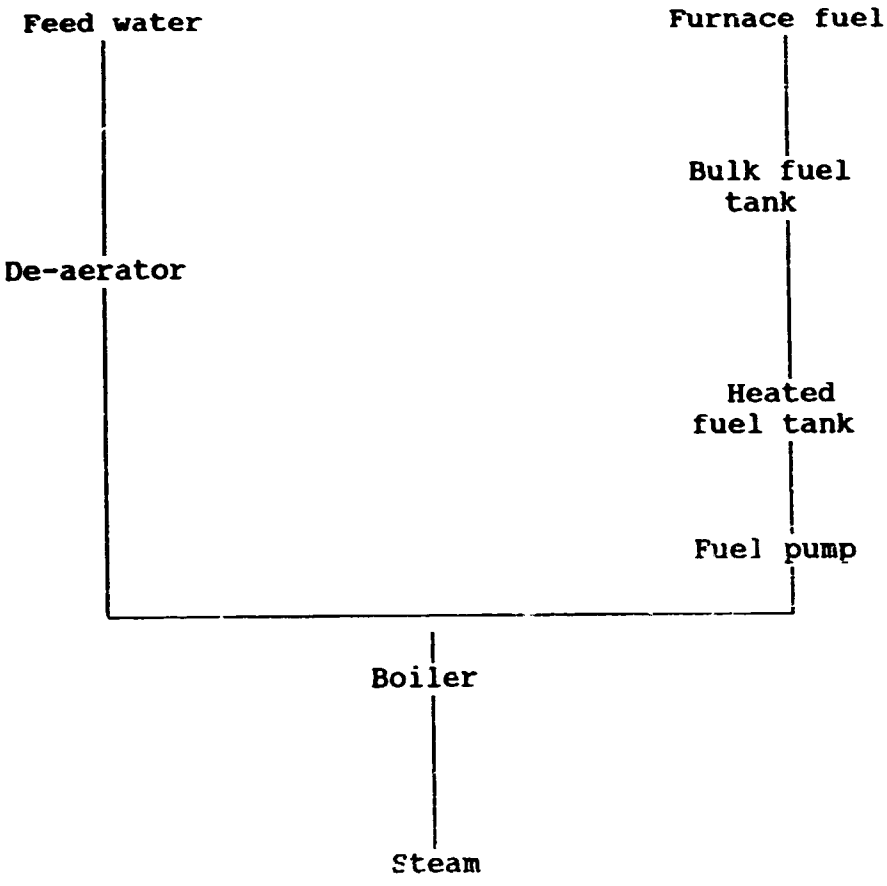
ANNEXURE-4 (Contd.)

WATER TREATMENT AREA FLOWCHART



ANNEXURE-4 (Contd.)

BOILER AREA FLOWCHART



ANNEXURE-5

SUMMARY OF TECHNICAL CONDITION OF THE PLANT

Machine name and quality	Purpose of the machine	Machine capacities		Comments
		Contract	Actual	
Fruit washer with blower (1 pc.)	To wash and convey pineapples to water trough	Up to 1500 Kgs. of fruit per hour	3000 - 4000 Kgs. of fruit per hour	Conveyor is under-utilized but adequate for the task. High pressure nozzles can be attached with a separate pump to improve cleaning.
Corers and sizers	To remove the peels and cores from the pineapples	Up to 15 fruits per minute per machine depending upon efficiency of operator	5-7 fruits per minute per machine	One machine has been modified and repaired. This may not be necessary since fruits are peeled/ sliced manually.
Gooseneck elevator	To convey chopped pineapples to the fruit mill	Up to 1500 Kgs. of fruit per hour	2500-3000 Kgs. of fruit per hour	Conveyor is under utilized but adequate for the task. The drive of conveyor will be modified to slow it down from 100 to 50 buckets per minute. Overloading of individual buckets should be avoided.
Fruit mill	To crush chopped pineapples prior to juice extraction	Up to 1500 Kgs. of fruit per hour	800-1000 Kgs. of fruit per hour	Mill does not effectively hammer particles larger than 1/2" cubes. Chopped pineapples average 2" cubes. The motor speed and nylon brushes have to be redesigned & an optimum operating condition decided.
Screw-type juice extractor (E)	To extract juice from chopped and crushed pineapple slurry	Up to 1500 Kgs. of fruit per hour	600 - 700 Kgs. of fruit per hour	Machine will be redesigned/modified to increase juice yield to 60 - 70% by weight of whole pineapple.

