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MANDERSTAM

CONSULTING SERVICES

Feasibility Study
On
The Establishment of Citrus Fruit
And Tomato Processing Plant

Project No: XA/ZIM/92/609

207p
tables
graphs
diagrams
maps
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FEASIBILITY STUDY

on

THE ESTABLISHMENT OF CITRUS FRUIT AND TOMATO PROCESSING PLANT

PROJECT NO: XA/ZIM/92/609

on behalf of

United Nations Industrial Development Organisation
PO Box 300
A-1400
VIENNA
Austria

Manderstam Consulting Services
2.08 - 2.09 Plaza
535 Kings Road
Chelsea
LONDON SW10 0SZ

Tel: 071 730 9224
Fax: 071 823 3056

August 1994

CONTENTS

ANNEXES

FOREWORD

This Study represents the Final Report on Tomato and Citrus Processing completed as a Draft Report by Manderstam Consulting Services for UNIDO and the Government of Zimbabwe in December 1993.

The Draft Report concluded that any further investment in Tomato processing capacity would not be profitable, but that Orange Juice Packing would deliver commercial returns to an investor.

The Draft Report was reviewed with UNIDO, ACI and Ministry of Industry representatives in Harare, 7-8 June 1994.

As a result of the review, it was decided by UNIDO and MCS that the Draft Report should be corrected and amended as requested by UNIDO to represent the Final Report, and that the section on Orange Juice should be updated using costs data provided by the investor ACI, and produced as a separate study volume, -the Zimbabwe Orange Juice Project, (ZOJP).

VCW/MCS
July 1994

FOREWORD

0.1.1. The Chapter, Section and Paragraph notation follows UNIDO's Terms of Reference, eg 3.B.a. Where no index numbers are indicated in the ToR, sections and paragraphs are notified in numerical sequence, eg 4.3.(i), all in the left-hand margin. Short tables are included in the text against a Chapter, Section and paragraph number. Long tables including COMFAR tables are found in the Annexes.

0.1.2. References in the text are denoted [ ] referring the reader to a Chapter, Section and paragraph elsewhere, to avoid repetition; or { } referring to a COMFAR entry for Financial and Economic calculations; or ( ), referring the reader to References and Citations in Annex 2.

0.1.3. **CURRENCY DENOMINATION**

Z $ = the Zimbabwe Dollar, at current prices, unless otherwise stated. The decimal place is conventionally denoted by a point . not as is customary in Zimbabwe, by a comma.

0.1.4. **FOREIGN EXCHANGE RATES**

The Exchange Rates adopted for the study are those middle rates reigning on 11 Feb 1993:

One Foreign Currency Unit		Z$
US $	=	6.4
RSA Rand	=	2.05
UK Pound Sterling	=	9.1
DM	=	3.85
Japanese Yen	=	0.052
Italian lira	=	0.0041

0.1.5. ACRONYMS & ABBREVIATIONS

ACI	=	Alison Canning Industries (Pvt) Ltd
ADA	=	Agricultural Development Authority
CIF	=	Costs of Insurance and Freight
CSO	=	Central Statistics Office
DTT	=	Dilute to taste
ESAP	=	Economic Structural Adjustment Programme
FAO	=	Food and Agricultural Organisation
FOB	=	Free On Board
GDP	=	Gross Domestic Product
GRZ	=	Government of the Republic of Zimbabwe
HPB	=	Horticultural Promotion Board
ITC	=	International Trade Centre
MIC	=	Ministry of Industry and Commerce
OGIL	=	Open General Import Licence
OPC	=	Own Produce Consumed
R&D	=	Research and Development
RTD	=	Ready to Drink
SSE	=	Small Scale Enterprise
ZAP	=	Zimbabwe Association of Packaging
ZIC	=	Zimbabwe Investment Centre

Other Acronyms in the text are given with addresses in References and Citations, Annex 2.

0.1.6. ACKNOWLEDGEMENTS

Manderstam Consulting Services acknowledge with thanks the immense assistance availed for this Study by all Government officials, private sector representatives, and international agencies in Harare.

0.1.7. MANDERSTAM CONSULTING SERVICES (MCS)

This feasibility study was undertaken by

Manderstam Consulting Services
2.0 -2.09 Plaza
535 Kings Road
Chelsea
LONDON SW10 0SZ

Tel: 071 730 9224
Fax: 071 823 3056

CHAPTER I

EXECUTIVE SUMMARY

1.1. CONCLUSIONS

1.1.1 Tomato Processing

An investment in a quality plant to process tomato grown at the Norton Estate near Harare would have too small a market to cover factory costs. Alison Canning Industries (Pvt) Ltd. (ACI) would meet strong barriers to entry in Zimbabwe's fiercely competitive and generally over-supplied market.

With improvements to its irrigation and professional farm management however, the Norton Estate could grow tomato for the local market, for local processing and some varieties for export. Other market produce should be systematically tested on the farm.

1.1.2. Citrus Processing

An investment by ACI at its Norton Estate in aseptic packing of orange juice is likely to be profitable. There is however no comparative advantage for the company in growing oranges of any variety at the Estate. As supplies of orange concentrate and of fresh orange from sources in Zimbabwe will be limited until 1997/8, ACI should import orange concentrate as its raw material. ACI's existing operations, including tobacco farming and curing at Norton, may deliver transfer subsidies to the Fruit Juice Packing line to offset additional locational, operating and market entry costs.

1.1.3. **Summary**

	NORTON FARM		ACI FACTORY	
	GROW	MARKET	PROCESS	MARKET
TOMATOES	yes	local	no	no
CITRUS	no	no	yes	Local/ PTA
BEANS/ PEAS	test	yes	later	test

1.2. **RECOMMENDATIONS**

1.2.1 **Cap 2. Project Background**

Farm and factory investments flourish in Zimbabwe. Existing infrastructure and human resources favour agro-industry development, and over time offset the climatic disadvantage of the prolonged dry seasons, May-Oct. Generally profitable tobacco farming and beef ranching are able to finance many non-traditional food production projects. Current ownership patterns are not however the best determinants of where agro-industries should be located: nationwide sectoral studies should be.

1.2.2 **Cap 3. Market and Plant Capacity**

The Zimbabwe domestic market for processed foods and beverages is highly fragmented.

Given the levels of supply, insufficient market gaps exist domestically and in neighbouring countries of the PTA or extra-regionally to warrant investments by ACI now in further capacity to supply tomato products, peeled, juiced or paste. Local demand will however provide outlets for fresh tomato grown on the Norton Farm. For tomato paste, demand in 1994 is estimated at 1,242 tonnes of which ACI might supply 162 tonnes with a further 20 tonnes for export. Therefore a 6t/h plant the smallest industrial technology available to produce quality paste is examined in this study with an annual capacity of 1,820 tonnes packed in 15.826

million 115 g cans. An exceptional marketing effort would be however be required by ACI to sell even 10% of this output in the first operating year.

Orange Juice is a different matter. The local market is not over-supplied, supplies are either sub-standard or imported from South Africa, and by 1997/8 local output of fresh orange will be sufficient to provide ACI with raw material. In the domestic market and in neighbouring countries of the PTA Region, demand is sufficient to justify a Zimbabwe source of supply of an aseptically-packed pure orange juice to compete with local suppliers and with imported products. The total domestic demand in 1994 for orange juice is estimated at 2.91 million litres. As the sole supplier of pure orange juice, ACI's first year domestic sales are projected at 1.59 million litres and exports at 0.8 litres. The plant capacity recommended is 3m litres a year of single strength orange juice, packed in 12 million 250 ml Tetra Pak packs (83).

New investments in Zimbabwe's processed foodstuffs industry are insufficiently documented. We recommend they should be monitored systematically, and publicised for investors by the Zimbabwe Investment Centre in Harare.

1.2.3 **Cap 4. Materials and Input**

Mazoe Citrus Estates have insufficient output to supply ACI with Orange Juice concentrate. New sources in Zimbabwe of process fruit are expected to be available in 1997/8 from orchards that have been planted over the past five years.

As the world supply of concentrate dominated by Brazilian output is low priced at US$1200 a tonne, we calculate that imported concentrate would provide ACI with a raw material for a profitable packing operation.

Tetra Pak Ltd are able to supply ACI with aseptic packing materials. The company already services the Dairy Corporation in Zimbabwe from a local base in Harare.

1.2.4 **Cap 5. Location, Site and Environment**

The location favours mixed farming or market gardening. At 50 kms from Harare it is near enough to a major Zimbabwe market for selling fresh tomato and processed juice. The local skills available to ACI are not yet trained for intensive farm or factory production, and will need time to acquire the essential disciplines. The recommended actions pose no special problems for the environment.

1.2.5 **Cap 6. Project Engineering**

The technology recommended for aseptic packing of Orange juice is Tetra Pak, who have no existing fruit juice packer in Zimbabwe, but are supplying the Zimbabwe Dairy Corporation with its packing system. The filling line is fully automated.

The technology recommended for tomato paste processing is designed to meet higher standards than have been common in Zimbabwe. The canning line could use 115 g cans supplied by the Harare can manufacturer, Carnaud Metal Box. Engineering outlines for tomato paste production are provided in case other planned supply sources in Zimbabwe fail to materialise and ACI finds it has a market gap it can fill.

1.2.6 **Cap 7. Plant Organisation & Overhead Costs**

The Tetra Pak factory is planned and costed as a stand-alone operation. In practice, ACI will find that much of its existing group management, labour force and infrastructure can be shared with the Tetra Pak line, substantially reducing overhead costs.

1.2.7 **Cap 8. Manpower**

There is adequate manpower in the Norton area to supply the workforce needed for expanded farm operations and for a new processing plant. The training phase may however need to be extended. Government is recommended to provide further support to the various Food Technology training institutions in Zimbabwe so that quality Control and food hygiene expertise is more readily available than at present. Special job opportunities for women exist in our proposals

for both farm and factory.

1.2.8 **Cap 9. Implementation Schedule**

An Investment decision in early 1994 could lead to plant commissioning by the third quarter 1994.

1.2.9 **Cap 10. Financial and Economic Evaluation**

Many benefits can accrue from diversified activities on estates such as that at Norton. Benefits include expanded employment and training opportunities for women. The limiting factors for any agricultural or industrial development at Norton are the market entry barriers for output sales and scarcities of middle management and skilled labour, not natural resource restrictions.

The recommended orange juice product line should be profitable if costs are controlled to the limits recommended. All manufactured output in Zimbabwe is very sensitive to foreign exchange rate changes determining imported material costs -in this case laminated packs and imported orange concentrate. The orange juice line is only viable if its sale price can be kept in line with Zimbabwe's high inflation rates that have been affecting investment planning since the drought of 1991/2.

Given tight costs control for the Tetra Pak line, the Financial rate of return on the investment - IRRE2- is calculated to be 48%. The Internal Rate of Return on the Orange Juice investment is 35%. The Economic rate of return with imported concentrate and packaging is negative, with foreign exchange cash flows in deficit until year 15. When local orange concentrate is substituted for imported concentrate, the forex cash flows, and employment linkages with agriculture, improve considerably. In this case, and with no additional export sales, the foreign cashflow would move into surplus in year 5.

The Tomato paste investment shows a small rate of return at 10%, below the threshold for viable investments. It faces prohibitively high market entry risks, and is not a recommended investment at this stage.

CHAPTER II

PROJECT BACKGROUND AND HISTORY

2.1. THE AGRICULTURAL SECTOR IN ZIMBABWE

2.1.1. The Agricultural sector in Zimbabwe was hard hit by the 1991/2 drought, with output reduced by an estimated 35%. Over the long term however, agricultural employment and output dominate the economy of Zimbabwe, and after Manufacturing, have shown the most rapid growth rates. Of the economically active population estimated at 3.921 million in 1991, 67.7% were engaged in agriculture,(81). Sectoral GDP contribution including forestry since 1987 has been averaging 17%,(1):

Gross Domestic Product, by Sector of Origin, at Factor Cost, Current Prices Z $ m

	1987	1988	1989	1990	1991	1992
Agriculture & Forestry	1123	1596	1753	2391	3709	5692
% of total GDP	13	16	15	16	19	22
Manufacturing	2099	2513	3162	3691	5585	7760
Total GDP	8419	10184	12114	14702	19587	25790

Source: IMF Stats Flash. Feb 1993.

Crop Production specifically declined by 29.6% in value a result of the drought in 1991/2. All kinds of farming suffered loss of output: commercial farms averaging 2,200 ha in size suffered but not as badly as small scale farmers working Communal Land averaging 125 ha in size. Farm produce from both sources and household produce declined from October 1991, with the consequence that food shortages forced normally self-sufficient households to turn to processed food supplies. Increasing proportions of disposable income had to be spent on foodstuffs, to the detriment of manufactured goods. Previous annual crop outputs from both sectors had shown an upward trend:

	Major Crop Sales: by Communal Farms	Commercial Farms	ZS m Total
1983	45.6	451.1	496.7
1984	103.2	603.5	706.7
1985p	224.9	861.5	1,086.4
1986	221.9	960.5	1,182.4

Source: ISO Statistical Yearbook 1989 Table 11.22,(1).

The principal source of growth in agricultural gross output value has been tobacco from Commercial Farms. In the 1991/2 season tobacco sales reached a record 201,104 tonnes worth ZS1.63 bn. Prior to the drought there had been strong growth as well in grain and industrial crops:

2.1.2. **Agricultural Output in Zimbabwe ZS 000**

CROP	1987	1988	1989	1990p
Tobacco	384,152	485,679	576,897	888,583
Maize	89,131	123,980	160,608	127,997
Wheat	26,086	37,747	100,434	147,497
Coffee	14,485	36,585	51,892	50,857
Cotton	87,705	107,553	116,108	106,356
Sugar	90,042	127,454	185,371	215,895
Tomatoes	4,426	7,210	7,628	9,611
Citrus	8,196	9,091	10,265	12,597

Source: CSO, Production Account of Agriculture, Forestry and Fishing (Excluding Communal Lands and Small Scale Market Gardening) 1982-90, (1)

2.1.3. **Manufacturing Input Industries** for agriculture located in Zimbabwe have reflected agricultural growth. The gross output of Domestic fertiliser and insecticide production are contained within the reported Industrial Group statistics for Chemicals and petroleum products, and tractor and trailer assembly is contained within the series for Transport Equipment. (Confidentiality rules in Zimbabwe do not allow the CSO to report output volumes of values for sectors in which there are fewer than 4 enterprises).

	Chemical and Petroleum Products	Transport Equipment	Z$ m
1982	477.6	99.7	
1983	557.1	145.4	
1984	545.3	161.6	

Source: CSO Annual Census of Production

While the number of Tractors for Farm Use has remained very constant at 15,763 in 1983 and 16,142 in 1990 as a result of severe import restrictions, spending by commercial farmers on the maintenance of vehicles, plant and equipment has increased from Z$ 47.442 m in 1983 to Z$ 142.098 m in 1990. Zimbabwe's Packaging Industry however supplying bags, sacks, cartons and cans for Commercial farm produce grew from Z$ 7.125 m in 1983 to Z$ 21.916 m in 1990,(10).

2.1.4. **Manufacturing Output Industries** in Zimbabwe adding value to agricultural output provide the downstream linkages in a vertically diversified economy. They were, like many other activities, greatly expanded during the period of UDI 1964-79, when sanctions obliged the Rhodesian Government to accelerate import substitution,(2). These industries flourished in a monopoly market, but now suffer from old obsolete equipment, and out-of-date standards for product quality and package design,(4.3.4).

2.1.5. **The Role of Agriculture** in the National Economy is normally to provide 100% of all subsistence foodstuffs and 30% of exports,(51). The 1991/2 drought created a food deficit, and a collapse in agricultural exports. Export permits had to be withheld for traditional exported foodstuffs, principally maize. A cash flow collapse for farmers had repercussions in bank liquidity, employment and Zimbabwe's farm input industries, all suffering from recessive demand in 1992,(3),(49).

2.1.6. **Government Policies** for the Agricultural sector and Agro Industries are designed to balance support for the larger scale Commercial farmer typically white and rich with support for the Communal farmer typically poor and black. This policy shift dating from Zimbabwe's Independence in 1980 is evidenced by many new programmes in support of small-scale traditional farmers compressed during UDI into marginal land and disadvantaged by the provisions of the Smith and Interim regimes. Exemplifying this policy is the creation of Development Division in the Government's Agricultural Finance Corporation, lending Z$ 18.68 m to over 9,052 Communal farmers, (9), and a Government-driven Communal Irrigation scheme designed to raise marketable yields from the small farmer, (5). Policy is explicitly directed at adding value to rural produce rather than exporting primary commodities into a volatile world market. The Ministry of Agriculture's policy for development includes the creation of supply links from communal farmers to food processors, [2.4.1.].

2.2 THE FOOD PROCESSING SECTOR IN ZIMBABWE

2.2.1. **The Role of Food Processing** in Zimbabwe's industrial sector is fourfold: -to provide a market for raw materials delivered by a resource-rich country, -to store surplus output that would otherwise perish for want of immediate markets, -to provide local substitutes for imported processed foods, -to help beat the acute and chronic foreign exchange shortages.

2.2.2. **The Food Processing Sub-sector** in Zimbabwe has grown rapidly from 13% of Manufacturing GDP in 1980, to 26 % in 1991. The sub-sector's linkage with a strong agricultural base had, until 1991/2, delivered consistent historic expansion, (52). Output value has been generated by a large number of enterprises, mainly in private ownership:

2.2.2. **Zimbabwe Food Processing,** 1989, by number of enterprises, employees and output value:

Sub-sector	Number of Enterprises	Output Value Z$000	Number of Employees
Slaughtering, prepared and preserved Meat	23	366.2	5,252
Dairy Products	9	187.8	3,703
Canned and preserved fruit and vegetables	11	26.5	1,490
Canned fish	-	-	-
Veg. and animal oils & fats	8	186.6	1,910
Grain milling	27	612.0	7,035
Bakery products	75	192.6	4,266
Sugar products	-	-	-
Cocoa chocolate & confectionary	13	58.3	1,301
Other food products	27	99.0	1,753
Distilled spirits & liquors	23	556.2	4,925
Soft drinks and mineral waters	22	184.2	2,543
Tobacco packing & products	20	220.3	4,193
Totals, Food processing	240	2,470.0	35,545
% of total manufacturing	15	26	19
Total Manufacturing	1,556	9,682.1	185,360

Source: CSO, Annual Census of Industry and Production,1993.

2.2.3. **The Average Size of Food Processing Enterprises**

The average size of food processors packing fruit and vegetable products in Zimbabwe 1991, measured by the number of employees, was 135. Eleven enterprises were recorded prior to the drought, in the Annual Census of Industry conducted by the CSO, employing a total of 1,490 and producing gross output worth Z$ 26.456 m. at an average labour productivity of Z$ 17,776.

2.2.4. **The Structure and Growth Rate of Food Processing**

The overall structure of the Zimbabwe Food Industry is given [2.2.2]. The growth rate of Fruit and Vegetable packers had suffered in the crisis period 1985-1988 by price controls and inadequate foreign currency allocations,(37). Trading losses were reported consequent on a critically-inflated costs structure for the industry. The price control on cans supplied by Carnaud Metal Box Zimbabwe's only supplier ended in 1990. With ESAP in 1991 costs came under better control, and when the Zimbabwe economy

responds to liberalisation and recovers from drought effects, food packing is expected to resume its former profitability and growth of 2-3% pa. The First quarter 1992 CZI Survey showed a 4% increase in enterprises reporting increases in foodstuffs output, and a 13% decline in enterprises reporting a contraction of output, (62).

2.2.5. **Costs Structure of Food Processors**

	1987	1988	1991
Costs % of Gross Output			
Raw Materials and packaging	51.3	54.4	51
Processing costs	28.8	31.5	25
Other direct costs	7.2	7.5	5
Fixed costs	20.5	19.8	17
Total costs	107.8	113.2	98
Gross Output	100	100	100

2.3. GENDER ISSUES

2.3.1 Gender Disaggregated Socio-Economic Base Data

[Data and comments in this section are amplified in ACI's Report on Gender Issues, Annex 16].

Recent data showing gender differentials in employment and education support the Government's recognition of the special difficulties faced by women as a consequence of drought and the Structural Adjustment Programme:

First, cost recovery in education and increases in school fees may erode the progress made in the educational status of women.

Second, the higher age profile of urban unemployed women means they have less chance of re-employment and re-training.

Third, women having less start-up capital face greater barriers to informal sector employment entry than men.

2.3.2. **Population, National and Local**

The 1992 Census of Zimbabwe gives 10,401,767 as the total population, of which 5,326,218 are women, distributed over 2,165,744 households nationwide, with an average household population of 4.8,. The intercensal population growth rate for Zimbabwe 1982-92 is 3.13%, (38).

The Norton Selous Rural Council area matches national sex ratios, with a slightly lower ratio of males to females at 95% a lower density per household at 4.5, and a local population growth rate quoted at 2.5%pa, (39).

2.3.3. **Education**

The problems set for women in development are primarily educational. 'A gender gap exists in both school enrolments (especially at secondary school level), and also in learning achievements, while at the higher levels women are heavily under-represented in the university and at the technical training colleges',(17).

2.3.4. **Employment**

The 1986/87 Labor Force Survey found 3.3 m adults of +15 years of age in the national workforce. Of these, 93% were reported to be employed, and 7% unemployed. Of the employed, communal farmers constituted 60% and 1.2 m only were employed in the modern or formal sector. The survey reported the egregious differences in male and female employment:

	MEN	WOMEN
Communual Sector	34	49
Modern Sector	43	16
Unemployed	6	6
Economically inactive	17	29
	100	100

Source: 1986/87 Labour Force Survey CSO Statistical Yearbook,1989, p 51.(1)\

Manpower statisticians believe that employment conditions have deteriorated and differentials in particularly rural unemployment have widened critically, with rural unemployment now 40% of the workforce, of whom over half are women.

Occupational distribution recorded by the Survey cited Females as constituting:

39.8% of all	Professional, Technical and related workers.
13.9%	Administrative and Managerial Workers.
43.8%	Sales Workers.
56.2%	Agriculture, Animal Husbandry and Forestry.
16.4%	Production and related workers.
47.4%	Of Total Employed.

In agriculture, women are now thought to supply 70% of the workforce. Although unemployment rates are cited as roughly equal, there are more unemployed women in the 25-59 age group, which is 75% of total. This has accelerated urban drift, and visible levels of poverty.

2.3.5. **National Policy and Programme Solutions**

The principal policy solution is to apply ESAP so that investment and employment can respond to market growth.'Increased levels of investment in manufacturing are expected to generate employment growth at approximately 3% a year'.'Thus, formal sector employment in manufacturing as a result of new investment could grow by 5,000-10,000 additional jobs per year' (40). Government's policy solutions are implemented by all Ministries and Departments. A focal point for programme implementation and promotion is the Department of Womens Affairs in the Ministry of National Affairs, which is responsible for project preparation and training,(42).

2.3.6. **Local Application at ACI**

These National solutions to the problems set by gender differentials can be reflected at local level in ACI's employment practices. The eligibility of women for work in ACI's food processing plant is conventional worldwide; in most other developing countries the proportion of female to male workers in food preparation is 5:1. There are ample cadres of women in the Norton area for employment by ACI,(43). For ZTCP, we recommend:

(i) that ACI actively support the expansion of local schools, and the adoption of sex-neutral curricular.

(ii) hat ACI establish a regular programme of in-house training for all staff members.

(iii) that female candidates be selected by ACI for national and international courses in Food Technology, (41).

2.4. PREVIOUS ACTIVITIES AND INVESTIGATIONS: SUMMARY

2.4.1. Government Studies

2.4.1.1. Zagrinda Agro-industrial Project

A feasibility study dated March 1992 Ref WP50/ZAGRIDA has been accepted by Government for tomato and citrus processing plants to be built by the Agricultural Development Authority (7), and the Development Trust of Zimbabwe (8). The project is for two tomato processing plants, one at Norton and one at Bulawayo, and later, for a Citrus juice plant at Chipinge, a prime citrus-growing area in South-East Zimbabwe. Government has made starting capital available in the 1992/3 Budget for the Zagrinda Plant near Norton. Construction may be completed 1993/4.

The Zagrinda Plant has ben designed to draw on tomatoes grown at the Coburn Estate near Norton, and on communal farm outgrowers. Its large processing capacity is bound to both encourage extensive tomato-growing as well as initially to drive up prices. The design capacity is 30 tonnes of tomato concentrate a day, but this can be extended by extra shifts to a reported 200 tonnes per day. At normal ratios, designed output would require a daily supply of 180 tonnes. Design and construction of the Zagrinda plant was to have been supplied by FATA, an Italian company with access to 80% supplier credits through SACE and Medio Credito Centralle. The end product, tomato concentrate, would be shipped in 200 kg drums to Italy for re-export to Egypt and other Mediterranean markets.

2.4.1.2. **IDC Food Processing Sector Study**

The Industrial Development Corporation (11) is a 100% State-owned parastatal with subsidiaries in many sectors including packaging, fertilisers, metal fabrication and mechanical engineering. In response to a joint venture proposal from Pakistani interests, it has embarked through its Research and Development Department on a study of Fruit and Vegetable processing in Zimbabwe, due for completion end 1993.

2.4.1.3 **Bank Appraisals of Investment Applications**

Many finance houses in Zimbabwe, public and private, have received applications from investors seeking loans for Horticultural Farms, Market Gardens, Citrus Plantations and Product Processing or Canning Plants. Once the profitability of investments in these or indeed any enterprise became evident in 1989-90, a spate of such applications was received by the Zimbabwe Investment Centre (13), and by lending institutions.

There are reports of another application besides ACI's to aseptically pack orange juice using Tetra Pak technology. Confidentiality rules prohibit Bank divulgence of clients' investment details, but we have strongly urged ZIC that it publish Investment Licence applications and approvals by sub-sector, with capacity outlines by year. This will help investors and the country avoid the danger of over-investment and supply beyond the limits set by markets and supply input sources.

2.4.1.4. **FAO Agro-industry Investigation**

The National Planning Commission (32) signed for Government in Nov 1992 with FAO (59) for consultants to undertake a four-month six-part study, under the Ministry of Industry and Commerce (2) as lead Ministry, into Zimbabwe's agro-industry prospects. The parts are:

1. The raw material base and processing capacity.
2. Growth point potential
3. Institutional context for agro-industrial development.

4. The informal sector, inc. Communal Farm activity.
5. Processing and packaging technologies
6. Marketing.

2.4.2. **Company Studies**

2.4.2.1 **Alison Farm Produce Study**

In 1986, Alison Farms (Pvt) Ltd, the sister company of the project sponsor Alison Canning (Pvt) Ltd, commissioned a private consultant to undertake a Feasibility Study of tomato growing prospects for its property at Norton, [2.5.1.2]. The Study was updated and used as a basis for the Terms of Reference for the current ZTCP Study. It envisaged a total investment of Z$ 145,000 to deliver fifth year output of 10,000 tons of tomato from the Norton Farm, at an output value per ton of Z$ 250. No study was made for on-site tomato processing, or for citrus growing. No mention was made of other processing studies, projects in the pipeline or of operating plants.

2.4.2.2. **The Heinz Canning Plant at Chegutu**

A long study and finance planning phase preceded the commissioning in 1992 of the Olivine Heinz Canning Plant producing canned vegetables and baked beans under the Heinz label at Chegutu, [3.A.5.1]. At 30 June 1992, Government held a 49% interest worth Z$ 11.025 million in Olivine Holdings (Pvt) Ltd, (57). A 2500 tpa Tomato products plant was due to be commissioned as a phase 2 investment by Chegutu Canning in which Heinz has the majority share at Chegutu in December 1993. Orders for 3 million cans from Carnaud Metal Box were placed in the first quarter of 1993. No record of any Licence issued by the Zimbabwe Investment Centre was available for the Heinz investment.

2.5. THE ZTCP PROJECT SPONSOR

2.5.1. Alison Canning Industries (Pvt) Ltd. (ACI)

18-20 Kaguvi Street,
PO Box 66228, Kopje, Harare
ZIMBABWE
Tel: 706310, 706360
Telex: 26494 ALI ZW.
Fax: 263 4 792174, 793329

2.5.1.1. Foundation

ACI was Registered on 27 Aug 1987, No 1407/87, by the Registrar of Companies, PO Box 8033, Causeway, Harare, Zimbabwe, under the Companies Act, Cap 190 of the Laws. It has authorised share capital at 32,000 shares of Z$1 each, paid up and held equally by Mr T.A.I Asharia and Mrs S.T. Asharia, sole Directors of the Company, as confirmed by NG Patel & Co, Chartered Accountants, 39 Mugabe Road, PO Box 5560, Harare, Tel: 702257. The Company has sister companies within the Alison Group active in tobcco and citrus farming, livestock ranching, at Norton, 50 kms SW from Harare, in property development (Keis Khama Properties (Pvt) Ltd), and in a motortrade business (Alison Motors (Pvt) Ltd), both in Harare.

2.5.1.2. Activities

Buildings at the Norton Farm are being modified to accommodate a soft drinks bottling line using synthetic raw materials, adjacent to the factory site adopted for the ZTCP project. No commissioning date has been set by the Project sponsor for this activity. We have advised the company to draft a business plan for it so that it can be integrated into the investment.

In addition to tobacco, the company has planted cash crops including tomato and passion fruit. Tobacco sales provided the principal source of Alsion Group revenue in 1992 with prices averaging Z$8.10 a kg. Expectations of lower prices for the 1993 crop are unlikely to upset ACI's intentions to develop farm and factory production at Norton. Sufficient production and development work is on-going at the Norton Farm to avoid designation under the Government's Farm

Confiscation for Restettlement Scheme announced in 1991.

2.5.1.3. **Employees: 2.**

(i) K.D. Tripathi, General Manager ACI 1966 B.Sc. Agriculture, Lucknow, India. 1968, Post-graduate Dip.F. Tech. India. Member IFT Chicago, USA. 1975-92: General Manager, Tropical Foods Ltd, Dar es Salaam, Tanzania.

(ii) G.K.Gaur, Factory Manager, same qualifications as Mr Tripathi. 1972-78, and 1991-2: Production Manager, hutan Fruit Products, Samchi, Bhutan.

2.5.1.4 **Ownership**

The Norton Estate Land Title is in the name of ACI's sister company, Alison Farms (Pvt) Ltd. Clifford Farm was transferred 15 Jan 1987, Registered No 1184/78; and John O'Groats Farm was transferred 17 Aug 1987, Registered No 5642/87.

CHAPTER III

MARKET AND PLANT CAPACITY

3.A.1. DEMAND AND MARKET ANALYSIS

A detailed market survey of the product mix potential for ACI was carried out, and specifications for such products were reached following a verification study. The data sought for the market survey included:

(i) current effective demand in the domestic and export markets for food and fruit juice products manufactured in Zimbabwe.

(ii) the current supply sources meeting this demand, domestic and imported.

(iii) the growth potential in different segments of the Zimbabwe domestic and export market for the identified product mix.

3.A.2. DATA AND PROJECTION EVALUATION METHODS

The evaluation methods employed in the survey were selected to meet the inadequacies in existing market statistics, and the undeveloped state of market research in Zimbabwe. They included:

(i) Data verification and cross-checking by interview with retail trade and manufacturing market leaders in Zimbabwe. Data on demand and supply for tomato and citrus product sales were verified with leading retail chains selling food products, principally the OK Bazaars and TM Stores, Lucullus Supermarkets, the Farmers Co-op and other members of the Zimbabwe Retailers Association (63). For the supply side, data was evaluated through the largest producers of packed tomato and fruit juice in Zimbabwe, - Cairns, Lemco, Lyons Brook Bond, Olivine Heinz, Mazowe Citrus Estates Ltd, and Schweppes (Central Africa) Ltd, (70).

(ii) The Comparability test for Data evaluation was not fully possible as a practical method for the Survey, as few Tropical African countries have per capita consumption data in sufficient detail to provide comparable standards for different segments of the market. Zimbabwe is moreover unique in several ways that do not make direct comparisons relevant: it has a well-developed manufacturing base, a market that has been habituated to extensive protection since the isolation of the UDI period, 1964-1979; and it has retained a large non-indigenous market for manufactured goods.

(iii) Proportionality tests were applied to market survey data to ensure that the resulting demand values are consistent with the spread of household income, and the supply values in other segments of Zimbabwe's food industry. As historic data are not available for market demand, and in the series that are available substantial non-discrete changes on volumes appear to be typical, it was not considered appropriate to attempt regression analysis in reaching conclusions on projected demand.

3.A.3. DEMAND AND MARKET ANALYSIS

3.A.3. 1. <u>The Market Demand Analysis : Zimbabwe</u>

A Survey was conducted to find out what products could be processed at the ACI Norton factory site from plant material that could be grown at the Norton farm. Having ascertained the farm potential for citrus and tomato crops, the Study researched data for the current and projected Domestic and Export Demand for:

(i) Canned Tomato Products, peeled skinned tomatoes, tomato paste, and juice. These products were selected for further technical study following the survey of the market potential [3.A.2].

(ii) Packed RTD and DTT fruit juices and syrups and Aseptic packs of single-strength Orange juice were also identified for further study following the initial farm and market survey, [3.A.2].

3.A.3. 2. **Identification of Products**

3.A.3 2.1. The search for a market niche in tomato-based and citrus products is world-wide, and gaps on retail shelves are rapidly filled by new product recipes. New producers are unlikely to be able to discern specialist niches for new products, unless they spend substantially on market research and product development, or begin production on a very small-scale `kitchen' basis. They are therefore constrained to compete in known product ranges for which there are proven technologies and established markets.

3.A.3 2.2. Zimbabwe is relatively well-supplied with the ranges of processed foodstuffs that might be grown and processed by ACI at the company's Norton farm and factory site. Canned vegetables and fruits from domestic and imported sources are strong selling lines, and supply has recently been increased by new entrants to the market, domestic and foreign. The least-risk crops in which ACI and its sister company have most experience are tomato and orange. Supply factors justifying this selection are fully described in Chapter v.

3.A.3. 2.3. **Tomato Products**

Our Market Survey suggests ACI would have difficulties in meeting competition by producing tomato soups, ketchups and sauces, as well as packed fruits, jams and confections, unless these were formulated in such a way as to appeal to the very fragmented Zimbabwe market, [3.A.3]. It would have some chance of acquiring a local market share for tomato paste, peeled tomato and juice from 1997, but other suppliers currently saturate the market and are likely to meet growth in demands. We do not consider growth prospects for peeled and juiced tomato to be strong enough currently to justify investments in plant to

produce them. The strongest domestic and export market among those tomato products we have considered is for tomato paste. We have therefore identified this product as the best prospect for ACI, despite current market constraints, and conditions for meeting a possible market gap have been studied and costed.

3.A.3 **2.4. Citrus Products**

Existing suppliers meet current demand for most citrus based products, -drinks, jams and marmalades, confectionery and canned fruit. The range of fruit juices syrups, squashes and cordials in retail outlets serving both high and low income groups and evidence from leading retailers and producers in Zimbabwe inferred our detailed product survey should be of aseptically-packed orange juice. No pure orange juices or other single strength fruit juices are produced industrially in Zimbabwe. Ready to Drink (RTD) juices with additives produced currently are selling faster, albeit in smaller volumes, than Dilute to Taste (DTT) crushes and cordials. Market penetration tests for a pure orange juice have been available through recent imports of South African aseptically-packed fruit juice ranges. These have been sufficiently encouraging, despite the high prices at which these packs sell, to warrant further study, [3.A.3].

3.A 3. **2.5. Existing Suppliers**

Existing suppliers of tomato and citrus products have strong historic links with trade, catering and industrial buyers in Zimbabwe. This implies that ACI will meet barriers to entry in many product lines. We therefore suggest limiting products and pack sizes to those with strong appeal in the largest fastest-growing market segment in which ACI will have some supply advantage, (3.A.3). In our identification of products for ACI, we have considered the production and market development in Zimbabwe and the Region, for an unsweetened, single-strength orange juice packed in the popular 250 ml Tetrapak, and a 115g canned tomato paste. These are products already familiar to the market, and for which there is readily adapted technology. Our survey accordingly investigated in detail the

market demand and supply conditions for canned tomato paste, and aseptically packed orange juice.

3.A.3. 2.6. **Future Product Options**

Once ACI has established its Farm and Factory production systems, it may, using its in-house food technology skills, develop other pack sizes for its basic products and new recipe products that are so far rare in Zimbabwe and the Region. ACI may embark on the production of 3-5 litre cans of paste, partly to store surpluses from bumper crops of tomato in the height of the growing season for re-canning later, and partly to supply shortfalls in the catering market. Diversification into tomato juice production could be achieved by reconstituting tomato paste, (76). Among the new recipe products it may develop for which small niche markets are beginning to emerge in the Region, are Tomato Bolognese Sauce, Tomato with Herbs, Tomato with Chili. ACI may embark on the canning of beans, peas and other vegetable crops which will have by then been tested at the Norton Farms, (72). Samples of dried tomato that are selling well in European markets from suppliers in the Mediterranean area were shown to ACI, but the company is geared to a larger production base than solar drying requires, and would have no competitive advantage against small scale producers of dried tomato that should soon emerge among the Communal Farmers of Zimbabwe.

3.A.3. 2.7. Among the new Fruit blend beverage recipes that represent later product options are Orange with Ginger, Orange with Cinnamon, Citrus Fruit Cocktails, etc. Differentiated packaging and product formulations offering Unique Selling Propositions with novelty appeal are regarded as particularly important for Fruit Juices for the high income household markets in Zimbabwe. (Product familiarity if not Brand Loyalty is important for Tomato Products selling to lower income households). Plans to produce a locally-blended nectar have been abandoned, given the high quality connotation the word `nectar' has in Zimbabwe, and its unfamiliarity in the market. Further brands of dairy products of yoghourt with

fruit juice flavours are planned by market leaders, but are unlikely to supply more than 2% of the market,(70). Given the rising market prospects for new fruit juice packers, ACI may later consider producing 1 litre packs for the higher income households and catering trade.

3.A.3. 2.8. Retailers confirmed our finding that 250 ml packs quench the thirst more than the 200 ml packs; that the 1 litre packs do not sell as well as do the 250ml packs; that the 200 ml and 1 litre packs might represent unprofitable pack size at this stage of market development. It is also possible, given the fruit juice technology that it will have and the number of new citrus orchards planned for the northern regions of Zimbabwe, that ACI may also consider producing its own orange juice for packing to displace imported orange concentrate and to compete with output from the present supplier Mazowe Citrus Estates. We do not think this should be attempted until supplies from new citrus growers reach a peak in 1998/9, until transport costs for raw fruit are substantially lower, and production costs are significantly lower than the border prices for imported concentrate and supplies from Mazowe. The location of any new plant to produce orange concentrate in Zimbabwe should also be carefully related to these factors.

3.A.3. **2.9. Products Identified for Further Study, By Processing and Packaging Method, for ACI**

PRODUCTS	PROCESSING METHOD	PACKAGING	CUSTOMS HS CODE
TOMATO			20021000
Paste	Evaporation	Can	20029000
ORANGE			20091900
Juice	Filling & Sealing	Aseptic pack	

3.A.3. **2.10 Identified Products, by End-product Weight in Cartons for Further Study:**

PRODUCTS	PACK	PACK SIZE g	PACK SIZE ml	NUMBER OF PACKS per carton	CARTON WEIGHT kg
TOMATO Paste	Can	115 g		24	3.76
CITRUS Juice	Tetra Pak		250 ml	12	3.10

3.A.3. **2.11 Current and Projected Domestic Demand**

The year 1993 has not been a good time to invest in consumer products in Zimbabwe. With the decline in Zimbabwe's GDP growth by 11% in 1992, per capita consumption has slowed, and declined by 5.6% overall in 1992. Consumption is expected by the World Bank to remain negative until 1995, but if the Government is successful with its Structural Adjustment programme and its response to the 1991/2 drought, GDP is projected to rise 6% in 1993, and by 7% in 1994, (49). We analyse the current domestic and export markets in the following section [3.A.3.2], and the projected growth in the markets in section [3.B.a.14].

3.A.3. **2.12 Zimbabwe's Current Demand for Food Products**

Zimbabwe's current market for processed fruit and vegetables has been depressed by supply and demand factors induced by the drought. The failure of the rains in 1991/2 reduced the supply of fresh foods available to the market, with the consequence that shortages and higher prices forced an immediate switch into canned and dried foods. Food prices increased by more than 70% in in 1992 over 1991. According to the Retailers Association of Zimbabwe, the proportion of Retail Sales attributable to food increased from 62% in 1991 to over 80% in 1992, (63). Leading retailers such as OK Bazaars with 36 stores nationwide plan to meet the change in demand with increasing allocations of store space to foodstuffs, and lower space allocations for housewares, softs, clothing and furniture, (64).

3.A.3. 2.13 Although processed foodstuff manufacturers benefitted in the shortrun from the switch in consumption, the reduction in disposable income and purchasing power during 1992 and the first half of 1993 meant that sales could not be sustained. The food processing industry ended 1992 with only a 1.9% increase in sales, while Textiles suffered a 22% fall, Clothing 16%, Metals 11%, Chemicals 13%. The position in Feb 1993 was that the lower end of the market demand has reduced its consumption of canned goods, and suppliers are trading down to meet this level. The upper end of the market is more bouyant and is expected to resume its normal rates of consumption for processed foods. OK Bazaars plan an increase in the number of stores under the OK Bazaar banner for the lower end of the market, and increases in sales through their upper end stores under the Bon Marche banner in 1993,(64). With an economic recovery driven through ESAP, leading food processors and importers are anticipating restoration of demand in Zimbabwe, with increases of between 3-9% over 1993-2000.

3.A.3. **3.1. The Zimbabwe Domestic Market**

For the product range envisaged for ACI comprises:

(1) the Household Market
(2) the Hotel and Restaurant Trade
(3) Institutional End Users and Wholesalers,

3.A.3. **3.2. The Household Market**

The Household Market represents the largest effective demand segment for processed foodstuffs, now and in the future. Currently 72% of all foodstuff sales are through retail channels to private households. Nationally, about 35% of total disposal household income is spent on foods of all kinds, with a proportion higher among low than among high income groups. ACI will be able to get a more precise measure of consumption from the forthcoming Household Income Consumption and Expenditure Survey conducted in 1990/91 by the CSO, (45). This Survey is also expected to confirm the highly skewed income distribution in Zimbabwe.

In Table 3.A.3 3.4, we give 1992 estimates of Zimbabwe's Household income by income range. In Column 2, all income ranges include a proportion of Own Produce Consumed (OPC), as high as 75% among 1.52 million households in group E, and close to zero among the 75,000 AB households in urban areas. In Column 3, the number of households in each income range is given. The CSO's Preliminary Report on the 1992 Population Census gives the average size of Households at 4.8 persons, and the total Zimbabwe population at 10,401,767, (38).

From this we derive a total AB market size of 389,000 persons, and a CE Market size of 10.012 million. The rural/urban divide is not easy to define, nor is it particularly relevant in measuring access to formal sector cash employment and access to distribution outlets for manufactured and imported products. Zimbabwe has a relatively high rate of urbanisation. The drought accelerated urban drift. Relatively good infrastructure enables many rural people to visit the towns regularly and to mix in the monetary

economy. No prospective investor in processed foodstuffs regards the rural population as entirely outside the potential market.