ANNEXURE-5 (Contd.)

SUMMARY OF TECHNICAL CONDITION OF THE PLANT

Machine name and quality	Purpose of the machine	Machine capacities		Comments
		Contract	Actual	
Juice (SS) collection tank	To collect juice from extractor	225 litres	150 litres	Tank cannot store sufficient juice for multiple batches. 300 - 450 litres SS tank to be procured or fabricated.
Product pumps	To pump juice beverage and syrup from one place to another another	900 litres of beverage per hour	1000 litres of liquid per hour	Spare rubber stators urgently needed for these progressive cavity screw pumps. To be arranged.
Pineapple skin stripper	To strip the skins off fruit to reduce extraction losses	Peels off 25 pineapples per minute depending on operator efficiency	Peels off 15 - 20 pineapples per minute	This equipment is not necessary if proper manual peeling is done.
Stainless steel with paddle type stirrers	To mix juice with sugar, water chemicals and additives to make beverage	450 litres	450 litres	Both tanks capable of holding 10 batches of beverage each (1000 - 1200 crates) per day.
Colloid mill	To break and crush all solid & fibrous particles in the beverage to extremely fine particle size which inhibit sedimentation	600 litres of beverage per hour	1800 litres of beverage per hour	Machine does not homogenize product to required level of fineness due to wearing out of grinders. The parts have to be replaced.
Stainless steel holding tanks	To collect homogenized beverage from the homogenizer to prevent it from fermenting	Not mentioned	200 litres of liquid per tank	The homogenized beverage holding tank is too small for continuous operation. 300 - 450 SS litre tank will have to be procured/ fabricated.

ANNEXURE-5 (Contd.)

SUMMARY OF TECHNICAL CONDITION OF THE PLANT

Machine name and quality	Purpose of the machine	Machine capacities		Comments
		Contract	Actual	
Spray type deaerator with vacuum pump	To evacuate air from the beverage to prevent it from fermenting	1500 litres of beverage per hour. To have preheater	1000 litres of beverage per hour. Has no preheater	Preheater to be attached
Tubular type pasteurizer	Uses steam to heat the beverage to 90 degrees C. to pasteurise it.	Up to 1500 litres of beverage per hour. Consumes 160 kg of steam per hour.	1000 litres of beverage per hour. Consumes 160 Kgs of steam per hour.	Steam leakages be repaired.
Stainless steel steam jackered kettles	Uses 50 Kgs of steam per kettle to heat and dissolve the sugar in water to form syrup	225 litres per kettle	200 litres per kettle. Syrup ready within 25-30 minutes	Steam leakage to be repaired.
Filter press with pump	To rid the syrup from suspended & foreign particles.	Not indicated	250 litres of Syrup per hour.	Filtering is accomplished using muslin cloth. Spare filter cloth to be procured.
Hydro bottle washer Model: DHW - 110	To wash bottles from the market prior to filling & crowning. Uses hot caustic solutions and fresh water.	60 bottles per minute. Machine consumes 250 Kg. of steam at 4 bar per hour	80 bottles per minute.	Present speed of machine is good. Machine needs several modifications, repairs & spares to update it. List of spares being procured.

ANNEXURE-5(Contd.)