3.A.3. **3.4. Distribution of Households in Zimbabwe, by Income Range.**

1	2	3	4	5	6
Income Group	Upper Range Z$/mnth	Numbers Households millions	%	of which Rural	Urban
A	3500 +	.021	1.0	.001	.020
B	2500	.060	2.9	.005	.055
C	1500	.117	5.4	.052	.065
D	750	.689	31.8	.522	.167
E	250	1.280	59.0	.940	.340
Total		2.167	100.0	1.52	.647

Source: TDC 1992, CI., and Market Researchers in Harare, 1991.

3.A.3. **3.5. The Household Market**

The Household Market in Zimbabwe is customarily split into two key segments, very different in character:

(i) The AB Market, which is high income and low density, comprises mainly non-indigenous families, European and Asian, but which since Independence has included a rising class of successful, well-educated, indigenous Zimbabweans. These households have an international taste for good quality, industrially-produced, convenience foods. In 1992, the AB market is estimated to number 389,000 people, of which 95% live in the urban or peri-urban areas, enjoying household incomes from Z$ 1501 a month, with a mean of about Z$ 2750 per month. The European population of Zimbabwe numbering about 100,000 people sets many of the cultural standards in consumption habits, and may be expanding with some net immigration as disillusioned Europeans quit

the continuing troubles of South Africa.

Of their disposable income, AB and upper C income group households spend about 25% on food. The AB consumption of industrially processed fruit-based drinks in Zimbabwe is comparable to levels attained in the fully-industrialised nations of Europe and North America, at 31 litres per capita a year. But consumption of processed tomato products is lowered overall to an estimated 1.02kg per capita a year by the low price and abundance of fresh tomato for processing and cooking at home, and by the low wages and availability of domestic staff,(66).

Tomato sauces and ketchups have a continuing perennial market among high income households, but other ready-made tomato products juices, peeled tomato and paste do not have the same convenience appeal as in labour-scarce economies of the industrialised world. Nor do canned products have the same allure for Europeanised households as they do for CE households emerging from traditional tribal cultures. Only during the winter months June to September when fresh tomato is scarce do AB households tend to buy and use considerable amounts of peeled, juiced and pureed tomato products. Packers store tomato harvested and canned during peak supply months October through May, and distribute to the market from June-September to meet demand rising by 30-40% above the annual norm, (70). Because of the prevailing preferences for fresh foods and antipathy to canned products, per capita consumption of tomato products among AB Households is still low at less than 1.02 kg a year. This compares with OECD consumption rates for processed tomato per capita of 29 kg in the USA, 26 kg in Italy, 8.4 kg in the UK, 4 kg in Japan, (55). Retailers reporting rapid increases in sales of more than 24% a year before the drought, report sluggish sales since, consistently high among wealthier households, but low to zero among the poor.

Because of their higher and more reliable spending power, AB households are less elastic in their response to price changes for food products. They have been the main market for high quality high-priced imported food products appearing in Zimbabwe's shops since the introduction of OGIL,(17). There is a strong interest in the glamour of foreign products, conspicuously more modern than Zimbabwe's own. This applies particularly to fruit-based RTD and DTT drinks, and to packed fruit juices, which many AB consumers have tasted and enjoyed on their holdiays in South Africa and Europe. [The product range is shown at para 3.B.a.10 & 11].

South African fruit juice ranges imported from CERES and FRESH-UP 100 have been selling at Z$ 12 for 1 litre packs in up-market stores and supermarkets, against local PVC bottled juices from SUNSPLASH and CASCADE at an equivalent of Z$ 6.8 a litre, [3.A.5.4.1]. Despite their high price, CERES and FRESH-UP are reported to have gained up to 3% of the processed fruit juice market in Zimbabwe. Canned fruit drink products that are a near substitute for pure fruit juice have also been entering the Zimbabwe market from packers in the region, and have given rise to protests from Zimbabwe producers, to the extent that a Government ban on such imports is anticipated, though the reason given for the possible ban is environmental, -the risk of litter from non-returnable cans.

Excluding DTT crushes made from non-citrus fruit, the per capita consumption rate for the AB market is put at 18 litres a year. This compares with an EEC annual average of 25 litres, and with a peak per capita annual consumption rate in Germany of 36.2 litres,(71). Of this, the AB market for orange juice is estimated at .84 million litres in 1992, derived from a per capita consumption rate of 2.16 litres a year growing at 4-9%. According to leading

retailers, this growth in consumption is almost as rapid among the lower income households.

(ii) The CE Market, which is the low-income, high density fraction of the Zimbabwe population, is estimated to number 10.012 million people, of which 73% live in rural towns and villages. Although this fraction of the market is known as `high density' because it is typically crowded into small houses in small urban plots, the larger part of the CE market is scattered in the rural areas. Without extensive cash employment, most of Zimbabwe's lowest income groups live a subsistence existence on their own produce,- OPC. Nearly 1 million households in the E income group are of this kind.

Some cash income for E group households is derived from crop sales and rural remittances from relations living and working in urban areas. Not much if any of this cash income is saved. It has to be spent on bare necessities that cannot be grown locally, - salt, clothing, tools, school fees. The dependency on locally-grown foodstuffs is very widespread. It was this group that has suffered most from the effects of the 1991/2 drought. At the upper end of the CD income group however, cash incomes from formal sector employment have been expanding since Zimbabwe's independence in 1980, principally from expansions in urban manufacturing and service industries. In Harare, formal employment expanded from 271,000 in 1985, to 352,000 at the end of 1991. In Chinhoyi, from 5,100 in 1985, to 8,200 in 1991. Cash earnings in urban areas however have not risen as fast as numbers employed, and with rising inflation reaching 50% in 1992, many real incomes have declined.

Nevertheless, it is to the mass market of the CD income groups that tomato and citrus products have their main appeal. Canned goods and bottled fruit drinks represent a

progressive lifestyle to which CD households aspire. The modern, urbanised appeal of industrially processed foods is growing as a supplement to the cutomary diet of traditional households in Zimbabwe. Tomato sauces are, have always been, a part of the traditional diet. A chaser of tomato sauce sharpened with chili has been made for years as a crafts product to be drunk with beer in Zimbabwe's beerhalls. Even more widespread is the use of tomato sauce with Zimbabwe's staple food, the mealie porridge -sadza. Traditional CD households urban and rural have a main meal usually in the evening of sadza, usually with a sauce or relish,-sumu. The sauce is invariably made of vegetable, sometimes of meat or fish, (25). The vegetables used for the sauce are greens, onion and tomato. The per capita consumption rate in households buying canned tomato is .086 g of tomato per 1 kg of porridge. The average consumption rate in normal circumstances for sadza is quoted at .5 kg per capita per day, and .2 kg for tomato, (65).

Small family-sized 210 ml tins of tomato paste with its rich flavour consequently enjoy a large sale among CD housewives. Since tomato paste represents a concentration of flavour from six times as much fresh tomato, it is increasingly popular as a sauce ingredient. At an average price equivalent of Z$ 10 per kg against the average 1992 price Z$ 20.4 for six kg of fresh tomato, tomato paste also enjoys an immense price and culinary advantage.

This factor is of great importance in the market growth for tomato products, principally paste, of whatever concentration. The CE market segments are very price-conscious, as they have to be with the real value of their cash incomes shrinking,(74). All stores led by the supermarket chains resort to frequent Sales and to price discounting in order to attract custom, and have increasingly large ranges

of `loss-leader' goods. Some retailers report day-long runs on stock in common use as a result of a widely advertised price reductions. Sales also leap with increases in income, retailers say. Processed Tomato sales are regarded by Market leaders as capable of `massive growth',(63). From these reports, we calculate a price elasticity for tomato products at 1.25, and a latent demand that could increase sales by 25% a year if supplies were available. Current per capita annual consumption in the CE income group is estimated at .06 kgs overall, compared with the OECD average 17.1 kg pa. The consumption rate in Zimbabwe is lowered by the subsistence lifestyle of E group rural households. Within the CD group however, the consumption rate for tomato products is estimated by market leaders at 0.14 kg per capita per year, and is likely to grow at between 10-25% from 1993/4.

A healthy market also exists in the upper end of the CE income group for fruit drinks, mainly those presented as low-priced DTT squashes and cordials, and RTD drinks with strong acidic flavours. The seasonal fluctuation in citric drink consumption is even more marked than among AB households, with a rise of between 15 and 20% in sales during the warmer season, August-May.

The year-round average per capita consumption rate for citrus based RTD and DTT drinks in the CE income household group is 3.8 litres, of which 'pure' orange juice consumption has been about .08 litres a year. With over a population of over 10 million, CD households consume .71 million litres of fruit juice products a year. Long-term growth for all groups is estimated by leading retailers at 6-8% a year.

3.A.3. **3.6. The Hotel and Restaurant Trade in Zimbabwe**

Hotels and Restaurants in Zimbabwe are large users of canned tomato products and fruit juices. This study appears to be the first making estimates of actual consumption. Despite the the economic benefits of local sourcing to meet demand from domestic and foreign tourism, no study has yet been made of the market for locally-manufactured products in Zimbabwe's 71 graded hotels and tourist lodges,(67).

This market has been growing steadily since Zimbabwe's independence in 1979. Foreign tourists visiting Zimbabwe have increased from 268,410 in 1980, to 636,676 in 1991, when 42% came from Southern Africa including the RSA, and 16% from high-spending tourist-generating countries of Europe the Americas and Asia,(68).

Because of global recession in 1992, and civil turmoil in RSA, no increase and indeed some reduction in foreign tourism was expected for 1992. Domestic tourism in Zimbabwe, where foreign exchange for overseas travel is rationed, normally represents a high proportion of bednights sold, -over 60% in 1992. Of a total 1.325 million bednights estimated as sold in 1992, we estimate 795,000 were sold to Zimbabwe residents, 530,000 to foreign tourists.

Per capita consumption rates for processsed tomato and fruit juices in tourist hotels are comparable with levels in OECD Countries,(55). Food and Beverage Managers catering for tourists have a continuing preference for the reliable product quality of industrially-prepared foods, over fresh foods that need to be selectively prepared and cooked for tourists' consumption.

Restaurants outside hotels that are considered likely to sell tomato products and processed fruit juices number 520 throughout Zimbabwe, and cater for an average of 20 clients a day, mainly AB income group wage earners. A large number of traditional restaurants serve sadza and sumu,(25). The overall per capita consumption rate for tomato products other than ketchups sauces and soups in Hotels and Restaurants is

estimated at 11.48 kg per client per year, creating a segmental market of 161 tons in 1992, [2.6].

3.A.3. 3.7. **Demand for Tomato Products by Hotels and Restaurants in Zimbabwe, 1992**

HOTELS	BEDNIGHTS SOLD	PER CAPITA CONSUMPTION kg pa	TOTAL SALES tpa
71	1.325	24.0	87.1
RESTAURANTS	CUSTOMERS SERVED m		
520	3.796	7.12	74.0
TOTAL	5.12	11.48	161.0

Source: Hoteliers and Restauranters estimates.HIRAZ (67)
Notes: The 71 hotels are those graded and licenced by the Ministry of the Environment and Tourism, Zimbabwe.

3.A.3. 3.8. **Hotel & Restaurant Demand in Zimbabwe for Fruit based Drinks & Juices**

Some Food and Beverage Managers appear to be resisting the use of processed tomato, preferring to buy in fresh tomatoes when they are available, and resorting to canned tomato products only in the winter season when the fresh fruit is in short supply. Usually however, Tourist hotels in Harare and Victoria Falls buy and use processed fruit juices and cordials, rather than prepare juice-based drinks from fresh fruit. Leading five star hotels buy-in juices, squashes and cordials from Zimbabwe processors for their restaurants and bars, and only occasionally use small amounts of fresh orange, -less than 1% of total sales. The consumption rate for fruit juices based on orange is estimated by leading Food and Beverage Managers at a fresh fruit equivalent of 0.068 litres per capita per day in hotels, and .05 litres per capita per day in restaurants. No clear industry wide split of fresh and processed fruit-based drinks was evident. Total catering demand for packed orange juice is estimated at

.98 million litres a year, some of it met by Mazowe orange concentrate.

3.A.3. **3.9. Demand by Hotels and Restaurants for Fruit Drinks in Zimbabwe, 1992.**

HOTELS	BEDNIGHTS SOLD m	PER CAPITA CONSUMPTION kg pa fje	TOTAL SALES tpa
71	1.325	25	90.75
RESTAURANTS	CUSTOMERS SERVED		
520	3.796	18	187.2
TOTAL	5.12		277.95

3.A.3. **3.10 Institutional End Users**

Industrial packers supplying the catering companies and institutions are in the case of tomato products either selling direct from the factories or through wholesalers. Some tomato processors supply products for distribution through major food companies, as LEMCO once did and now SOLOMIO do for Lyons Brook Bond. Fruit juice manufacturers in Zimbabwe buy concentrate from the Anglo-American processing factory at Mazowe, a source that until recently was a monopoly supplier, and reconstitute it to produce DTT and RTD juices, carbonates, squashes and cordials of various kinds. These products are then sold into the household market through normal retail channels, to hotels and restaurants, to wholesalers supplying the retail and other markets, and to Institutional end-users, such as schools and canteens.

The split of product sales between market segments is not at all clear for any product line. Considerable secrecy shrouds output totals, distribution channels, and market share. Some supplies of tomato product sold to other food packers, institutions and catering companies find their way back into the open market and meet a small portion of tourist and household demand. Juice and paste are used by packers of for example Beans in Tomato Sauce.

Fruit juice packers supplying bulk to

institutions and catering companies do not trace sales routes thereafter and consequently treat trade buyers as a separate market segment, with known outlets given preferential distribution privileges. To avoid double counting, we have assessed the Institutional Market as a residual and matched it to both tomato and citrus volumes marketed in Zimbabwe. These volumes are consistent with the per capita consumption rates for processed tomato products and for fruit juices based on orange, and are verified by such market research as has been carried out in Zimbabwe for example, by Probe, and Quest Research Services,(66).

End-use analysis for cans is carried out in Zimbabwe by the only domestic supplier, Carnaud Metal Box, (69). Out of a 48 million can capacity, Carnaud Metal Box sold mainly to food processers 39.5 m in 1991, and 43.6 m in 1992, with about 47% in 1992 going to Baked Bean packers, Cairns, Olivine Heinz, and others. (Non-food applications are motor oils & chemicals). It is estimated that 1,590 tons of paste, peeled and juiced tomato were packed in cans in Carnaud Metal Box cans of various sizes in 1992 for the domestic market:

3.A.3. **3.11 Estimated Sales of Cans by Carnaud Metal Box for Food Packing, by End Use, Zimbabwe 1992**

Product	Cans m	Tonnes
Tomato based	12.2	2990
of which,		
Tomato products	6.0	1590
Other Veg	5.9	2598
Jam	7.4	4030
Fruit	4.0	1834
Meat	14.1	3042
Total	43.6	14485

Source: Retail Trade, Zimbabwe.

3.A.3. 3.12 Domestic Demand for Tomato Products Sales Volume Estimates, by Market Segment, Zimbabwe, 1992.

1 MARKET SEGMENT	2 POPULATION SERVED m	3 PER CAPITA CONSUMPTION kg pa	4 TOTAL SALES tpa	5 %
1. HOUSEHOLDS	10.4	1.091	954	60
of which: AB	.389	1.02	398	25
CE	10.011	1.06	556	35
2. HOTELS and RESTAURANTS	8.12	11.48	161	10
3. INSTITUTIONAL	na		475	30
TOTAL			1590	100

Sources: Retailers and Market Leaders in Zimbabwe May 1993.

3.A.3. 3.13 Domestic Demand for Tomato Products,by product by Product Composition, Zimbabwe, 1992.

1 PRODUCT	2 TONNES INPUT	3 OUTPUT	4 %	5 CANS 000	6 CARTONS 000
1. Paste	4134	734	43		
2. Peeled	777	730	44		
3. Juice	124	95	6		
4. Other	138	111	7		
TOTAL	5133	1690	100	3975	167

Source: Retailers and Market Leaders in Zimbabwe.
Notes: Col 2: The input/output conversion factors are:

1.	paste (28% equivalent)	6:1
2.	peeled	1.2:1
3.	juice	1.3:1
4.	other	1.22:1

3.A.3. **3.14 Domestic Demand for Fruit Based Drinks Sales Volume Estimates, by Market Segment, Zimbabwe, 1992**

	1 MARKET SEGMENT	2 POPULATION SERVED m	3 PER CAPITA CONSUMPTION litres pa	4 TOTAL SALES tpa 000	5 %
1.	HOUSEHOLDS	10.4	4.33	45	41
	of which,				
	AB	.389	18.00	7	6
	CE	10.012	3.8	38	35
2.	HOTELS and RESTAURANTS	5.12	7.23	37	34
3.	INSTITUTIONAL	na		28	25
	TOTAL			110	100

Note: 1000 litres ffe = 1 tonne
ffe = fresh juice equivalent

3.B SALES FORECAST AND MARKETING OF PRODUCTS

3.B.a. 1. Domestic Market Penetration

The Market survey of Zimbabwe's supply side for the identified product range suggests strongly-placed competition for any new products that ACI might produce. There is a wide range of tomato and fruit juice products, both domestically produced and imported, see below [3.B.a.4 & 7].

Zimbabwe food packers have been however unable to modernise their processes and product designs. The reasons for low quality in product formulations, and out-of-date packaging, are given as:

(i) the continuing shortages of, and controls on, foreign exchange for imports.

(ii) the protection from foreign competition that has given most manufacturers a protected market behind high tariff frontiers

(iii) the uneducated state of the market which in all income groups has been habituated to take whatever Zimbabwe industry has been able to supply,(63).

(iv) suggestions that the small size of the food industry enables cartelisation practices, such as trade agreements on price and market share. The use of low grade tomatos for processing and of preservatives for fruit juice products provides all competition with great scope for quality improvements.

3.B.a. 2. **The Supply of Tomato Products**

The supply of Tomato Products to the Zimbabwe Market from domestic sources was restricted by capacity limits 1989/91 and by raw material shortages during the 1991/2 drought. Carnaud Metal Box was obliged to ration supplies of open-end cans and flats to packers in Zimbabwe and neighbouring countries because of the shortage of foreign exchange allocated to import tinplate from South Africa.

Few alternatives to canning exist. Much tomato and other vegetable output from Communal Farms is sun-dried and stored for OPC, or marketed locally. Recent bids by Swiss freezer companies to sell freezing systems to Zimbabwe have faltered, because of the limited electricity grid and uncertainty of power supplies, even in Harare.

Because of constraints such as these, latent demand is believed by retailers to exceed effective demand by large margins. Market leaders assert the market's latent demand has been and still is unmet, with a substantial sales restricted first, by supply shortages and second, by lack of purchasing power. The gap has not been filled yet by imports. Because of the tariff barriers and transport costs, imports are estimated to be negligible, at 6.4% of total tomato product demand by volume in 1992. The Zimbabwe's total domestic supply is estimated at 1,590 tons in 1992, comprising mainly peeled and paste tomato, [3.A.3.13.]. An export market

absorbed about 20 tons. Nine companies are currently engaged in supplying the market from factories in Zimbabwe , and major new capacity investments to meet projected demand are imminent:

3.B.a. 3. **Processed Tomato and Tomato Based Product Packers in Zimbabwe, Feb. 1993**

1. Cairns Foods Ltd,(TOMANGO & BORDER STREAMS) Upton Road, Ardbennie, Harare, Zimbabwe. Tel 67741.
2. Lemco, Zimbabwe Ltd (Lever Bros)(CASHEL VALLEY) 2, Stirling Road, Workington, Harare. Tel 61941.
3. Olivine Industries (Pvt) Ltd (HEINZ) 36, Birmingham Road, Workington, Harare.Tel 69961.
4. Rab Roy, (RAB ROY), PO Box 2322, Harare.
5. Lyons Brook Bond,(GIBCAN), PO Box 290, Rusape.
6. Wombles,(WOMBLES) PO Box HG 402, Highlands, Harare.
7. Steers, 12 James Crescent, Harare.
8. Nutresco Pvt Ltd. (COUNTRY KITCHEN) Simon Mazorodze Road, PO Box ST 61, Southerton.
9. Pantry Pride, PO Box HG 253, Highlands, Harare.

3.B.a. 4. **Tomato Products, Retailed in Zimbabwe, Feb 1993.**

PRODUCT	VOLUME	PACKAGE	PRICE ZS	BRAND NAME	SOURCE
Puree	410 g	can	5.05	GIBCAN	for Lyons Brook Bond Z
Sauce	375 ml	stpb	3.65	RAB ROY	Rab Roy Z
Paste	210 ml	can	2.80	TOMANGO	Cairns Z
Sumu & Beans	435 g	can	4.58		
Puree	410 ml	can	4.80		
	215 ml	can	2.80		
Sauce	375 ml	gstb	5.70		
Peeled	400 g	can	5.40	CASHEL VALLEY	Lemco Z
Juice	410 g	can	3.80		
Sauce	370 ml	stgb	5.70		
Bergersauce	375 ml	stgb	4.80		Steers Z
Marinade	750 ml	stgb	15.80	WOMBLES	Wombles Z
Soup	75 g	sachet		COUNTRY KITCHEN	Nutresco Z
Sauce	30 g	sachet		PANTRY PRIDE	Z
Fresh Toms	1 kg	pack	3.40	Local Growers	Z

3.B.a. 5. **Imported Tomato Products:**

Puree	410 g	can	9.80	ALL GOLD	Langeburg, RSA
Peeled	400 g	can	9.50	KOO	
Paste	115 g	can	5.95	KOO	
Peeled	410 g	can	5.60	GOLDCREST	Goldcrest, RSA
Peeled	410 g	can	5.70	POT O'GOLD	Verpack RSA

3.B.a 6. **Tomato Products Suppliers' Market Shares**

The totals in 3.B.a.7. represent estimates of actual, effective demand, as measured by sales figures from market leaders and retailers. There is extensive plagiarism in African product manufacturing. Sales data have been supplied to us in confidence. In order not to breach commercial confidentiality, we are obliged to consolidate company market shares.

There are three well-established market leaders supplying the Zimbabwe domestic market. These market leaders have a 63% market share. The balance is either met by other smaller domestic suppliers, or by imports from South Africa. Note that two important new domestic suppliers are expected to enter the Zimbabwe market in 1993.

3.B.a. 7. **Sources of Supply of Tomato Products and Market Shares, Zimbabwe, 1992.**

SOURCE	PRODUCT [By Number from 3.A.12] 1	2	3	4	TOTAL	%
Market Leaders	469	430	39	9	995	63
Others	171	175	81	96	493	31
Imports	44	45	6	7	102	6
Total	684	650	85	111	1590	100

3.B.a. 8. **The Supply of Fruit Based Drinks**

The domestic supply of fruit drinks in Zimbabwe is dominated by Mazowe Citrus Estates, a subsidiary of Anglo-American Co of South Africa. From ageing citrus orchards 30 kms from Harare, Mazowe harvest a declining yield of oranges which it processes into a concentrate. Packed in 2.9 and 5 litre drums this product is widely distributed to Zimbabwe fruit juice packers, catering outlets, and to some export markets.

3.B.a. 9. **Processed Citrus Juice Packers**

1. African Distillers Ltd, (SUNSPLASH) Stapleford Box 2346, TA Rochelle, Harare. Masvingo. Tel 32901.
2. Schweppes (Central Africa) Ltd, (CASCADE, MAZOE), PO Box 506, Woolwich Road, Harare, Tel 62661.
3. Zimbabwe Fruit Processors Ltd, PO Box 175, Mvurwi. Tel 25720829
4. Mazowe Citrus Estates, (MAZOE), Mazowe. Tel 175 2431
5. Reckit & Colman (PURITY) 1, Melbourne Rd Harare
6. Solomio Farms Pvt Ltd (GOURMET FINE FOODS), PO Box 125, Ruwa.
7. Jani Investments (Pvt) Ltd, (La ROCHELLE Canning) 46 Edson Crescent, Graniteside, Harare. Tel 790867.

3.B.a. 10. Citrus Products, Retailed in Zimbabwe, 1993

PRODUCT	VOLUME	PACKAGE	PRICE ZS	BRAND NAME	SOURCE
Lemon Juice	200 g	ftpb	9.59	GOURMET	Solamie Z
Lemon Barley	375 ml	stpp	4.59	PURITY	Reckit & Colmas Z
Orange Barley	375 ml	stpp	4.50	PURITY	Z
Pure Juice	250 ml	ftpp	1.70	SUNSPLASH	Af.Dis Z
Fruit Mix	200 ml	ptpp	2.80	CASCADE	Lyons Z
Orange Crush	500 ml	scpp	3.30	MAZOE	Schweppes Z
Grapefruit segments	425 g	can	4.95	CASHELL VALLEY	Lemco Z
Fresh Lemons	1 kg	loose	6.80		Local Z growers
Fresh Orange	1 kg	loose	5.80		Local S growers

3.B.a. 11. Orange Drinks Imported into Zimbabwe

PRODUCT	VOLUME	PACKAGE	PRICE ZS	BRAND NAME	SOURCE
Juice	1 litre	tetp	12.80	LIQUI-FRUIT	Ceres, RSA
Juice	200 ml	tetp	4.00	FRESH-UP 100	Fresh-up, RSA
Orange juice	250 ml	tetp	4.00		Kgalagadi Beverages, Botswana
Orange drink	340 ml	can	2.20	FANTA	Woolworths RSA
Orange juice	250 ml	combo	4.40	ORANGE-SIP	

Note: ftpp = foil-topped plastic bottle
stpp = screw-topped plastic bottle
ptpp = push-top plastic bottle
stgb = screw-top glass bottle
tetp = Tetra pak or brik
combo = Combibloc aseptic pack

3.B.a. 12. Sources of Fruit Based Drink Supply and Their Market Shares, Zimbabwe, Feb 1993.

The Zimbabwe market leaders in fruit drinks crushes and syrups are Schweppes (Central Africa) Ltd, and Lyons Brook Bond, supplying 88 million litres in 1992, approximately 80% of total market supply. With 45 widely advertised and distributed products like Mazoe Orange Crush and Calypso Orange Syrup, in various packs, Schweppes and Lyons compete with 11 other Zimbabwe manufacturers, and with several importers. Market size is estimated at 110 million litres a year, expanding at a long-term growth rate of 9% a year. Per capita consumption is put at 8.45 litres a year. Sales in 1992 were down 5% on 1991, but up on previous years. Prices are extremely competitive, but Schweppes and Lyons

with their commanding positions and bulk output are able to price on very low margins.

Recent imports from South Africa including up-market fruit juices from CERES and other suppliers are believed to be increasing their market share to between 2 and 3%. For reasons explained above, imports have some market advantage at the present time, despite their retail higher prices, [3.B.a.11]. Market leaders however state that import penetration can be offset by export opportunities in the RSA and other PTA/SADCC Markets. The export market absorbed an estimated .4 million litres in 1992, [3.B.a.25]. The total output from the industry is estimated at 110.4 million litres in 1992:

3.B.a. 13. **Sources of Fruit Based Drinks Supply and their Market Shares, ZIMBABWE, 1992**

SOURCE	VOLUME SUPPLIED millions of litres	%
Market Leaders	88.3	80
Other Domestic	18.7	17
Imports	3.3	3
Total	110.4	100

Source: Retailers and Manufacturers, Harare

3.B.a. 14. **Competing Imported Products**

Zimbabwe manufacturers have been exposed since the introduction of ESAP and OGIL in 1991 to increasing competition from imports. For manufacturers of processed tomato products in cans and fruit drinks in cans and PVC bottles, imports have represented a small but significant threat to their market share. The AB market appreciates the quality of imported South African fruit juices from CERES, is ready to pay a premium price for quality and the novelty of aseptic packing in laminated cartons According to retailers, wealthier households have been buying canned RSA tomato products, again in search of 'international quality'. Imports from the RSA are expected to increase in volume, and to decrease in price as tariffs of 60% are lowered.

3.B.a. 15. Zimbabwe manufacturing standards generally have been protected historically, and will suffer from modern competition, the SAZ Director has said."We have to brace ourselves for tough external and internal competition. Monopolies that thrived in the UDI era and after independence are being brought down because of ESAP, and more goods have been placed on OGIL. Only quality and good prices will be able to keep our products in good stead," (27).

Many authorities anticipate increased competition from imports in Zimbabwe's Domestic market. An EIU report on Zimbabwe asserts that although Zimbabwe's manufacturing sector had the same potential as Agriculture and Mining to stimulate growth under ESAP, the sector would suffer initially from "a painful shakeout" as macro-economic parameters are adjusted,(60). By that EIU means the removal of protection and privileged access to resources.

Competing imports have been absent in the Zimbabwe market as a result of High Import Duties on foodstuffs and the presence of all foodstuffs on the Negative List, (50). With the introduction of OGIL and ERS in 1991, competing imports have appeared in the Zimbabwe market, mainly from South African suppliers, albeit at a premium prices attributable to duties of 40-60%, [3.B.a.4,5,10 & 11]. Imports from all sources are set to rise from 3% of total domestic demand to 10% by 2003, market leaders say, (70). But Imports can be offset by export opportunities, mainly in the RSA.

From these market characteristics stem our product identification and Quality Control advice to ACI, investment opportunities for better quality products, and the prospects for increased market penetration by imports:

3.B.a. 16. **Imports of Selected Food Products into Zimbabwe 1991**

	PRODUCT	HS CODE	SOURCE	VOLUME kgs	VALUE Z$ CIF
1.	Tomatoes Preserved	20021000	UK	150	340
2.	other preserved tomatoes litres	20029000	Botswana	11,400	9,603
			RSA	5	47
			Zambia	24	88
3.	Orange juice, other than fresh and frozen	20091900	Australia	198	668
			Germany	1	5
			UK	363	3,295
			Mozambique	1,200	2,188
			RSA	1	124

Source: ISC 1.

Notes: The recorded imported volumes and values are not fully consistent, due to data collection difficulties at Customs Entry ports into Zimbabwe, but indicate that small volumes were imported as soon as OGIL was introduced.

3.B.a. 17. **Zimbabwe's Projected Demand for Food Products**

In a dynamic economy with long-run prospects of 6% growth in GDP, an upward shift in the number of households with purchasing power for processed foodstuffs can be expected as incomes rise across the economy. AB income groups are likely to increase their income share, and many households in the upper CD household income groups with their large proportion of wage and salary earners are likely to move up to join higher income and spending groups. While CD households have suffered most from public service and company retrenchment in 1992/3, and may not resume their increase in real disposable incomes until 1994/5, the core of this market is intact.

The consequences of the 1991/2 drought and other constraints on growth particularly high population growth in excess of 3% mean that per capital consumption has declined in 1992/3 among all save the higher income groups. This has the effect of lowering the national average per capita consumption growth in World Bank estimates to negative rates, -3.7 in 1993, and -4.1 in 1994, (49). The currently low levels of food product consumption in the largest market

segments suggests high future growth and substantiates market leaders' projections of large percentage increases in sales, (70).

3.B.a. 18. With the return of rains to normal levels in 1992/3 and the restoration of fresh food supplies, processed foodstuff sales have been depressed. Canned foods sales have been at `an all time low'. Depressed sales reflect the chronic lack of purchasing power in Zimbabwe. Long-term prospects are however regarded as good. Realisation of the latent demand for food products depends on how tastes and purchasing power are transformed over time by economic development, and there is every sign now that Government is resolved to liberalise the economy so that Zimbabwean desire for change can be fully expressed, (21). Food Processing leaders believe recovery will follow better harvests and the increased producer prices, up to Z$ 900 from Z$ 550 for maize, and to Z$ 995 from Z$ 520 for wheat. A cessation of the Drought Levy and reduction in the top rate of Income Tax from 50% to 45% are anticipated. These changes are likely to restore consumer confidence and to raise purchasing power in the higher income households. They provide a reasonably bouyant context for marketing quality food products. If latent demand represents a potential demand growth of 25% a year expected by market leaders to be realised as soon as purchasing power is restored, the growth in the market may be as follows:

3.B.a. 19. **Projected Domestic Demand for Tomato Products, by Type of Product, ZIMBABWE, 1993-2004. Tonnes**

	1 PASTE	2 PEELED	3 JUICE	4 OTHER	5 TOTAL
1992	680	700	95	111	1590
1993	834	795	119	139	1987
1994	1199	919	149	217	2484
1995	1646	1055	186	218	3105
1996	2135	1203	272	271	3881
1997	2815	1358	339	339	4851
1998	3884	1592	446	445	6367
1999	5094	1751	557	557	7959
2000	7045	1790	696	696	9949
2001	8831	1865	870	870	12436
2002	11503	1866	1088	1088	15545
2003	14185	2332	1558	1360	19431

Source: Industry Market Leaders, Harare, 1993.
Note: Col 4 includes volumes of puree, and juice sold to packers of pasta and baked beans.

Whatever the overall growth rates, the product mix is expected to change to reflect a composition more in line with international norms. The consumption of tomato paste is projected to increase from 43% in 1992 to 73% of total demand in 2003, and peeled tomato demand to decline from 44% to 12% of total.

3.B.a. 20. These projected increases in demand for tomato products and other canned vegetables persuaded Carnaud Metal Box to invest in a second canning line in 1990. There is some concern in Zimbabwe as to whether demand will warrant the new capacity. Projections of increases in canned processed tomato entail an increase in tomato product consumption from .091 kg per capita in 1992 to .178 kg per capita in 1995, with comparable increases in demand from the catering trade and institutions. With paste selling at 43% of total processed tomato in 1992, the total market is estimated at 684 tons in 1992, with a similar growth potential. Market leaders derive their expectations from the recovery and growth rate in the AB and CD consumption, the projected 6% GDP increase in the economy, and a continuing switch from fresh tomato use to canned paste.

3.B.a. 21. **The Projected Domestic Demand for Fruit Drinks**
From the market analysis [3.A.3.3.5] we have seen how close the AB market is already in its fruit drink consumption to norms prevailing in Europe and North America, and how far from those norms the CE market still is. It would not be surprising to find Zimbabwe following international growth, and increasing market demand by 9%-15% a year. Most Trade sources however expect an overall market growth of 6% by volume from 1993. This implies an annual increase in effective demand of .67 litres per capita, and an increase in total household spending on fruit drinks of Z$ 21.86 a year.

3.B.a. 22. **Projected Domestic Demand for Fruit Drinks, Zimbabwe, 1993-2004, Millions of litres**

YEAR	lm	YEAR	lm
1992	110	1998	156
1993	117	1999	165
1994	124	2000	175
1995	131	2001	185
1996	139	2002	196
1997	147	2003	208

Note: Consolidated domestic and export demand projections are contained in 3.B.a.46 & 47.

3.B a. 23. **The Export Market**
In addition to supplying domestic demand, there are good prospects for exporting food products to neighbouring countries within the PTA. This study section covers a World market overview for Tomato Products and Fruit Juices, and the Regional Market in the PTA, SADC and other Southern African countries adjacent to Zimbabwe.

3.B.a. 24. Exporting is encouraged by Zimbabwe Government incentives and facilities,(6). The proportion of Foreign exchange earnings from exports under the Export Retention Scheme ERS that can be retained or sold to other exporters is expected to increase from the current 35% to 50% in the 1993 Budget,(50). Under the Export Incentive Scheme, the Ministry of Finance through Customs pays exporters of processed, not fresh, goods 9% of FOB Invoice Value declared on CD 1 Export Control Forms. This is used either to lower the foreign

exchange prices of exports making them more competitive, or to increase margins, [10.5].

The drive to expand exports is an essential component of ESAP. Export Growth overall is projected to be in excess of 10.4 from 1993, (49). No trade projections are available for the selected product range for ACI, but from the following factors we anticipate a worst case scenario in which growth of 5% a year is sustainable for all Zimbabwe exports in this range. The overall export market is so porous that individual exporters with good connections are able to achieve large increases to particular markets with low overall import growth. This is possible even for widely-traded and high competitive goods like processed tomato and fruit juices. That Zimbabwe begins from a low base in exporting these goods is illustrated by CSO statistics:

3.B.a. 25. **Exports from Zimbabwe of Selected Products to Illustrative Countries, 1991**

PRODUCT	DESTINATION country	VOLUME kg	VALUE ZS
TOMATO preserved	all	4631	139593
of which,	Mauritius	1440	102266
	Germany	2808	31763
Other TOMATO preserved	all	14502	139593
of which,	Malawi	13164	105644
	Portugal	1281	7912
ORANGE JUICES		litres	
	all	319063	1312684
of which,	Botswana	171263	300851
	Mozambique	44110	72856
	South-Africa	37220	316161
	Netherlands	51840	583892

Source, CSO and Zimbabwe Customs, Harare, (1).

3.B.a. 26. **World Demand, Tomato Products**

Global demand for Processed tomato products is rising at 3% a year, although supply appears to have been rising even faster, leading to a downward pressure on prices. Reliable data for fresh tomato production is not available, but OECD data suggests it was expanding by 3.7% during the 1980s, and that of all tomato output, 61% is for processing, and 39% for the fresh market, (55). International trading in tomato and processed tomato is usually subject to restriction by border controls such as high duties, import quotas and non-tariff measures, designed to protect domestic vegetable growers.

In all tropical countries where tomatoes grow prolifically, they are grown and consumed fresh by most households with low cash incomes. Processed tomato is consumed by higher income households in increasing volumes, and its rate of substitution for fresh tomatoes in cooking is said to be steady but gradual, (73). `Mediterraneanisation'of world culinary practices following international trends points to an expanding market for tomato pastes and concentrates, seen and found to be both tasty and convenient. Of all processed tomato, the OECD data for the 1980s says 80% of the total was paste and concentrates, 12% peeled, 8%, tomato juice, (55). Pastes dominate exports, and suppliers distribute to distant markets as is shown by the following list of examples:

3.B.a. 27. **Internationally Traded Tomato Based Products: Selected World Retail outlets, Feb 1993**

PRODUCT	VOLUME	PACKAGE	PRICE	CURRENCY	BRAND	SOURCE
Paste	425 g	can	2400	Uganda	NTOMATA/ Keen Soft	Cyprus Drinks
Concentra	70 g	can	300	Uganda	La- SARMESINA	Italy
Paste	340 g	can	2100	Uganda	KENYLON/ Kabazi	Kenya Canners
Sieved	350 g	stgp	1.59	UK pound	PASSATA/ SAFEWAY	Italy
Sauce	400 g	stgp	1.21	UK pound	NEWMAN'S	USA
Sauce	400 g	can	1.39	UK pound	NAPOLINA/ CPC	Italy
Peeled	400 g	can	1.34	UK pound	DOM - MARIO/SAFEWAY	Italy
Concentra	142 g	tube	1.18	UK pound	DOM - MARIO/SAFEWAY	
Chopped Chili	410 g	can	1.39	UK pound	SAFEWAY	Italy

Note: US $ = 1200.- =US$. UK pound = US$ 1.52.

3.B.a. 28. Zimbabwe paste export prospects are however curtailed by the large world surplus. The EEC's 1992 year end stocks were 190,000 tonnes equivalent and for other tomato products 286,000 te. The USA had stocks of 2-3 million tonnes. The downward pressure on prices of globally-traded tomato products continues. The EC has frozen processing subsidies to Italy and Greece, while allowing new subsidies for Spain and Portugal. CIF prices in Europe range around US$ 812-825 per tonne of paste at 36-38%, and US$ 310-590 for 26-28%. Given these conditions, Zimbabwe's 1991 tomato product exports did well to achieve a volume of 19.133 tonnes, of which 9 tonnes were paste. We cannot conclude there would be any strong sales prospects for Alison Canning paste in the markets outside the PTA.

3.B.a. 29. **World Demand, Fruit & Vegetable Based Drinks** Trade in fruit and vegetable based drinks reached a value of US$ 5 billion in 1990, a rise of 25% on 1989. Since 1980, trade has increased threefold. In Europe and North America fruit juice consumption is one of the fastest growing

food products, with annual volume growth rates of 9% and 6% pa respectively. Within this product range, blended juices are the most rapidly growing product line, with citrus and passionfruit as leading flavours. The leading exporters of orange juice are Brazil, exporting US$ 1.2 billion in 1989, -55.9% of world exports, followed by the United States with US$ 175.7 million worth of exports,-8% of the total,(71).

Of the 15 largest importers of fruit and vegetable juices 1985-89, the leading markets are the United States, whose share of total has actually declined from 31% to 23% over the period, with an import value of US $ 2.767 billion in 1989; and Germany, still at that time West Germany only, importing 16% in 1989, -a rising share of the total at US $ 550,000 million,(71).

3.B.a. 30. The 1991 ITC Market Study of Fruit Juices speaks of a `spectacular growth potential' This it says derives from increasing health consciousness of consumer markets and the higher standards of living that substitute fruit juices for water as the everyday drink. Fruit juices and squashes, either RTD or DTT, are also expanding outside OECD countries but access to fresh juice supplies limits the scope for preserved juice sales for all income groups, so that only middle and higher income groups tend to buy packed juices. As living standards rise and purchasing power increases, scope for a higher quality juice than is now available will develop.

3.B.a. 31. All OECD markets volume shortages sustain prices and keep buyers vigilant for new sources of supply. Zimbabwe's horticultural products are already making a mark in some EEC countries. But imports are dominated by the Mediterranean producers, and increasingly many processed food products are designed by multiple store groups to be manufactured under contract and sold under their own label, for example, SOMERFIELD, the brand name of products sold through the Gateway chain in the UK, [see Annex 10]. The formulation and processing of Own Label products made in developing countries is tightly-controlled by the

distributing company. Product diversification is aimed at satisfying consumer tastes in what is a multi-segmented market, with many opportunities for food processing technology. But although ACI may well obtain sales outlets through its contacts in the UK, it is an unlikely partner for a joint venture in Own Label production for any of the identified products. This is because its farm capacity is limited, its comparative advantages for world marketing restricted, and its management style averse to external participation or control.

While OECD markets will be open to fresh and concentrated juice supplies from Zimbabwe, OECD packers of single strength juice competetively absorb all prospects for Tetrapacked juice from ACI. Although the EC Market allows direct duty free access for ACP products, the high cost of freight transport means and intense competition means that for a small Zimbabwean producers, the immediate market offers export prospects only to specialist producers meeting particular market niches, as for beef meeting a small EC quota, metals and flowers (74).

3.B.a. 32. **Internationally Traded Orange Drinks**
Selected Retail Outlets, May 1993

TYPE	VOLUME	PACK	US $	SOURCE	
Carbonated	2 litre	stpb	1.34	Sunkist	UK
Juice	1.125 l	stpb	1.13	Del Monte	RSA
Orangeade	945 ml	ptpb	2.78	Sodastream	UK
Comminuted	2 litre	stgb	.96	Somerfield	UK
Orange Drink	195	fcpb	.29	Barraclough	UK
Orange Juice	700 ml	tetp	1.19	Dittmeyer	FDR
Orange Juice	1 litre	tetp	1.19	Britvic	UK
Orangeade	330 ml	pttc	.39	HP Bulmer	UK
Orange Juice	500 ml	ftpb	2.03	Johnsons	UK
Orange Juice	170 ml	pttc	.63	Waha	KSA

Note: ftpb = foil-topped plastic bottle
stpb = screw-topped plastic bottle
ptpb = push-top plastic bottle
fcpp = flimsy clear plastic pack
stgb = screw-top glass bottle
pttc = pull top tin can
tetp = Tetra Pak or Brik
comb = Combibloc aseptic pack

Source: MCS Market Survey.