SUMMARY OF TECHNICAL CONDITION OF THE PLANT

Machine name and quality	Purpose of the machine	Machine capacities		Comments
		Contract	Actual	
Stainless steel lagged holding, filling & vacuum tanks	To contain and keep the pasteurised beverage hot & fill it in the bottles prior to crowning	450 litres 50 litres 25 litres	450 litres	Automatic control systems to be designed, made & installed to prevent daily overflow losses and manual stirring.
16 Head rotary filling mach. with vacuum pump	To (vacuum) fill the hot beverage in the bottles prior to crowning	70 bottles per minute	50 bottles per minute	Machine has been worked on recently and it performs satisfactorily Spare filling nozzles and F.Q. tubes to be be procured/fabricated
5 station rotary crown corking machine	To cap or seal the filled beverage bottles.	70 bottles	20 - 25 per minute	Machine very inefficient: breaks too many bottles, spoils many caps
Air compressor	Compressor blows out broken bottles from cork receivers			Does not seal properly, wastes lot of production time. Machine to be replaced.
Bottle sterilizer with bottle conveyor & crate conveyor	To heat the filled and crowned beverage bottles to 90 deg. C. in order to sterilize them. Bottle conveyor brings in the bottles. Crate Conveyor brings in empty crates	70 bottles	20 - 25 per minute	Machine recently modified and its performance is satisfactory. However, steam leakages and strainers to be repaired.

ANNEXURE-5(Contd.)

SUMMARY OF TECHNICAL CONDITION OF THE PLANT

Machine name and quality	Purpose of the machine	Machine capacities		Comments
		Contract	Actual	
Steamax boiler Model: ST-10/F/15/P/11 - Fully automatic - High pressure - Forced draught - Forced circulation - Water Coil - Packaged boiler	To generate process steam at 13 bar (W.pressure) and 192 deg C	Evaporative 1000 Kg of dry saturated steam per hour at 15 bar (Max safe) pressure). Power output 780 Watts. Conn. Load. 12 KW(UEB)	Evaporative 800 - 1000 Kg. of dry saturated steam at 15 bar(Max. safe pressure) Power output 774 watts. conn. load: 13.5 KW (Max.) PF=0.8(UEB)	Total steam utilized approx. 700 Kgs per hour. Boiler satisfactory for task. Should reduce steam generation pressure to 10 bar and reduce steam leakages. To improve oil feed & filtration system.
Steam distribution system	To take steam to the various receivers at the required temperatures & pressures	Sizes: Pipes and fittings 50 mm, 40 mm, 32 mm, 25 mm, 20 mm, 12 mm. diameters. Max. lengths 20 ft.	Sizes: Pipes and fittings 50mm,40mm, 32mm,25mm, 20mm,12mm. diameters. Max.lengths 20 ft .	Steam distribution poorly designed resulting in damage of vital fittings and energy wastage. Modification and repair work to be be done.
Steam condensate recovery and utilization system	To collect all steam condensate from the receivers & put it to good use in the factory, like washing of bottles & preheating beverage before it is pasteurized	No mention.	None.	Almost 700 Kgs. of steam condensate per hour is escaping daily (with temperatures close to 97 deg. C) Over 200 MJ/ Hr. of heat are lost this way. So waste heat recovery and management will have to be done.

ANNEXURE-5(Contd.)

SUMMARY OF TECHNICAL CONDITION OF THE PLANT

Machine name and quality	Purpose of the machine	Machine capacities		Comments
		Contract	Actual	
AC-Generator Frame SOA725 M/c No. 83301AG-34	To generate electricity	Not specified	100 KVA 1500 RPM 415 V 139.5A 3 - Phase. 50 HZ Pf 0.80	Max. total electric load for the whole factory is 104 KW. Generator satisfactory for task. Spare parts not in stock. List of spares required from manufacturers.
6 YDX Diesel fired engine.	To drive the Ac-generator	Not specified	1500 RPM 122.5 BHP BSS: 649 6 Vertical Cylinder Diesel Engine & Water cooled	Consumes 13 - 14 litres of diesel oil per hour at full load. Engine satisfactory for task. Spare parts to be procured.
Automatic mains failure (AMF) Panel model: 4448/110 Sr. No. 4831012/ 820284	-To monitor U.E.B.line volts. -To monitor the generator voltage -To start the engine -To shut down the engine -To protect the engine	Not specified	100 KVA 415 V 139.5A 3 Phase 50 HZ Pf 0.80 24 V d.c 4 Watts	LVM not operational due to lack of spare module. Spare supplied not adequate and some are absent. Spares to be procured.