3.B.a. 33. **The African Regional Market**

In 1990, Zimbabwe's exports of all kinds to 46 African countries were worth Z$ 1,143.3 m, of which the largest value was to South Africa: Regional markets in order of importance were:

Republic of South Africa	28.0 %
Botswana	18.7 %
Malawi	15.2 %
Mozambique	11.6 %
Zambia	11.0 %
Kenya	3.9 %
Zaire	3.1 %
Tanzania	2.6 %
Uganda	1.2 %

3.B.a. 34. In the African Market of the PTA and in Botswana and the Republic of South Africa, a recent study of horticultural exports noted sales opportunities for dehydrated and canned products in the Region's mining industry,(54). Zimbabwe exporters are only likely to meet serious competition from South African suppliers. But established suppliers like Langeberg and Goldcrest have been producing such a large market for so long, they have left a number of market niches unserved. ACI is recommended to explore these further, with a view to supplying them eventually with extended product list.

3.B.a. 35. In 1992, after the drought, Zimbabwe's exports collapsed by 2.5% in US$ terms, ending an upward trend 1988-91, but export growth is expected to resume from 1993, with growth of 10.4%, (49). The potential for ACI Sales in the Republic of South Africa is regarded as excellent,(70). The RSA is the largest market for Zimbabwe goods, and already imports a range of foodstuffs, including citrus and processed food products, either direct via Beit Bridge or via Botswana. The 1964 Trade Agreement RSA/Zimbabwe, updated in 1986, is due for renegotiation, providing Zimbabwe with tariff concessions on a range of exports to the RSA. These offer concessional rebates of up to 15% on current tariffs. We recommend ACI to develop outlets now and to ascertain the applicable duties when exporting to the RSA is due to begin,(36).

3.B.a. 36. SADC Countries,-those comprising the Southern African Development Community- were originally Front Line States opposing South African apartheid,(33). They comprise a population totalling 85 million with world trade worth over US$20 billion. Discussions are underway to merge SADC with the Preferential Trade Area of Eastern and Southern African States,-the PTA- with which it overlaps,(34). This is to be transformed into the Common Market for East and South African States, -COMESA-, in which pressures to lower trade barriers physical and fiscal will help food processors in Zimbabwe.

3.B.a. 37. **The PTA Market**

The immediate potential for Tomato and Fruit Juice Sales in PTA Countries is also regarded as limited for three reasons, (70). First, all 18 PTA member countries have been affected by recession and drought. Second, purchasing power generally is still low. The PTA area has total market population of over 235 million people, but the GDP per capita income at 1980 prices is only US $ 297, [see Annex 14]. Thirdly, intra-PTA trade has not expanded as rapidly as had been planned. Last year, imports were US$ 554 million, exports US$ 580 million,-an overall increase of only 5% on 1982. This was despite many measures adopted to remove trade barriers.

3.B.a. 38. **PTA Trade Liberalisation**

By 1992, the number of items on the common list had been raised to 769, of which 75 were food items, an increase of 537 items since 1984,(34). Reductions by 60% in intra-PTA import tariffs were due to be introduced for common list items by all member countries by October 1993, and by 100% by the year 2000. Not all PTA members have felt able to comply. Only 8 have published their Import Tariffs in full. Residual protectionism and non-tariff barriers still affect cross border trade.

The historic development of industries in some countries of the region gives them comparative advantages, but none that stems from climatic differences. Few PTA countries have food processing abilities like Zimbabwe's, but they

do possess small core A-B markets for tomato based products and packed orange juice. Neither of these is yet on the common list, and therefore face tariffs of 20-60%, but are expected to be listed by 1994.

3.B.a. 39. **Projections of Exports of Selected Products into all Markets from Zimbabwe, 1992-2003**

	PROCESSED TOMATO tpa	FRUIT DRINKS litres 000
1993	20.0	1096
1994	21.2	1166
1995	22.3	1236
1996	23.4	1310
1997	24.6	1387
1998	25.8	1470
1999	27.2	1558
2000	28.6	1651
2001	30.0	1750
2002	31.5	1855
2003	33.4	1966

Fruit Drinks include orange juice concentrates at single strength equivalent.
Processed tomato includes peeled and juice.

3.B.a 40. For both tomato products and orange juice, the PTA and Regional markets offer small sales outlets for ACI's immediate product options. Their long-term growth providing a polical solution is found for South Africa's future is reflected in projections of output increases at 3% pa. South African retailers known to ACI will assist sales so that eventually a 2.5% penetration of the market may be achieved. The use of tomato paste in the Southern African region is similar to Zimbabwe's, although per capital consumption levels appear to vary depending on the availability of fresh as against canned, dried and other processed types, as well as on socio-economic and cultural factors:

3.B.a. 41. **The Export Potential in Selected Regional Markets for ACI Sales of Tomato Paste, 1994**

See Note:	1	2	3	4	5
RSA	37.00	.35	12950	15	0.1
Botswana	1.4	.07	98	1	1.0
Malawi	8.02	.03	271	-	-
Mozambique	16.65	.01	166	2	1.2
Zambia	8.73	.09	785	2	0.3
Namibia	1.9	.05	95	-	-
Total ACI				20	

Note:
1. Population, million.
2. Per Capita Consumption of Tomato Paste kg pa
3. Total Market tpa
4. ACI Sales in Year 1. tpa
5. % of total 4 % of 3)

3.B.a. 42. Regional markets have suffered the same climatic and economic set-backs 1991/2 as Zimbabwe. Moreover, new capacity for tomato paste production and aggressive marketing by Ceres for Tetrapak fruit juices will restrict sales opportunities for ACI. New tomato processing plants in the RSA include a major investment at Messina close to Beit bridge, whose market area will include Zimbabwe.

Whatever the Regional trade liberalisation agreements, new suppliers will meet strong competition in Regional markets, as existing exporters from Zimbabwe have found. Zimbabwe's export potential given new incentives is put by exporters at 6% a year, but ACI's market penetration could be greater if the company's export contacts are used to the full.

3.B.a. 43. Projections of ACI Sales of Tomato Paste to the Regional Market, PTA, SDCC & RSA

YEAR	1994	1995	1996-2008 pa
Cartons 000	c	c	c
Tons	t	t	t
RSA	5.434 (5)		
Botswana	1.362 1		
Malawi	-	na	na
Mozambique	0.725 2		
Zambia	1.087 3		
Namibia	-		
Totals			
Cartons 000	7.246	7.609	7.989
Tons	20	21	22.05
115 g			
Cans 000	173.9	189.82	191.74
US$ 000	54.778	59.79	60.39

Note: Ex-works price per can = ZS2.016 = US$ 0.315
Tons of product, net.
Carton = 24 x 115g cans = 2.76 kg net.
Year on year real growth projected at 5% to 1996.
Regional inflation rate projected at 20%.
20 Export sales converted at ZS6.4 = 1US $ for
Total Sales Revenue by Year, Table 3.B.d.

3.B.a. 44. The Export Potential in Selected Regional Markets for ACI Sales of Orange Juice, 1994

See Notes:	1	2	3	4	5
RSA	37.00	11	407	.3	.07
Botswana	1.4	5	7	.2	2.9
Malawi	9.02	4	36	.1	.28
Mozambique	16.65	2	33.3	.1	.3
Zambia	9.73	4	34.9	2.06	.17
Namibia	1.9	2	3.8	.05	1.32
Total ACI			.81		

Notes: 1. Population, millions.
2. Per Capita Consumption of Citrus Drinks lpa
3. Total Market millions of litres
4. ACI Sales in Year 1, millions of litres
5. % of total (4 % of 3)

3.B.a. 45. Projections of ACI Sales of Orange Juice to the Regional Market, PTA SDCC & RSA, 1994

YEAR		1994		1995	1996-2008
Cartons 000		c		c	c
Litres 000			l	l	l
RSA		100	300		
Botswana		66.6	200		
Malawi		33.3	100		
Mozambique		33.3	100	na	na
Zambia		16.6	50		
Namibia		16.6	50		
Totals					
Cartons 000		270.0		286.3	303.47
Litres 000			810	858.9	910.42
250 ml					
Packs	000	3240		3435.6	3641.64
US $	000	693.36		735.22	779.31

Notes: 1 Carton = 12 x 250 ml packs
1 pack ex works price = Z$1.368 = US $ 0.214
na = not available in the ZTCP Study

3.B.a. 46. CONSOLIDATED PROJECTIONS OF DOMESTIC AND EXPORT MARKET DEMAND FOR ZIMBABWE TOMATO PRODUCTS,

Tonnes, 1992 -2003, [from Tables 3.B.a. 19 and 39].

YEAR	DOMESTIC	EXPORT	TOTAL
1992	1590	20.0	1610.0
1993	1987	21.2	2008.2
1994	2484	22.3	2506.3
1995	3105	23.4	3128.4
1996	3881	24.6	3905.6
1997	4851	25.8	4876.8
1998	6367	27.2	6394.2
1999	7959	28.6	7987.6
2000	9949	30.0	9979.0
2001	12436	31.5	12467.5
2002	15545	33.4	15578.1
2003	19431	34.8	19465.8

3.B.a. 47. **Consolidated Projections of Domestic and Export Market for Zimbabwe Fruit Drink Products 1992- 2003, from [Tables 3.B.a.0 22 & 39]**

	Millions of Litres		
	DOMESTIC	EXPORT	TOTAL
1993	117	1.096	118.096
1994	124	1.166	125.166
1995	131	1.236	132.236
1996	139	1.310	140.313
1997	147	1.387	148.387
1998	156	1.470	157.470
1999	165	1.558	166.558
2000	175	1.651	176.651
2001	196	1.750	197.750
2002	208	1.855	209.855
2003	220	1.966	221.966

3.B.a. 48. **Tomato Product Supply Side Changes: Capacity Increases Planned for Zimbabwe's Tomato Processors**

A large but unrecorded number of investors, domestic and foreign, have been investigating tomato processing projects in order to meet anticipated increased demand for exports and expanding consumption in Zimbabwe.

To meet the demand growth, one market leader has installed a 50% increase in capacity designed to come into production in 1993. Heinz, a new entrant into tomato paste production, has a 2000 tpa capacity plant under construction at Chegutu, aimed at the domestic market and export, due for commissioning in December 1993. As a major player with an existing vegetable canning factory at Chegutu, this company Chegutu Canners has a powerful sales force with established outlets in Zimbabwe and the Region, and a system of outgrowers who will supply the Cannery as a preferred customer.

Chegutu Canners are likely to be able to supply canned paste at prices which other suppliers will not be able to match. Cairns, who have been supplying Heinz with processed tomato as an ingredient for Baked Beans, will have to find alternative outlets for this volume. Other established suppliers have the capacity and market links to hold their market share against

newcomers. Processing contractors Solomio supplying Lyons Brook Bond are expanding their farm and factory at Ruwa to deliver increased tonnages of tomato products, mainly paste.

Recent events have given pause to expansion plans. The commissioning of the Zagrinda plant has been delayed, allegedly by changes in its relationship with its joint venture partner, the Italian Tomato paste company Fata,(74). Fata was to have exported Zagrinda tomato paste to the North African and Arab markets, but may now have been daunted by the excess of supply and falling prices. Three other prospective investors have curtailed investment plans because of the prospective and current oversupply. Smaller canneries and processed tomato packing centres are being planned by Agritex to provide a market for Communal Farmers, but Agritex officials recognise they will have difficulty in selling into a saturated market:

3.B.a. 49. **Projected Supply of Tomato Products for the Zimbabwe Domestic Market, by Source of Supply tonnes, 1992-2003**

	MARKET LEADERS	OTHER PRODUCERS	NEW ENTRANTS	IMPORTS	TOTAL MARKET	SURPLUS DEFICIT
1992	995	493	-	102	1590	
1993	1178	500	190	119	1987	
1994	1178	500	1500	162	2484	856
1995	1178	500	1750	211	3105	534
1996	1178	500	2500	271	3881	568
1997	1178	500	2500	364	4851	-309
1998	1178	500	2500	509	6367	-1680
1999	1178	500	2500	676	7959	-3105
2000	1178	500	2500	895	9949	-4876
2001	1178	500	2500	1399	12436	-6859
2002	1178	500	2500	1943	15545	-9424
2003	1178	500	2500	2000	19431	-13253

3.B.a. 50. Up to 1991/2, all established manufacturers were attempting to satisfy what had been regarded as an undersupplied market by increased productivity through improved raw materials use and second shifts. Genuine market shortages occurred. The widespread perceptions of market growth prior to the drought led to many new capacity increases and plans for capacity increases. It is clear now that for the immediate future, the market for

tomato products is oversupplied. The excess capacity is attributable to a collapse of purchasing power, 1992/3, to inflated estimates of demand, and to lack of transparency in new capacity investments.

3.B.a. 51. **The Sales Forecast & Marketing of ACI Products**
Tomato Paste

In order to succeed in Zimbabwe's competetive market, ACI would have to offer tomato paste at discounted prices and dislodge existing suppliers. ACI might be able to do this by transfering cost savings and profitability from its farming of tobacco to its factory, subsidising its tomato product until it has established a market. The company might also, through its special marketing contacts and expertise, find outlets in Zimbabwe and the Region for low-priced high quality paste. It would, in view of current over supply, have to knock existing suppliers off the shelves. Leading retailers say a low-priced high quality paste from ACI might get 15-20% of the market by dislodging existing products. But to capture 14% of the domestic market in 1992, it will only be using 10% of the capacity of the smallest plant able to produce quality paste. In 1996, with 27% of the market, the plant would operate at 30% of capacity, and in 1998 with 38% of the projected domestic market for paste it would operate at just under 70% of capacity.

In exporting to the Regional PTA markets, the projections are far from assured. ACI's exports at 20 tons in the first year also depend on overcoming high barriers to entry, and exceeding trade projections of existing exports. Despite the high rate of demand growth, ACI's projected sales are high risk. Suppliers with many market brands could at any time flood the market with low-priced paste. Moreover, ACI's projected sales growth is insufficient to generate the pay-off needed for the investment, with discouragingly low rates of return on equity and total investment, {Annex 14.11-14}.

3.B.a. 52. **ACI Tomato Paste Sales Forecasts, Domestic & Export and Market Share 1994-1996, at 1993 prices**

		1994	1995	1996
Total Market				
Tomato products	tons	2482	3105	3881
of which,				
Tomato paste,	tons	1242	1646	2135
	%	50	53	55
ACI domestic sales	tons	162	342	546
market share	%	13.04	20.78	25.57
cans	000	1408.69	2973.91	4556.06
24 can cartons	000	58.69	123.91	189.83
CS revenue	000	2839.928	5998.384	9185.069
ACI export sales	tons	20	21	22
cans	000	173.9	189.82	191.71
24 can cartons	000	7.246	7.609	7.989
$	000	54.778	59.79	60.39
= CS	000	350.592	352.656	386.496
Total sales	tons	182	364	546
cans	000	1582.60	3165.21	4747.83
24 can cartons	000	65.94	131.88	197.82
CS	000	3190.52	6381.07	22333.65
Capacity use	%	10	20	30
% of Nominal (14.5)		9.0	18.9	28.9

3.B.a. 53. **Market Study Conclusions for Tomato Processing**

For tomato products, all Zimbabwe manufacturers new and old are going to face oversupply at home and increased competition from imports. From South Africa, higher penetration with low-cost high-quality products is expected. From domestic output, tomato product exports may expand, but domestic output on current data is set to move into surplus. Together, all supply sources in Zimbabwe are likely to move into further oversupply by 1994, and to leave no clear domestic market gap for ACI until 1997.

3.B.a. 54. **Investment Recommendations**

Unless exports can be expanded more rapidly to absorb surpluses, a tomato processing plant for ACI would enter a saturated domestic market. Despite rapid demand growth, ACI would only find a niche for canned tomato products with further specialised research. We therefore suggest deferring canned paste and peeled tomato until a clear market opening arises.

3.B.a. 55. In order to optimise capital allocation and to prevent over-production, it is important for planned capacity expansion in Zimbabwe, as in other countries, to be monitored and published. This is a natural function of the Zimbabwe Investment Centre. We have recommended a system to ZIC for aggregating industrial licence applications by sectoral capacity proposed and realised, so that without breaching commercial confidentiality, investors can be provided with data on actual and planned capacity,(13). One of the current weaknesses in African Industrialisation is the duplication of industries and of factories producing similar items. `Many industries and factories do not operate profitably because of excess capacity, with the same products competing for limited markets', a PTA seminar noted in March 1993,(34). Despite the need to find products for absorbing agricultural output and Zimbabwe's canning capacity, over-production must be avoided.

3.B.a. 56. **Fruit Juice Supply Side Changes:**

Capacity Increases Planned for Zimbabwe's Fruit Juice Processors

For fruit juices, there is a reasonable market opportunity to supply low-priced good-quality orange juices in an aseptic pack for the domestic market. There is no existing packer of pure orange juice in such packs in Zimbabwe. The imported products from South Africa can be undercut in price and out-marketed with the juice in a brighter more popular carton. The processing technique will allow ACI to produce an orange juice without preservatives, and, as the health risks of sodium benzoate become more widely known, further support will be given to the campaign of the Zimbabwe Standards

Association to raise and enforce minimum quality control standards for `pure fruit juices', (27). The percentage of pure fruit juice content can be adjusted to match market taste and production costs.

3.B.a. 57. Existing product ranges of RTD and DTT drinks based on low fruit content and high additions of citric acid may continue to dominate, because the bulk of the market still demands low-priced products without caring much about quality. No new entrants to the industry appear to have applied for investment licences, (13). Capacity is expected therefore to remain relatively constant against rising demand:

3.B.a. 58. **Projected Supply of Fruit Juice Drinks for the Zimbabwe Market, by Source of Supply, 1992-2003**

Millions of litres

	MARKET LEADERS	OTHER PRODUCERS	IMPORTS	TOTAL SUPPLY	MARKET	SURPLUS DEFICIT
1992	88	18.7	3.3	110	110	
1993	88.5	19	4.7	112.2	117	- 4.8
1994	90	19	5.6	114.6	124	- 9.4
1995	90	19	5.9	114.9	131	-16.1
1996	90	19	6.5	115.5	139	-23.5
1997	90	19	8.1	117.1	147	-29.9
1998	90	19	9.4	118.4	156	-37.6
1999	90	19	12.5	121.5	175	-53.5
2000	90	19	13.9	122.9	185	-62.1
2001	90	19	15.7	124.7	196	-71.3
2002	90	19	20.1	129.1	208	-78.9
2003	90	19	22.0	131.1	220	-89.0

Source: Survey of Beverage Manufacturers and Retailers, Harare. Zimbabwe Trade Statistics, 1992.

3.B.a. 59. **Zimbabwe Fruit Drinks Market Deficit, (Col 1)**
Orange Juice Demand (Col 2)
ACI Juice Domestic Sales (Col 3)
Export Market Projections (Col 4)
of which, ACI Orange Juice Exports (Col 5)
in Millions of Litres, 1992-2008

	1	2	3	4	5
1992	4.8	2.59	-	-	-
1993	9.4	2.74	-	1.096	-
1994	16.1	2.91	1.59	1.166	.81
1995	23.5	3.08	1.842	1.236	.858
1996	29.9	3.26	2.090	1.310	.910
1997	37.6	3.46	"	1.387	"
1998	53.5	3.68	"	1.470	"
1999	62.1	3.91	"	1.558	"
2000	71.3	4.14	"	1.651	"
2001	78.9	4.39	"	1.750	"
2002	89.0	4.65	"	1.855	"
2003	98.8	4.93	"	1.966	"
2004	109.6	5.23	"	2.083	"
2005	121.7	5.54	"	2.208	"
2006	135.1	5.87	"	2.340	"
2007	149.9	6.22	"	2.480	"
2008	166.4	6.59	"	2.628	"

Source: Market leaders, Harare.
Notes: Col 2 and 4 include Fruit Juices and Beverages sold as 'Pure' or 'Fresh' Orange Juice without additives or preservatives. These drinks constitute 53% of current market shortfall, and an estimated one quarter of all citrus drinks supplied. Col 4. Exports include Mazoe single strength equivalent concentrates.

3.B.a. 60. **ACI Orange Juice Sales Forecasts, Domestic and Export and Market Share, 1994-1996, at 1993 Prices**

			1994	1995	1996-
Total Zimbabwe Market Fruit Drinks litres		m	124.0	131.0	139.0
of which,					
Orange Juice litres		m	2.91	3.08	3.26
% of all Fruit Drinks			2.4		
ACI Domestic sales					
litres		000	1590	1841.1	2090.0
Market share		%	55	59	64
250ml packs		000	6360	7364.4	8358.36
12 pack trays		000	530	613.7	696.53
Z$ revenue		000	8676.09	10068.99	11428.42
ACI Export Sales					
litres		000	810	858.9	910.42
250ml packs		000	3240	3435.6	3641.64
12 pack trays		000	270	286.3	303.47
US $		000	696.36	735.22	779.31
=Z$ revenue		000	4456.71	4705.41	4987.58
Total ACI Sales					
litres		000	2400	2700	3000
250ml packs		000	9600	10800	12000
12 pack trays		000	800	900	1000
Z$ revenue		000	13132.8	14774.4	16416.0
Capacity use		%	80	90	100
% of Nominal	(15.1)		57	65	74

3.B.a. 61. **Citrus Products**

The recommendation is to produce and market a pure orange juice from imported and local concentrates, using aseptic packing technology. The initial capacity should be 3 million litres a year, packed in 12 million x 250 ml packs. Initial market constraints may limit capacity use

to 80-90% in the first two years of production, but projected market expansion in years 1996 onwards can be met by increasing the number of hours the plant is worked to 334 shifts a year. The versatility of the Tetra Pak system will allow ACI to develop other juice blends as raw materials become available, from passion fruit juice, peach, apple, pineapple etc.

3.B.a. 62. We recommend the Zimbabwe Government make resources available to assist the Zimbabwe Standards Association in identifying realistic and affordable standards for the country's food manufacturers and for the education of the consuming public.

3.B.b. **THE SALES PROGRAMME**

3.B.c. **The Marketing Strategy**

3.B.c. 1. **Marketing Advice**

ACI is advised to capture domestic sales through notably high quality products and competitive pricing, and to win export markets through marketing contacts with wholesaling agents and retailers. Direct ex-works sales from suppliers avoiding wholesalers margins of 20% would be a means of developing sales into the Region. In Zimbabwe, ACI will appoint commission agents to distribute to outlets around the country, reporting to a Marketing Manager in charge of domestic and export sales. In the Regional Markets, trade links will be established in urban centres to supply the small volumes that market research suggests should be lead sales trials centres, -Johannesburg and Pietersburg in the RSA, Francistown and Serowe in Botswana, Blantyre in Malawi, Maputo and Beira in Mozambique, and Livingstone and Lusaka in Zambia. All these market centres are connected by road and rail to Harare.

3.B.c. 2. The Organisational Set-up for Distribution and Product Pricing

3.B.c. 2.1. Distribution at 100% Production:

PRODUCT	Tonnes 000	Packs 000	Cartons	Cartons 000 DOMESTIC	EXPORT
TOMATO Paste	1820	15826	659.4	923	22
ORANGE Juice	3000	12000	1000	730	270

3.B.c. 2.2 Tomato Products manufactured wholesaled or retailed in Zimbabwe are not loss leaders for other products and are therefore not finely priced to attract volume sales. Consistently with commercial practice elsewhere, the smaller the unit size the higher unit price and margins applied. Catering packs of tomato paste wholesale at between Z$4.35 per kg. for 20% brix, to Z$ 5.36 for 28% brix, with an average 20% ex-works markup. The 115 g cans of tomato paste wholesale at the equivalent Z$ 16.20 per kg. with a retail markup of about 60%. The smallest cans 70 g sometimes available in Harare wholesale at Z$ 34.11 per kg.

3.B.c. 3. Product Pricing. Z$ per unit US$ at 1993 values

PRODUCT	PRODUCTION COST	Ex-WORKS PRICE	VARIABLE MARGIN %	EXPORT (14 & 15: 18)
TOMATO Paste				
115 g can	1.789	2.02	30.4	.3156
carton	42.936	48.48		7.575
ORANGE Juice				
250 ml pack	1.172	1.369	16	[illegible]
tray	14.064	16.435		2.5608

Aseptically-packed concentrated orange juice diluted to single strength retails internationally at a price 60-90% above the retail price per 100 ml for carbonated or communuted orange juice in PET or PVC bottles. Bottled, freshly-squeezed RTD orange juice to be kept refrigerated, is internationally retailed at an average price premium of twice to three times the price per 100 ml of diluted concentrated juice diluted to single strength. These relative margins vary widely.

3.B.c. 3.1 (iii)Discounts and Commissions [see 3.B.e]

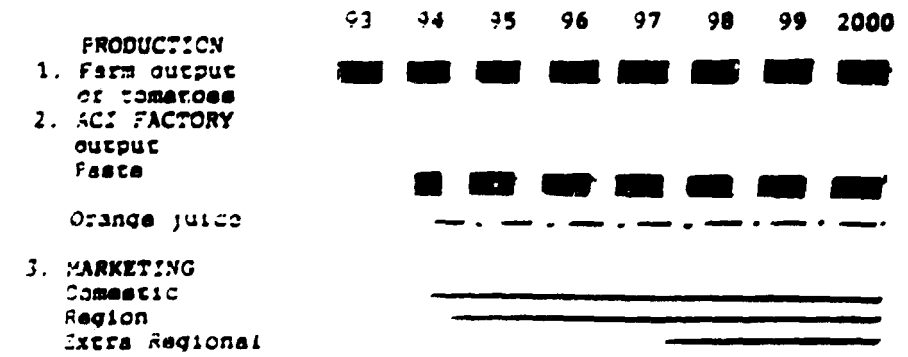
3.B.c. 3.2 (iv) Promotional Efforts [see 3.B.a.]

3.B.d. **Annual Sales Revenues {see Annex 14 & 15.18}**

3.B.e. **Sales and Distribution Costs**
Marketing Cost of Domestic Sales: 30 %

3.C.a. 1. **Production Programme (see also 3.D.a.1 & 4.1.1)**
The factory production programme is based on a working year of 250 days, with 115 days for downtime, maintenance and workers' holidays. The tomato programme for Norton farm is based on the harvesting season September-May, ([redacted] in the Activity Bar Chart below), with very limited volumes available June-August during the dry season. If and when ACI embark on paste production, the factory will have to repack stored paste during the low season: The Orange Juice Packing Programme is shown as continous, but breaks will occur annually for plant maintenance.

3.C.a 2. **Activity by Year**



3.C.a. 3. The scope of activities for Farm and Factory links farm seasonal output with feedstock procurement and processing. The production plan is to have the Orange juice line installed by June 1994, and to embark on domestic marketing to secure a six months' build-up of domestic sales during the last half of 1994. By June 1995, ACI will be able to embark confidently on citrus juice export marketing, with proven samples for ACI trade contacts in the Region. Orange juice production may be varied with other fruit juice lines, and interrupted by maintenance downtime. Other products, canned beans and peas, would be processed mid-year July-Oct from 1994 when tomato is scarce or unavailable.

3.C.a. 4. **The Annual Production Programme for:**

1. The Farm [see Cap IV and V].
2. The Factory (1) Tomato Products.
   (2) Citrus Products.
   (3) Other Products.

3.C.a. 5. **The Annual Production Programme Inputs:**

(i) Seeds for processing tomato varieties are available from local sources in Zimbabwe, with limited imported supplies dependent on forex availability from South Africa and Holland. Quotations for locally-grown seed from the Farmers' Co-Op, Wynne Street, PO Box 510, Harare. Tomato seed per kg, Rosso, Z$ 336.29. Floradade, Z$ 330.00. From Mansons, Box 1994, Harare. Tel: 725830. Tomato seed per 20 g. Rosso, Z$ 11.00. Floridade, Z$ 28.60. Moneymaker, Z$11.35. Peas, Green Feast variety, Z$10.60 per kg. Bean seed was not available.

(ii) Irrigation equipment made in Zimbabwe by Promet can be installed by local companies at Z$1.68 per metre. Drip irrigation delivers either 2 litres per hour or 4 litres per hour. Lines are on ground surface, as experience shows dug in lines suffer from moisture-seeking roots blocking drip apertures. Trickle systems for coffee and citrus are also available delivering 12.5 litres per hour. Micro-jet sprinkler systems are priced Z$

per meter and Z$0.36 per jet. Suppliers include IRRIG-8 Tel: 45066, Dore & Pitt, Southerton, Harare, Tel 67613.

3.C.a. 6. **Factory Outputs** [see 3.D.b.1 to 3]

3.C.b. **Product Descriptions, Specifications and Input Specs**-[Descriptions see 3.A.3.2.9, Specifications see 4.3.3]

3.C.b. 1. **Inputs: For Tomato Paste:**

It is anticipated that up to 7800 t of fresh tomatoes could be available from the 130ha site if a yield of 60 t/Ha is produced. This would give an estimated yield of 6600 t juice, (allowing 15% loss from skins, seeds and defective fruit) and 1100 t 280 Bx paste. This is sufficient for single shift operation for 163 days, assuming constant supply of raw material, which could be achieved by planning production for 5 days/week, and harvesting for 6 days/week. For longer processing periods, and 2 or 3 shift working, supplies of fresh tomatoes would need to be obtained from other sources.

(i)	Raw materials/8 hour shift:-	
	Tomatoes:	48t
	Salt:	0.020t
(ii)	Consumables/8 hour shift:-	
	Cans (115g):	64,000
	Cartons (24 cans):	2,666
(iii)	Utilities/8 hour shift:-	
	Electricity:	400 kw
	Water:	40,000 litres
	Coal:	2500 kg
OR	Oil:	1600 litres

3.C.b. 2. **Inputs for Orange Juice:**

(i)	Raw materials/8 hour shift:-	
	Concentrate:	1.65 t
	Water - Food Quality	

(ii) Consumables/8 hour shift:-

Tetrabrik:	6 Reels
Trays:	1333
or cartons:	1500
Straws:	36000
PPP strips:	36000 equivalent
Shrink Film:	0.33m2

(iii) Utilities/8 hour shift:-

Electricity:	480 kw
Coal:	1687 kg
Water purified:	7500 litres
Water process:	5000 litres

3.C.b. 3. **Raw Material Requirements for ACI Products, Tonnes from all Sources**

INPUT PRODUCT	From Farm TOTAL	Bought-in
(i) TOMATO Paste	7800t	4200
(ii) CITRUS Juice-		550t

3.D. **PLANT CAPACITY**

3.D.a **Parameters for the Determination of capacity**

3.D.a. 1. **Tomato Paste**

The demand for tomato paste in Zimbabwe in 1992 has been estimated to be 680 t derived from approximately 4000 t fresh tomatoes. This has been projected to rise to 2482t paste by 1994, and 3881t by 1996. but with demand met from existing or newly created sources. The plant considered in this study is small scale, capable of handling 6 t fresh tomatoes per hour, to produce 910kg/hr paste at 28 Bx, equivalent to 7.28 t/8 hour shift. Single shift working would produce 1820t paste PA at 100% capacity.

The production of canned peeled tomatoes and tomato juice has been discounted from this proposal since the projected demand is small : the former would require a small scale line handling an input of 6 t fresh tomatoes/hour to

run for 167 hours, 21 single shifts, to produce the requirements for 1994, rising to only 41 shifts by 2000. The capital cost for a tomato peeling and canning line would require an investment in equipment alone of around US$ 305,000.

Consideration of any larger plant is therefore ruled out. The subsequent filling and seaming operations will handle 1.5 t product/hour (against an outturn of around 910kg/hr), this being the minimum capacity machinery for commercial continuous operation, at quality standard for present day Zimbabwe.

3.D.a. 2. **Orange Juice**

The demand for fruit juices in Zimbabwe in 1992 has been estimated at 110m litres, rising to 131m in 1996 and in excess of 200m by 2003. The potential for locally-produced, aseptically-packed, good quality, orange juice has been identified. An aseptic plant, such as the Tetra Pak design, should run for 250 days per year, preferably on 3 shifts a day. To operate in this manner concentrates will need to be used in and out of the fresh citrus harvesting season. For this project, the equipment required for processing imported concentrates is assessed since this is an option which can be implemented without delay and without excessive investment in extraction and concentration equipment that would be better sited elsewhere. A budget cost for juice extraction and concentration equipment to effect a Bx concentration is in the region of US $ 1.5m. The estimate for a filling and packing operation is US$ 701,375, [see 6.4.2].

3.D.b. **Normal Plant Capacity by Product**

	Tonnes INPUT		OUTPUT	
	TPH	TPA	TPH	TPA
1. TOMATO PASTE	6.0	12000	0.910	1,820
2. ORANGE JUICE	0.188	500	1.122	3,000

Note: OUTPUT BASED ON 250 WORKING DAYS PA.
TOTAL NUMBER OF 8 HR SHIFTS FOR ORANGE JUICE IS 334.

CHAPTER IV
MATERIALS AND INPUTS

4.1. RAW MATERIAL AVAILABILITY

4.1.1 Tomato

4.1.1.1 Tomato Production in Zimbabwe

Although tomatoes are commonly grown on small-scale communal farms in Zimbabwe, accurate data on volume are not available. A high proportion is used for family consumption with surpluses being traded in a fairly unstructured way. Production from large scale commercial farmers in 1989 amounted to 10,700 tonnes from 512 hectares, an average yield of 21 tonnes/ha.

4.1.1.2 Tomato Production, from large-scale commercial farms, Zimbabwe, 1982-89

	1982	1983	1984	1985	1987	1988	1989
Area(ha)	385	378	464	329	466	516	512
Production tonnes	6690	7975	3904	6999	10403	7767	10692

Source: C.S.O. Crop Production on Large Scale Commercial Farms 1989

Export of tomatoes from Zimbabwe amounted to only 102 tonnes in 1990, rising to 146 tonnes in 1991, primarily of high value cherry tomatoes to northern Europe.(Source: Horticultural Promotions Council).

Tomatoes for local sale, or for any proposed ACI factory, can be grown on the Project Sponsor's farm at Norton. There is a four month period annually July-October when tomatoes are out of season. Low yields in this period will enable ACI to source some tomato from the Norton farm, or to buy limited volumes from neighbouring communal farms, for example at Zvimba and Murombesi. The quantity to be bought in will depend on whether one or two 8-hour shifts per day are worked in the processing plant, and assumes a 6 tonne/hour fresh fruit processing capacity. Operating at 10-30% of capacity, as would be likely in view of market conditions, the Norton farm

could supply all raw material needs. Yields from the farm could reach 75 tonnes per hectare. Yields on communal farms have been averaging 20 t/ha:

4.1.1.3 Raw Material Sources for a 6 tph Tomato Paste Factory by Month

MONTH	NORTON FARM YIELD tonnes per ha	HECTARES HARVESTED per month	FARM OUTPUT tonnes	BOUGHT-IN tonnes SHIFT 1	BOUGHT-IN tonnes SHIFT 2	TOTAL SUPPLY tonnes SHIFT 1	TOTAL SUPPLY tonnes SHIFT 2
Jan	50	16	800	400	1600	1200	2400
Feb	58	16	928	272	1472	1200	2400
Mar	65	16	1040	160	1360	1200	2400
Apr	70	16	1120	80	1280	1200	2400
May	75	16	1200	0	1200	1200	2400
Jun	70	16	1120	80	1280	1200	2400
Jul	-	-	-	-	-	-	-
Aug	-	-	-	-	-	-	-
Sep	-	-	-	-	-	-	-
Oct	-	-	-	-	-	-	-
Nov	50	16	800	400	1600	1200	2400
Dec	50	16	800	400	1600	1200	2400
YEAR							
Average	61						
Total		128	7808	1792	11392	9600	19200

Allowing for a break for maintenance in July, fresh tomato would then need to be sourced from lower altitude producers from August to October, if the processing plant were to continue operation through this period.

4.1.2. Citrus Availability

There are three sources of supply from:

1. Norton Farm,
2. Other Sources in Zimbabwe,
3. Citrus concentrate, imported & local.

4.1.2.1 Citrus from the Norton Farm

Trial plantings of citrus -orange and lemons- have been made at the Norton Farm over the past 3 years. Although growth and yield potential look reasonable, it is not anticipated that significant quantities will be available for processing from this source, for three reasons:

First, because of Norton's altitude and climate, its citrus yield and quality will be below that from lower altitude sites, for example Beit Bridge on the borders with South Africa.

Second, large quantities of non-export quality fruit are to be available in 1997/8 for export, local consumption and processing from recent plantings in Zimbabwe.

Third, current prices for citrus concentrate on the world market are low and supplies plentiful. [These factors are described below, and in Chapter V.]

4.1.2.2 Citrus from Other Sources in Zimbabwe

Substantial plantings in the past three years promise ample supply of citrus fruit in 3-5 years' time. One nursery alone has sold over a million orange trees since 1990,(53). The validity of fruit output projections for ZTCP rests on a major study by ULG for Government examining Export Prospects for Horticulture,(54).

With an allowance for crop spoilage, the total output of fresh whole fruit is projected to be 266,667 tonnes in the year 2000. About 60% is projected to be Grade One fruit for Export, 9% will be sold on the Domestic Market as Grade Two fruit, with a residual of 31% available for processing. Of this, we assume 40% by weight of the whole fresh citrus fruit can be extracted for juice:

ZIMBABWE CITRUS FRUIT OUTPUT: PROJECTIONS 1992-2000

by Grade of Fruit, in tonnes of whole fresh fruit Col 1-4, and tonnes of single strength juice, Col 5.

1. YEAR	2. TOTAL SUPPLY	3. of which, GRADE 1	4. GRADE 2	5. PROCESSING	6. JUICE
1992	29925	17955	2693	9277	3711
1993	45175	27105	4246	14004	5602
1994	73333	44000	6600	22733	9093
1995	105583	63350	9502	32731	13092
1996	139167	83500	12525	43142	17257
1997	171167	102700	15405	53062	21225
1998	203750	122250	18338	63163	25265
1999	236667	142000	21300	73367	29347
2000	266667	160000	24000	82667	33067

Source, Cols 1-4, Horticultural Export Marketing Study, (54).
Col 5 ZTCP, Manderstam at 40% by weight of col 4.

4.1.2.3 Citrus Concentrate Availability

Fruit concentrates are readily available at low cost on the international market. Current prices for orange concentrate of around US $ 1,200/tonne represent a price of US $100/tonne of orange used, including processing, packaging and transport. This assumes a conversion factor of 12 tonnes oranges per tonne of orange concentrate (65° Brix).

The principal supplier in Zimbabwe is Mazowe Estates, an Anglo American investment some 40 kms north of Harare. Its products are:

(i) 65° Brix orange concentrates in drums at Z$ 14,750 per tonne.

(ii) 50° Brix comminuted orange Z$ 11,630 per tonne.

Mazowe is harvesting declining yields from ageing trees and has barely enough output to meet local demand by its present customers. None is available for export, and it seems very unlikely that any would be available to ACI. The nearest source in the Republic of South Africa is BRONPRO Fruit processors PO Box 427 Nelsprvit 1200, RSA Fax: 01311 53377. Imports from RSA are assumed to face a 60% import duty at Beit Bridge, and 10% transport charge.

4.2. RAW MATERIAL SPECIFICATION

4.2.1. Tomato

Varietal selection must reflect the need for low-cost raw materials for processing. Varieties must therefore be suitable for production of a field scale without support staking or other relatively sophisticated agricultural practices. It is also very important that the chosen variety has a good red colour without greenback when ripe, both for canning whole or for paste, especially if the product is to enter international trade.

Tomatoes for paste must also have a high soluble solids content , ideally from 5.5-6 5° Brix. It is generally considered to be uneconomic to process tomatoes below 4.5° Bx. For this project a solids content of 5° Bx. has been assumed in calculations.

Fruit must also be sufficiently acid to give a juice pH of not more than 4.5, otherwise sterilisation,

rather than pasteurisation, is necessary to guarantee commercially-acceptable sterility and to avoid the danger of botulism.

Culls from the fresh tomato trade are sometimes used but these are normally available because of quality defects which have made them unsuitable for the higher-priced fresh market. They are generally unsuitable for processing, for whole, peeled, and because colour is often poor, for paste.

Samples of whole canned tomatoes produced in Zimbabwe were compared with imported products from South Africa and judged to be of significantly poorer quality. Cans contained a lower number of fruit. Fruit colour was generally poor and a higher proportion of fruit was broken. Since the imported products are sold at a higher price, this might indicate a market opportunity for ACI, were sales of peeled whole tomato not declining as a percentage of all processed tomato.

Little information on varietal comparisons is available from official sources in Zimbabwe . Evaluation studies of canning tomato varieties have been conducted by the Agricultural Development Authority (ADA) in conjunction with the FATA Group on behalf of the Zimbabwe Agro-Industrial Development Agency (ZAGRINDA).

Trials, which are continuing, were commenced in August 1991 on two sites, Middle Sabi Estate in the low veld (altitude 440m) and Nijo Estate in Mashonaland Region (1510m). Eight varieties were compared:

1) **Chonto Mejarado PS**
   Good shape and colour and suitable for canning whole and as paste. Average yield. Further evaluation needed.

2) **Rio Grande, Rio Fuego**
   Both varieties ideal for canning whole or as paste. Deep red colour and good size and shape. Reasonably good yields. Recommended.

3) **Campbell 33**
   Highest yielding variety, consistently over 100 tonnes/ha in these trials. Large fruit with red

flesh. Too large for canning whole but suitable for paste. Round rather than plum shape

4) **Heinz 2274**
Yield similar to Chonto Mefarado PS, shape similar to Campbell 33 but smaller. Further evaluation needed.

5) **Bulker**
Good red colour, high dry matter, and suitable for canning. Only moderate yields.

6) **Ventura**
Good red colour, early production and easy to pick. Variable yield and quality with tendency to hollow fruit.

7) **Roma**
The most common processing variety grown in Zimbabwe. Yield can be high but was variable in these trials. Fruit has high dry matter but flesh is pale in colour, which is a significant defect.

The processing variety we recommend for growing on the Norton Farm is Roma plum.

4.2.2. <u>Citrus Concentrate</u>

The potential for local , aseptically-packaged, good quality orange juice has been identified since none is currently produced in Zimbabwe. An aseptic plant packing processed concentrate, such as in the selected Tetra Pak design, should be able to run for 250 days per year and preferably for more than 8 hours shift per day, for maximum economy. Even when local fresh fruit for juicing is available, concentrates would need to be used out of season.

For orange juice, suitable varieties must be selected. Washington Navel types, for example, are not suitable since the juice develops an unpleasant bitter taste after extraction. Valencia types, with local season of July-September, produce very good quality juice.

The orange oil content in the extracted juice needs to be controlled, ideally down to a level of 0.1%, to prevent too strong, bitter a flavour. To achieve this low level, either expensive reaming equipment which

halves the fruit and squeezes the juice without removing oil, or peeling equipment must be used before extraction. The alternative is to use citrus presses which crush and extract juice and peel-oil. The oil is then removed in a special vacuum de-oiler before processing.

Purchased orange concentrate for dilution should comply with the international standards of 65° Bx, pulp content maximum of 8%, and oil content below 0.1%. It is preferable to use concentrate packed aseptically to avoid the need for holding concentrate stock in a cold store at - 20°C,

4.3. STANDARDS

4.3.1 National and International Standards

High quality output and the highest standards of food hygiene are essential if ACI wishes to produce to meet modern standards and to export to quality-conscious markets. In Zimbabwe, tourists visiting hotels and restaurants increasingly expect foods and beverages to meet international standards. Food Companies supplying airlines are required to meet standards set by international authorities,(26), but have only been able to source from Zimbabwe suppliers, many of whom preserve their products with sodium benzoate and sulphur dioxides, even for orange juices labelled as `Pure'. We recommend the adoption by ACI of pasteurisation technology and of TQCM -Total Quality Control Management-(14).

4.3.2. National Standards

National standards for the Food Processing Industry, enshrined in Cap 321 of the Laws, are enforced by Government and are under continuous review. In 1992, legislation was enacted requiring food packers to introduce a Sell-By date on packed foodstuffs. Many have been unable to comply. Foreign exchange has not been available to import the date-stamping equipment. Foreign Exchange constraints have equally limited effective action to acquire new machinery for enhancing food product quality and package design,(27).

4.3.3. **International Standards**

International standards adopted by ZTCP for ACI product options are derived from the Codex Standards 134-1981.

For Tomato Juice		>4.5%	TSS	49-1981
For Concentrates:	Puree	8-24%	TSS	57-1981
	Paste	>24%	TSS	
Double Concentrates		28-30%	TSS*	
Triple Concentrates		35% +	TSS*	

* Commercial descriptions, not standards
> more than, or not less than
TSS = Total Soluble Solids

For Citrus Juice,	Lemon	6%	TSS	47-1981
	Grapefruit	9%	TSS	46-1981
	Orange	10%	TSS	45-1981

For Concentrates: NO SET INTERNATIONAL STANDARDS

4.4. **SPECIFICATION OF PROCESS CONSUMABLES**

[For details of supply sources see 4.8]

4.4.1 **Tomato Paste**

1. Cans 115g - supplier CMB
   65 X 44 D4/1P EIXX
   Litho with printed 4 colours
2. Tomatoes [see 4.2].
3. Salt - supplier Blue Ribbon Foods Ltd
   Pure dried vacuum salt
4. Cartons supplier - Hunyani
   kraft fibre board cartons
   glued - no staples

4.4.2 **Citrus Juice**

[For details of supply sources see 4.8]

1. Flexible packaging - supplier Tetra Pak flexo claycoated duplex film - 230/240 GM. 2 Polythene coated board imported under HS Code 48.11.
2. Orange Juice concentrate [see 4.2].
3. Water -FQ = Food quality, own supply, potable
4. Packing trays - Hunyaniplain die-cut trays 125K/B/125K
5. Shrinkwrap - supplier - Saltrama plastics, Harare 450mm x 1500m 25 micron polythene
6. Glue supplier Tetra Pak hot melt
7. Straws - supplier Tetra Pak
8. PPP strip - supplier Tetra Pak

4.5 FACTORY SERVICES

1. Water - own services, potable.
2. Electric power ZESA National Grid 3 phase 440 volts.
3. Coal - LAKAS Products for steam generation.
4. Steam - own boilers - saturated steam.
5. Oil
6. Waste Disposal:
   Solid (see 4.8.6)
   Water - Soakaway
7. Security - own resources
8. Insurance:-

		Unit Costs
Fire and related risks:		0.425
Consequent 6 month loss of profit		.21
Burglary		7.0
Cash loss		4.0
Premises and stock		
Product liability, of turnover		.0325%
Food & Poison cover		Z$75pa
Public liability max	Z$250,000	Z$50

4.6. SUPPLY PROGRAMME FOR PRODUCTION

(Batch Size, Storage, Transportation.)

4.6.1 Tomato Paste

If tomatoes from Alison Farms were to be used, transportation would be by tractor and trailer from the fields. This delivery flow needs to be balanced to achieve the 6-7 tonne/hour of raw material required. Cans would be held at the factory in dry store as required. Salt, if used, will also be held in dry store on site. Cartons will be ex-store, delivery quantities to be as economically favourable. On site stores will be at ambient temperature, dry and clean.

4.6.2 Citrus: orange juice

If produced from concentrates, stock holding will depend on market conditions and delivery times. If the concentrate is packed aseptically in drums as is usually the case, it can be stored at ambient temperature. If not, any lengthy storage, must be at -20 C to avoid fermentation. Packaging will be held in ambient store on site.

4.6.3 **Minimum delivery quantities**

Packaging film	- 30 reels equivalent to 180,000 packs
Straw	- 16 cartons each containing 3x8000 strawsfor 384,000 packs
PPP strips	- as required
Hot melt glue	- as required
Trays	- as required
Shrinkwrap film	- as required

4.7. **CONSUMPTION COEFFICIENTS:**
Raw materials, consumables and factory services, by volume per tonne of product ACI INPUT VOLUMES

4.7.1 **Tomato Paste**

	Input/t
Fresh tomato	6.59
Salt	.005
Cans - 115g	8.333
Cartons	0.347
Water	43956 l
Steam	8.25 t
Electricity	60 Kw
Coal	0.220 t
Waste	0.989 t
Storage	1.40 m3
Insurance	[see 4.5]

4.7.2 **Orange juice**

	input/t
Concentrate	0.167
Water	0.833
Packaging film *	per tonne
Trays	3920
Straws	145
PPP strips	3920
Hot melt glue	3920
Shrink film	47.85m2
* 1 reel = 6200 packs.	
Water GP	530L
Steam	2.2t
Electricity	53 kw
Coal	0.18 t
Waste	-
Storage	0.98 m^3
Insurance	[see 4.5]

4.8. SUPPLY SOURCES FOR

(1) RAW MATERIALS,
(2) FACTORY UTILITIES AND SERVICES
(3) CONSUMABLES

4.8.1. For Raw Materials [see 4.1]

4.8.2. Factory Utilities & Services

1. Water for general purposes is supplied from ACI's own boreholes and the Lake Manyame (Robertson) on the northern boundary of Norton Farm, (Annexe 8). Lake water allocation is 1.5 million M3 per year. The Farm has its own dam reservoir capacity 20 million gallons. There are 9 x 2" boreholes.
2. Steam is raised for the factory from coal-fired boilers at the ACI site, but may be raised by fuel oil-burning boilers should the existing boilers be too far from the food processing sheds. Fuel oil is imported but coal is supplied by Lakas Products (Pvt) Ltd. PO Box 3697, Harare, one of three companies supplying from Wankie Colliery. All supply at the same price. The boiler cost estimates for these investments imply some rebate on new boiler quotations from manufacturers in Harare, [6.4.2].
3. Security: as for the Norton Estate.
4. Insurance cover through Kantharia Insurance Brokers, Harare.
5. Waste Disposal will be by an animal feed company.
6. Transport. Farm-factory transport is to be supplied by ACI or Alison Farms (Pvt) Ltd. Domestic distribution will be acquired by ACI at commission terms yet to be agreed through C.I. Enterprises, PO Box 1723, Harare. Forwarding services for any export distribution will be acquired from Kestrel Shipping (Pvt), Allen Wack & Shepherd, AMI Zimbabwe, or other.
7. Engineering maintenance. ACI on-site workshop.

4.8.3. Consumables: Sources for Consumables

1. Cans-Carnaud Metal Box PO Box ST 128 Southerton, Harare. Fax 65469
2. Tetrapak (83).
3. Salt-Blue Ribbon Foods Ltd
4. Water-ACI's own boreholes, filtration plant and recycled evaporator water.
5. Cartons-Hunyani, 27g Cripps Road,Grantside, Harare
6. Shrink-Film. Saltrama Plastics, Harare

4.9. UNIT PRICES FOR RAW MATERIALS, CONSUMABLES AND FACTORY SERVICES

Prices for Raw Materials, Consumables and Factory Services are to be annually contracted in order to ensure adequate supply volumes and specifications. The price of processing tomato bought in from neighbouring farms would be seasonally contracted, and are likely to differ from open market prices for non-canning varieties. We have assumed for any factory production an average buying in price for delivered inputs at an average of 1992 prices. In the case of imported inputs such as citrus concentrate and packing laminate, the average price includes Costs of Freight, Insurance, and Import Duty payable, at US1=Z$6.4. in Feb 1993.

4.9.1. UNIT COSTS FOR ACI FACTORY PRODUCTION, WITH TROUGH AND PEAK PRICES REPORTED FEB 1993..

	ITEM	UNIT	TROUGH PRICE Z$	PEAK PRICE Z$	ADOPTED ZTCP Z$
1.	RAW MATERIALS				
	Tomato (95)	tonne			600
	From the Farm		172	340	
	Others		360	950	
	Orange juice conc.	tonne			
	Imported (64)		7680	13824	12288
	Mazoe			14750	
2.	CONSUMABLES				
	for Tomato Paste:				
	Locally-sourced:				
	Cans 410 g				
	115 g	1000			575
	Litho printing	1000			35
	Labels				
	23.5x10.5	1000	200	160	
	Cartons	unit			2.08
	Salt	kg			1.40
	for Orange Juice:				
	Tetra Pak (66)				
	Imported				
	250 ml	pack	.26	1.18	0.34
	Locally-sourced				
	Straws	1000			20.57
	PPP Strips	1000			13.69
	Hot melt glue	1000			1.60
	Water (FQ)	1000 M3			15.00
	Trays	(12pack)			1.93
	Shrinkwrap	M2)			
3.	FACTORY SERVICES				
	Coal, delivered	tonne			201.60
	Water (GP)	1000 M3			12.00
	Maintenance				
	Security				
	Insurance	[see 4.5]			
	Transport				
	Distribution	on ex-works price			20%
	Shipping cont	per 20 ft container			20-29,000
	Electricity	per Kwh < 300 KvA			0.1876
		per month fixed			42.00
		per Kwh > 300 KvA			
		at peak 6am-9pm			5.15
		other times			3.93
		per month fixed			150.00

Note: Average Prices are Suppliers' lowest or best manufacturers' price obtainable Feb 1993 Imported prices are CIF plus duty and delivery.

4.10. UNIT PRICE, BY FIXED COST, VARIABLE COST, FOREIGN and LOCAL COST, DIRECT and INDIRECT COST. [See 4.9]

4.11. SPECIFICATION OF QUALITY and QUANTITY of EQUIPMENT FOR FACTORY UTILITIES/SERVICES: WATER, STEAM, ELECTRICITY, FUEL, COOLANTS [See 4-5 and 4.7]

4.12. UNIT AND ANNUAL INPUT COST DETERMINANTS

4.12.1. <u>Factors Affecting Input Costs are:</u>

(i) Seasonal and annual fluctuations in rainfall and temperature affect crop yields. Some evidence suggests drought conditions can be expected every four years.

(ii) The Chegutu Canning factory and any Zagrinda Project for tomato processing in the area are likely to bid up tomato feedstock prices from farms.

(iii) Transport costs have inflated 50% since Feb 1992, and are reported to be still rising. This may affect distribution costs of between 20-30% on ex-works prices

(iv) Metal Box cans output capacity was extended Feb 1993 with a new line delivering a total of 105 million cans pa. 1992 demand was estimated at 95 m cans. Supply is therefore assured, and prices soft.

(v) Application by Zimbabwe Customs of tariff reductions agreed by the PTA on imported industrial inputs sourced from within the PTA/COMESA Region, eg Tetra Pak laminate from RSA or Kenya.

(vi) Inflation [see Cap 10].

4.13. TOMATO PRODUCTION - ALISON FARMS - CROP COSTINGS

VARIABLE COSTS	TOMATO Z$/ha
Seed	72.00
Fertiliser	2521.00
Insecticide and fungicides	714.00
Irrigation water	102.00
TOTAL	3409.00
FIXED COSTS	
Crop labour (369.6 days A$7.00)	2587.00
Fuel and power	420.00
Management	1973.00
Machinery depreciation	2115.00
TOTAL	7095.00

Notes: Machinery depreciation includes trickle irrigation.

Fuel and power includes irrigation pumping costs.

TOTAL VARIABLE AND FIXED COSTS 10504.00/HA

CHAPTER V
LOCATION, SITE AND ENVIRONMENT

5.1. THE LOCATION:

5.1.1 Selection Criteria

Alison Farms (Pvt) owns two adjacent properties at Norton, 50 km from Harare, which would provide the site for a tomato and citrus production and processing factory.

The Estate consists of two farms, referred to throughout this study as "The Norton farm".

		Land Registration Title Nos
1. Clifford	1426.79 ha	APRef 1011 to 1014 and 1125 to 1127, 1965
2. John O'Groats	669.50 ha	PRef 731 to 7 34 and 811 to 812.
TOTAL	2096.29	

Norton is located in Natural Region IIa in the Zimbabwe Related Farming Systems classification. Region IIa is described as the "Intensive Farming Region" with rainfall moderately high (750-1000mm) and with an average of at least 18 rainy pentads per season. This region normally enjoys reliable conditions, rarely experiencing severe dry spells in summer and is considered suitable for intensive systems of farming based on crops and/or livestock production.

Norton is expected to be gazetted as a special development Growth Point, attracting provision for infrastructural development. There was no reason at the time of this Study to suppose that the Norton Farms would be liable to resettlement under the 1992 Land Acquisition Act. We were not required to investigate the intensity of current land-use for ranching or tobacco.

Norton is served by a Class 1, two-lane metalled road from Harare. The farm is also adjacent ot the Harare-Bulawayo railway, and has its own sidings. Electric power lines enter the estate from a substation on ZESA's National Grid from Norton town. Water is pumped from the nearby lake into which the Farm Estate

drains. There are existing irrigation pipes and pumps.

Internal roads are adequate for transportation around the Estate, and telecommunications facilities are available.

5.2. ACCESS TO RAW MATERIALS.

5.2.1. Tomatoes

Climatically, there is no reason why tomatoes should not be grown successfully in the Estate. The soil structure and inclusion of tobacco in the rotation will limit the potential maximum area of the crop however. Structurally, the land is not ideal for intensive crop rotations because of the increased risk of soil erosion and reduced production potential unless substantial quantities of organic matter were available corporation. It would not be advisable to grow tomatoes and tobacco in the same rotation because of the risk of carry-over of soil-borne pathogens such as nematodes and fungal wilt and root diseases.

The climate should allow the production of two crops of tomatoes per year on the same land, but because of the soil structure limitations and uncertainty about the precise potential for tomato production on the site, this is not recommended until more experience is gained. A traditional rotation of 1 year tobacco or tomato and 3 years grass, would be prudent.

With a current tobacco area of 130 ha. this would allow an area of 130 ha for tomatoes. With good management, a yield of 60 tonnes/ha. marketable fruit is considered, by the project sponsors, to be achievable based on recent variety trials conducted in Zimbabwe. This is higher than yields currently being achieved by tomato growers in the commercial farming sector and would give a total maximum annual production of 7,800 tonnes of fresh tomato. This would enable the production of a similar quantity of peeled tomato, or 6,600 tonnes tomato juice, or 1,300 tonnes tomato past (double concentrate, 28%)

Assuming a farm production season of 200 days and a 8 hour working day in a future processing factory, this would give an average input of 4.88 tonnes/hour fresh tomatoes. Allowing for "down time", this would

correspond with a 6 tonne/hour nominal capacity plant. For a 10 tonnes/hour processing line a total of 14,400 tonnes fresh tomatoes would be required, allowing for down time. There would therefore be a requirement to source 6,600 tonnes from other producers in the event that the larger capacity line (10t/hr) is selected.

Two communal Farms in the area are potential sources. These are Zvimba, 25kms from the Estate where vegetable crops, including tomatoes, are already grown; and Murombezi, 35kms away. Adequate land is available at these sites for producing additional volume but considerable input in co-ordination and technical support would be needed. At present Communal farm tomato yields are less than 25 tonnes per hectare.

No arrangements have been formalised with the two Communal Farms at this stage. This would be recommended as a matter of urgency if and when the project were to proceed at the higher throughput level, particularly in relation ot the potential competition for supplies from other tomato processing plants, such as the Zagrinda and Heinz projects.

5.2.2 **Citrus.**

Trials plantations of citrus (lemons and oranges) have been established on the Estate over the past three years and growth and yield potential look reasonable. The trees have not received optimal management in terms of irrigation, nutrition or pruning. [see also 4.1.2.].

The yield potential for citrus on the Estate is a crucial but an uncertain factor since there are no established plantations in the immediate area. Zimbabwe's biggest citrus producer, Mazowe Estates, is at a similar altitude , north-east of Harare. Yields are reported to be below maximum potential, but this may be affected by the increasing age of some of the plantations.

There have been more recent plantings in the Chegutu area south of Norton but these have not yet reached full cropping. Studies are currently being conducted by commercial agronomists in Harare (82) to explore the yield potential for citrus in different locations, but no more specific data for the Norton area are

available at present.

It would be prudent to assume lower production levels than those achieved at lower altitudes, such as in the Beitbridge areas on the southern boundary of Zimbabwe. For the purposes of any potential citrus farming, a reduction of 30% below the maximum expected yield in the Beitbridge area is proposed.

This would indicate a yield with good management at full cropping of 50 tonnes per ha. Assuming the achievement of 60% export quality this would give 30 tonnes per ha. available for export, and 20 tonnes per ha. for local sales and processing.

5.2.3 **Recommended Strategy**

The Norton area is not considered suitable for grapefruit production because of sub-optimal temperatures resulting from its altitude.

Citrus production on the Norton Farm would compete for available arable land with tomato production. If the full area of tomatoes proposed is grown, no worthwhile area of citrus could be accommodated. A choice between the two therefore has to be made. In the light of the Marketing and Financial analysis for processed tomato, and the lack of advantage for citrus, priority should be given to the tobacco crop.

Market assessment indicate good sales potential for processed citrus products of high quality in Zimbabwe. Recent records of citrus plantings in the country indicate the availability of significant quantities of citrus for processing by 1997/8. Imported concentrated juices are also available immediately for fruit drink manufacture.

The availability of large quantities of tomatoes of consistent quality and reliable volume is less certain, particularly as these would tend to come from the Communal Farming sector. Assuming good management, near maximum potential production of tomatoes on the Norton Farm could be achieved in the first production season. Full citrus production would not be achieved until 10 years after planting, or nearly 12 years from ordering trees. For this reason and the higher capital requirement, the risk attached to citrus production is substantially greater.

It is recommended therefore that Alison Farms should proceed with tomato farming in preference to citrus. Additionally, Alison's existing experienced in tobacco production will be of benefit since there are some similarities with tomato farming from an agronomic viewpoint.

5.3 CLIMATIC AND SOIL CONDITIONS

5.3.1 Survey Report

Detailed survey reports by the Department of Conservation and Extension of the then Rhodesian Government produced in 1971 (Clifford) and 1976 (John O'Groat) describe the land classification, topography and cropping potential. Areas of land according to soil classification are shown in Table 5.3.1.

Classes I to VI are considered suitable for arable land (Class IVw arable land if drained), Classes VI to VII non-arable land and Class V is vlei land. Some 1035 ha. therefore constitutes arable land, or 50% of the total. Tomato and citrus production requires land of at least Class IV and preferably better.

TABLE 5.3.1.
Land Areas By Soil Classification (hectares).

1 Class	2 Clifford	3 John O'Groat	4 Total
I	-	-	-
II	47	-	47
III	644	332	976
IV	12	-	12
IVw	201	270	471
V	499	70	569
VI	-	-	-
VII	-	-	-
VIII	-	-	-
TOTAL	1403	672	2075

Soils on both farms are derived from granite. Clifford soils range from shallow to moderately deep but are generally moderately shallow straight sands. Heavier textured soils are found in the vicinity of the tobacco barns and comprise moderately deep sands that change rather abruptly at 25cms to sandy clays. Generally, the arable soils are slightly restricted in drainage. John O'Groats soils are coarse granite sands. They are generally moderately deep with no

improvement with depth. The common limiting factor is a waterlogged horizon and much of the land on this farm suffers from waterlogging to various degrees.

5.3.2 **Altitude**

The altitude is- 1360 metres with relatively little variation.

5.3.3 **Topography**

Clifford Farm is flat to gently undulating and John O'Groats comprises wide, very gently sloping ridges separated by wide gently sloping vleis land with no marked drainage line.

There are no slopes on the estate of a degree sufficient to cause problems with cultivation or vehicular movement. Whilst acute erosion should not represent a problem for the same reason, there is some risk even on these gently slopes because of the relatively low inherent fertility of the soils. This needs to be taken into account in deciding upon suitable rotations.

5.3.4 **Climate - Norton Farm.**

(i) Temperature - average annual - 18.5°C.

(ii) Rainfall - annual mean - 844mm

(iii) Rainfall distribution.

Month.	Rainfall (mm)
January	201.17
February	165.35
March	101.85
April	35.05
May	7.35
June	1.78
July	0.25
August	1.52
September	4.57
October	30.73
November	107.70
December	186.44
TOTAL	843.79

The probability of receiving a "planting rain" i.e. 25mm or more in 5 days by a certain date is as follows:

Date	Probability (%)
October 25th	20
November 7th	40
November 15th	60
November 25th	80

Source: Rhodesia Department of Conservation and Extension Farm Planning Scheme Report, 1976.

More detailed seasonal meteorological data is not available for the site itself, but information for Harare [17 56S 31 05E , 1479 metres altitude] is given below. Figures are long-term average where [1] and [2] represent the average daily maximum and minimum temperature [degrees Celsius], [5] and [6] represent the average rainfall [mm] and average duration of bright sunshine [hours].

Monthly Average Meteorological Data - Harare.

	[1]	[2]	[3]	[4]	[5]	[6]
Jan	29.9	15.8	33.3	10.6	178	198
Feb	25.9	15.6	31.1	9.4	158	192
Mar	25.9	14.4	31.7	8.9	85	204
Apr	25.6	12.6	30.6	5.6	39	255
May	23.4	9.1	29.4	2.2	10	270
Jun	21.3	6.7	26.1	0.0	5	273
Jul	21.4	6.4	27.2	-1.1	<1	269
Aug	23.6	8.2	31.1	-0.6	3	295
Sep	26.7	11.2	32.2	3.3	10	290
Oct	28.7	14.5	35.0	5.6	31	289
Nov	27.1	15.4	34.4	8.3	97	219
Dec	26.2	15.6	33.3	8.3	169	209

Source: The Met. Office, Bracknell, UK. Average temperatures at Norton will be slightly higher than the above as the altitude is around 100metres lower.

5.4 SITE RESOURCES

5.4.1 Water Supply.

Boreholes provide a limited amount of water for domestic use. Since there are no aquifers in the area these do not supply quantities sufficient for crop irrigation. Analysis of the borehole derived water by the Zimbabwe Government Analyst Laboratory [Lab.No.

P81/93, 23/0293], shows it to be suitable as a potable water supply for uses including processing factory use.

Water from the Darwendale Dam reservoir is available for crop irrigation. Alison Farms have water rights to abstract 1.5 million cubic metres per year from this reservoir [Title no. 9037, Diid Office no. 1/71]. Further water is available from an overspill reservoir of 90,000 m3 capacity on the farm.

Cost of water delivery from this source (January 1993) is Z$12.00 per 1000 cubic metres.

Water analysis shows the reservoir water to be suitable for irrigation on well-drained upland soils, although it will tend to raise the soil pH. Samples should be taken from time to time to check this, [Analytical report from Chemistry and Soil Research Institute, Harare; ref CL/5/2/774, 08/03/93].

The suitability of the water supply for drip irrigation is a distinct advantage. Such systems are to be preferred for tomato production since they use water more efficiently and give the potential for improved yield and quality. Whilst overhead sprinkler irrigation is practised in many areas and has the advantage of the relatively easy layout, efficient irrigation can be achieved only if the supply is at a steady pressure and there is no significant wind.

Drip irrigation is independent of wind conditions and the water flow can be easily controlled by suitable pressure regulators. The penetration of water into the soil can be controlled to the optimum depth and moisture content. Irrigation can be applied at any time of the day with nearly 100% efficiency. The application of fertilisers and crop protection chemicals through drip irrigation systems conveys additional advantages provided that, as in this case, the supply is independent of drinking water supplies.

The irrigation system also markedly influences the development of fungal and bacterial diseases and some pests. Overhead irrigation promotes free moisture conditions which provide a favourable environment for diseases such as early and late blight (Alternaia and Phytophthora), grey leaf spot (Stemphylium), bacterial

speck (Pseudonomas), bacterial spot (Xanthomonas) and others. Wet conditions also favour fruit rots which can cause major crop losses. Whilst the drier aerial conditions resulting from drip irrigation may result in increased incidence of diseases such as powdery milkew and pests such as mites, these are more easily controlled.

The possibility of restrictions on water supplies, as were applied in the drought conditions of 1991/92 in Zimbabwe, make the efficiency of irrigation supply a higher priority than in the past.

Underground water supply mains for irrigation are already installed on 400 ha. land on Clifford Farm which would be the proposed site for tomato production.

5.4.2 **Electrical Power Supplies**

Electricity supplies are provided to the Estate on NESA's National Grid from Norton Town. Substations of 50 kva, 100 kva, 200 kva and 500 kva are situated on the farm. The site of the 50 kva substation is the proposed location of the processing factory and this supply will therefore need upgrading. Although there have been and may be again interruptions in the power supply, we have not thought it necessary to recommend a stand by generator.

5.4.3 **Waste Disposal.**

Farm and factory outputs would be principally organic, derived from fresh fruit and vegetable input, with no hazardous characteristics. Wastes from the preserving and packing process are all benign, with some risk of acidity to soils were the preparation residues dumped without proper composting.

Waste water used for washing tomatoes before processing should not be heavily contaminated and can be disposed of by soakaway arrangements. Discarded tomato peel and seed has a ready outlet for stock feed, if dried. This has been confirmed for example by Agrifoods (Pvt) Ltd. Harare. Alternatively it could be disposed of immediately to avoid the expense of a drying plant.

ACI's products would be packed in disposable cans, and combustible laminated paperboard packs. Litter is an

abiding problem for Zimbabwe, though standards of urban cleanliness are well above those of many neighbouring countries. There is no anti-litter legislation. Beer and aerated drinks manufacturers are not allowed to pack in disposable packs regarded as an environmental hazard. We have advised ACI to print packs with disposal advice to consumers.

5.4.4 **Manpower**

Norton has a population of 40,000 people, in a relatively well populated district. In addition, 350 workers live with their families on the Estate. [see Cap VIII and Annexe 16]. Budgeted tomato yields assume a high level of crop management skills. Only limited technical support is available from the Government extension service, Agritex. The employment of a manager with experience and technical knowledge of tomato production, qualified ot UK HND or graduate level or equivalent, is therefore necessary.

5.4.5 **Living Conditions**

Living conditions are described as good, with easy access to markets, a primary school, a clinic and municipal services in Norton town. Farm and factory managers' houses dating from Lilford's development of the Estate in colonial times are close to the factory site and are in good condition. Some new and restored housing has been supplied by the Company.

5.5. ENVIRONMENT IMPACT ASSESSMENT.

5.5.1 **Soil Erosion**

The soils of the Estate are of relatively low inherent fertility and subject to risk of erosion, especially if overcropped. The rotation proposed should not lead to a substantially increased risk in this respect, compared to the present situation however.

5.5.2 **Agrochemical Application**

Tomato production would require a regular programme of pesticide application for maximum yield and quality. An increased use of agrochemicals on the Estate will therefore result. Whilst this is inevitable, their use should be kept to a minimum and every effort made to avoid pollution of watercourses during spray application and the disposal of used containers.

Some success is being achieved in Zimbabwe with the use of biological pest control agents, leading to a reduced need for pesticide use. This practice should be encouraged on the Estate. In the UK, pesticide application is governed by legislation under the Food and Environment Protection Act. This lists approved pesticides, governs maximum chemical residues in products, and demands training and certification of spray operatives. A similar approach would be desirable in Zimbabwe, both for environment and consumer protection reasons.

Pesticide application equipment should be regularly maintained and calibrated to avoid uneven application resulting in either underdosing or overdosing, both of which are undesirable.

The use of mown grass and grass mulch in the existing small citrus plantation and any further citrus plantings will avoid the need for herbicide use and also reduce the risk of soil erosion.

5.5.3 **Air Pollution**

The steam generating plant required in the processing operation may be coal-fired for reasons of economy. This will obviously result in some aerial pollution but not of a significant magnitude. We are not aware of any constraints to the use of such coal-burning equipment in the locality, and coal-fired curing facilities for tobacco are already in use at the Norton farm.

5.5.4 **Summary**

Neither the proposed inputs nor outputs from farm or factory pose an environmental hazard for the Norton area.

5.6 COSTS OF LAND AND SITE PREPARATION.

5.6.1 **Costs of Land.**

The 5180 acre Farm Estate with its tobacco-curing barns, on which the factory is to be located, was bought for Z$500,000 by the project sponsor in 1986. The exceptionally low purchase price of Z$238 per ha. is explained by the rapid exodus of white farmers at a time of civil war between the Ndebele and Shona tribes in Zimbabwe. The civil war subsided, and property prices recovered, only with the understanding

reached by ZANU and ZAPU in 1987.

Norton land price in 1992 were averaging Z$700 per ha. but this cannot be adopted as the financial cost the project sponsor meets in allocating his land for the project. The cost must reflect the comparative advantage ACI now has in low cost assets for productive use, an advantage over other producers starting farms and factories on newly-acquired greenfield sites, {L13}.

Had the project sponsor invested Z$500,000 instead of buying land in 1986, it would be earning Z$60,000 at 12% a year. This is one opportunity cost of his land acquisition, and can be taken as the economic cost of the land he is to use for crop production and the factory.

5.6.2 **The Costs of Site Preparation**

The costs of site preparation are similarly below those for greenfield sites in the Norton area, for the reason that a level site measuring 20 m x 70 m between existing building is accessible by the farm road and is served with water pipes and electric power. The estimate for site preparation is Z$ 4,500.00 {L14}. Sheds will have to be built to accommodate plant, loading bays and stores, for which current cost estimates are:

(i) Tomato Paste

	unit cost Z$	size	Total
shed	10,650 m2	320 m2	3,408,000

(ii) Citrus Juice

	unit cost Z$	size	Total
shed	10,650 m2	210 m2	2,236,500

The cost of erection and civil works is included. Some saving would be expected if both sheds were built, {L2}.

CHAPTER VI
PROJECT ENGINEERING

6.1. THE PLANT LAYOUT; PLANT SELECTION CRITERIA

6.1.1 Overview

There is adequate space at the Norton Farm for plants to produce orange juice, tomato and other vegetable products.

6.1.2 Tomato Paste

In view of the market research indications that the domestic market is saturated, and that the export potential is limited, it is recommended that when a tomato plant is installed it should be the smallest that is consistent with adequate quality. Any planned installation should utilise the latest hot-break technology. The basis of this process is that after initial washing and sorting, the tomatoes are heated by steam at 95°c for two purposes:

i) To soften the material and facilitate waste removal.

ii) To destroy the pectin esterase enzyme, present in the tomatoes. This has the effect of giving a thicker end-product because the pectin is not broken down by the enzyme.

A double effect evaporation will give a product of good colour and quality. A triple effect evaporator would involve increased capital cost and would not improve the quality of the product, and is therefore not recommended.

6.1.2.1. Process description

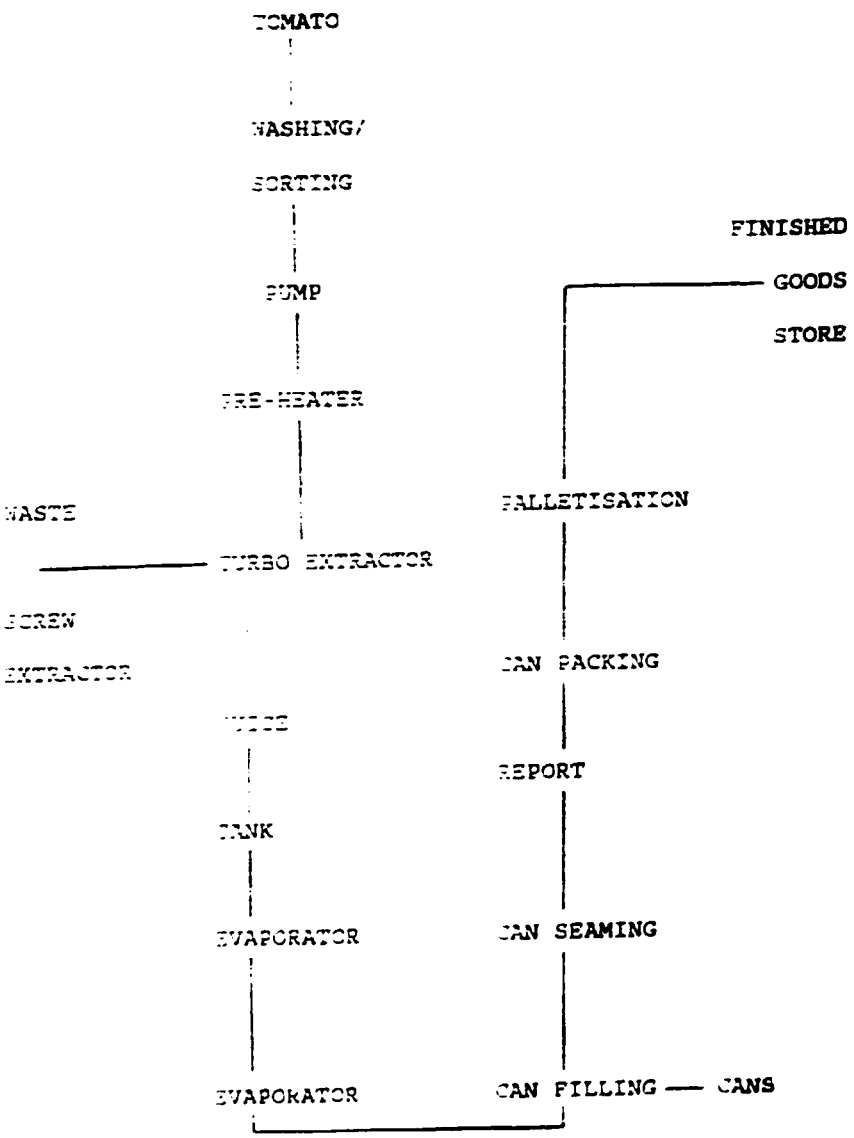
Freshly harvested good quality ripe tomatoes are washed and sorted prior to being heat treated to deactivate the pectin esterase, in a steam-heated pre-breaker. The pulp is then pumped to a turbo-extractor pulper-finisher which removes skins and seeds for discharge by screw conveyor ready for animal feed.

The sieved finished juice is then concentrated on a double-effect vacuum evaporator to bring the juice (50 Bx) to the desired concentration (28 Bx) and consistency. The finished paste is then filled into cans, which are seamed, pasteurised in vertical

retorts, cooled and packed into cartons.

The plant layout for this plant as applied to the facilities available at Norton Farm is shown at Annex 13.

6.1.2.2. **Flow diagram for Tomato Paste:**



6.1.3 <u>Citrus Juice</u>

Market research has identified a gap in the market for good quality aseptically-packed citrus juices. The Tetra Pak technology is recommended because the technology is already in Zimbabwe, used for milk products. It is further considered that the most effective method until abundant fresh fruit is

available in 1997/98 is to produce the orange juice by dilution of concentrate.

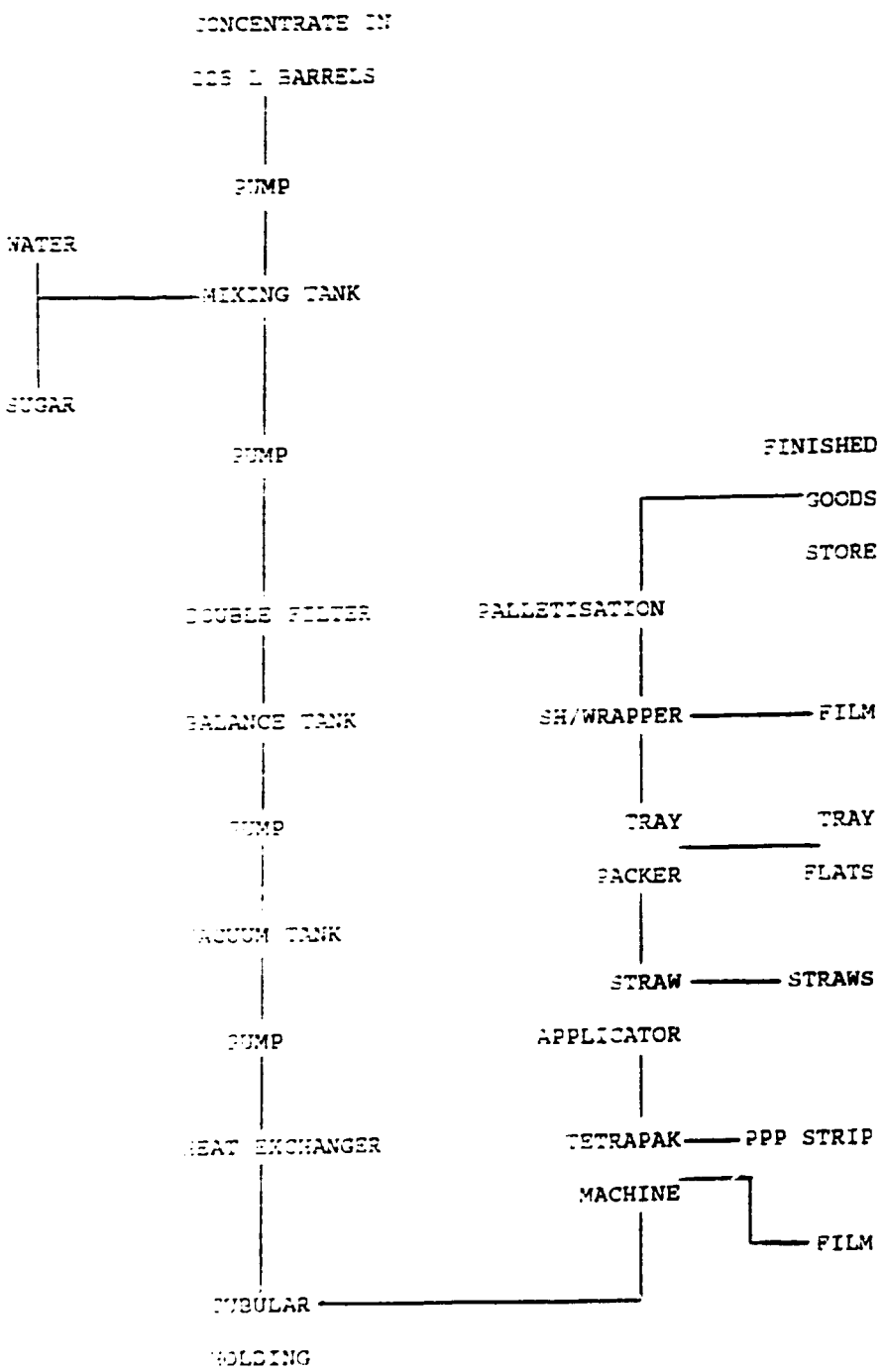
The aseptic-packing of orange juice is preferred to bottling or canning. Bottles have to be returnable in Zimbabwe and represent a higher weight and cost to product content ratio than aseptic packs. Canning of orange juice eliminates much of the RTD market which is available for aseptically-packed juices. Aseptic packing requires only a simple process for diluting concentrate, and in distribution does not need the cold chain or inmix of preservatives required for most Zimbabwe fruit-based beverages.

6.1.3.1 Process Description

The concentrate is pumped from aseptic barrels into a mixing tank, diluted with water, pasteurised in a heat exchanger, aseptically filled into 250 ml Tetrabricks, then packed into trays, and shrinkwrapped.

The plant layout for this plant as applied to the facilities available at Norton Farm is shown at Annex 14.

6.1.3.2 **Flow diagram for Orange Juice:**



6.2. THE SCOPE OF THE PROJECT: FARM AND FACTORY

6.2.1. Tomato Paste Processing

There is limited scope for supplying this product because the domestic market is saturated, and the world market prospects are handicapped by Zimbabwe's high transport costs and world oversupply. As designed, a tomato paste plant could handle production from the Alison Farms and could process bought-in additional raw material by operating for longer or more shifts. There is technical scope for expansion of the product range, in that the same filling and seaming equipment and the retorts could be used for:

(1) Different sized cans
(2) Other products, such as beans, peas or fruit products. In this situation further investment would be necessary to obtain pre-washing, soaking and blanching plant. Some of this could be locally constructed, which would reduce the cost. This would enable year-round production of certain lines, and utilise the plant more efficiently.

6.2.2. Citrus Juice Packing

The equipment listed is only capable of packing one size of pack. Further major investment would be required to pack any other size. It is however straightforward, subject to packaging, to pack other types of juice, or mixtures of flavour, on the same line. This would allow some flexibility in future use. The minimum run for any one product line is 200,000 packs printing. Some variation to print packs for different products is possible through co-printing.

6.3. TECHNOLOGY SELECTION CRITERIA:

6.3.1 Tomato Paste

The market research indicates that there is a demand for 115g packs of tomato paste, but that demand is fully met by other suppliers. If and when ACI decides to compete in this market, it is recommended that the hot-break process is chosen that will ensure a good quality product able to meet the future standards expected in Zimbabwe.

The size of plant recommended is the smallest normally commercially available to achieve this technology, and obtain a good quality, safe product. The use of cans is recommended because of their strength and keeping qualities in hot countries, when compared to flexible packs or tubs. Some reduction in costs could be achieved by the introduction of hand-filling, and semi-automatic seaming, without any reduction in quality. But penalties are incurred in the higher costs of supervision, quality control, and operating scale. Small scale technology offering volumes of less than 6 tph is available from the Indian sub-continent, but is employed only when quality marketing and packaging considerations are not important, [see also 10.2].

6.3.2 **Citrus Fruit**

There is an identified demand for 250 ml packs of orange juice on the Zimbabwean market. Some of the existing juice products are of poor quality, with sugar and/or preservatives added. For this reason, it is recommended that an aseptic process is chosen to give:

(1) Good quality product
(2) Good characteristics in storage
(3) Low weight packaging-as compared to bottles.
(4) Proven technology
(5) Attractive packaging as a sales aid.
(6) Easy pack disposal.

6.4. FARM AND FACTORY EQUIPMENT LIST

6.4.1. **The Farm Equipment List**

Alison Farms (Pvt) Ltd already possesses a full range of equipment at Norton, (Annex 11). Additional equipment which in our opinion must be acquired to enable ACI to receive from the farm adequate supplies of tomato includes drip irrigation, insecticide sprayers, [see Chap 4 & 5 for Farm input recommendations].