ANNEXURE-5(Contd.)

SUMMARY OF TECHNICAL CONDITION OF THE PLANT

Machine name and quality	Purpose of the machine	Machine capacities		Comments
		Contract	Actual	
Halving machine	To cut hard skin fruits like passion frt., oranges & mangoes into two fairly equal halves	80 fruits per minute	50-60 fruits per minute	Suitable for domestic and study purposes.
4-Head rosing machine	To extract juice from orange halves.	50-60 fruits per minute	2-3 oranges per minute	Not cost effective, wastes too much time and unsafe to operators.
Course and fine juice pulpers	To extract juice from passion fruits & tomatoes	300-350 Kgs of fruit per hour.	80-100 Kgs of fruit per hour	Suitable for domestic and study uses.
Brush washer	To wash/scrub squash bottles	Not mentioned	4 bottles	Suitable for domestic and study uses.
Jet bottle washer	To wash/rinse squash bottles	Not mentioned	24 bottles	Not cost effective and wastes too much time. Domestic machine.
SS mixing tank with propeller type stirrer	For mixing squash products	450 litres	450 litres	
2 Head vacuum filling machine with vacuum pump	To fill fruit squashes in to 750 ml. bottles.	Up to 400 bottles per hour	200-250 bottles per hour	Metal contact parts were supposed to be in stainless steel. Today filling is successfully achieved by siphoning

ANNEXURE-5(Contd.)

SUMMARY OF TECHNICAL CONDITION OF THE PLANT

Machine name and quality	Purpose of the machine	Machine capacities		Comments
		Contract	Actual	
Hand operated pilfer proof capping machine	To seal 750 mls filled squash bottles	Up to 400 Bottles per hour	80-100 bottles per hour	Machine breaks too many bottles; spoils plenty of caps and has mechanical defects.
Water treatment plant with proportional doser, Chlorine doser, Centrifugal pump, Sand filter, Upflow filter and Softener	To clarify and soften all water for the plant	Not specified	Volumetric flow rate of water is 18 cubic metres per hour	Essential instrumentation (e.g.Hardness test kit; chlorine test kit and TDS meter) and spares (e.g.solution bags, (approx.) resin, activated carbon and brinometer) were not supplied. However, plant sufficient for factory operations. Not being operated properly. Resins to be changed.
Radial and axial drilling machine	For radial and axial drilling operations	Not specified	Drilling speeds 80-2600 rpm.	Machine not satisfactory for tasks.
Small lathe machine	For various lathe works e.g.turning, boring, thread cutting, parting, etc.	Not specified	Machine chuck can hold work 12-13" D (Max)pipes & shafts less than 1 1/2"D. 8 speed spindle 45-938rpm	Machine tools not supplied.

ANNEXURE-5(Contd.)

SUMMARY OF TECHNICAL CONDITION OF THE PLANT

Machine name and quality	Purpose of the machine	Machine capacities		Comments
		Contract	Actual	
Bench grinding machine	For grinding	Not specified	Grinding wheel of 250 mm. Dia.	Machine satisfactory for task.
Arc welding transformer Type: AW300	For electric arc welding operations	Not specified	240A 15KVA up to 55% duty cycle, 170A (upto 100% duty cycle) Max welding, current for 1/2 hour= 300A Air cooled machine	Machine satisfactory for task.

ANNEXURE - 6

ORGANISATION CHART