6.4.2. The Factory Equipment Lists & Cost Estimates For The Tomato Paste Line

COST ESTIMATES (14.2)	LOCAL Z$	FOREIGN US$
Plant machinery & equipment		
Foreign-sourced (L8)		
Washing unit with Conveyor and pump Pre-heating, pre-breaking and enzyme Deactivation Pulper/sieve with screw conveyor Control panel Water cooling tower Filling machine Seaming machine		398,000
Double effect evaporator		300,000
Pasteurising retorts 2 @ US$ 36,000		72,000
Spares		60,000
Contingent import duty		83,000
sub-total US$		913,000
Auxiliary & Service Facilities		
Locally-sourced (L22)		
Pallets.300 @ Z$11.67	3,500	
Boxes 300 @ Z$25.00	5,000	
Water softener	22,000	
Boiler	60,000	
Foreign-sourced (L10)		
Water treatment plant		40,000
Fork Lift Truck		21,000
QC Equipment		20,000
Contingent import duty		8,100
sub-totals Z$	90,500	
US$		89,000
.....		
sub totals carried forward		
Z$	90,500	
US$		1,002,000

6.4.2. Factory Equipment & Cost Estimates Contd

for the TOMATO PASTE LINE (cont)

cf	LOCAL Z $	FOREIGN US $
	90,500	1,002,000
Incorporated fixed assets		
Locally-sourced (L17)		
Lorries 2 @ Z$ 128,000	256,000	
Pre-production expenditures		
Foreign costs (L11)		
Delivery CIF		80,000
Installation		50,000
Training		35,000
sub-total US $		165,000
TOTALS Z $	346,500	
US $	1,183,000	
Total Cost in US $		1,237,740

6.4.3. Factory Equipment List & Cost Estimates For the Orange Juice Tetra Pak Line

COST ESTIMATES	FOREIGN US $
Plant machinery & equipment (CIF)	
Mixing and Filling	
Mobile pump for pumping concentrate	3,000
2000l mixing tank	
complete with stirrer outlet to	13,700
2000l mixing tank complete with stirrer outlet to	13,700
Centrifugal pump to	2,000
In line double filter to	2,000
Float controlled balance tank to	2,500
Positive displacement lobe pump, to	3,500
Vacuum tank, complete with level controllers	
vacuum pump and valves	21,000
Centrifugal pump to pasteurising system comprising:	2,000
Parallel plate heat exchanger	12,500
Tubular holder	2,000
Steam heating/controlling equipment and pipework	10,700
Temperature regulating equipment	13,500
CIP equipment comprising 2 x 500l mixing vessels	
and re-circulating pump	6,600
(part) Connecting pipes and valves, from	
pasteurisation to filling machine	17,000
Tetra Pak TBA3 Tetra Brik machine for	
filling 250 ml packs	158,700
Packaging	
Tray packer	46,000
Shrink wrapper	25,000
Straw applicator	41,000
Assorted conveyors	30,000
Spares parts	34,600
Contingent import duty	46,100
sub-total US $	507,100
.....	
sub-total carried forward US $	507,100

6.4.3. **Factory Equipment List & Cost Estimates** Contd for the Orange Juice Tetra Pak Line {15.2}

COST ESTIMATES	LOCAL Z $	FOREIGN US $
Carried forward		507,100
Auxiliary & Service Facilities		
Locally-sourced (L22)		
Steam boiler	60,000	
Foreign-sourced (L10)		
Water treatment plant for dilution water		40,000
QC equipment		12,000
Contingent import duty		5,200
sub-total US $		57,200
Incorporated fixed assets		
Locally-sourced (L17)		
Lorries 2 x US 128,000	256,000	
Pre-production expenditures		
Foreign Costs (L11)		
Delivery CIF		80,000
Installation		0
Training		0
sub-total US $		80,000
TOTALS in US $		652,000
in Z $	316,000	
TOTAL COST in US $		701,375

Note: Equipment quotation from Tetra Pak, Harare (83). Contingent 10% Import duty on capital goods subject to change in the 1993 Budget at 10% depending on source. Installation and Training costs are included in the equipment cost.

6.4.4 Additional Optional Equipment For Which Quotes Were Obtained:

6.4.4.1 Cold Storage

Commercial refrigeration units are supplied fully installed by several companies in Harare, including Imperial, 84, Kelvin Road, South Graniteside, Harare, Tel: 705755. Quotes including tax for a 2.4 m x 2.4 m cube including 1.1 kw compressor are Z$ 26,394.50. Smallest Unit 1.8 m x 2.4 m, Z$ 22,506. The room is built of galvanised steel, insulated with 3 mm expanded polystyrene, sustaining an adjustable temperature at around 5°c operating 12-16 hours in every 24.

6.4.4.2 Steam Raising

Boilers are fabricated in Zimbabwe by Cochrane Eng.(Pvt) Ltd.PO Box ST 361, Harare. Tel: 73700/92. Quotes cover boiler unit, mountings, pumps, pressure parts, induced draught fan, stoker, electrical control panel and connecting pipes.

Range smallest: 1000 kg of steam per hour. Coal Input capacity 110 kg per hour. Price: Z$489,848, installation Z$ 30,000, sales tax 10%.

Range largest: 14,325 kg steam per hour. Coal input capacity 1495 kg per hour. Price: Z$2,2204,166, installation Z$ 46,000, sales tax 10%.

6.4.4.3 Steam-Jacketed Tilting Pots

Food Quality stainless steel equipment is made in Zimbabwe by Stainless Steel Industries Pvt Ltd., a parastatal subsidiary of IDC. It offers steam jacketed tilting pots with loose lids:-

Litres	Z$
45	4316
136	5219
227	6669

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Litres	Z$
45	4316
136	5219
227	6669

6.5 **CIVIL WORKS**

6.5.1 **Farm [Cap 4 & 5]**

6.5.2 **Factory**

6.5.2.1 **Facility**

It is envisaged that the Tetra Pak production facility

and the tomato paste processing line will be housed in a shed of approximately 40m x 13.25m. The shed should be designed such that one area ie for the Tetra Pak production facility, can be constructed first as a stand alone exercise, but permitting a future extention for tomato paste. The construction should be as follows.

* Reinforced concrete floor and foundations.
* Steel frame - height 7m at sides block work to height of 4m with steel cladding above
* Roof of double skin, insulated cladding.
* Doors as required for access.
* Internally:
  Blockwork to be tiled to full height
  Floor to be screeded with epoxy resin or equivalent.
* Drains to soakaway of hygienic construction, readily accessible for cleaning.
* Adequate lighting, screened
  UV insects killers
  Also
    Production offices
    QL offices

  Services to include
    Process water
    Washing water
    Steam
    Electricity

6.5.2.2 Other construction

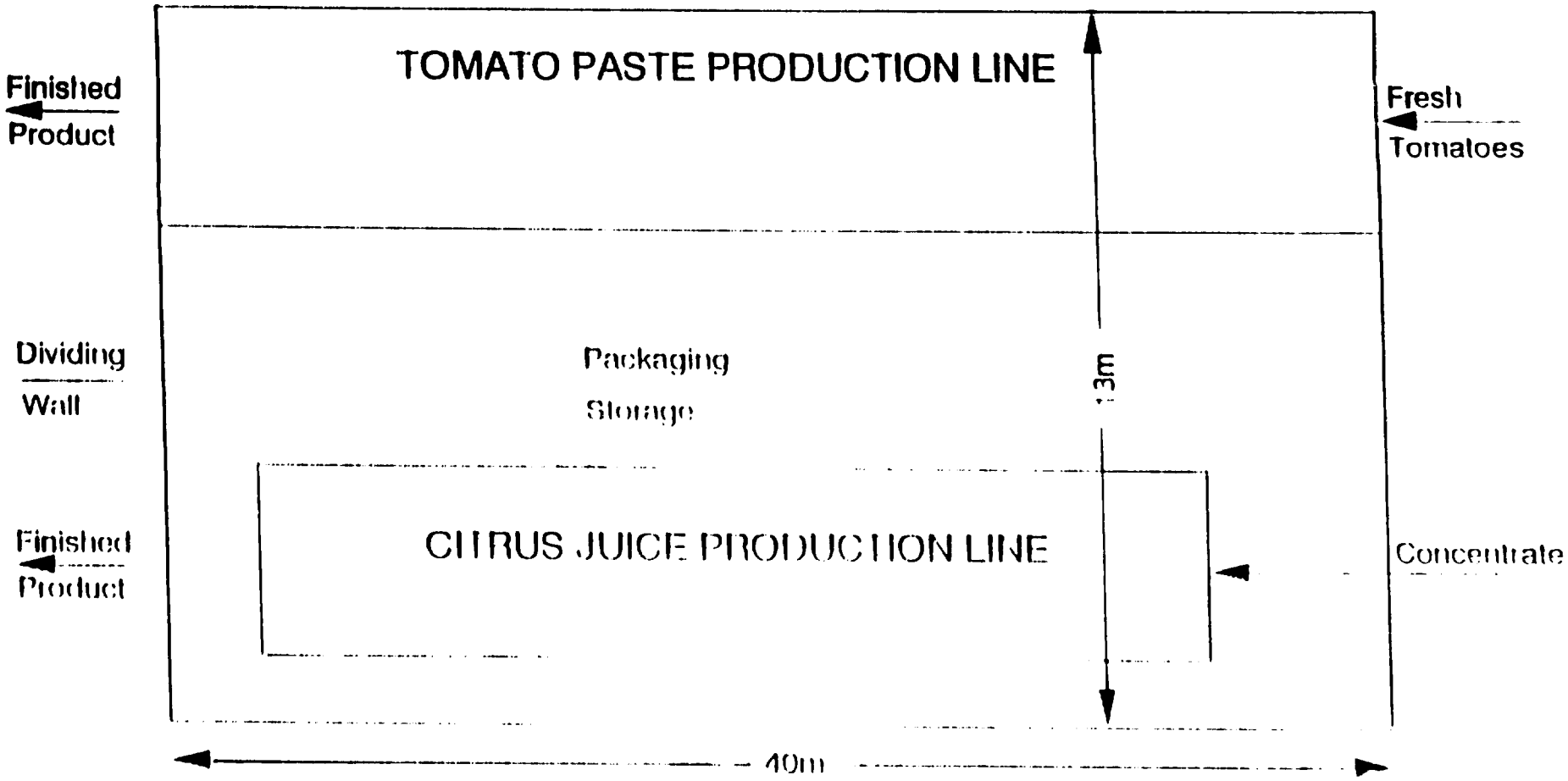
It might be necessary to erect extra buildings for storage of packaging, consumables and finished goods. If steam is already available from an existing boiler serving the tobacco curing sheds, major economies of scale could be achieved by providing steam to the process plant.The plan includes provision for a concrete apron for loading/unloading.

6.5.2.3 Costs [see 5.3.2]

6.5.2.4 Site plan

Full details of the equipment layouts are given in Annexes 13 for tomato processing and citrus fruit facility. The relative position of each plant is shown overleaf.

6.5.2.4 Site Plan-Factory



CHAPTER VII

PLANT ORGANISATION

7.1. **COST CENTRES**

Two cost centres are envisaged ie

(i) the farm and

(ii) the factory.

7.1.1 **The Norton Farm**

7.1.2 **The ACI Factory**

The following cost centres are also recommeded:-

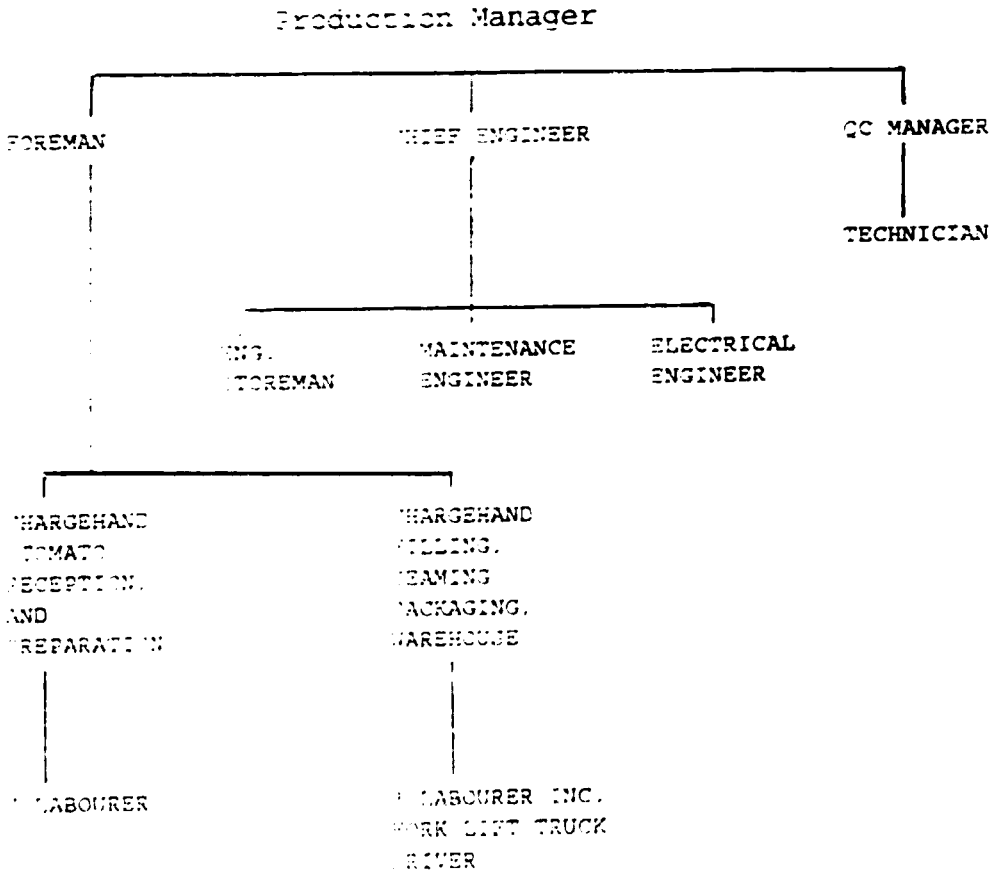
Production
Services
Administration
Technical Services
Quality Control

7.1.3. **The Organisation chart.**

The following organisational studies are proposed:-

7.1.3.a **Tomato paste**

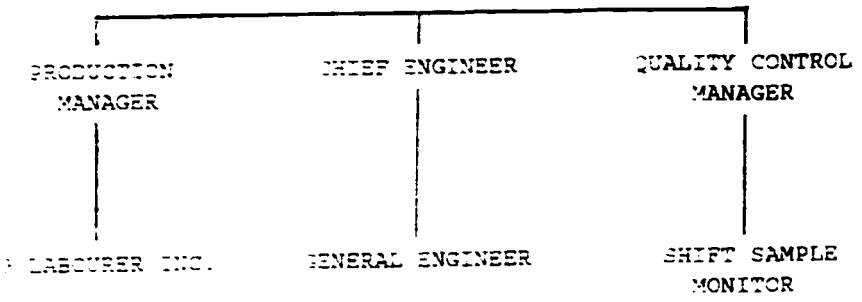
Production Organogram



7.1.3.b CITRUS JUICES

PRODUCTION ORGANOGRAM

PRODUCTION MANAGER



CHAPTER VIII

MANPOWER.

8.1. OVERALL STRATEGY

The Alison group of companies has a capable core management that is able to lower the overhead costs of farm and factory operations at Norton. Manpower costs among the direct costs of production may be reduced through careful personnel management. ACI, like other companies in the group, is expected to treat management and labour costs as fixed. There are limited opportunities for employing casual labour for seasonal farm work. The labour force may however be built up from commissioning with some savings to the ACI payroll.

8.1.1 The Farm : Management.

The requirement for additional tomato production from RS/9H Some additional labour is needed to cultivate tomato crops, as recommended [Cap IV]. An additional 369.6 mandays are costed at Z$ 2,587.00 per hectare [see 4.1.2].

POSITION	NUMBER	TOTAL COST (Z$)
Crop manager	1	115200
Assistant manager	1	86400
Supervisors	2	24000
Tractor Drivers	2	12000
Administration	3	15000
TOTAL	9	252600
COST/HA		1973

8.1.2. Farm Staffing Table

LABOUR REQUIREMENT - ALISON FARMS - TOMATO

PRODUCTION - Man days/ha.

	CROP MONTH						
	1	2	3	4	5	6	TOTAL
Operation							
Seedbed preparation	3.0						3.0
Seedbed watering	3.2						3.2
Applying lime and ferts	2.0						2.0
Ploughing and harrowing	2.0						2.0
Row making	4.0						4.0
Transplanting	-	50.0					50.0
Topdressing		1.0	1.0	1.0			3.0
Spraying	10.0	10.0	10.0	10.0	10.0	10.0	60.0
Irrigation							
- sprayline	-	10.5	10.5	10.5	10.5	10.5	52.5
- trickle	-	1.5	1.5	1.5	1.5	1.5	7.5
Harvesting	-	-	-	-	-	136.0	136.0
Transport to packhouse	-	-	-	-	-	13.0	13.0
SUBTOTAL	24.2	44.5	14.5	14.5	13.5	162.5	295.7
Contingencies	1.4	16.1	3.6	3.6	3.4	40.6	73.9
TOTAL	42.4	80.6	18.1	18.1	16.9	203.1	369.6

Notes: Average yield 41 tonnes/hectare
Labour for spray irrigation for illustration only -not included in total

Source: FAO/Alison Farms.

8.1.3 **The Farm : Labour Profile - Alison Farms**

Total Tomato Production -128 ha

CROP NUMBER 16 ha planted/month - MAN HOURS/MONTH

	1	2	3	4	5	6	7	8	TOTAL
MONTH									
Jan	-	525	1290	290	290	270	3250	-	5915
Feb	525	1290	290	290	270	3250	-	-	5915
March	1290	290	290	270	3250	-	-	-	5390
April	290	290	270	3250	-	-	-	-	4100
May	290	270	3250	-	-	-	-	-	3810
June	270	3250	-	-	-	-	-	-	3520
July	3250	-	-	-	-	-	-	-	525
Aug	-	-	-	-	-	-	-	1290	1815
Sept	-	-	-	-	-	525	1290	290	2105
Oct	-	-	-	-	525	1290	290	290	2395
Nov	-	-	525	1290	290	290	270	3250	5915
TOTAL	5915	5915	5915	5915	5915	5915	5915	5915	47320

8.2. **MANPOWER FOR THE FACTORY**

The salary and wage rates are calculated for 13 months to allow for tax, pensions and other social security costs. An additional allowance needs to be made for the Government's Standards Development Levy, charged at 0.15% of payroll costs in 1992.

8.2.1 **Factory Staffing Tables: Labour and Management**

Manning estimates are given for the two production lines,
Tomato (A) and Orange Juice Packing (B), as though they were separate investments, as is recommended. The higher manning numbers and costs for the tomato line are attributable to the fresh tomato processing described [Cap V1].

8.2.2 Manpower for ACI

PRODUCT LINES		(A) TOMATO 000pa	Z$pa	(B) ORANGE	Z$pa 000pa
A.	ADMINISTRATION				
	(1) General Manager	1	83.2	1	83.2
	(2) Asst GM	1	58.24	1	58.24
	(3) Accountant	1	58.24	1	58.24
	(4) Clerk	1	41.60	1	41.60
	sub-total (L134)	4	241.28	4	241.28
B.	MARKETING				
	(1) Manager	1	58.24	1	58.24
	(2) Asst Manager	1	41.60	1	41.60
	(3) Clerk	1	19.50	1	19.50
	(4) Salesmen	1	41.60	1	41.60
	sub-total (L136)	4	160.94	4	160.94
C.	MANAGEMENT				
	(1) Production	1	83.2	1	83.2
	(2) Quality Control	1	58.24		58.24
	(3) Chief Engineer	1	91.52		91.52
D.	SUPERVISORY/TECHNICAL				
	(1) Foreman	1	58.24	1	58.24
	(2) Production	1	83.2		
	(3) Engineer maint	1	41.6	1	41.6
	(4) Engineer elect	1	41.6		
	(5) QC Technician	1	41.6	1	41.6
	(6) Warehouse charge	1	41.6	1	41.6
E.	GENERAL WORKERS				
	(1) RM Reception	3	58.5	1	19.5
	(2) RM Sorters	4	78.00		
	(3) Preparation	1	19.5	1	19.5
	(4) Packing	6	117.0	3	58.5
	(5) Tetrapak opera	1	26.0		
	(6) Warehouse	2	39.0	1	19.5
	(7) Stores	1	19.5		
	(8) General	2	39.0		
	sub total C,D,E.( )	27	872.30	16	597.74
	G.TOTAL manpower/costs	35	1277.52	24	999.96

Note: These payroll costs are based on 250 x 8 hour shifts per year, plus pay for a 13th month to cover social costs. As advised previously, it will be necessary to run the Tetra Pak machine packing orange juice for an extra 84 shifts/year to achieve the recommended standard output. The direct labour cost for categories C, D and E at 1994 prices will therefore be Z$ 7[illegible]8,840, ([illegible]15,[illegible]).

8.2.3 Availability of Qualified Women

There is an acute shortage of qualified and experienced women able to assume technical and managerial positions in Zimbabwe's Food Industry. Cadres with formal training are already in employment and ACI would have to compete in a tight market for their services. Unemployment levels among men and women are however so great at around 40% of the workforce both Nationally and in the Norton area, that recruitment of well-educated personnel is not considered to be a problem for a new investor. Among the 45,000 persons in Norton Selous Rural Area, and the 40,000 in the Norton Town Board Area, there are estimated to be 34,000 persons available for work, of whom 19,000 are women, and 3808 are women educated to Grade 6.(43).

8.3 TRAINING REQUIREMENTS AND COSTS

8.3.1 Training Requirements and Costs

For both lines the training requirements would fall under 3 headings:

1.Engineering

All engineering employees will need to understand the running, control, servicing and repair of the whole plant. This would be provided on and off site by the suppliers and installers of the processing lines. Training will also be necessary to overcome breakdown, poor running and general maintenance failures. This should be possible during the installation and commissioning period when the plant would normally have working parts exposed.

2.Production

When the plant has been installed, and commissioning is underway, production staff would then be trained on the plant with explanations of the processes involved by the installation engineers.

3.Technical

It is very important to involve technical staff at an early stage so that they gain familiarity with the plant involved. An understanding of the technology and running procedures is essential if proper technical control is to be achieved. If the personnel involved are completely untrained, it is recommended

that they are sent on Food Technology / Food hygiene courses at local educational institutions. Refresher courses can also be of use later.

8.3.2 Training Costs

Tomato paste
Training is quoted as US $35,000, which will cover the on-site training. An extra cost will be the external general courses.

Citrus Juice
Engineering training is offered free at the Tetra Pak Training School in Cyprus. Additional training in operating the machinery, and explanations of technologies involved would be provided on site by the Tetrapak engineer and technologist. The cost of their services would be US $24,000.

8.4 FOREIGN MANAGEMENT AND TECHNICAL ASSISTANCE

Factory
The need for Foreign Management and Technical Assistance beyond the commissioning/training period will depend to a large extent on the initial experience of the local staff. If they have previous experience in factories, the training envisaged should be adequate, with the assistance, where appropriate, of training manuals.

Farm
Similarly, on the farm some initial outside input will be required to assist in the growing and harvesting of tomatoes. The extent of this assistance will also depend on the experience of the existing staff.

CHAPTER 1X

IMPLEMENTATION SCHEDULE

9.1 IMPLEMENTATION PRE-CONDITIONS

For the orange juice packing proposed, raw materials including the concentrates and packing, will be available year round. There are therefore nc seasonal lead times to be taken into account. Therefore the project can be implemented as soon as financing is secured.

ACI is a leading group business in Harare with excellent credit ratings. ACI's Chairman, Ali Asharia, is confident that he will be able to raise finance internally and from the banking system for floating the project until commissioning and for meeting the costs of its fixed assets and working capital, (84).

9.2 DATA AND PROJECT ACTIVITIES: ELABORATION OF THE IMPLEMENTATION PROGRAMME AND ALTERNATIVES

9.2.1 Project Implementation

ACI must establish a management system to implement the project, but may employ consultants to secure its position with credit institutions and input suppliers.

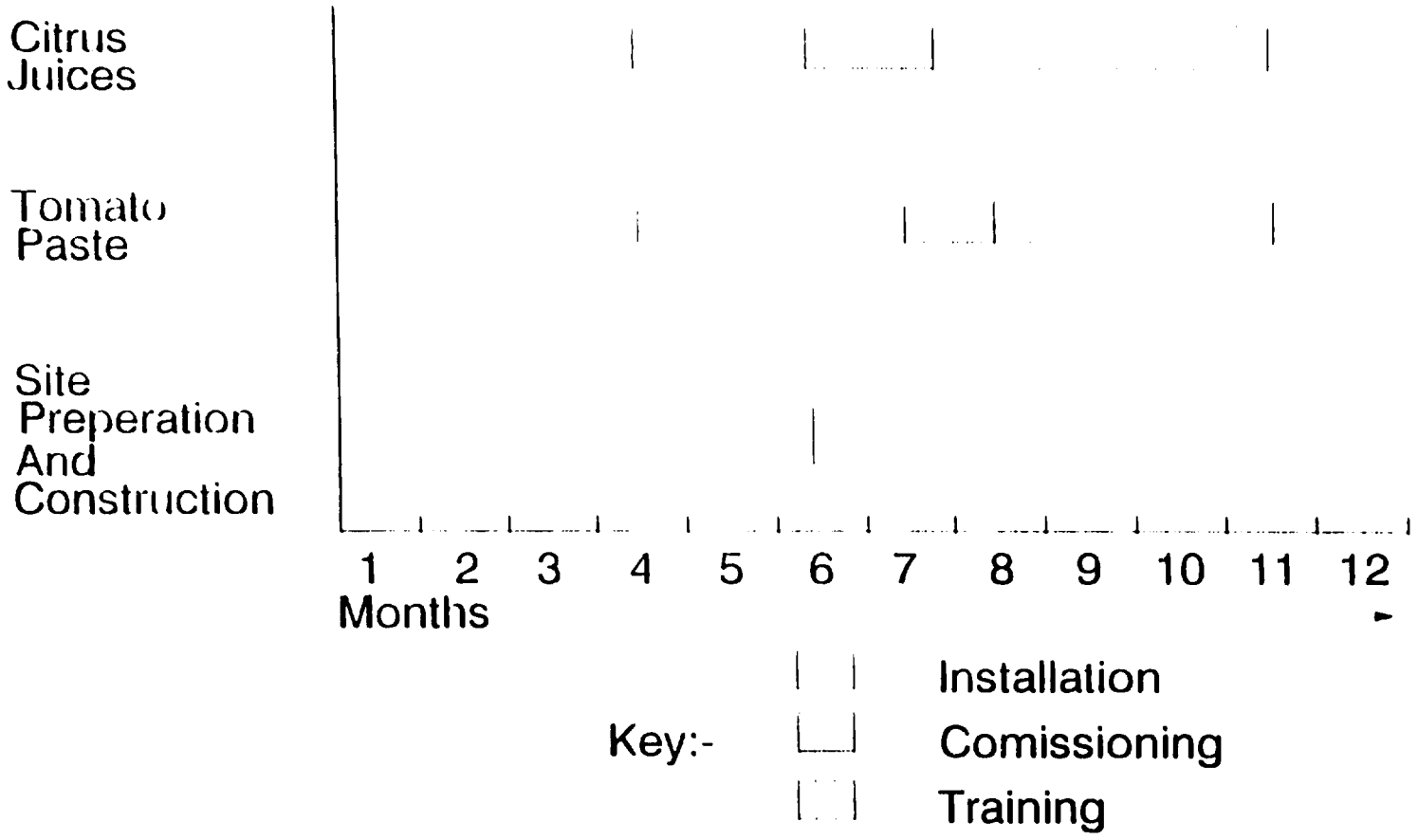
9.2.2 Arrange Technology Supply

With Tetra Pak already established in Zimbabwe, ACI can readily arrange details of equipment supply. Alternatively, ACI may establish contact with Metal Box Liquid Packaging Division in Johannesburg, (85).

9.2.3 Detailed Engineering from Supplier

Tetra Pak have completed so many aseptic packaging plants round Africa, that engineering detail is now packaged for easy transfer. Alternatively, ACI could employ plant consultants to design a custom-built system.

9.1 Timetable for Implementation-Factory



9.2.4 **Tendering**

As there are relatively few suppliers, tendering can be undertaken directly by ACI for the supply of plant. Costs tend to be standardised for all plants, with cost variations set by transport and installation costs.

9.2.5 **Evaluation of Bids**

The main criteria is price for the fixed assets, but the proximity of servicing facilities will also be important for a novice packing company.

9.2.6 **Award of Contract**

ACI's existing Legal Adviser will be in charge.

9.2.7 **Planning of Civil Works**

Civil works are determined by the nature of the fixed assets to be installed. ACI has in-house engineering competency but may alternatively hire consultant engineers to oversee the planning and construction of the civil works for the plant.

9.2.8 **Tendering**

ACI has in-house construction capabilities but may contract the civil works required to a local contractor.

9.2.9 **Award of Contract**

Implemented by ACI lawyers.

9.2.10 **Finance Arranged**

IFC Harare have invited ACI to apply for finance. ACI should discuss preliminaries with IFC at an early stage. ACI may alternatively approach its Commercial Bank.

9.2.11 **Finance Agreement**

The Finance Plan will specify a detailed drawdown and repayment schedule, following the cashflow values agreed by the Bank and ACI. Alternatively ACI may

hire consultants to devise alternate Finance Plans to float the Project.

9.2.12 **Construction Period**

The construction period should not be later than November 1994 if ACI wishes to commission by January 1995.

9.2.13 **Land Purchase**

The site is already owned by ACI.

9.2.14 **Civil Works**

As the site is already partly serviced, civil works must be undertaken by October and be completed when the plant is installed and connected to utilities in November 1994.

9.2.15 **Plant Installation**

November-December 1994 is planned for plant installation.

9.2.16 **Testing**

Validation of the plant system delivered under contract will be undertaken by plant suppliers in December 1994. Alternatively, ACI will have the option of hiring consultants to oversee commissioning and plant performance.

9.2.17 **Commissioning**

December 1994. The plant supplier will normally oversee plant commissioning.

9.2.18 **Build-up of Administration**

ACI already has in place key administrators able to undertake implementation activities.

9.2.19 **Manpower Recruitment**

Some longer lead time may be necessary to hire the key personnel needed for the plant.

licensing and registration of any food product marketed in the country.

9.2.26 Capital Issue Expenses

As ACI will be raising its equity internally no floatation expenses will arise.

9.3 SELECTION OF IMPLEMENTATION ACTIVITIES: TIME SCHEDULE AND SEQUENCE FOR THE ORANGE JUICE LINE

	ACTIVITY	MONTH 1994						MONTH 1995					
		7	8	9	10	11	12	1	2	3	5	6	7
1	Project Implementation establish management	x											
2	Arrange technology supply			x									
3	Detailed engineering from supplier			x									
4	Tendering			x									
5	Evaluation of bids			x									
6	Award of contract				x								
7	Planning of civil works			x									
8	Tendering				x								
9	Award of contract				x								
10	Finance arranged preliminary				x								
11	Finance agreement			x									
12	Construction period					xx	xx						
13	Land purchase n/a												
14	Civil works					x	xx						
15	Plant installation					x	x						
16	Testing						x						
17	Commissioning						x						
18	Build-up of Administration		x	x	xx								
19	Manpower recruitment				xx	xx							
20	Training					xx	xx		xx	xx	xx		
21	Procurement of inputs				x	x	x	x	x	x	x	x	x
22	Marketing plan		x										
23	Marketing activities				x	xx	xx	xx	xx	xx	xx	xx	xx
24	Pack design				x								
25	Licensing & tax registration			x									
26	Capital issue expenses n/a												

9.4 COST ESTIMATES FOR IMPLEMENTATION

Where activities are undertaken by the ACI Chairman, a token daily rate of Z$100 is applied* although he may wish to apply a higher or lower rate in practice. For professional services required whether in-house or externally hired, a rate of Z$150 is applied. For executive staff work prior to commissioning the rate Z$250 per manday is applied.

9.2.20 **Training**

Tetra-Pak recommend that the Production Manager, QC Manager and Chief Engineer are present from the start of the civil works in order to familiarise themselves with all aspects of the process, the construction and the plant as it is installed. During this period it should be possible for them to attend any training courses that are available.

For supervisory/technical staff, it is recommended that they are recruited to start in October so as to gain an understanding of the plant and assist where necessary in the installation and commissioning work. For production staff, these personnel should be gradually recruited from November onwards as needed for commissioning work. Training and retraining should be more or less continuous through the first year of production to ensure smooth plant operation and a quality control.

9.2.21 **Procurement of Inputs**

Tetra Pak will advise ACI on delivery dates for the packaging materials. Sources for concentrate and other inputs are quoted in this study.

9.2.22 **Marketing Plan**

ACI has many contracts in Zimbabwe's wholesaling and retailing system but should pre-arrange with them for distribution and margins to be charged.

9.2.23 **marketing Activities**

These activities will follow the schedule in the Marketing Plan.

9.2.24 **Pack Design**

The plant and packaging suppliers normally assist clients with pack design. ACI has however in-house graphic and printing skills that may be mobilised for this activity.

9.2.25 **Licensing and Tax registration**

Company and Trading Law in Zimbabwe requires the

	ACTIVITY	MANDAYS	RATE PER DAY Z$	TOTAL COST Z$
1	Project Implementation establish management	1	100	100
2	Arrange technology supply	5	100	500
3	Detailed engineering from supplier	2	100	200
4	Tendering	4	50	200
5	Evaluation of bids	1	100	100
6	Award of contract	2	150	300
7	Planning of civil works	4	150	600
8	Tendering	4	50	200
9	Award of contract	2	150	300
10	Finance arranged	2	100	200
11	Finance agreement	1	100	100
12	Construction period	40	150	6000
13	Land purchase n a	n.a		
14	Civil works	20	150	3000
15	Plant installation	15	50	750
16	Testing	7	50	350
17	Commissioning	3	50	150
18	Build-up of Administration	20	50	1,000
19	Manpower recruitment	15	50	750
20	Training	30	50	1,500
21	Procurement of inputs	10	100	1,000
22	Marketing plan	10	100	1,000
23	Marketing activities	30	50	1,500
24	Pack design	5	100	500
25	Licensing & tax registration	3	100	300
26	Capital issue expenses n a	n.a		
	TOTAL MANDAYS	186		
	ESTIMATED COST ZIMS			23,300

CHAPTER X

FINANCIAL AND ECONOMIC EVALUATION

10.1 FINANCIAL AND COMMERCIAL PROFITABILITY ANALYSIS

10.1.1 Total Investment Costs.

10.1.1.1 Tomato Paste Processing

The installed capital cost of the specified factory production factory for Tomato Paste is estimated at Z$ 11,223,440. of which 66% is foreign, (Annex 14.Page 1.)

The full equipment schedule excludes canning plant for can sizes other than 115 g (see 6.4.2). It includes land preparation costs, and pre-production staff training by the machinery supplier over three man months. The company already has farm transport and by skilled fleet management may be able to eliminate or lower the additional costs of two-locally supplied lorries at Z$ 256,000.

10.1.1.2 The Orange Juice Plant

The total investment cost for Orange Juice packing is Z$ 7,107,780, of which 57% is foreign, (Annex 15, Page 1.) The Tetra Pak filling equipment and auxiliary services for 250 ml packs is estimated at US$ 701,375 including engineering design, CIF, a provision for 10% import duty, installation, training and contingency, (6.4.2). Quality control equipment for the Tetra Pak laboratory is estimated at US$ 12,000. Lorry transport is provided independently of other ACI operations at Z$ 256,000.

The optional extra cost not included at this stage is US$ 365,000 to fill One Litre Juice packs if and when the market justifies this investment.

10.1.1.3 Working Capital Requirements.

Provisions for days of cover agreed with ACI are listed in the COMFAR Annexes, (Tomato:14.8 and Orange 15.8).

10.1.2 **Projection of Annual Investment Expenditures**

10.1.2.1 **Tomato Paste**

Fixed capital investment in the construction year is Z$ 11,228,440 for a Tomato Paste line (14.2), with annual Current Working Capital Investments projected for 1994-2008, (14.3-4).

10.1.2.2 **Orange Juice**

Similar projections for the Orange Juice line in the construction year and 15 years of production are shown, (15.2-4).

10.1.3 **Total Production Costs**

Factory and Financial costs are projected for 1994-2008, (Annexes 14 & 15, pages 5-7). An inflation rate of 20% pe year has been adopted for all costs, with the exception of labour projected to rise at 25% a year as ACI keeps its payroll ahead of the general increase in prices. Foreign costs are projected to rise at 3% a year, reflecting the long term price trends in source countries, (see 10. ii...). No differential inflation rate in product pricing has been introduced, and none is recommended. Any increase in the costs and offer price for tomato would further impair market prospects for tomato paste, and the profitability of orange juice is already assured at cost and price increases in line with the genral rate of inflation.

10.1.3.1 **Tomato Paste**

Unit production costs for Tomato Paste rise from Z$1.70 per 115g can in 1994 to Z$ 2.14 costs in 2000.

10.1.3.2 **Orange Juice**

For 250 ml packs of Orange Juice unit production costs rise from Z$ 1.17 in 1994 to Z$ 1.87 in 2000.

10.1.4 **Sources of Finance**

10.1.4.1 For a Tomato Paste Line, 61% loan funding from offshore sources with 39% equity from ACI is proposed as a possible finance plan, were the

investment's market prospects feasible,{14.21}.

10.1.4.2 For the Orange Juice line, ACI is able to finance 28 % of the capital required from company resources and to access offshore loan capital on favorable terms, currently 8%. These sources will allow a grace period of two years and constant repayment terms. There is no need to request any back-end loading of finance service payments, since cash flow is strong enough to meet them from year 3. Foreign loan capital worth Z$ 5,185,280 at current rates needs to be raised, {15.21}. The debt/equity ratio is 2:1.

10.1.4.3 Other local sources of finance are available to ACI should the need arise. Prior to 1989, the Zimbabwe Development Bank (31) had exclusive access to foreign exchange provided to Zimbabwe through offshore lines of credit. Since 1989, other commercial banks have been able to supply foreign loan capital through the important External Loans Coordination Committee of the Reserve Bank of Zimbabwe and the Ministry of Finance, Economic Planning and Development,(31). Further opportunities for accessing foreign venture and loan capital were expected in the 1993 Budget. Zimbank among others has access to offshore lines of credit available to companies with export potential like ACI, (39)

10.1.4.4 The Zimbabwe Development Bank makes available term finance to sub-borrowers for periods up to 15 years. It on-lends credits from ABD, EIB and DEG at varying rates, on the principal of which sub-borrowers can obtain Foreward Risk Cover through the Reserve Bank. Interest rates range from 9.6% for EIB credits to 13.58% for DEG foreign exchange loans. Interest payments are a risk to sub-borrowers. Local currency lending by ZDB is either soft at 15%, or commercial at 35.5%. No working capital is lent. For this sub-borrowers must refer to their commercial banks. ZDB's terms include a 3 year grace period for the repayment of capital and interest.

10.1.4.5 Other Banks normally lending for agribusiness and manufacturing are currently advancing term loans to very few new businesses. The reason is that interest rates at 40% or more are in excess of what even well-run businesses can service. Many companies have been overborrowed and are seeking to lower their gearing. In the period prior to 1991 when inflation was running at 25-30% pa, and interest rates on loans at 12-14%, high debt-to-equity ratios of 70:30 were the norm. The 1993 financial climate now obliges companies to seek new equity and to lower their outstanding debt.

10.1.4.6 Soft loans and development equity are available to private enterprise investors in Zimbabwe from some from bilateral aid sources eg UK ODA, DANIDA and USAID, (46); and from some multilateral aid sources, eg IFC, EIB, ADB and the CDC, (47). The procedures for accessing these public funds are necessarily exacting, and expose investors to inevitable delay and in many cases, to unwanted publicity.

10.1.4.7 **Cash Flow Projections**
Cash flows for the two projects are in the Annexes 14 and 15, pages 11-14.

10.1.4.8 **Financial Cover**

A. **Tomato Paste**
Equity of Z$4,431,440 and loan funding of Z$ 6,796,800 would be sufficient to meet the initial investment costs. Throughout the project however, net cash flow is insufficient to cover outstanding debt. The sole year with a small surplus is 1997. From 1994 to 2008, the accumulated Net Cashflow is in deficit, (14.11-13). Financial Cover is negative throughout the life of the project, (14.30).

B. **Orange Juice**
Equity of Z$ 2,012,500 and loan funds of Z$ 5,185,280 adequately meet the initial investment. Casnflow is in surplus throughout the project, except for a deficit in the first year.

Accumulative Net Cashflow moves into surplus in 1999, {15.11-13}. Debt service ratios are strong, {15.30}. Net cashflow rises to twice outstanding Debt by year 13. ACI's planned financial resources adequately cover all the needs of the Tetra Pak project. In order to avoid the heavy interest payment penalties of bank overdrafts, it would be advisable to arrange for a second injection of equity capital in year 2, and to arrange payoffs from reserves in subsequent years when otherwise bank overdrafts would continue at a high level.

10.1.4.9 **Annual Financial Costs**

A. **Tomato Juice**

Following a two year grace period, repayment of loan principal begins at a constant rate Z$ 617,891 from 1996 to 2006. Debt service costs from 1996-2006 range from Z$534,744 to Z$49,431, {14.11-13}.

B. **Orange Juice**

Following a two year grace period, the costs of servicing loan finance begin at Z$ 414,822 in 1996 and ends with a payment of Z$ 37,711 in 2006, {15.5-7}. Repayment of principal is constant at Z$ 471,389 from 1996-2006, {15.11-13}. Dividends for the Equity owners are drawn from the Tetra Pak operation after year 4 at a rate comparable to the projected rate of interest currently 21%-26% obtainable from Harare bank deposits, {15.11-13}.

10.1.5 **<u>The Financial Evaluation</u>**

10.1.5.1 **Projected Balance Sheets**

A. **Tomato Paste**

The Projected Balance sheets 1994-2008 show the heavy impact of accumulated trading losses, 1994-1998, {14.16}. The mounting bank overdraft would have to be met by further equity injections or allocations from cash reserves. The project's illiquidity is illustrated by ratio of total debt to current assets, {14.15-17}.

B. Orange Juice

A strong Balance sheet reflects the positive cashflow. The generation of substantial profit from 1995 liquidates the Bank Overdraft in 1997, (15.15-17). Equity falls from 18% of total liabilities in 1994 to 1.4% in year 15. Current liabilities are well covered by accumulated cash surpluses, rising to Z$ 163,753,500 in year 15.

10.1.5.2 **Projected Income Statement**

A. Tomato Juice

Gross profits are negative in the first three years of production, (14.18-20). A net profit is made for the first time on projected sales in 1997, but net profits remain a low percentage of total sales, 3.9% in 1997, and just above 1% in 2008.

B. Orange Juice

Net profits rise from 4.98 % of sales in 1995 to over 40% in 2008, (15.18-21). The strong cash flow for the Tetra Pak operation sustains liquidity throughout the life of the project. The Gross losses in year 1 could be avoided by some rescheduling of direct labour costs by management and are in any case soon offset by cash inflows. Outstanding debt is easily covered by total cash flow although outstanding loans have to be met in foreign exchange. Tax is expected to be rebated to 20% for investments located in Zimbabawe's growth points, and is already rebated under the SIA of the current Finance Act, (56). Further changes are expected in the 1993 Budget. Tax for ZTCP is calculated and deducted at 25% of taxable profits.

10.1.6 **Investment Profitability Evaluation**

10.1.6.1 **Projected Cashflows**

Cashflow projections for each investment are shown in the COMFAR Tables Annexes 14 & 15, pages 11-13.

For the Orange juice line, the rising value of local net cashflow offset the costs of net foreign exchange cash outflows as debt is serviced. This shown in chart 15.27, and the annual flow of funds

in chart 15.28.

10.1.6.2 **Rate of Return and Pay Back.**

A. **Tomato Paste**

The return on equity (ROE1) is 10.89%, well below the minimum rate of return expected of private sector investments in Zimbabwe. Accumulative net cash in the business less depreciation never pays back the initial capital invested. A notional dividend payment is made from 1998, but this too is uncovered.

B. **Orange Juice**

The return on Equity (ROE1) is 61.85%, well above the 28-30% return accepted by most Banks as the minimum for adequate profit and risk cover, and comparable to rates of return in other successful agro-industries in Zimbabwe. Pay back of equity investment is achieved in year 7. A dividend is accommodated at a rate equivalent to the best obtainable on deposit accounts in Harare.

10.1.6.3 **Discounted Cashflow and IRR**

A. **Tomato Paste**

The Net Present Value of the project's cashflow discounted at 30% is negative at - Z$ 11,493,680. The Internal Rate of Return at which costs and revenues are discounted to zero is 7.26%, well below the minimum rate in Zimbabwe,{14.14}. The ratio of Equity paid in plus reserves in the business to net cash inflow (ROE2) is 7.79%, with a sub-commercial NPV of Z$ 6,613,210.

B. **Orange Juice**

The Net Present Value of the Tetra Pak investment taken as a whole is Z$ 3,470,070, at a discount rate of 30%, and an IRR of 35.16%, {15.14}. The ratio of Equity paid in plus accumulated reserves to net cash inflow (ROE2) is 48.22%, with a NPV of Z$ 7,193,380, against equity paid up at Z$ 1,612,500 and undistributed profits worth Z$ 179,942,900 at the end of the project life. This compares very favourably with the values of other

agro-industry investments shown to us in confidence by Zimbabwe financial institutions.

10.1.7 **Sensitivity Analysis**

A. Tomato Paste

a) Break-even capacity utilisation at which total costs are met by annual sales is high at 90%. The market for product sales is unlikely to reach sales using 70% of capacity, {14.27}. An increase in sales prices of 25% in year 9 would lower breakeven to about 30%, and a 10% increase lowers BE to 54%. Reductions in sale prices of 10% and 25% or their equivalent mean that at no output level would the plant break-even.

b) The high ratio of variable to fixed costs means the project is also vulnerable to variable costs increases. A reduction of 10% in variable costs lowers the BE point from 90% to about 50% of capacity; an increase of 10% would mean that at no level of capacity use would total costs be covered.

B. Orange Juice

a) Break even capacity utilisation at which total costs including finance costs are met by annual sales is reasonable at 24%, {15.24}. The variation of sales prices or their equivalent has no significant impact on breakeven or the fixed cost coverage ratio. A 10% increase in sales prices in the 5th year for example lowers capacity use from 22% to 19%, while a 30% reduction in sales prices increases breakeven capacity use from 22% to about 27%.

The effect of a sales price increase of 30% lowers effective cover to 15% of capacity; a 30% reduction raises it to about 56%, demonstrating the low risk of the projected costs structure for ACI, {15.26}. Sales price variations within 10% on the Internal Rate of Return is also not critical. With an IRR of 35%, a 10% decrease in sales prices lowers the IRR to about 7%, while an increase raises lifts it to about 84%, {15.29}.

(b) The effects of variations in variable costs on the Fixed cost/variable margin ratio are not critical to project viability. An increase in variable costs of 40% defers positive ratios from the end of year 2 to the end of year 4. A decrease of 10% in variable costs lifts the negative ratio in year 2 to positive values, (15.25). Similarly, variations in interest rates within 20% have little impact on discounted net worth.

10.2 ECONOMIC EVALUATION

10.2.1. General Economic Climate

The Zimbabwe Economy in 1993 has been under considerable stress. GDP has fallen since 1992 by nearly 8%, [Annex 10:1.]. Manufacturing output in 1992 fell by 9.5%. Inflation may have abated in the first half of 1993 from the high rates of 50-70% prevailing in 1992, but in May was reported to be rising again for all income groups, and may be annualising at about 28%. Government spending has been running at Z$ 13.4 billion in 1992, with limited prospects for any reduction in 1993. A further US$ 1.0 billion will probably have to be be requested from aid donors by Government to give effect to ESAP, against a Budget estimate of Z$1.8 billion. Borrowing by Government from the banking system to cover its deficit at Z$1.3 billion has had the effect of crowding out the private sector, and of sustaining interest rates at a high level, [Annex 5].

Private consumption is heavily reduced, with the average annual wage quoted at Z$ 380 a month, and real incomes down 10% on the 1991 level. Many new private sector investments under these conditions have been deferred.

10.2.2. Economic Impact of the ACI Investment Proposals

A. Tomato Products

Further Tomato paste production in Zimbabwe would make little net contribution to the National Economy, given its weak linkages with the supply sector, the displacement risk for other Zimbabwe

tomato paste producers, and the substitution effect it would have for fresh tomato.

B. **Orange Juice**

Orange juice packing will offer better linkages when local raw material sources are tapped and effect some import substitution, but there are many SSE industrial investments with greater economic benefits for Zimbabwe than these. In the present state of supply factors and world demand, it is hard to match the cost/benefit ratios of tobacco and beef, which ACI already produces.

10.2.3 **The Economic Cost/Benefit Analysis**

As Zimbabwe is a relatively well-managed economy with a large internationally traded sector, its market prices are not regarded as radically different from border prices. The National Discount Rate for project appraisal is not in Zimbabwe a precisely defined criterion for project ranking. In so far as a common economic cost of capital is assumed by evaluators in the public sector, 11-12% is common for national or aid-funded projects. For private sector projects, the rate used for bank appraisals has been 30%, reflecting the high current central rediscount rate and opportunity costs of capital, 49%.

Economic values of project inputs and outputs can be assessed at border prices where these are clear. But with CSO inflation running at between 30 - 50%, and interest rates not set by the market but by administrative action, the flow of relative values is a highly independent variable that may be overturned in any long-range projection. Differential inflation rates further vitiate planning accuracy. The new CSO weighting for Consumer Price changes highlights the exceptional increases for foodstuffs over 1992, -up by over 70% on 1991. This compares with a general all-items increase of 45%. The annualised all-items inflation rate prior to 1991 was 20%, the rate adopted for this study.

10.2.4 **The Structure of Value Added**

The Gross Domestic Value added in the 4th year of the Orange Juice project at unadjusted prices is Z$ 14,313,000, or 50.5% of total,(15.31). This increases to Z$ 48,623,800 or 68.9% in the 9th year,(15.32).

10.2.5 **The Foreign Exchange Shadow Rate**

Any investments depending on foreign exchange costs inflating at less than the Zimbabwe inflation rate are likely to benefit from relative cost changes over time while exchange rates remain stable.

Improvements to the market mechanisms for foreign exchange and some damping of demand have helped to stabilise the Zimbabwe $,(Annex 3, for trends 1982-92). The continuing demand for Forign Exchange means however that the Zimbabwe Dollar is overvalued. A reasonable indicator of the gap between the official rate and what the market is prepared to pay for US $. exists in the forex acquisition window created by Government through the Export Retention Scheme,(50). The Shadow rate of Foreign Exchange adopted for ZTCP is the current official rate, plus the premium now paid for ERS entitlements held by exporters. The premium paid by the Zimbabwe market for tradable foreign exchange accumulated through the Export Earnings Retention scheme is running at a 24% premium on the official rate.

With such a major part of its input costs met in foreign exchange, the Tetra Pak investment is sensitive to changes in rates. Continuing project deficits in foreign exchange are more than offset by strong cashflows in Z$. and mean it is not over-vulnerable to the risks of further devaluation. . At Z$7.94 to the US$, a 24% shadow rate, the Tetra Pak investment is still financially profitable. At this devalued rate of exchange for the Z$, the ROE1 is 43%, and ROE2 38%,(15.30). Export values at 16% of total sales benefit from devaluation. But the payoff for its offshore borrowings are deferred, and mean that the orange juice project will be an economically unattractive investment until its main

raw materials are locally sourced.

10.2.6 **Foreign Exchange Earnings/Savings**

Neither the Tomato paste line nor the Tetrapak line offer immediate benefits in terms of foreign exchange earnings or savings. Neither is an import substitution investment. Neither promises major export markets. The Tetra Pak line is largely financed offshore, will require imports of its packaging material for the foreseeable future, and is unlikely to be able to use local orange concentrate until 1997/8. Its foreign cash flow will be negative unless export earnings can be increased by ZS 6.4 million equivalent a year.

10.2.7 **Infrastructural Implications**

No additional road, rail or telecoms infrastructure is needed to service the farm and factory site at Norton. The investments studied would not impose any significant additional burden on social and governmental infrastructure.

10.2.8 **Technology Transfer**

Neither of the investments studied are strikingly labour-intensive, with one employee for every US$50,700 worth of capital for orange juice packing, and one per US$37,703 for paste production. The production plans entail the use of modern equipment that performs processing tasks efficiently to high output specifications. These tasks could be performed by labour, were it to be so trained and organised. From experience in Asia and historically in Europe, we know that mass demand for processed products can be met by small scale enterprise. Given a transformation of culture in Zimbabwe and of the business climate for technology transfer, the demand for processed tomato products and indeed for juiced fruit could be met in most parts of the country by SSE 'kitchen' operations.

Instead, the benefits of assured industrial quality and industrial scale are here proposed through the conventional industrialisation of consumer product supply. The technically and financially recommended system for ACI is volume production by ACI for mass

consumption, instead of production by the masses for their own immediate use. To the extent that this project will supply affordable industrial substitutes for local products, it will have the effect of suppressing local employment in tomato and fruit processing, with small consumer advantages arising in terms of the greater convenience of aseptically packed orange juice. The ingenuity of Tetra Pak's aseptic filling system is the result of massive R&D expenditure. The company, with 16,000 employed worldwide, employs 2000 alone in research and development, and will soon design ways of aseptically packing foods other than fluid beverages.

Little work has been directed at reducing the minimum economic scale of juicing and pack-filling systems. Globally, insufficient R&D has been devoted generally to the refinement of SSE technology, with the result that SSE technology remains crude and inadequate, and its output quality is invariably too low to meet export or even LD market aspirations. We recommend that international agencies concerned with rural development in Africa devote more attention and resources to the refinement of SSE technologies, so that small markets can acquire workable systems for their own production.

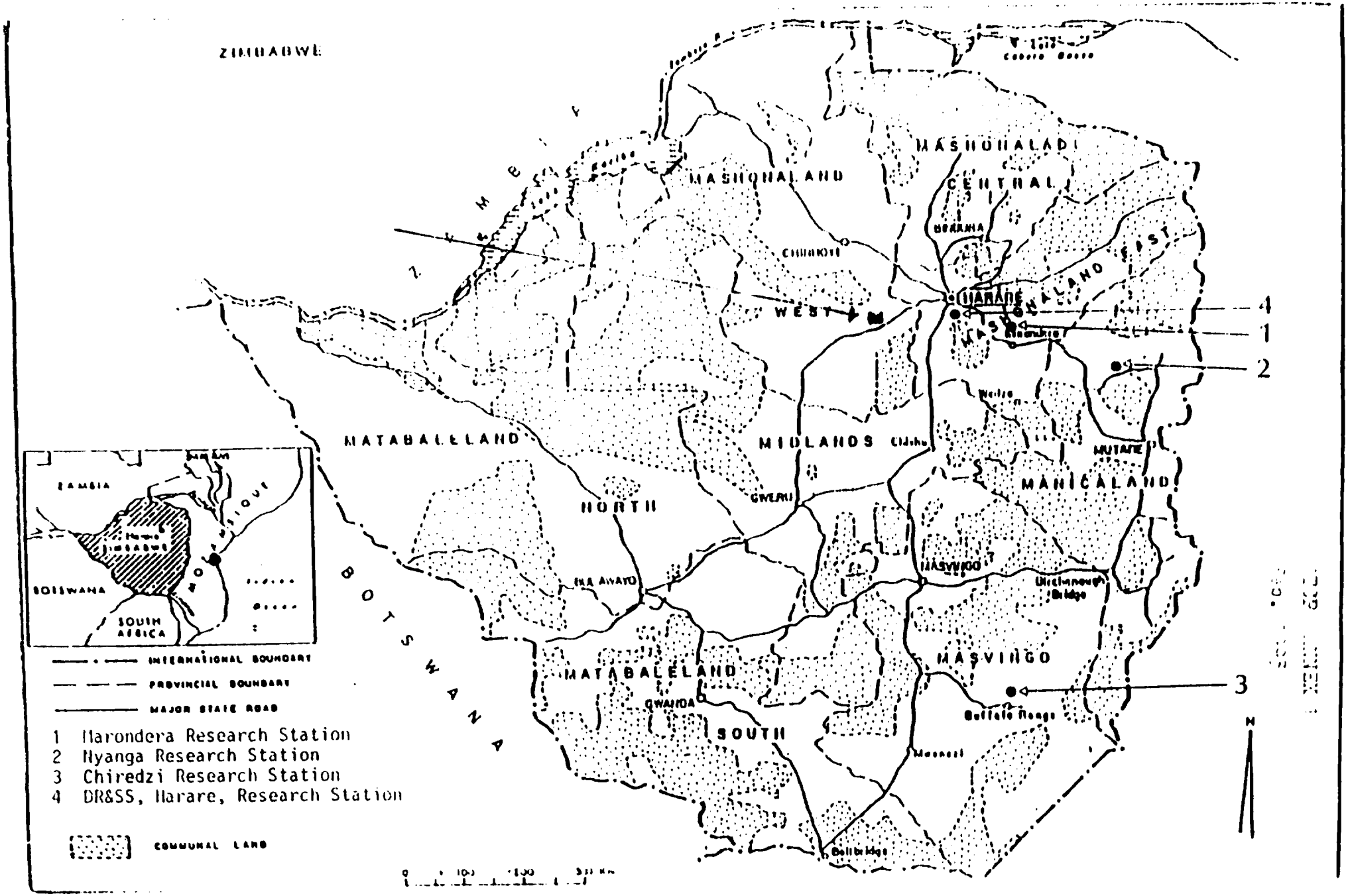
10.2.9 **Local Economic Impact**

No special employment benefits arise as a result of the Tetra Pak project. There are no extensive linkages to the local economy, and future supplies of orange concentrate are likely to come from other parts of Zimbabwe, [4.1.2]. While there is some unemployment and under-employment in the Norton area, it is significantly less serious a social problem there than in many other peri-urban and rural areas in Zimbabwe. Living costs are higher in urban and peri-urban areas than in the Norton area, where the bulk of the population have incomes in which consumption of their own produce is a large part, [see Household Budgets in 3.A.3]. But because cash incomes are relatively low, the additional incomes to be derived from any ACI

investment would be a valuable support to the immediate households with ACI wage earners. Shadow wage costs in rural areas, once assumed to be zero, are now in Zimbabwe treated as 45% of actual cash wages and are not therefore so low as to place a critical premium on employment, (30).

10.2.10 **Gender Equalisation Impact**

The relative population and local employment rates for males and females are given in [2.3.2]. The ZTCP Project employment prospects for male and female staffing are given in [8.1.2]. A general study of the prospects for female employment in Zimbabwe is contained in Annex 16. The impact of the proposed employment in Farm and Factory on the labour catchment area of Norton will not significantly reduce rural male or female unemployment. The additional labour for tomato growing can be female, with no more than three days of training. In the Tetra Pak line, and later in any Tomato paste line, female staff can be trained to operate the equipment, as is common practice in other countries.


ZIMBABWE
MASHONALAND
CENTRAL
MASHONALAND
EAST
MASHONALAND
WEST
MATABELELAND
NORTH
MIDLANDS
MANICALAND
MATABELELAND
SOUTH
MASVINGO
HARARE
CHINHOYI
GWERU
MUTARE
MASVINGO
GWANDA
BOTSWANA
ZAMBIA
MOZAMBIQUE
SOUTH AFRICA
INTERNATIONAL BOUNDARY
PROVINCIAL BOUNDARY
MAJOR STATE ROAD
1 Harondera Research Station
2 Nyanga Research Station
3 Chiredzi Research Station
4 DR&SS, Harare, Research Station
COMMUNAL LAND
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ANNEXES

1. REFERENCES AND CITATIONS

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(3) Ministry of Lands, Agriculture and Rural Resettlement, (MLARR), Ngungunyana Building, 1 Borrowdale Road, Private Bag 7710, Causeway, Harare. Tel: 706081.

(4) Horticulture Promotion Council, (HPC). Commercial Farmers Union, (CFU). 113 Leopold Takawira Street, PO Box 1241, Harare. Tel: 791381. Fax: 706607. Executive Officer: S T Heri.

(5) AGRITEX. The Department of Agricultural Technical and Extension Services, MLARR, PO Box 8117, Harare. Tel: 707311, 794601. (see 59).

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25) SUMU is the generic name for a traditional vegetable relish based on tomato, used as a sauce with the Zimbabwe staple food, sadza, a mealie porridge.

26) Airlines serving Harare are for example supplied with meals by Catercraft (Pvt) Ltd, Po Box AP 30, Harare Airport, Tel: 731772-4. General Manager, Yvonne Mngaza. Meal quality regulators are IATA, and ACTA, the Airline Caterers' Trade Association. Airline preference is for juice in cans, not bottles.

27) Standards Association of Zimbabwe, SAZ, 17 Coventry Road, Wokington, Harare, Tel 66495-8. CTA of Project ZIM/47/37 on packaging is John Salisbury. SAZ Head Office is at Northend Close, Northridge Park, Borrowdale, PO Box 2259, Harare. Tel: 882017-9. Director, Dr Hywell Williams. SAZ Divisional Director for Standards Writing, Dr Maureen Mutasa, food scientist, who sits on the Government's Standards Committee at MIC. SAZ is a Private Company registered under the Companies Act, but is 2/3rds funded by Government through a 0.15% Standards Development Levy on employers' wage bills.

28) Growth Points are governed by Statutory Instrument 57 and 58 of 1987 and are gazetted under the Excision of Land (Declaration of Growth Point) Statutory Instrument, No 214 of 1990. The executing authority for Government is the Ministry of Local Government, Rural and Urban Development, Mukwati Building, Private Bag 7706, Causeway, Harare, Tel 790601/9. OIC, Israel Khupe.

30) Zimbabwe Development Bank, ZDB House, Rotten Row, PO Box 1720, Harare. Tel: 721000-8-9, 705471. Fax: 263 4 720723. ZDB made an operating profit of Z$13.5 m in 1992 (1991 Z$4.6 m). It has made loans to one borrower for Citrus Juice Production, and was appraising one other in 1993. ZDB adopts a weighted cost of capital currently 30% as the National Discount rate in project appraisal, and the shadow price of labour in rural areas at 40-50% of wages.

ZDB's definition of Small and Medium scale is any project for which the loan application is less than Z$1.5 m. Its minimum loan is Z$ 100,000, on a debt/equity ratio of 2:1.

(31) Ministry of Finance, Munhumutapa Building, Samora Machel Avenue, Private Bag 7705 Causeway, Harare. Tel: 794571.

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(33) SADC, The Southern African Development Community, Private Bag 0095, Gaberones, Botswana. Tel: Gaberones 51863.

(34) Two PTA documents are sources: (i) The PTA Trade and Development Strategy: Market Integration and Economic Transformation for Sustainable Growth, Oct 1991; and (ii) The PTA Development Report: A Decade of Economic Integration, 1982-92. From these, the PTA Basic Economic Indicators are summarised in Annex 9 of this Study. Both documents are available from the PTA Secretariat, Ndeke House, PO Box 30051, Lusaka, Zambia. The Strategy sets priorities for food security in the PTA sub-region through, inter alia, the promotion of agro-industries. The PTA Clearing House is located in Harare: 72, Hardwicke House, Samora Machel Avenue, PO Box 2940 Harare. Tel: 793911.

(35) The European Community EC), NCR House, 1st and Samora Machel Avenue, PO Box 4252, Harare. Tel: 707139,707120. Agricultural Desk, Mr Muller and Mr Jim Trahy, Tel: 707140, 722137.

(36) The Republic of South Africa, RSA, has an Economic Mission in Zimbabwe, Temple Bar House 6th Floor, Baker Avenue/Angwa Street, Harare. Tel: 707901. Mr Visser is the Trade Officer.

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(39) ZIMBANK Making Corporation Ltd , Zimbank House, First

Street/Speke Avenue, PO Box 3198, Harare. International Division, 6th Floor, Tel: 735011. Fax: 735600. Managers, M Kwaramba, J Chando. Zimbank has lines of credit from offshore lenders for example Canadian Imperial and the PTA Bank available to Zimbabwe investors at relatively low interest rates, 7% -11%. The sub-borrower is obliged to repay interest and principal in the foreign exchange denominated for the loan, but can obtain forward cover for up to five years from Zimbank. An Export Pre- and Post- Shipment overdraft facility is available from Zimbank as from other commercial banks against export orders, and is quoted at US$ Libor rates to cover the foreign exchange cost of project working capital needed for imports.

40) ESAP, Annex III. Technical Note Assessing and Addressing the Social Dimensions of Adjustment, Jan 1991.(17).

41 Training Opportunities Overseas. For example, an offer from Budapest Hungary through UNIDO Vienna for nominees from Zimbabwe to attend a course in Food Industry Quality Control, 3-13 May 1993.

42. Ministry of National Affairs, Employment Creation and Cooperatives, Department of Women's Affairs, ZANU PF Building, Rotten Row/Samora Machel Avenue, Private Bag 7762 Causeway, Harare. Tel: 793721. Senior Secretary for Women's Affairs, Bridget C.G.Mugabe. The Department has Project Officers in each of 8 Provincial capitals, and inter-Departmental project proposals for Women's SSEs including fruit and vegetable processing to produce fresh packed, frozen packed, part-cooked frozen packed, and dried products. For the construction of a modern National Women's Training Centre, following the National Action Plan for Women in Development, it has sought the assistance of UNIDO (23), and of UNIFEM, 304, East 45th St, NY New York 10017, USA Tel: 212 906 6435.

43) Norton Selous Rural Council, Private Bag 904, Norton. Tel: 162 2219, 2228, 2226. Chief Executive, Ferris Zimunya. Norton Town is governed by a separate Town Board. Both Rural and Urban areas fall within Chegutu District, District Administrator, c/o Ministry of Local Government, Rural and Urban Development, Chegutu. Tel: 2206. Chegutu District falls within the Mashonaland West

Province, Chinhoyi. Provincial Governor, PO Box 97, Chinhoyi. Tel 2037.

44) University of Zimbabwe, Mt Pleasant, Box MP 187, Harare. Tel: 303211. Dr Lillian Marovatsanga, Food Science Technology, Faculty of Science. A 3 year MSc Course is planned for March 1994. The last term course was in 1985. Food Hygiene Courses have been held 1992/3 with visiting lecturer, Dr Pat Lund. Course members are sponsored by industry, hotels and the Zimbabwe Society of Food Science and Technology, with 58 members in 1993.

45) Income, Consumption and Expenditure Survey 1990/91 was being tabulated for publication by the CSO (1). It records values spent by sample households in Zimbabwe and the Z$ value of OPC,- Own Produce Consumed. The Survey will give weekly, monthly and estimated annual spending by households on

Lemons	Item 65
Oranges	69
Tinned Fruits	77
Tinned Vegetables	104
Dried Beans	105
Dried Peas	106
Fruit Juices & Squashes	140

Household Budget Surveys are of great value in Market Research where they state the per capita volumes consumed. Spending per item will reveal volumes, where the average buying price is known. We recommend ACI to obtain the Survey results as a check on ZTCP Market estimates of Demand.

46) USAID, 1, Pascoe Avenue, PO Box 3340, Harare. Tel: 720757, 720739. General Development Officer, Dr Robert Armstrong.

47) The Commonwealth Development Corporation, Ist Floor, CDB House, PO Box 3758, Harare. Tel: 708343. The CDC has currently only two agro-industry investments in its Zimbabwe portfolio, in private tea and dairy companies. It is open to applications from private companies for up to 50% loan and equity funding but its minimum participation must exceed Z$ 2.25 m. It lends at a concessional rate of just below the UK base rate.

48) The International Finance Corporation , a World Bank Affiliate has an African Project Developmenmt Facility, (APDF), Southampton House 5th floor, 68-70 Union Avenue, PO Box UA 400, Harare. Tel: 730967-9. Fax 730959. Investment Officer , Anil Sinha. The APDF assists indigenous investors with Feasibility Studies. The IFC invests equity in feasible projects meeting its selection criteria, eg Beta Bros (1990) wholesale company. Optimus (1988) paraffin lamps and stoves, Abbey Soaps and detergents (1990). In Uganda, IFC has co-financed horticultural projects with FMO and EADB.

49) Zimbabwe, Progress Report on Adjustment with Drought. Prepared by the World Bank, for the Zimbabwe Consultative Group Meeting, Dec 2-3, 1992. GDP and Balance of Payments Projections to 1995 are in Annex 10. The Zimabawe office of The International Bank for Reconstruction and Development (IBRD) is at the 11th floor, CABS Centre, J Moyo Avenue, Tel: 729611-3. Resident Representative, Chris Poortman. Public Expenditure Economist, Disch Arne. Resident Economist, Kapil Kapoor.

50) ERS, the Export Retention Scheme introduced Dec 1991, now permits exporters to retain 30% of their export earnings, and may be extended to 50% retention this year. Their entitlement to this portion in Foreign Exchange are tradable, with recent buyers paying 20% -25% above the normal Exchange Rate. This Forex can be used by those acquiring it to import any imports not on the Negative List. The list includes prepared foodstuffs, and all food items in The Customs and Excise Tariff HS Chapters 16 to 21.

51) Zimbabwe Agricultural Sector Memorandum, 31 May 1991. Document of the World Bank, (49). The 3 Volume document reviews agricultural inputs and markets in 1990 and garin milling, but did not otherwise address vertical integration prospects for agro-industries.

52) Government Policy and the Manufacturing Sector, Apr 1983. A Study for the Ministry of Industry and Energy Development, by DJ Jansen et al., 10, Orange Avenue, Larkspur, Cal. 94939, USA.

53) Dodhill Horticulture Co. PO Box 142, Chegutu, Zimbabwe.

Tel:153 3820,153 275922. Tech info: John McChlery.

54) Horticultural Export Marketing Study, Zimbabwe, Sept 1992,for the Ministry of Lands, Agriculture and Water Development, (S), by ULG Consultants Ltd, UK. Projected exports include fresh and chilled fruit, not processed. In 4 years, ULG expect cottage industries to be processing 3000 tpa.

55) The Current Situation and Medium Term Prospects for the OECD Tomato Market, Sept 1991. The OECD Group on Fruit and Vegetables, for the OECD Working Party on Agricultural Policies and Markets, Directorate for Food Agriculture and Fisheries, OECD, Paris.

56) The Special Initial Allowance (SIA) provides through the Department of Taxes for a rebate of 50% in the first year, and 25% in the second and third year of company profit taxes on the installed capital cost of investments. SIA credits can be carried forward. In addition, a Waiver of 10% import tax and 20% surtax on imported capital equipment for new or expanded investments is allowed by the Ministry of Finance Satutory Instrument 34/35 1992. An Import Duty of 10% is payable on capital goods imported into Zimbabwe. All rates are subject to change.

57) 1992 Financial Statements presented to Parliament by the Senior Minister of Finance, Dr Bernard Chidzero, 30 July 1992. Total long-term loans were Z$ 3,966 million. Investments, Z$ 1,003 million.

58) Mecparma quotations dated Oct 1992, valid six months. Delivery 4-7 months from order. Payment C&I L/C ,30% against order, 70% against shipping docs. Price includes plant assembly under Mecparma supervision and commissioning. Guarantee six months from shipment.

59) FAO, Food and Agricultural Organisation, 9th Floor, Robinson House, Union Avenue, PO Box 3730, Harare. Tel:723545. FAO's principal TA project with UNDP is for AGRITEX,(S),- ZIM 91/005.

60) EIU, the Economist Intelligence Unit, London. A report on Zimbabwe's economic prospects by former CZI economist,

Roger Riddell, quoted by the Zimbabwe Herald, 20 Feb 1993.

61 Zimbabwe Shipping Services, 3rd Floor Stanley House, 3 Moyo Avenue, PO Box 2089, Harare. Tel: 796111.

62 CZI, Confederation of Zimbabwe Industries, PO Box 3794, Harare. Tel: 792361 2. Director, Tony Read. The CZI's Triennial survey is published in the CZI Industrial Review, July 1992.

63 The Retailers Association. Chairman, Bill Clarke, PO Box 3598, Harare. Tel: 704111.

64 OK Bazaars. PO Box 3081, Harare. Tel: 738644/5/6/9. Fax: 729433. Operations Director: Grant Hudson.

65 The Nutrition Unit of the Ministry of Health conducted surveys of nutrition in the 1980s, and in its main work to lower mortality rates for the under fives, has not discerned serious malnutrition or the scurvy that usually results from fruit or vegetable shortages.

66 Little Market Research has been conducted in Zimbabwe, - a reflection of the sellers' market the country has been, and the fragmented state of its consumption patterns. With liberalisation and the admission of competing imports, more research has been commissioned, for example, from Probe Market Research, Tel: 792734-5, and Quest Research Services, Tel: 738376. Our ZTCP Study draws on some of their confidential surveys for leading retailers and manufacturers.

67 The Hotel and Restaurant Association of Zimbabwe, (HIRAZ), 8th Floor Travel Centre, PO Box HG 306, Highlands, Harare. Tel: 733211. Chief Executive: Don Mahleka. Ex Secretary: Violet Rulcande. Coordinator: Lee Gent.

68 Zimbabwe Tourist Development Corporation, (ZTDC), PO Box 8052, Causeway, Zimbabwe. Tel: 793666-8, Fax: 793669. Research and Planning Manager: Givemore Chidzidzi.

69 Carnaud Metalbox, Metal Packaging Division, PO Box ST 128, Southerton, Harare. Tel: 65530-6. Fax: 65469.

Marketing Manager: Martin Webster. Planning Manager: Felicity Laurence.Sales Representative: Hennings K Kondowe.

70 Market Leaders in Tomato Processing:
Cairns Foods Ltd. Upton Road, Ardbennie, PO Box 1813, Harare. Tel: 67741. Fax: 263 4 67953. Marketing Director: Keith Smith.

Lemco Foods. Lever Brothers Zimbabwe, 2, Stirling Road PO Box 950, Harare. Tel: 14 61941. Marketing Manager: Theo Kumali. Internal Research: Shepherd Ruseda.

Olivine Industries (Pvt) Ltd. Heinz, 36, Birmingham Road, PO Box 797, Harare. Tel: 69961-4 Fax: 263 4 63363. Sales Manager Industrial: Harry Moss.

Market Leader in Citrus Drink Production:

Schweppes (Central Africa) Ltd, PO Box 506, Harare. Tel: 62661-7.

71 Market Study: Fruit Juices, with Special Reference to Citrus and Tropical Fruit Juices. A Study of the World Market. ITC Geneva, 1991. Fax: 41 22 7300111.

72 ACI has the option of farming and processing other vegetable products in addition to tomato and orange. Our Market Survey noted the popularity of beans and peas which however are heavily supplied by other manufacturers, notably Cairns and Heinz:

BAKED BEANS AND PEAS RETAILED IN ZIMBABWE, 1993

Beans, baked	440 g	can	4.68	BRANDS	Cairns
Beans, baked	435 g	can	4.17	HEINZ	Olivine
IMPORTED					
Peas	410 g	can	9.50	KOO	Langeberg RSA
Fresh Peas	200 g	pack	4.99	Local grower	

73) Trade Sources in Europe, eg:

Gerber Foods International Ltd. Northway House Ltd 1379, High Road, Whetstone, London N20 9LP. Tel: 446 1424. Fax: 4128. Kiril Mischeff Ltd Broadwell House 21, Broadwall, London SE1 9PL. Tel: 928 8966. Fax: 261 9081.

Princes Foods Ltd. 8th Floor, Royal Liver Building, Liverpool, L3 1NX. Tel: 051 236 9282. Fax: 051 236 1057.

74) Fata Food, Fata European Group Srl. Via Spezia 54/56, 43100 Parma, Italy. Tel: 0521 94 244 984244. Fax: 29 35 92.

75) The Identified Product Mix:

	CITRUS	TOMATO
Type of Product	Orange Juice	Paste
Type of Packaging	Tetrabrik	Can
Processing method	Hot filling	Hot filling

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76) A switch from tomato paste into juice manufacture can be realised through using the CIP (Cleaning in place) equipment specified.

80) Zimbabwe's population is expected to increase by 2.92% pa between 1995-2000, a decline from the 3.16% pa recorded 1985-90. In 1995 the population is projected at 11.34 million, in 2025 at 22.62 million. (World Resources: a Guide to the Global Environment. World Resources Institute, 1709, New York Avenue, NW. Washington DC, 20006, USA.).

81) FAO Yearbook Vol 45, 1991.

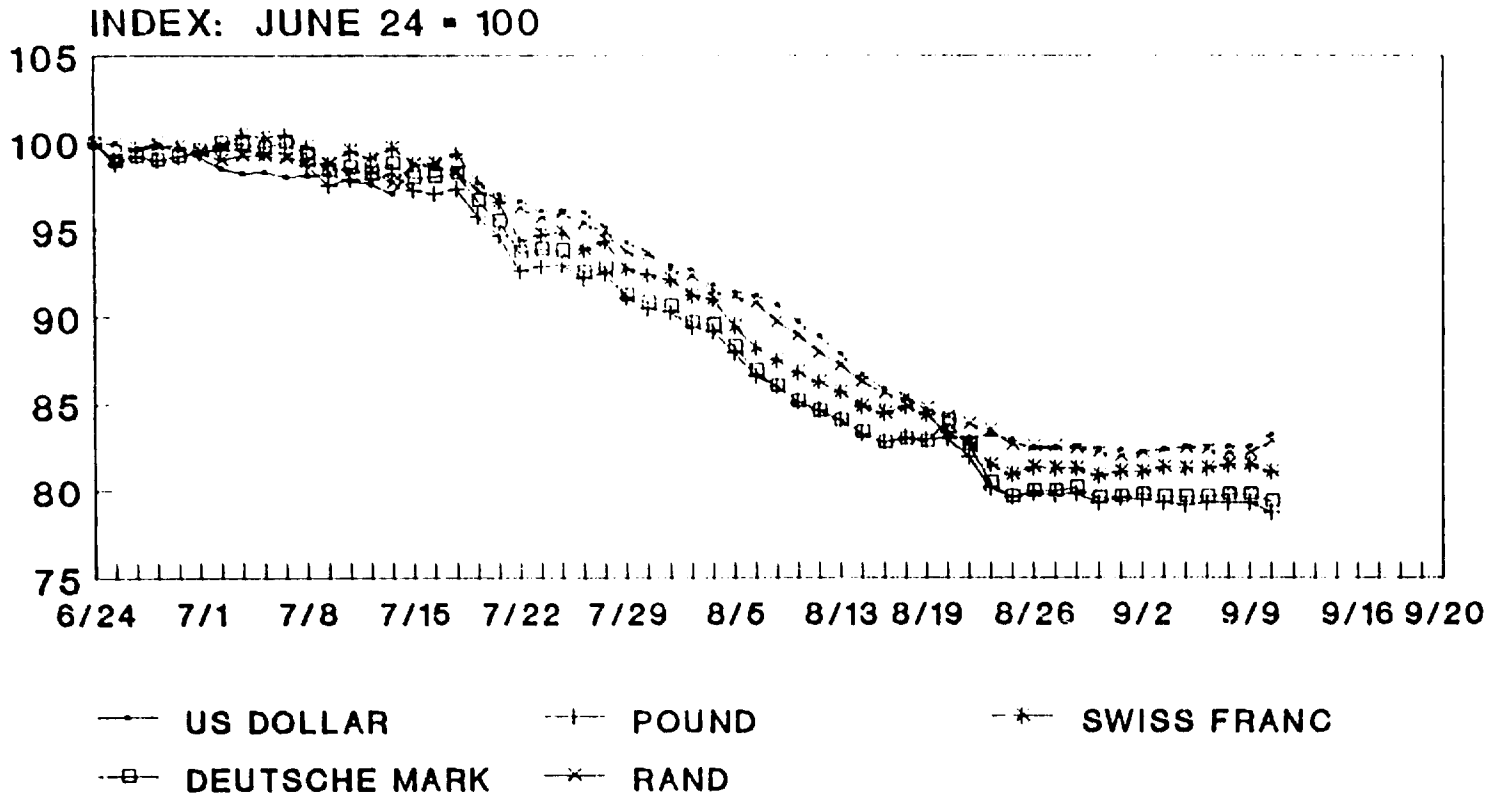
82) eg. W.E.Collett, Oceanic Fruits, Harare.

83) Tetra Pak Ltd. took over Alfa Laval in April 1993, and in Zimbabwe services the Zimbabwe Dairy Corporation. The Office in Harare: Adrian Clayton-Howe, PO Box AY57 AMBY, Harare. Tel 010 263 4) 45709. The UK Office: Commercial Director Steve Wyatt, 1 Longwalk Road, Stockley Park Uxbridge, Middlesex, UB11 1DL. Tel: 0895 868000. Fax 0895 868001.

ZIMBABWE DOLLAR EXCHANGE RATE TRENDS

MONTH END		US$ RATE	% Dep. p.a.	£ RATE	% Dep. p.a.	DM. RATE	% Dep. p.a.	RAND RATE	% Dep. p.a.	SwFr RATE	% Dep. p.a.	FrFr RATE	% Dep. p.a.
1982	Nov.	1,3045		0,8106		3,2485		1,4493		2,7897		9,1773	
	Dec.	1,0876	-22,1	0,6712	-8,0	2,5896	-17,4	1,1670	-12,6	2,1790	-12,8	7,3196	-8,0
1983	Dec.	0,9047	-16,7	0,6225	-7,3	2,4565	-5,1	1,1018	-5,8	1,9693	-9,6	7,5082	+3,4
1984	Dec.	0,6656	-25,9	0,5711	[illegible]	2,0872	-15,0	1,3163	+19,7	1,7211	-12,1	6,3848	-14,7
1985	Dec.	0,6093	-7,5	0,4227	-26,5	1,4992	-28,1	1,5777	+19,1	1,2634	-27,0	4,5987	-28,1
1986	Mar.	0,6105		0,4131		1,4225		1,3018		1,1909		4,3698	
	Jun.	0,5754		0,3756		1,2667		1,4356		1,0366		4,0393	
	Sep.	0,6058		0,4216		1,2231		1,3412		0,9921		4,0059	
	Dec.	0,5959	-2,3	0,4055	-4,2	1,1605	-22,4	1,3144	-16,7	0,9694	-23,2	3,8439	-16,0
1987	Mar.	0,6123		0,3813		1,1021		1,2308		0,9194		3,6738	
	Jun.	0,5972		0,3731		1,0920		1,2211		0,9080		3,6438	
	Sep.	0,5864		0,3604		1,0799		1,2177		0,8975		3,5932	
	Dec.	0,6013	-0,9	0,3234	[illegible]	0,9588	[illegible]	1,1511	-11,7	0,7757	-19,9	3,2455	-15,2
1988	Mar.	0,5828		0,3106		0,9690		1,2382		0,7998		3,2858	
	Jun.	0,5514		0,3216		1,0035		1,2805		0,8329		3,3859	
	Sep.	0,5253		0,3123		0,9890		1,3060		0,8373		3,3648	
	Dec.	0,5147	-14,4	0,2874	-10,6	0,9195	[illegible]	1,2238	+4,4	0,7793	+0,4	3,1379	-3,3
1989	Mar.	0,4975		0,2943		0,9400		1,2702		0,8201		3,1750	
	Jun.	0,4670		0,3006		0,9174		1,2932		0,7881		3,1135	
	Sept.	0,4522		0,2706		0,8456		1,2263		0,7330		2,8650	
	Dec.	0,4405	-14,4	0,2744	[illegible]	0,7440	[illegible]	1,1172	-8,8	0,6781	-12,9	2,5428	-18,8
1990	Jan.	0,4349		0,2603		0,7372		1,1076		0,6517		2,5115	
	Feb.	0,4313		0,2553		0,7288		1,1010		0,6405		2,4660	
	Mar.	0,4163		0,2535		0,7048		1,1018		0,6232		2,3720	
	Apr.	0,4098		0,2511		0,6872		1,0896		0,5958		2,3066	
	May	0,4072		0,2444		0,6850		1,0802		0,5794		2,3098	
	Jun.	0,4037		0,2322		0,6753		1,0760		0,5731		2,2674	
	Jul.	0,4060		0,2196		0,6515		1,0553		0,5524		2,1816	
	Aug.	0,4053		0,2086		0,6308		1,0334		0,5214		2,1145	
	Sep.	0,3928		0,2091		0,6129		1,0096		0,5075		2,0522	
	Oct.	0,3904		0,1995		0,5915		0,9941		0,5008		1,9776	
	Nov.	0,3868		[illegible]		0,5831		0,9739		0,4970		1,9691	
	Dec.	0,3794	-13,9	0,1968	[illegible]	0,5665	[illegible]	0,9726	-12,9	0,4865	-28,4	1,9317	-24,0
1991	Jan.	0,3735		0,1902		0,5557		0,9514		0,4715		1,8860	
	Feb.	0,3646		0,1895		0,5523		0,9338		0,4787		1,8815	
	Mar.	0,3395		0,1946		0,5795		0,9273		0,4944		1,9676	
	Apr.	0,3334		0,1964		0,5839		0,9386		0,4912		1,9696	
	May	0,3254		0,1877		0,5593		0,9138		0,4764		1,8972	
	June	0,3109		[illegible]		[illegible]		0,8955		0,4818		1,8925	
	July	[illegible]		[illegible]		[illegible]		0,8325		0,4450		1,7333	
	August	0,2563		[illegible]		0,4475		0,7401		0,3912		1,5201	
	September	0,2004		0,1144		0,3332		0,5618		0,2906		1,1356	
	October	0,2018		0,1160		0,3397		0,5713		0,2969		1,1544	
	November	0,1976		0,1121		0,3215		0,5532		0,2837		1,0978	
	December	0,1978	-47,8	0,1061	[illegible]	0,3011	-46,8	0,5431	-44,1	0,2686	-44,8	1,0276	-46,8
1992	January	0,1964		0,1102		0,3175		0,5490		0,2820		1,0819	
	February	0,1977		0,1122		0,3232		0,5656		0,2927		1,0988	
	March	0,1982		0,1140		0,3238		0,5710		0,2973		1,1052	
	April	0,1974		0,1114		0,3273		0,5682		0,3004		1,1031	
	May	0,1970		0,1091		0,3205		0,5618		0,2909		1,0759	
	June	0,2017		0,1059		0,3068		0,5589		0,2769		1,0323	
	July	0,2027		0,1058		0,2994		0,5612		0,2669		1,0108	
	August	0,2061		0,1039		0,2905		0,5652		0,2618		0,9893	
	September	0,1977		0,1107		0,2793		0,5573		0,2426		0,9438	
	October	0,1901		0,1209		0,2923		0,5614		0,2610		0,9912	
	November	0,1843		0,1219		0,2946		0,5569		0,2653		1,0002	
	December	0,1824		0,1208		0,2948		0,5570		0,2673		1,0056	
FIRST MERCHANT BANK		0,1656		0,1093		0,2626		0,5079		0,2418		0,8696	

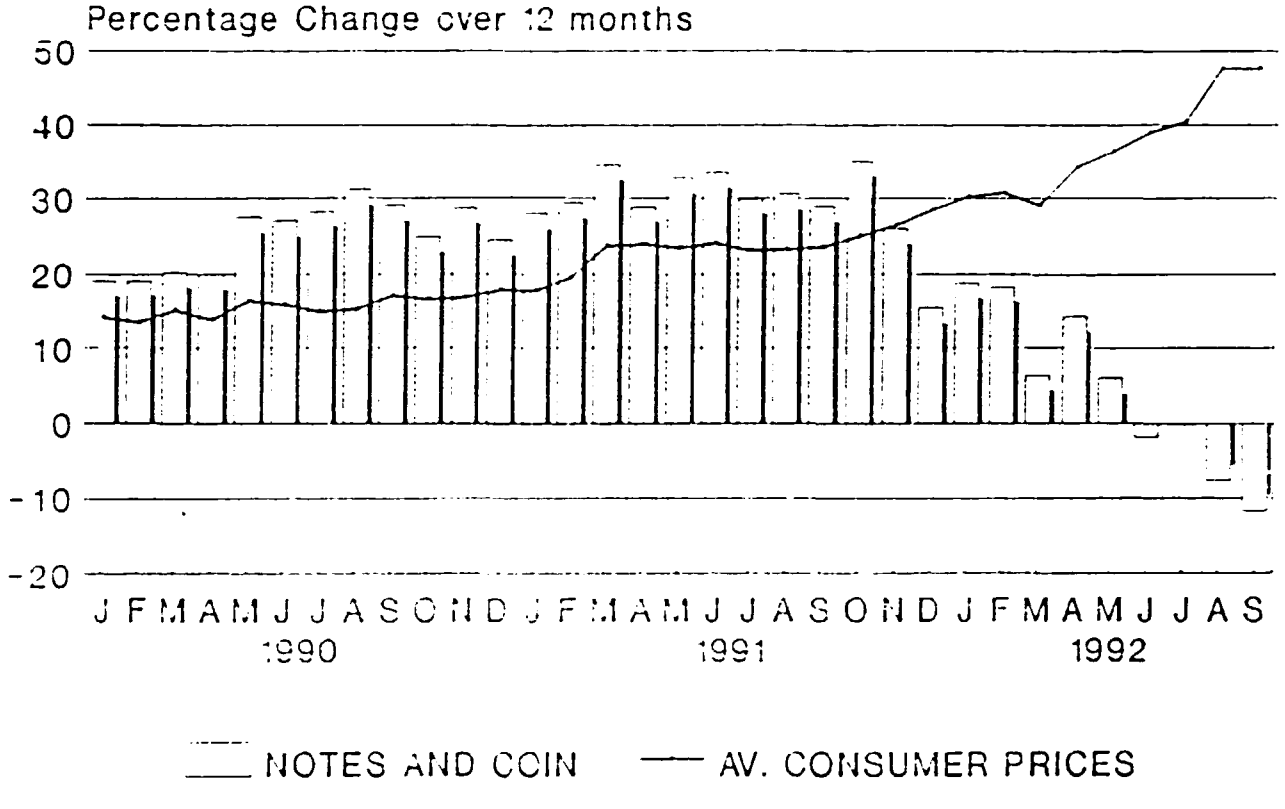
EXCHANGE RATE TRENDS
JUNE 24 - SEPT 20



FIRST MERCHANT BANK

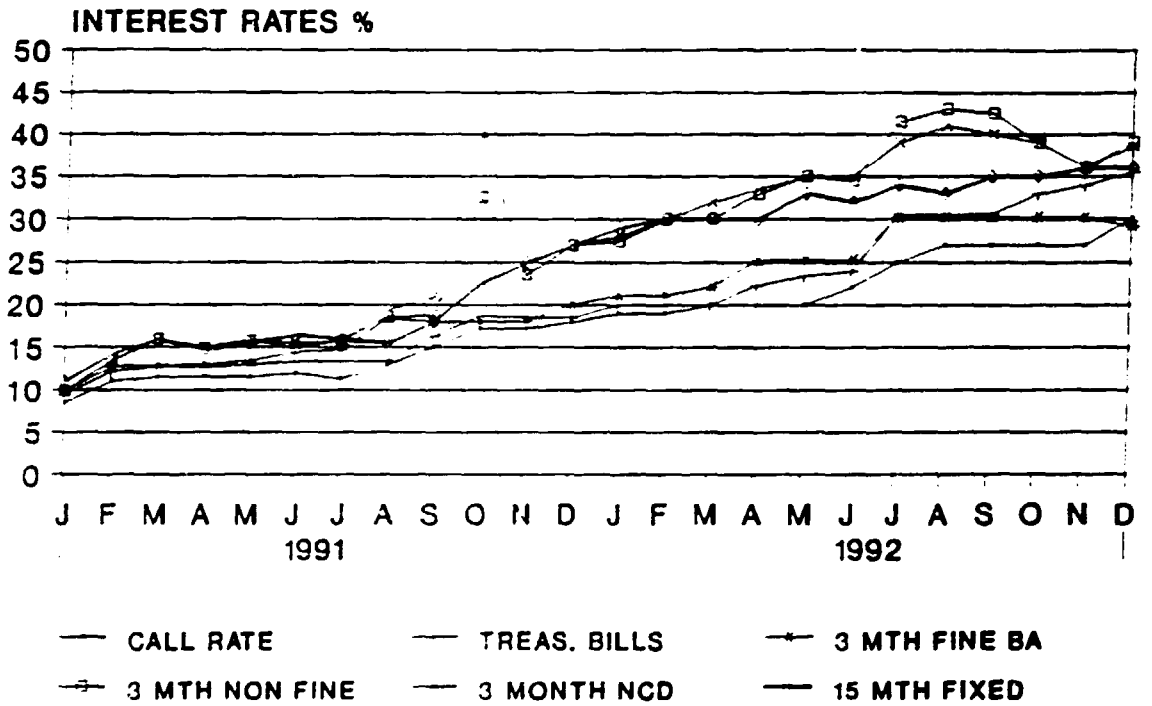
MONEY SUPPLY & PRICES

Notes and Coin/Consumer Prices



FIRST MERCHANT BANK

INTEREST RATE TRENDS
JANUARY 1991 to DECEMBER 1992



FIRST MERCHANT BANK

INTEREST RATE TRENDS

January 1991 to November 1992

FIRST MERCHANT BANK

ZIMBABWEAN EXPORTERS OF FRESH PRODUCE:

Tony Morkel and Associates
P O Box BW 6
Borrowdale
Harare
Tel: 725662
Fax: 702006
Telex: 24252

Utopia Fresh Exports
P O Box 66293
Kopje
Harare
Tel: 702634/732091
Fax: 702546
Tlx: 26198

Oceanic Fruits
P O Box BW 55
Borrowdale
Harare
Tel Bill Collett 704278

Africa Produce Marketing
P O Box HG258
Highlands
HARARE
Zimbabwe
Telephone 707893
Person to contact Mr John Silver

Hortico Produce
P O Box HG697
Highlands
HARARE
Telephone Arcturus 382 Telex 26063ZW
Person to contact Mr J Perlman

FAVCO
P O Box 1910
HARARE
Tel 706177
Person to contact Mr Gerry Van Zonder

Wholesale Fruiterers
P O Box 1740
Harare
Zimbabwe
Telephone 794671 Telex 24223 ZW
Person to contact Mr Babiolakis

/...

ZIMBABWE
FRESH PRODUCE

HORTICULTURE PROMOTION COUNCIL

S. T. HERI BSc. Agric. (Agric Econ.)
EXECUTIVE OFFICER

113 Leopold Takawira Street
P O Box 1241
Harare Zimbabwe

Tel: 791881 Harare
Telex: 22084 ZW
Fax: 706611

Mazowe Valley Marketing
P O Box 109
Concession
Zimbabwe
Telephone Mr Frank Miller
Sachel Farm - Glendale

Doma Producers
P O Box 7
Mhangura
Zimbabwe
Telephone (160) 52129 Telex 22143ZW

Enterprise Co-op
P O Box HG9
Highlands
HARARE
Telephone 45611 Telex 24014 ZW
Speak to Mr Peter Lombard

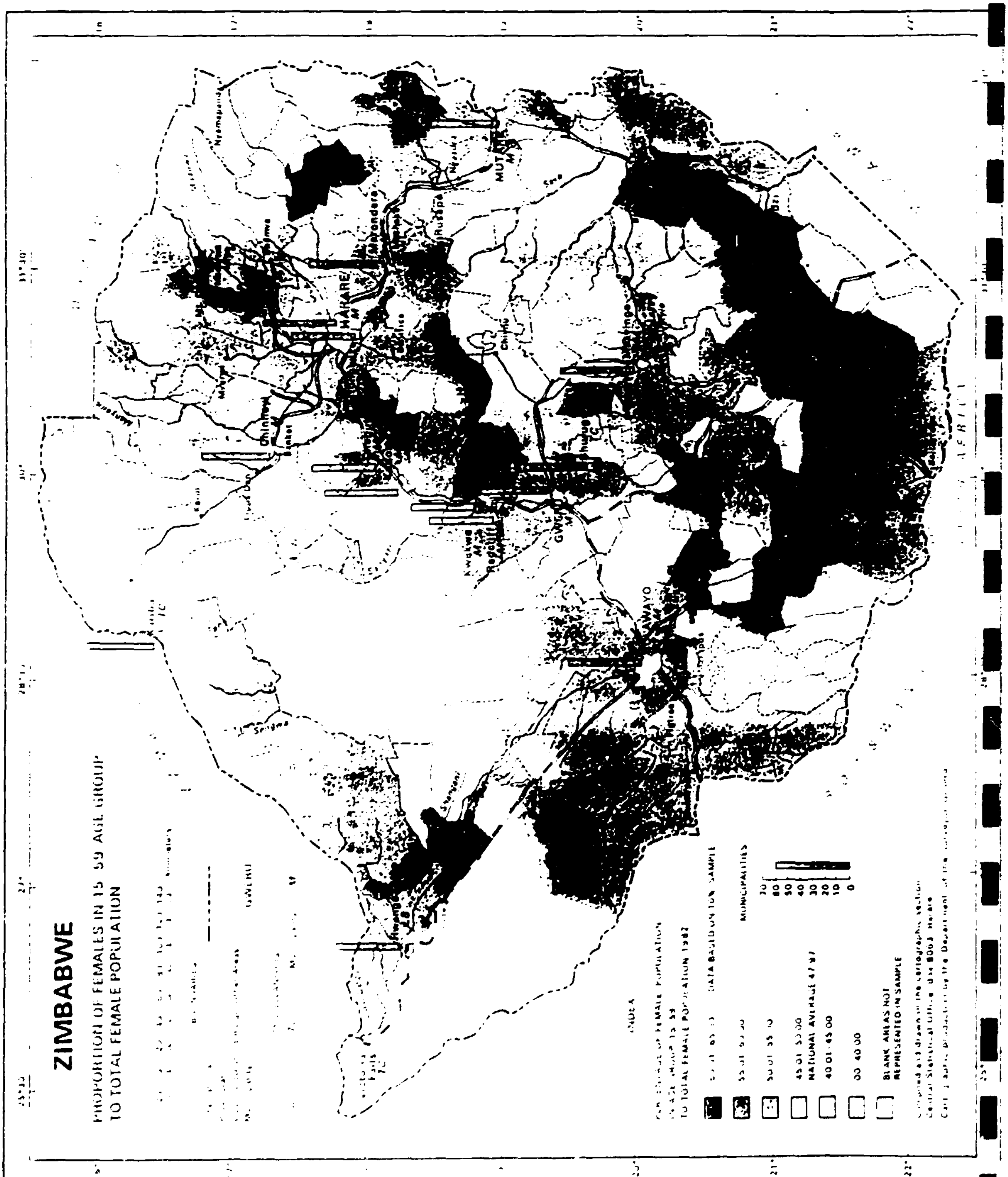
Manica Produce Market
P O Box 3238
Paulington
MUTARE
Tel (120) 64330
Person to contact Mr Neil Sharples

Mr H Motteux
Private Bag V7410
Mutare
Zimbabwe
Telephone (120) 214193

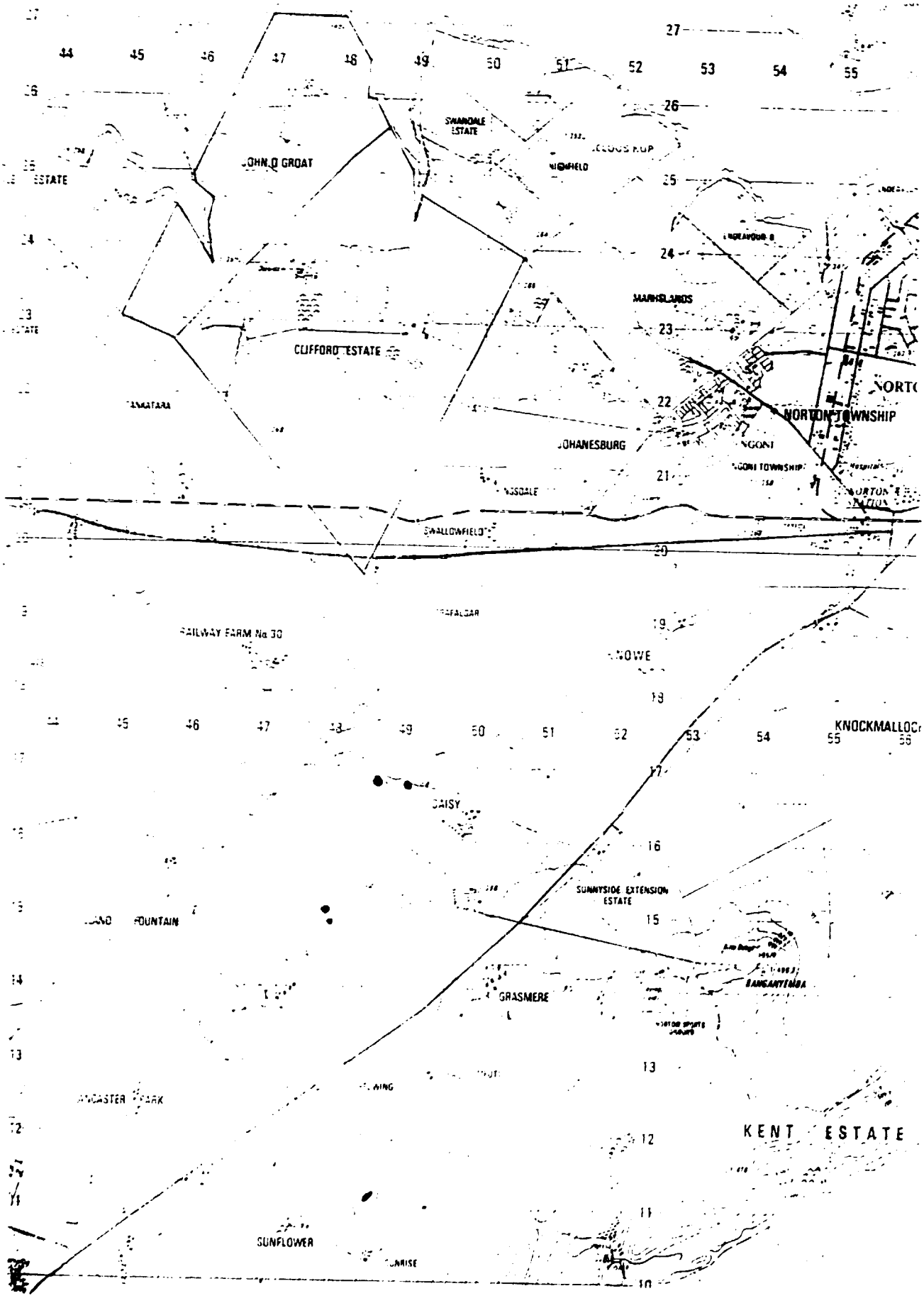
Selby Enterprises
P O Box A460
Avondale
HARARE
Phone Adam/Giles Selby 732833

Mr Chris Kay
Chiparawe Pvt Ltd
P O Box 45
Marondera
Telephone Marondera 450022

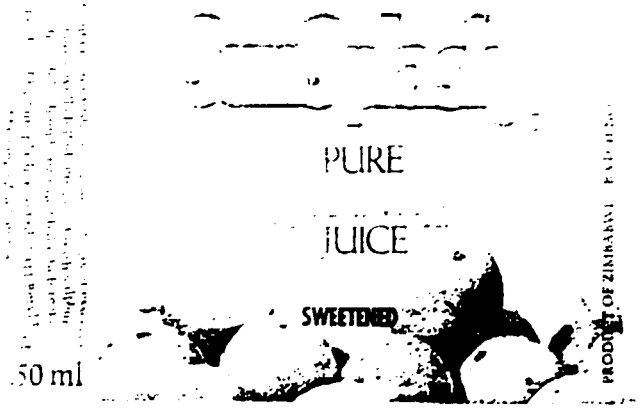
Mr Ian D Gordon
Hilbre Farm (Pvt) Ltd
P O Box 78
Darwendale
Telephone Norton (162) 2536/7/8 or Darwendale 3242/3221
Fax (162) 2689


ZIMBABWE
PROPORTION OF FEMALES IN 15 59 AGE GROUP
TO TOTAL FEMALE POPULATION
NATIONAL AVERAGE 47.97
BLANK AREAS NOT REPRESENTED IN SAMPLE
MUNICIPALITIES
HARARE
MUTARE
Marondera
Rusape
Chinhoyi
Kwekwe

ANNEX 8


JOHN O GROAT
CLIFFORD ESTATE
SWANDALE ESTATE
MARKSLANDS
NORTON TOWNSHIP
JOHANESBURG
SWALLOWFIELD
RAILWAY FARM No 30
DAISY
SUNNYSIDE EXTENSION ESTATE
GRASMERE
KENT ESTATE
SUNFLOWER
KNOCKMALLOC


Kenylon
ORANGE DRINK
Net Contents
300ml
DILUTE TO TASTE
Manufactured in Kenya by
KABAZI CANNERS LIMITED
P.O. Box 1000, NAKURU
Kenylon
ORANGE DRINK
Net Contents
300ml


PURE
JUICE
SWEETENED
50 ml

SOMERFIELD

IN TOMATO JUICE

POMODORI PELATI NON INTERI PRODOTTI IN ITALIA A NORMA DI LEGGE – PESO NETTO 400 g e

Store unopened in a cool, dry place. Once opened remove all contents from the can and place in a suitable container. Cover and keep refrigerated. Consume within three days.

Ingredients: Tomatoes, Tomato Juice, Sugar, Citric Acid, Oregano, Basil

SOMERFIELD

IN TOMATO JUICE

BEST BEFORE END AUGUST 1993 (3) 400 g e

NUTRITION INFORMATION

TYPICAL VALUES	PER 100g
ENERGY	96kJ 23kcal
PROTEIN	1.0g
CARBOHYDRATE	4.2g
of which sugars	4.2g
FAT	0.2g
of which saturates	TRACE
SODIUM	TRACE
FIBRE	0.9g

5 000192 139736

Every Somerfield product is quality guaranteed, however if you are not entirely satisfied please return it to the store where it was purchased and your money will be refunded. This does not affect your statutory rights.

Produced and packed in Italy for SOMERFIELD P.O. Box 708, Bristol BS99 1GA

TROUT HALL

GRAPEFRUIT SECTIONS IN SYRUP

NUTRITIONAL INFORMATION

PACKED FOR
TROUT HALL LIMITED
188 SPANISH TOWN RD
KINGSTON JAMAICA W.I.

PRODUCT OF JAMAICA

DISTRIBUTED BY
STEVENS & BROTHERTON
2 Vinson Close
Orpington Kent BR6 0XG

BEST BEFORE END JUNE 1994

5 010619 331933

539g

TROUT HALL

GRAPEFRUIT SECTIONS IN SYRUP


250 ml
NEW
READY TO DRINK
Rowntree's
FRUIT
JUICE DRINK
A FUN FRUITY TASTE
NO ADDED COLOURS
BEST SERVED CHILLED
BLENDED FRUIT JUICE DRINK
NEW
READY TO DRINK
Rowntree's
FRUIT
JUICE DRINK
A FUN FRUITY TASTE
NO ADDED COLOURS
Rowntree's
FRUIT
JUICE DRINK
TOMATO PUREE
TOMATO PUREE
CASHEL
Valley
SEALED IN FRESHNESS
CASHEL
Valley
SEALED IN FRESHNESS

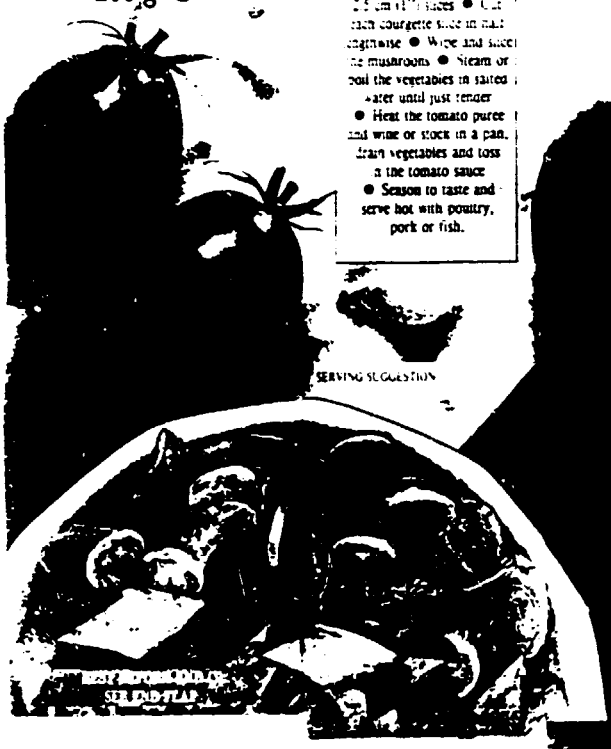
BELLA Tomato

·PURÉE·

DOUBLE CONCENTRATED

28%-30%

200g e



SEE END FLAP

BLUSHING LEEKS AND COURGETTES

Serves four as a side dish.

Quantity	Ingredients
2	Leeks
2	Large courgettes
100 g 4 oz	Mushrooms
75 g 3 oz	Bella Tomato Puree
75 ml 3 fl oz	White wine or chicken stock
	Salt and ground black pepper

Method

- Trim leeks and cut diagonally into 1 cm (½") slices
- Wipe courgettes and cut diagonally into 2.5 cm (1") slices
- Cut each courgette slice in half lengthwise
- Wipe and slice the mushrooms
- Steam or boil the vegetables in salted water until just tender
- Heat the tomato puree and wine or stock in a pan, drain vegetables and toss in the tomato sauce
- Season to taste and serve hot with poultry, pork or fish.

SERVING SUGGESTION

BELLA Tomato ·PURÉE· DOUBLE CONCENTRATED 28%-30% 200 g e

JUNE 1994

DRY PLACE

Add flavour and colour to your savoury dishes. Use in casseroles, bolognese and barbecue sauces and many vegetable dishes, or whenever you need that extra, richer tomato flavour.

Nutrition per 100 g	
Energy	421 kJ/99 kcal
Protein	5.0 g
Carbohydrate	18.9 g
Fat	0.4 g

INGREDIENTS:
FRESH TOMATOES

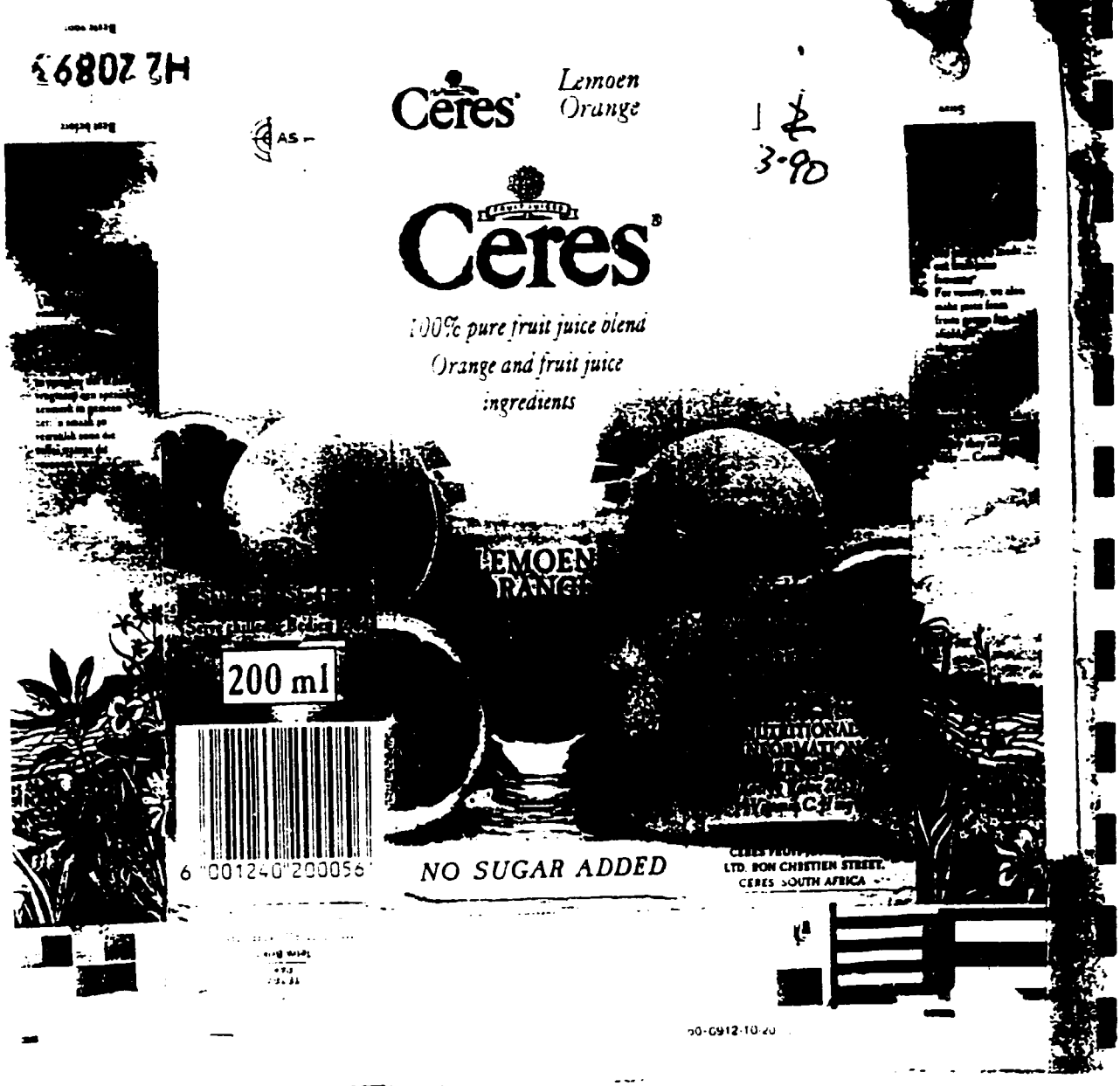
Gateway Foodmarkets Ltd.,
P.O. Box 197, Bristol

gateway

Produce of Italy by PV7

Doppio concentrato di pomodoro
Prodotto in Italia da PV7

5 000192 020120



FROM SOUTH AFRICA


ZIMBABWE IS BORN
PURE GOLD
MANDELA FR
Sip into The Maz
A lot of things ha
Mazoe Orange
that distinctive, ch
exceptionally ha
It's no wonder it
favourite choice
REPUTED-CONTAINS 50% REAL JUICE

ANNEX 10

Table 1: SUMMARY OF PROJECTED KEY INDICATORS
(percent)

From The IBRD PROGRESS REPORT on ADJUSTMENT WITH DROUGHT. Nov 1992 (49).

Key Indicators	1991	1992	1993	1994	1995
GDP growth	3.6	-11.0	6.0	7.0	6.0
Consumption per capita growth	3.2	-5.6	-3.7	-4.1	-0.6
Gross domestic investment/GDP	22.0	24.5	25.0	23.5	23.0
National savings/GDP	15.0	10.9	15.2	20.3	22.9
Central Government deficit/GDP1/	-10.8	-9.1	-9.3	-4.7	-3.2
Export Growth	0.3	-2.5	10.4	15.0	10.2
Import/GDP	30.6	37.8	35.8	33.5	33.8
Current account deficit/GDP	-9.4	-19.6	-14.6	-6.7	-3.2
DOD/GDP	50.7	72.8	75.4	71.2	69.6
Debt Service/XGS	21.6	28.5	27.8	26.0	20.1

Table 2: ZIMBABWE: BALANCE OF PAYMENTS
(US$ millions at current prices)

	Historical			Est.	Projected		
	1989	1990	1991	1992	1993	1994	1995
Current Account: (excluding grants)	-75	-292	-548	-970	-760	-380	-191
Merchandise Imports, fob	1338	1527	1700	1829	1916	1970	2126
Merchandise Exports, fob	1680	1717	1785	1545	1791	2266	2656
Trade Balance	343	190	85	-284	-125	296	530
Nonfactor Services	-201	-218	-331	-403	-365	-354	-393
Payments	406	463	601	693	681	690	751
Receipts	205	245	271	290	316	336	356
Resource Balance	141	-28	-246	-687	-490	-58	137
Factor Payments	-214	-262	-304	-284	-278	-322	-341
o.w.Interest Payments	156	187	221	228	245	287	305
Current Transfers	-2	-3	2	1	7	12	13
Capital Account: 1/	164	334	419	751	759	428	286
Grants	78	118	141	227	251	201	188
Foreign Investment	-10	-12	3	16	28	38	44
Net LT Capital Inflow	55	118	282	481	481	189	124
Short-term Capital 2/	41	90	-17	-42	0	-73	-70
Overall Balance	89	12	-129	-219	-1	-68	95
Financing	-89	-12	129	219	92	25	-126
o.w. Change in Reserves	-225	-140	-81	-6	-132	-111	-158
o.w. Net Use of Fund Resources	-39	-24	-5	222	143	122	51
Purchases	0	0	0	222	143	122	51
Repurchases	-39	-24	-5	0	0	0	0
Memo Items:							
Long Term External Debt	2336	2601	2931	3595	3924	3995	4171
Gross domestic product	6183	6199	5851	4941	5206	5609	5993
Exch. Rate (Zim$/US$)	2.11	2.45	3.44	..	..	..	..

1/ Projections in this capital account are based on historical trend and go beyond what is currently committed.

2/ Includes errors and omissions historically.

Implements Available at Alison Farms

1. Harrow T-28 - one
2. Harrow T-16 - one
3. Farrow Plough Imco-3 - one
4. Farrow Plough Baim-3 - one
5. Grass slasher - one
6. Ridger/Fertilizer/Plaker - Two Row Imco - one
7. RC Ridger 3 Row EDB Applicator - one
8. Road Grader - one
9. Four-Row Planter - Imco - one
10. Four-Row Planter - Daly - one
11. Fertilizer Applicator - VICON - one
12. Lime Box Applicator - one
13. Boom Spray
14. Tractor Massey Furguson - MF-1105 - one
15. Tractor Massey Furguson - MF-290 - one
16. Tractor Massey Furguson - MF-178 - one
17. Tractor Massey Furguson - MF-175 - one
18. Tractor Massey Furguson - MF-165 - one
19. Tractor Massey Furguson - MF-35 - one
20. Tractor Trailers - Flat Bed 3 tons - one
21. Truck - BEDFORD - 7 tons AWD - one
22. Pickup - NISSAN PG -720 - 3/4 tons - ten
23. Maize Shellar Imco - one
24. Erimdisrt Mill Imco - one
25. Cattle Feed Mixer - one

TABLE 1.
BASIC INDICATORS

COUNTRY	TOTAL AREA ('Ka2')	ARABLE LAND 1989 ('000 Ha)	POPULATION ('000)		POP'N AVERAGE ANNUAL GROWTH RATE (%) 1982-90	DENSITY 1990 (Inhab. per ka2)	GDP AT CURRENT MARKET PRICES (Mns USD)		GDP AT CONSTANT 1980 MARKET PRICES (Mns USD)		PER CAPITA GDP 1990 AT CONSTANT 1980 MARKET PRICES (USD)
			ACTUAL 1990	FORECAST 1992			ACTUAL 1990	FORECAST 1992	ACTUAL 1990	FORECAST 1992	
ANGOLA	1,246,700	3,247	10,011	10,538	2.5	8	8,410	10,456	9,473	11,131	946
BURUNDI	27,834	1,119	5,470	5,792	3.1	197	1,086	1,020	1,385	1,455	253
COMOROS	2,171	78	475	511	2.2	219	248	306	174	178	366
DJIBOUTI	22,000	7	427	457	4.5	19	357	371	338	346	792
ETHIOPIA	1,221,900	14,242	51,183	54,406	3.2	42	6,080	6,526	4,891	5,179	96
KENYA	582,646	1,880	24,368	26,306	3.9	42	8,781	9,663	10,844	12,047	445
LESOTHO	30,355	320	1,771	1,868	3.0	58	582	841	558	659	315
MALAWI	118,484	2,379	8,504	9,092	3.2	72	1,860	2,333	1,622	1,741	191
MAURITIUS	2,045	104	1,074	1,096	0.9	525	2,537	3,338	1,774	2,023	1,652
MOZAMBIQUE	801,590	2,886	15,784	16,648	2.7	20	1,556	949	2,125	2,290	135
RWANDA	26,338	820	7,113	7,576	3.3	270	2,317	2,530	1,359	1,327	191
SOMALIA	637,657	853	6,284	6,667	3.2	10	907	898	801	807	127
SUDAN	2,505,813	12,466	25,191	26,621	2.8	10	25,858	43,298	7,779	7,795	309
SWAZILAND	17,363	160	789	844	3.5	45	657	782	816	872	1,034
TANZANIA	945,087	4,058	27,300	29,019	4.4	29	2,549	1,842	6,597	7,190	242
UGANDA	236,036	4,712	17,358	18,487	3.3	74	3,790	3,882	2,396	2,718	138
ZAMBIA	752,614	5,026	8,122	8,734	3.6	11	3,122	4,274	4,348	4,559	535
ZIMBABWE	390,580	2,754	9,809	10,487	3.4	25	6,562	7,499	8,488	9,376	857
PTA AS A WHOLE	9,567,213	56,912	221,033	235,147	3.3	23	77,259	100,805	65,688	71,694	297

TABLE 1. (Cont'd)
BASIC INDICATORS

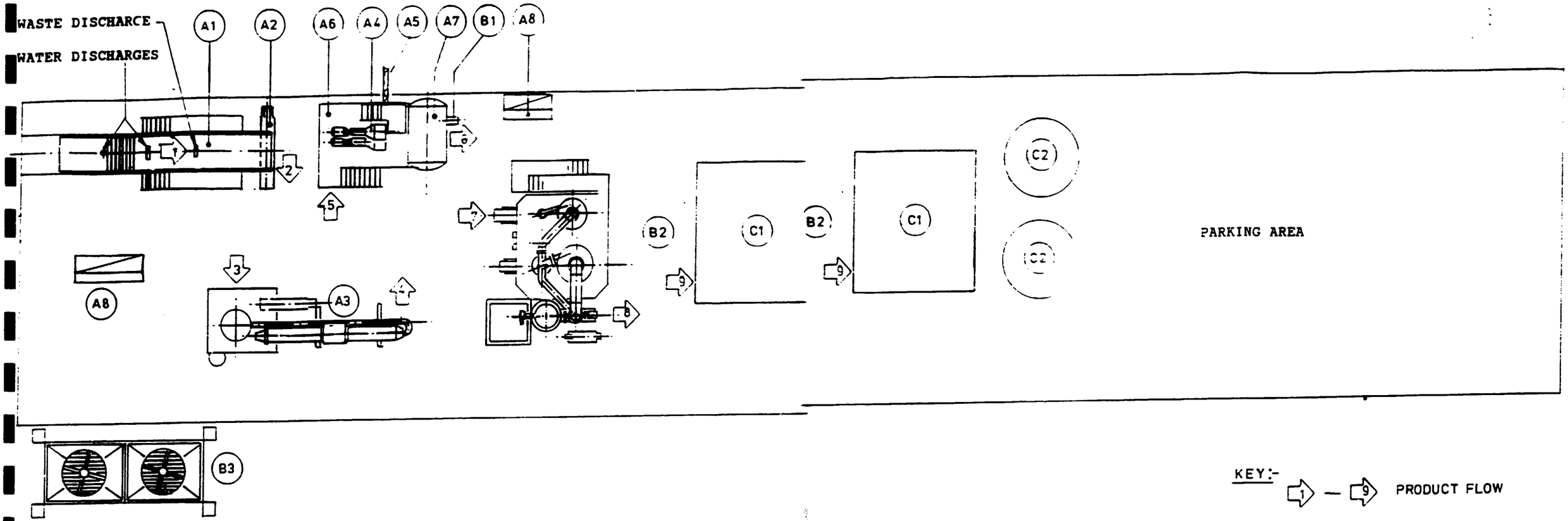
COUNTRY	GDP (Mns USD)		PER CAPITA GDP 1990 AT CURRENT MARKET PRICES (USD)	TOTAL EXPORTS 1991 (Mns USD)	TOTAL IMPORTS 1991 (Mns USD)	INTRA-PTA EXPORTS 1991 (Mns USD)	INTRA-PTA IMPORTS (Mns USD)	MONEY SUPPLY 1990 (Mns USD)	INTER-NATIONAL RESERVES END OF 1990 (Mns USD)	EXTERNAL PUBLIC DEBT OUTSTANDING (Disbursed) 1990 (Mns USD)	CON...
	ACTUAL 1990	FORECAST 1992									
ANGOLA	6,524	6,639	652	3,091	1,371	0.00	6.40	6,804	...	7,155	
BURUNDI	1,151	1,161	210	101	227	5.70	28.59	131	105	850	
COMOROS	227	228	478	28	129	0.04	1.43	40	30	178	
DJIBOUTI	434	464	1,016	54	376	25.80	21.73	147	94	345	...
ETHIOPIA	6,041	6,064	118	307	1,114	29.27	9.71	2,411	24	3,116	83.8
KENYA	8,958	9,033	368	1,324	2,229	251.48	65.38	1,201	209	4,810	155.1
LESOTHO	832	835	470	58	103	0.32	2.22	102	73	372	184.9
MALAWI	1,662	1,673	195	443	545	34.71	36.66	148	138	1,366	240.4
MAURITIUS	2,422	2,453	2,255	1,120	1,445	7.54	19.62	372	741	739	142.8
MOZAMBIQUE	1,208	1,204	77	390	899	5.79	85.81	...	...	4,853	...
RWANDA	2,216	2,218	311	203	213	13.77	33.15	282	44	694	111.6
SOMALIA	946	948	151	106	197	0.67	36.83	135	...	1,922	...
SUDAN	11,021	12,361	437	358	1,419	0.70	38.26	4,682	11	9,156	933.9
SWAZILAND	645	651	817	327	77	27.15	6.52	74	216	251	280.6
TANZANIA	2,335	1,836	86	385	1,090	17.95	37.30	569	193	5,294	359.4
UGANDA	3,816	3,845	220	171	464	2.15	139.08	228	64	2,301	6,629.7
ZAMBIA	3,391	3,396	418	1,061	1,066	40.82	76.63	633	193	4,784	1,194.2
ZIMBABWE	6,313	6,346	644	1,541	1,438	197.60	50.76	988	168	2,449	183.8
PTA AS A WHOLE	60,138	61,406	272	11,068	15,063	662.35	662.35	...	...	49,629	...

TABLE 2.
SELECTED SOCIAL INDICATORS

COUNTRY	URBAN POPUL. AS A % OF TOT. POPUL. 1989	LIFE EXPECTANCY AT BIRTH, 1990 (YEARS)	INFANT MORTALITY RATE 1989 (p. 1000)	TOTAL FERTILITY RATE 1990 (Births per Woman)	GLOBAL SCHOOL ENROLLMENT RATIO 1988 (p. 100)	PRIMARY SCHOOL ENROLLMENT RATIO 1988 (p. 100)	SECONDARY SCHOOL ENROLLMENT RATIO 1988 (p. 100)	ADULT LITERACY RATE 1990 (p. 100)	PER CAPITA DAILY CALORIE SUPPLY 1989.
ANGOLA	28	46	173	6.5	49	93	..	42	1,725
BURUNDI	5	50	116	6.8	33	70	4	50	2,253
COMOROS	27	55	...	6.8	56	88	..	..	2,113
DJIBOUTI	..	49	...	6.6	31	46	..	..	..
ETHIOPIA	13	48	133	7.5	28	37	15	..	1,658
KENYA	23	60	70	6.6	73	96	18	69	1,973
LESOTHO	20	57	97	5.6	80	113	25	..	2,307
MALAWI	12	48	147	7.6	48	66	4	..	2,009
MAURITIUS	41	70	22	1.9	78	106	53	..	2,679
MOZAMBIQUE	26	49	173	5.4	34	68	5	33	1,632
RWANDA	7	49	119	8.3	45	67	6	50	1,786
SOMALIA	36	48	129	6.8	14	15	..	24	1,736
SUDAN	22	51	105	6.3	36	49	20	27	1,996
SWAZILAND	32	57	...	6.3	82	104	..	..	2,631
TANZANIA	31	50	103	6.6	42	66	4	..	2,151
UGANDA	10	49	100	7.3	47	70	8	48	2,013
ZAMBIA	49	54	78	6.7	69	97	..	73	2,026
ZIMBABWE	27	64	63	4.9	93	128	51	67	2,232

TABLE 3.
POPULATION (In Millions Inhabitants)

COUNTRY	1982	1983	1984	1985	1986	1987	1988	1989	1990
ANGOLA	8.2	8.2	8.5	8.8	9.0	9.2	9.4	9.7	10.0
BURUNDI	4.3	4.5	4.6	4.7	4.8	5.0	5.1	5.3	5.5
COMOROS	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5
DJIBOUTI	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4
ETHIOPIA	39.8	40.9	42.2	42.3	43.8	44.8	46.1	48.9	51.2
KENYA	18.0	18.9	19.5	20.4	21.2	22.1	23.0	23.3	24.4
LESOTHO	1.4	1.5	1.5	1.5	1.6	1.6	1.7	1.7	1.8
MALAWI	6.6	6.6	6.8	7.0	7.4	7.6	8.2	8.2	8.5
MAURITIUS	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.1
MOZAMBIQUE	12.8	13.1	13.4	13.8	14.2	14.6	15.0	15.4	15.8
RWANDA	5.5	5.7	5.8	6.0	6.2	6.5	6.7	6.9	7.1
SOMALIA	4.9	5.1	5.2	5.4	5.5	5.7	5.9	6.1	6.3
SUDAN	20.2	20.8	21.3	21.9	22.5	23.2	23.8	24.5	25.2
SWAZILAND	0.6	0.7	0.7	0.8	0.7	0.7	0.7	0.8	0.8
TANZANIA	19.3	19.9	20.5	21.2	23.3	24.2	25.4	25.6	27.3
UGANDA	13.6	13.9	15.0	15.5	15.2	15.7	16.2	16.8	17.4
ZAMBIA	6.1	6.3	6.4	6.6	6.9	7.2	7.5	7.8	8.1
ZIMBABWE	7.5	7.9	8.1	8.4	8.7	9.0	9.3	9.6	9.8
PTA AS A WHOLE	170.3	175.5	181.4	186.0	192.9	199.0	205.8	212.4	221.0



KEY:- 1 — 9 PRODUCT FLOW

LINE FOR THE PRODUCTION OF TOMATO PASTE - HOT BREAK SYSTEM

A.1 1 WASHING SORT UNIT

A.2 1 'MONO' PUMP

A.3 1 ENZYME INACTIVATION AND PRE-HEATING UNIT

A.4 1 TURBOEXTRACTOR

A.5 1 SCREW CONVEYOR (FOR WASTE)

A.6 1 SUPPORT STRUCTURE

A.7 1 JUICE COLLECTING TANK

A.8 1 ELECTRO-PNEUMATIC CONTROL BOARD

B.1 1 CENTRIFUGAL PUMP

B.2 1 DOUBLE EFFECT CONTINUOUS EVAPORAT

B.3 FIN FAN COOLERS

T BREAK SYSTEM

RE

G TANK

C CONTROL BOARD

NTINUOUS EVAPORATOR

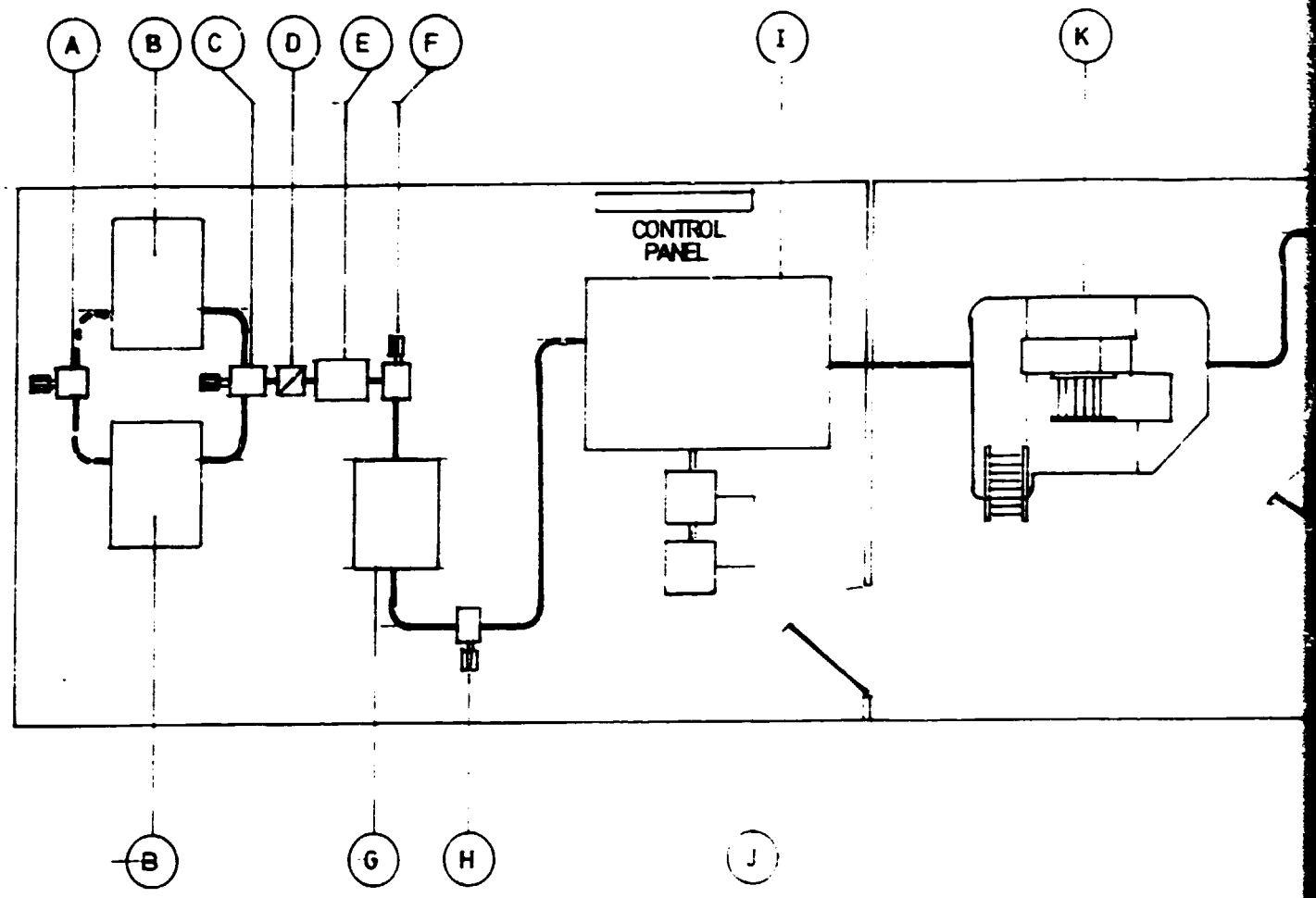
C.1. FILLING/SEAMING MACHINE

C.2 RETORTS

THE MANDERSTAM GROUP
CONSULTING ENGINEERS
2/10 HARBOUR YARD CHELSEA HARBOUR LONDON SW10 0XD

TITLE PLANT LAYOUT
TOMATO CONCENTRATE LINE

JOB No. -	DATE	SCALE — REV
DRAWN	9.10.93	ORG. No.
CHKD		
APPVD		



PROPOSED LAYOUT —— FRUIT JUICE PROCESSING LINE (FROM CONCENTRATED JUICE)

A. TRANSPORTABLE PUMP FOR PUMPING CONCENTRATE FROM B

B. DILUTION TANK

C. CENTRIFUGAL PUMP

D. DOUBLE FILTER

E. BALANCE TANK

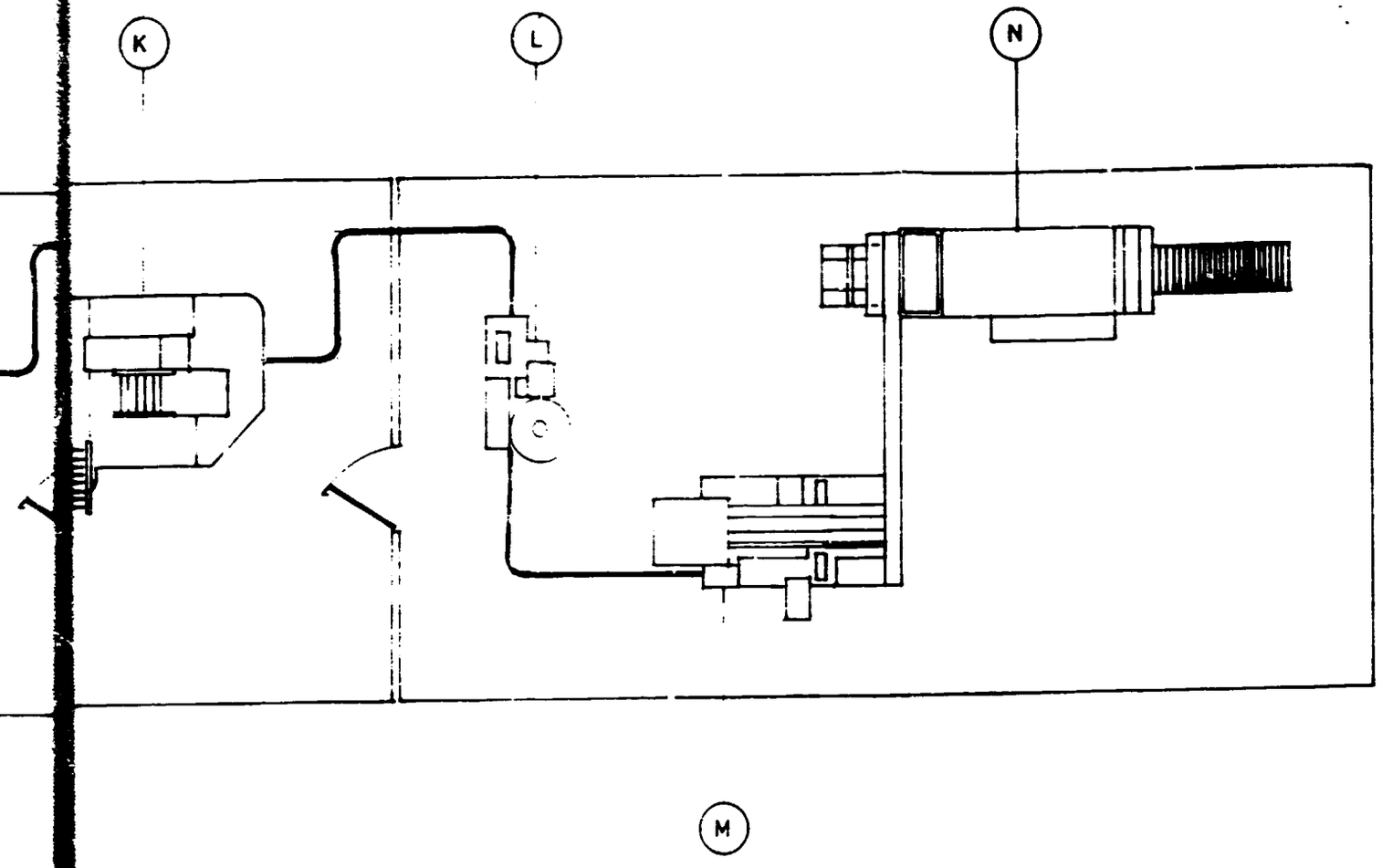
F. POSITIVE DISPLACEMENT PUMP

G. VACUUM TANK

H. CENTRIFUGAL PUMP

I. PLATE HEAT EXCHANGER/ PASTEURISER

J. HEATING EQUIPMENT FOR HEAT EXCHANGER



PUM[illegible] DISPLACEMENT PUMP

[illegible]NK

[illegible]GAL PUMP

[illegible]T EXCHANGER/

[illegible]ER

[illegible]QUIPMENT FOR

[illegible]HANGER

H. TETRABRIK FILLING EQUIPMENT

L. STRAW APPLICATOR

M. TRAY PACKER

N. SHRINKWRAPPER

THE MANDERSTAM GROUP CONSULTING ENGINEERS 2/10 HARBOUR YARD, CHELSEA HARBOUR, LONDON SW10 0XD			
TITLE PROPOSED LAYOUT FRUIT JUICE FROM CONCENTRATE			
JOB No.	DATE	SCALE —	REV
DRAWN DPD	JAN 84	DRG. No.	
CHK'D			
APP'D			

COMFAR 2.1 UNIDO

COMFAR 2.1 - WANDERSTAM CONSULTING SERVICES, LONDON, ENGLAND

ACI ZIMBABWE TOMATO PASTE
25 6 93
115 g CASS TOMATO PASTE

1 year(s) of construction, 15 years of production
currency conversion rates:
foreign currency 1 unit = 6.4000 units accounting currency
local currency 1 unit = 1.0000 units accounting currency
accounting currency: Z$

Total initial investment during construction phase

fixed assets:	11228.44	66.523 % foreign
current assets:	0.00	0.000 % foreign
total assets:	11228.44	66.523 % foreign

Source of funds during construction phase

equity & grants:	4431.64	0.000 % foreign
foreign loans :	6796.80	
local loans :	0.00	
total funds :	11228.44	60.532 % foreign

Cashflow from operations

Year:	1	2	3
operating costs:	3283.60	6515.45	10720.17
depreciation :	1626.94	1626.94	1626.94
interest :	0.00	0.00	543.74
production costs	4910.54	8142.39	12890.85
thereof foreign	26.70 %	16.50 %	14.88 %
total sales :	3190.51	7657.25	13783.05
gr . income :	-2167.77	-1941.39	-1927.78
net income :	-2117.77	-1916.39	-1902.78
cash balance :	-1087.28	-820.23	-1602.19
net cashflow :	-1087.28	-820.23	-440.56

Net Present Value at: 30.00 % = -11493.68
Internal Rate of Return: 7.26 %
Return on equity1: 10.89 %
Return on equity2: 7.79 %

Index of Schedules produced by COMFAR

Total initial investment
Total investment during production
Total production costs
Working Capital requirements
Cashflow Tables
Projected Balance
Net income statement
Source of finance

COMFAR 2.1 UNIDO

COMFAR 2.1 - MANDERSTAM CONSULTING SERVICES, LONDON, ENGLAND

Total Initial Investment in US

Year	1993
Fixed investment costs	
Land, site preparation, development	1.500
Buildings and civil works	3408.000
Auxiliary and service facilities	660.740
Incorporated fixed assets	256.000
Plant machinery and equipment	5843.200
Total fixed investment costs	10172.440
Pre-production capital expenditures	1056.000
Net working capital	1.000
Total initial investment costs	11228.440
Of it foreign, in %	66.623

ACI ZIMBABWE TOMATO PASTE --- 25 6 93

COMFAR 2.1 UNIDO

---------- COMFAR 2.1 - MANDERSTAM CONSULTING SERVICES, LONDON, ENGLAND -----

Total Current Investment in US

Year	1994	1995	1996	1997	1998
Fixed investment costs					
Land, site preparation, development	0.000	0.000	0.000	0.000	0.000
Buildings and civil works	0.000	0.000	0.000	0.000	0.000
Auxiliary and service facilities	0.000	0.000	0.000	0.000	0.000
Incorporated fixed assets	0.000	0.000	0.000	0.000	0.000
Plant, machinery and equipment	0.000	0.000	0.000	0.000	0.000
Total fixed investment costs	0.000	0.000	0.000	0.000	0.000
Reproduction capitals expenditures.	0.000	0.000	0.000	0.000	0.000
Working capital	610.449	544.772	722.463	1428.477	2379.683
Total current investment costs	610.449	544.772	722.463	1428.477	2379.683
Of it foreign, %	10.009	1.316	0.977	1.116	25.031

---------- COMFAR 2.1 - MANDERSTAM CONSULTING SERVICES, LONDON, ENGLAND -----

Total Current Investment in US

Year	1999	2000	2001	2002	2003
Fixed investment costs					
Land, site preparation, development	0.000	0.000	0.000	0.000	0.000
Buildings and civil works	0.000	0.000	0.000	0.000	0.000
Auxiliary and service facilities	0.000	0.000	0.000	0.000	0.000
Incorporated fixed assets	0.000	0.000	0.000	0.000	0.000
Plant, machinery and equipment	0.000	0.000	0.000	0.000	0.000
Total fixed investment costs	0.000	0.000	0.000	0.000	0.000
Reproduction capitals expenditures.	0.000	0.000	0.000	0.000	0.000
Working capital	1150.249	1387.023	1672.891	2018.122	2435.126
Total current investment costs	1150.249	1387.023	1672.891	2018.122	2435.126
Of it foreign, %	10.641	10.568	10.496	10.425	10.355

COMFAR 2.1 UNIDO

Total Current Investment in Z$

Year	2004	2005	2006	2007	2008
Fixed investment costs					
Land, site preparation, development	0.000	0.000	0.000	0.000	0.000
Buildings and civil works	0.000	0.000	0.000	0.000	0.000
Auxiliary and service facilities	0.000	0.000	0.000	0.000	0.000
Incorporated fixed assets	0.000	0.000	0.000	0.000	0.000
Plant, machinery and equipment	0.000	0.000	0.000	0.000	0.000
Total fixed investment costs	0.000	0.000	0.000	0.000	0.000
Preproduction capitals expenditures.	0.000	0.000	0.000	0.000	0.000
Working capital	2938.952	3547.819	4283.797	5173.648	6249.826
Total current investment costs	2938.952	3547.819	4283.797	5173.648	6249.826
Of it foreign, %	10.284	10.214	10.142	10.070	9.998

COMFAR 2.1 UNIDO

---------- COMFAR 2.1 - MANDERSTAM CONSULTING SERVICES, LONDON, ENGLAND -----

Total Production Costs in '000 US

Year	1994	1995	1996	1997	1998
% of nom. capacity (single product).	9.073	18.988	28.978	48.540	68.228
Raw material 1	653.879	1642.161	3007.349	6045.007	10196.310
Other raw materials	1372.727	2694.063	4933.734	9917.191	16727.650
Utilities	10.695	26.859	49.188	98.872	166.771
Energy	171.530	282.401	419.281	689.413	1029.810
Labour, direct	672.300	1090.375	1362.969	1703.711	2129.639
Repair, maintenance	128.000	153.600	184.320	221.184	265.421
Spares	74.240	76.467	78.761	81.124	83.558
Factory overheads	10.000	12.000	14.400	17.280	20.736
Factory costs	2993.370	5977.927	10050.000	18773.780	30619.890
Administrative overheads	370.234	336.345	418.694	521.283	649.102
Indir. costs, sales and distribution	20.000	201.175	251.469	314.336	392.920
Direct costs, sales and distribution	19.313	23.176	27.811	33.373	40.047
Depreciation	1626.939	1626.939	1626.939	1321.979	407.099
Financial costs	0.000	0.000	543.744	494.313	444.881
Total production costs	4929.855	8165.561	12918.660	21459.060	32553.940
Costs per unit (single product)	1.703	1.348	1.397	1.386	1.495
Of it foreign, %	16.990	16.732	15.064	7.796	2.507
Of it variable, %	86.623	85.372	83.944	77.226	85.723
Total labour	1133.530	1593.150	1991.438	2489.297	3111.621

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COMFAR 2.1 UNIDO

---------- COMFAR 2.1 - MANDERSTAM CONSULTING SERVICES, LONDON, ENGLAND -----

Total Production Costs in ZS

Year	1999	2000	2001	2002	2003
% of nom. capacity (single product).	68.228	68.228	68.228	68.228	68.228
Raw material 1	12235.570	14682.690	17619.220	21143.070	25371.680
Other raw materials	20073.180	24087.810	28905.380	34686.450	41623.750
Utilities	200.126	240.151	288.181	345.817	414.980
Energy	1189.660	1391.481	1611.666	1887.888	2219.355
Labour, direct	2662.048	3327.560	4159.451	5199.313	6499.142
Repair, maintenance	318.505	382.206	458.647	550.377	660.452
Spares	36.064	38.546	91.306	94.045	96.866
Factory overheads	24.883	29.860	35.832	42.998	51.598
Factory costs	36790.030	44220.410	53169.680	63949.960	76937.820
Administrative overheads	808.375	1006.866	1254.260	1562.638	1947.072
Indir. costs, sales and distribution	491.150	613.937	767.422	959.277	1199.096
Direct costs, sales and distribution	48.059	57.668	69.203	83.039	99.648
Depreciation	407.099	407.099	203.662	0.225	0.225
Financial costs	395.450	346.019	296.588	247.156	197.725
Total production costs	38940.160	46652.000	55760.820	66802.300	80381.590
Costs per unit (single product)	1.789	2.143	2.562	3.069	3.693
If it foreign, %	1.975	1.548	1.160	0.856	0.653
If it variable, %	85.879	85.920	86.179	86.253	85.961
Total labour	3889.526	4861.908	6077.385	7596.731	9495.914

COMFAR 2.1 UNIDO

COMFAR 2.1 - MANDERSTAM CONSULTING SERVICES, LONDON, ENGLAND

Total Production Costs in CS

Year	2004	2005	2006	2007	2008
% of nom. capacity (single product).	68.228	68.228	68.228	68.228	68.228
Raw material 1	30446.020	36535.230	43842.270	52610.730	63132.880
Other raw materials	49948.500	59938.200	71925.840	86311.020	103573.200
Utilities	497.976	597.572	717.086	860.503	1032.604
Energy	2617.115	3094.426	3667.200	4354.529	5179.324
Labour, direct	8123.927	10154.910	12693.640	15867.040	19833.800
Repair, maintenance	792.543	951.051	1141.261	1369.514	1643.417
Spares	99.772	102.766	105.848	109.024	112.295
Factory overheads	51.917	74.301	89.161	106.993	128.392
Factory costs	92587.770	111448.400	134182.300	161589.400	194635.900
Administrative overheads	2426.371	3024.000	3769.243	4698.646	5857.818
Indir. costs, sales and distribution	1498.871	1873.588	2341.985	2927.481	3659.352
Direct costs, sales and distribution	119.578	143.500	172.203	206.641	247.969
Depreciation	0.225	0.225	0.225	0.225	0.225
Financial costs	148.234	98.863	49.431	-0.000	0.000
Total production costs	96781.130	116588.600	140515.400	169422.300	204401.300
Costs per unit : single product)	8.446	8.356	8.455	7.783	9.390
Of it foreign. %	0.495	0.371	0.275	0.200	0.168
Of it variable.%	85.626	85.255	84.853	84.423	83.948
Total labour	11869.590	14837.370	18546.710	23183.380	28979.230

COMFAR 2.1 UNIDO

COMFAR 2.1 - MANDERSTAM CONSULTING SERVICES, LONDON, ENGLAND

Net Working Capital in ZS

Year			1994	1995	1996	1997	1998
Coverage	mdc	coto					
Current assets &							
Accounts receivable	30	12.0	309.778	663.142	1127.179	2027.654	3693.986
Inventory and materials	10	36.0	48.258	121.197	221.952	446.141	752.520
Energy	30	12.0	11.739	18.186	26.780	43.782	66.604
Spares	180	2.0	37.120	38.234	39.381	40.562	41.779
Work in progress	30	12.0	249.448	498.161	837.500	1564.482	2551.658
Finished products	10	36.0	90.656	175.396	290.797	535.974	868.583
Cash in hand	30	12.0	112.898	139.066	171.595	212.048	262.371
Total current assets			859.896	1653.381	2715.184	4870.644	8237.501
Current liabilities and Accounts payable	30	12.0	249.448	498.161	837.500	1564.482	2551.658
Net working capital			610.449	1155.221	1877.684	3306.162	5685.843
Increase in working capital			610.449	544.772	722.463	1428.478	2379.682
Net working capital, local			549.351	1086.953	1802.361	3214.903	4998.917
Net working capital, foreign			61.098	68.267	75.323	91.258	686.928

Note: mdc = minimum days of coverage ; coto = coefficient of turnover .

COMFAR 2.1 - MANDERSTAM CONSULTING SERVICES, LONDON, ENGLAND

Net Working Capital in ZS

Year			1999	2000	2001	2002	2003
Coverage	mdc	coto					
Current assets &							
Accounts receivable	30	12.0	4440.721	5340.011	6423.172	7727.994	9300.070
Inventory and materials	10	36.0	903.024	1083.629	1300.355	1560.426	1872.511
Energy	30	12.0	79.925	95.910	115.092	138.111	165.733
Spares	180	2.0	43.032	44.323	45.653	47.023	48.433
Work in progress	30	12.0	3065.836	3685.034	4430.807	5329.164	6411.485
Finished products	10	36.0	1044.400	1256.313	1511.776	1819.794	2191.247
Cash in hand	30	12.0	324.989	402.928	499.958	620.781	771.260
Total current assets			9901.929	11908.150	14326.810	17243.290	20760.740
Current liabilities and Accounts payable	30	12.0	3065.836	3685.034	4430.807	5329.164	6411.485
Net working capital			6836.093	8223.116	9896.006	11914.130	14349.260
Increase in working capital			1150.250	1387.023	1672.890	2018.123	2435.127
Net working capital, local			6026.768	7267.209	8764.508	10572.230	12755.210
Net working capital, foreign			809.325	955.906	1131.499	1341.896	1594.049

COMFAR 2.1 UNIDO

---------- COMFAR 2.1 - MANDERSTAM CONSULTING SERVICES, LONDON, ENGLAND -----

Net Working Capital in ZS

Year			2004	2005	2006	2007	2008
Coverage	mdc	coto					
Current assets &							
Accounts receivable	30	12.0	11194.440	13477.530	16229.560	19547.410	23548.100
Inventory and materials	10	36.0	2247.014	2696.417	3235.700	3882.840	4659.409
Energy	30	12.0	198.880	238.656	286.387	343.664	412.397
Spares	180	2.0	49.886	51.383	52.924	54.512	56.147
Work in progress	30	12.0	7715.647	9287.370	11181.860	13465.780	16219.660
Finished products	10	36.0	2639.281	3179.790	3831.988	4619.111	5569.271
Cash in hand	30	12.0	958.710	1192.252	1483.263	1845.935	2297.977
Total current assets			25003.850	30123.390	36301.680	43759.250	52762.960
Current liabilities and							
Accounts payable	30	12.0	7715.647	9287.370	11181.860	13465.780	16219.660
Net working capital			17288.210	20836.020	25119.820	30293.460	36543.300
Increase in working capital			2938.951	3547.816	4283.793	5173.648	6249.832
Net working capital, local			15391.910	18577.370	22426.690	27079.330	32704.320
Net working capital, foreign			1896.330	2258.656	2693.135	3214.142	3838.976

Note: mdc = minimum days of coverage ; coto = coefficient of turnover .

COMFAR 2.1 UNIDO

COMFAR 2.1 - MAUDERSTAM CONSULTING SERVICES, LONDON, ENGLAND

Cashflow Tables, construction in ZS

Year	1993
Total cash inflow	11228.440
Financial resources	11228.440
Sales, net of tax	0.000
Total cash outflow	11228.440
Total assets	11228.440
Operating costs	0.000
Cost of finance	0.000
Repayment	0.000
Corporate tax	0.000
Dividends paid	0.000
Surplus (deficit)	0.000
Cumulated cash balance	0.000
Inflow, local	4431.640
Outflow, local	3759.000
Surplus (deficit)	672.640
Inflow, foreign	6796.800
Outflow, foreign	7469.440
Surplus (deficit)	-672.640
Net cashflow	-11228.440
Cumulated net cashflow	-11228.440

COMFAR 2.1 UNIDO

COMFAR 2.1 - MANDERSTAM CONSULTING SERVICES, LONDON, ENGLAND

Cashflow tables, production in 2S

Year	1994	1995	1996	1997	1998	1999
Total cash inflow	3025.538	5486.881	11344.220	23604.020	34672.370	40936.410
Financial resources	249.448	248.713	339.340	726.982	987.176	514.178
Sales, net of tax	2776.091	5238.168	11004.880	22877.040	33685.200	40422.230
Total cash outflow	4112.813	7307.106	12946.420	23229.090	37530.790	42302.290
Total assets	859.896	793.485	1061.803	2155.459	3366.858	1664.427
Operating costs	3302.917	6538.622	10747.980	19642.720	31701.950	38137.610
Cost of finance	0.000	0.000	543.744	494.313	444.881	395.450
Repayment	0.000	0.000	617.891	617.891	617.891	617.891
Corporate tax	-50.000	-25.000	-25.000	318.652	246.973	334.678
Dividends paid	0.000	0.000	0.000	0.000	1152.230	1152.230
Surplus (deficit)	-1087.275	-820.225	-1602.192	374.928	-2858.418	-1365.871
Accumulated cash balance	-1087.275	-1907.500	-3509.693	-3134.765	-5993.183	-7359.054
Inflow, local	2739.843	5121.146	10901.630	22844.580	40516.700	47956.290
Outflow, local	3938.075	7156.328	11598.040	21850.100	35552.480	40849.720
Surplus (deficit)	-1198.233	-2035.181	-696.404	994.486	4964.215	7106.574
Inflow, foreign	285.695	365.735	442.589	759.434	-5844.328	-7019.881
Outflow, foreign	174.738	150.779	1348.378	1378.994	1978.303	1452.569
Surplus (deficit)	110.957	214.955	-905.789	-619.560	-7822.631	-8472.449
Net cashflow	-1087.276	-820.225	-440.559	1487.131	-643.412	799.696
Accumulated net cashflow	-12315.720	-13135.940	-13576.500	-12089.370	-12732.780	-11933.080

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COMFAR 2.1 UNIDO

COMFAR 2.1 - MANDERSTAN CONSULTING SERVICES, LONDON, ENGLAND

Cashflow tables, production in ZS

Year	2000	2001	2002	2003	2004	2005
Total cash inflow	49125.880	58953.800	70747.980	84901.880	101887.600	122271.900
Financial resources	619.198	745.773	898.357	1082.322	1304.162	1571.724
Sales, net of tax	48506.680	58208.020	69849.630	83819.560	100583.500	120700.200
Total cash outflow	50449.070	60321.910	72214.660	86492.570	103708.900	124470.100
Total assets	2006.221	2418.664	2916.479	3517.448	4243.115	5119.540
Operating costs	45898.880	55260.570	66554.920	80183.630	96632.580	116489.500
Cost of finance	346.019	296.588	247.156	197.725	148.294	98.863
Repayment	617.891	617.891	617.891	617.891	617.891	617.891
Corporate tax	427.831	575.962	725.991	823.651	914.751	992.044
Dividends paid	1152.230	1152.230	1152.230	1152.230	1152.230	1152.230
Surplus (deficit)	-1323.184	-1368.109	-1466.680	-1590.688	-1821.227	-2198.195
Annuiated cash balance	-8682.238	-10050.350	-11517.030	-13107.710	-14928.940	-17127.140
Inflow, local	57549.780	69062.510	82878.470	99458.510	119355.600	143233.500
Outflow, local	49019.160	58909.750	70814.390	85097.150	102309.900	123057.400
Surplus (deficit)	9530.617	10152.750	12064.080	14361.360	17045.770	20176.110
Inflow, foreign	-8423.894	-10108.710	-12130.490	-14556.630	-17457.990	-20961.630
Outflow, foreign	1429.909	1412.155	1400.275	1395.427	1399.006	1412.683
Surplus (deficit)	-9853.803	-11520.860	-13530.760	-15952.050	-18867.000	-22374.310
Net cashflow	792.957	698.596	550.592	377.155	97.185	-329.219
Annulated net cashflow	-11140.130	-10441.530	-9890.938	-9513.783	-9416.599	-9745.817

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COMFAR 2.1 UNIDO

COMFAR 2.1 - MANDERSTAM CONSULTING SERVICES, LONDON, ENGLAND

Cashflow tables, production in ZS

Year	2006	2007	2008
Total cash inflow	146734.700	176092.200	211323.800
Financial resources	1894.488	2283.921	2753.882
Sales, net of tax	144840.200	173808.300	208569.900
Total cash outflow	149509.000	179092.600	215563.400
Total assets	6178.284	7457.571	9003.711
Operating costs	140465.800	169422.100	204401.100
Cost of finance	49.431	-0.000	0.000
Repayment	617.891	0.000	0.000
Corporate tax	1045.362	1060.640	1006.311
Dividends paid	1152.230	1152.230	1152.230
Surplus (deficit)	-2774.250	-3000.391	-4239.563
Cumulated cash balance	-19901.390	-22901.780	-27141.340
Inflow, local	171888.700	206277.000	247545.700
Outflow, local	148070.500	178231.700	214595.400
Surplus (deficit)	23318.230	28045.310	32950.270
Inflow, foreign	-25154.000	-30184.850	-36221.860
Outflow, foreign	1438.459	360.852	967.958
Surplus (deficit)	-26592.460	-31045.700	-37189.820
Net cashflow	-954.687	-1848.156	-3087.305
Cumulated net cashflow	-10700.500	-12548.660	-15635.960

COMFAR 2.1 UNIDO

---------- COMFAR 2.1 - MANDERSTAM CONSULTING SERVICES, LONDON, ENGLAND ----

Cashflow Discounting:

a) Equity paid versus Net income flow:
Net present value ..... -5805.42 at 30.00 %
Internal Rate of Return (IRRE1) .. 30.59 %

b) Net Worth versus Net cash return:
Net present value ..... -6613.21 at 30.00 %
Internal Rate of Return (IRRE2) .. 7.79 %

c) Internal Rate of Return on total investment:
Net present value ..... -11493.68 at 30.00 %
Internal Rate of Return (IRR) .. 7.26 %

Net Worth = Equity paid plus reserves

COMFAR 2.1 UNIDO

COMFAR 2.1 - MANDERSTAM CONSULTING SERVICES, LONDON, ENGLAND

Projected Balance Sheets, construction in ZS

Year	1993
Total assets	11228.440
Fixed assets, net of depreciation	0.000
Construction in progress	11228.440
Current assets	0.000
Cash, bank	0.000
Cash surplus, finance available	0.001
Loss carried forward	0.000
Loss	0.000
Total liabilities	11228.440
Equity capital	4431.640
Reserves, retained profit	0.000
Profit	0.000
Long and medium term debt	6796.800
Current liabilities	0.000
Bank overdraft, finance required	0.000
Total debt	6796.800
Equity, % of liabilities	39.468

COMFAR 2.1 UNIDO

COMFAR 2.1 - MANDERSTAM CONSULTING SERVICES, LONDON, ENGLAND

Projected Balance Sheets, Production in ZS

Year	1994	1995	1996	1997	1998
Total assets	12565.160	13634.100	14957.740	15777.220	17637.660
Fixed assets, net of depreciation	9587.500	7946.561	6305.622	4969.643	4548.544
Construction in progress	0.000	0.000	0.000	0.000	0.000
Current assets	746.999	1514.316	2543.589	4658.595	7975.130
Cash, bank	112.998	139.066	171.595	212.048	262.371
Cash surplus, finance available	0.000	0.000	0.000	0.000	0.000
Loss carried forward	0.000	2117.766	4034.158	5936.936	4851.617
Loss	2117.766	1916.393	1902.777	0.000	0.000
Total liabilities	12565.160	13634.100	14957.740	15777.220	17637.660
Equity capital	4431.640	4431.640	4431.640	4431.640	4431.640
Reserves, retained profit	0.000	0.000	0.000	0.000	0.000
Profit	0.000	0.000	0.000	1085.319	870.283
Long and medium term debt	6796.800	6796.800	6178.909	5561.018	4943.127
Current liabilities	249.448	498.161	837.500	1564.482	2551.657
Bank overdraft, finance required	1087.273	1907.500	3509.693	3134.765	4840.955
Total debt	8133.521	9202.461	10526.100	10260.260	12335.740
Equity, % of liabilities	35.269	32.504	29.628	28.089	25.126

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COMFAR 2.1 - MANDERSTAM CONSULTING SERVICES, LONDON, ENGLAND

Projected Balance Sheets, Production in ZS

Year	1999	2000	2001	2002	2003
Total assets	19162.940	20766.890	22707.270	24904.500	27252.620
Fixed assets, net of depreciation	4127.445	3706.346	3488.684	3474.459	3460.234
Construction in progress	0.000	0.000	0.000	0.000	0.000
Current assets	9576.939	11505.220	13826.860	16622.510	19989.480
Cash, bank	324.989	402.928	499.958	620.781	771.260
Cash surplus, finance available	0.000	0.000	0.000	0.000	0.000
Loss carried forward	5133.564	5152.397	4891.771	4186.751	3031.644
Loss	0.000	0.000	0.000	0.000	0.000
Total liabilities	19162.940	20766.890	22707.270	24904.500	27252.620
Equity capital	4431.640	4431.640	4431.640	4431.640	4431.640
Reserves, retained profit	0.000	0.000	0.000	0.000	0.000
Profit	1133.397	1412.857	1957.249	2307.337	2600.318
Long and medium term debt	4325.236	3707.345	3089.454	2471.563	1853.672
Current liabilities	3065.836	3685.034	4430.807	5329.163	6411.484
Bank overdraft, finance required	6206.829	7530.018	8898.119	10364.800	11955.500

	1999	2000	2001	2002	2003
Total debt	13597.900	14922.400	16418.380	18165.530	20220.660
Equity, % of liabilities	23.126	21.340	19.516	17.795	16.261

Projected Balance Sheets, Production in ZS

Year	2004	2005	2006	2007	2008
Total assets	30033.420	33555.180	39719.240	47162.580	56152.070
Fixed assets, net of depreciation	3446.009	3431.784	3417.559	3403.333	3389.108
Construction in progress	0.000	0.000	0.000	0.000	0.000
Current assets	24045.150	28931.140	34818.420	41913.320	50464.980
Cash, bank	958.710	1192.252	1483.263	1845.935	2297.977
Cash surplus, finance available	0.000	0.000	0.000	0.000	0.000
Loss carried forward	1593.556	0.000	0.000	0.000	0.000
Loss	0.000	0.000	0.000	0.000	0.000
Total liabilities	30033.420	33555.180	39719.240	47162.580	56152.070
Equity capital	4431.640	4431.640	4431.640	4431.640	4431.640
Reserves, retained profit	0.000	137.830	2091.096	4204.316	6363.369
Profit	2373.616	3105.495	3265.450	3311.282	3148.298
Long and medium term debt	1235.781	617.391	-0.000	-0.000	-0.000
Current liabilities	7715.646	9287.370	11181.860	13465.780	16219.660
Bank overdraft, finance required	13776.740	15974.950	18749.190	21749.560	25989.100
Total debt	22728.160	25880.210	29931.050	35215.340	42208.760
Equity, % of liabilities	14.756	13.207	11.157	9.397	7.892

COMFAR 2.1 UNIDO

---------- COMFAR 2.1 - SANDERSTAN CONSULTING SERVICES, LONDON, ENGLAND -----

Net Income Statement in $

Year	1994	1995	1996	1997	1998
Total sales, incl. sales tax	3190.507	7657.248	13783.050	27566.110	46311.060
Less: variable costs, incl. sales tax.	2219.887	5940.533	11038.890	21260.950	40532.080
Variable margin	970.620	1716.715	2744.168	6305.158	5778.984
As % of total sales	30.422	22.419	19.910	22.873	12.479
Non-variable costs, incl. depreciation	3138.386	3658.108	4128.201	4406.875	4216.848
Operational margin	-2167.766	-1941.392	-1384.033	1898.283	1562.137
As % of total sales	-67.944	-25.354	-10.042	6.886	3.373
Cost of finance	0.000	0.000	543.744	494.313	444.881
Gross profit	-2167.766	-1941.393	-1927.777	1403.971	1117.256
Allowances	23.855	50.387	77.155	129.364	129.364
Taxable profit	-2191.621	-1991.780	-2004.932	1274.607	987.892
Tax	-50.000	-25.000	-25.000	318.652	246.973
Net profit	-2117.706	-1916.393	-1902.777	1085.319	870.283
Dividends paid	0.000	0.000	0.000	0.000	1152.230
Undistributed profit	-2117.766	-1916.393	-1902.777	1085.319	-281.947
Accumulated undistributed profit	-2117.766	-4034.158	-5936.936	-4851.617	-5133.564
Gross profit, % of total sales	-67.944	-25.354	-13.987	5.093	2.413
Net profit, % of total sales	-66.377	-25.027	-13.805	3.937	1.879
ROE, Net profit/equity	-47.787	-43.243	-42.936	24.490	19.638
ROI, Net profit+interest, % of invest.	-17.888	-15.475	-10.369	10.868	7.775

ACI ZIMBABWE TOMATO PASTE --- 25 6 93

COMFAR 2.1 UNIDO

COMFAR 2.1 - WANDERSTAM CONSULTING SERVICES, LONDON, ENGLAND

Net Income Statement in ZS

Year	1999	2000	2001	2002	2003
Total sales, incl. sales tax	55573.280	66687.940	80025.520	96030.630	115236.800
Less: variable costs, incl. sales tax.	48592.380	58264.750	59871.590	83799.800	100513.600
Variable margin	6980.895	8423.184	10153.930	12230.830	14723.120
As % of total sales	12.562	12.631	12.688	12.736	12.776
Non-variable costs, incl. depreciation	5117.369	6236.478	7424.134	8950.347	11101.430
Operational margin	1863.526	2186.706	2729.795	3280.481	3621.691
As % of total sales	3.353	3.279	3.411	3.416	3.143
Cost of finance	395.450	346.019	296.588	247.156	197.725
Gross profit	1468.074	1840.688	2433.211	3033.328	3423.969
Allowances	129.364	129.364	129.364	129.364	129.364
Taxable profit	1338.710	1711.323	2303.847	2903.964	3294.605
Tax	334.678	427.831	575.962	725.991	823.651
Net profit	1133.397	1412.857	1857.249	2307.337	2600.318
Dividends paid	1152.230	1152.230	1152.230	1152.230	1152.230
Undistributed profit	-18.833	260.627	705.019	1155.107	1448.088
Accumulated undistributed profit	-5152.397	-4891.771	-4186.751	-3031.644	-1583.556
Gross profit, % of total sales	2.642	2.760	3.041	3.159	2.971
Net profit, % of total sales	2.039	2.119	2.321	2.403	2.257
ROE, Net profit, % of equity	25.575	31.881	41.909	52.065	58.676
ROI, Net profit+interest, % of invest.	8.463	9.042	10.196	11.038	10.939

COMFAR 2.1 UNIDO

COMFAR 2.1 - SANDERSTAN CONSULTING SERVICES, LONDON, ENGLAND

Net Income Statement in Z$

Year	2004	2005	2006	2007	2008
Total sales, incl. sales tax	138284.100	165941.000	199129.200	238955.000	286746.000
Less: variable costs, incl. sales tax.	120570.300	144638.200	173519.800	208177.600	249767.100
Variable margin	17713.840	21302.720	25609.390	30777.360	36978.940
As % of total sales	12.810	12.838	12.861	12.880	12.896
Non-variable costs, incl. depreciation	13777.180	17106.310	21249.130	26405.430	32824.320
Operational margin	3936.658	4196.404	4360.258	4371.926	4154.613
As % of total sales	2.847	2.529	2.190	1.830	1.449
Cost of finance	148.294	98.863	49.431	-0.000	0.000
Gross profit	3788.367	4097.539	4310.813	4371.922	4154.609
Allowances	129.364	129.364	129.364	129.364	129.364
Taxable profit	3659.003	3968.175	4181.449	4242.558	4025.245
Tax	914.751	992.044	1045.362	1060.640	1006.311
Net profit	2873.616	3105.495	3265.450	3311.282	3148.298
Dividends paid	1152.230	1152.230	1152.230	1152.230	1152.230
Undistributed profit	1721.386	1953.265	2113.220	2159.052	1996.068
Accumulated undistributed profit	137.830	2091.096	4204.316	6363.369	8359.438
Gross profit, % of total sales	2.740	2.469	2.165	1.830	1.449
Net profit, % of total sales	2.078	1.871	1.640	1.386	1.098
ROE, Net profit, % of equity	64.843	70.076	73.685	74.719	71.041
ROI, Net profit+interest, % of invest.	10.597	9.993	9.120	7.975	6.590

Source of Finance, construction in Z$

Year	1993
Equity, ordinary ..	4431.640
Equity, preference.	0.000
Subsidies, grants .	0.000
Loan A, foreign .	6796.800
Loan B, foreign..	0.000
Loan C, foreign .	0.000
Loan A, local....	0.000
Loan B, local....	0.000
Loan C, local....	0.000
Total loan	6796.800
Current liabilities	0.000
Bank overdraft	0.000
Total funds	11228.440

COMFAR 2.1 UNIDO

COMFAR 2.1 - MANDERSTAM CONSULTING SERVICES, LONDON, ENGLAND

Source of Finance, production in ZS

Year	1994	1995	1996	1997	1998	1999
Equity, ordinary ..	0.000	0.000	0.000	0.000	0.000	0.000
Equity, preference.	0.000	0.000	0.000	0.000	0.000	0.000
Subsidies, grants .	0.000	0.000	0.000	0.000	0.000	0.000
Loan A, foreign .	0.000	0.000	-617.891	-617.891	-617.891	-617.891
Loan B, foreign..	0.000	0.000	0.000	0.000	0.000	0.000
Loan C, foreign .	0.000	0.000	0.000	0.000	0.000	0.000
Loan A, local....	0.000	0.000	0.000	0.000	0.000	0.000
Loan B, local....	0.000	0.000	0.000	0.000	0.000	0.000
Loan C, local....	0.000	0.000	0.000	0.000	0.000	0.000
Total loan	0.000	0.000	-617.891	-617.891	-617.891	-617.891
Current liabilities	249.448	248.713	339.340	726.982	987.176	514.178
Bank overdraft	1087.273	820.226	1602.194	-374.930	1706.190	1365.875
Total funds	1336.721	1068.939	1323.642	-265.839	2075.475	1262.163

COMFAR 2.1 - MANDERSTAM CONSULTING SERVICES, LONDON, ENGLAND

Source of Finance, production in ZS

Year	2000	2001	2002	2003	2004	2005
Equity, ordinary ..	0.000	0.000	0.000	0.000	0.000	0.000
Equity, preference.	0.000	0.000	0.000	0.000	0.000	0.000
Subsidies, grants .	0.000	0.000	0.000	0.000	0.000	0.000
Loan A, foreign .	-617.891	-617.891	-617.891	-617.891	-617.891	-617.891
Loan B, foreign..	0.000	0.000	0.000	0.000	0.000	0.000
Loan C, foreign .	0.000	0.000	0.000	0.000	0.000	0.000
Loan A, local....	0.000	0.000	0.000	0.000	0.000	0.000
Loan B, local....	0.000	0.000	0.000	0.000	0.000	0.000
Loan C, local....	0.000	0.000	0.000	0.000	0.000	0.000
Total loan	-617.891	-617.891	-617.891	-617.891	-617.891	-617.891
Current liabilities	619.198	745.773	898.357	1082.322	1304.162	1571.724
Bank overdraft	1323.188	1368.101	1466.681	1590.705	1821.233	2198.216
Total funds	1324.494	1495.983	1747.146	2055.136	2507.505	3152.048

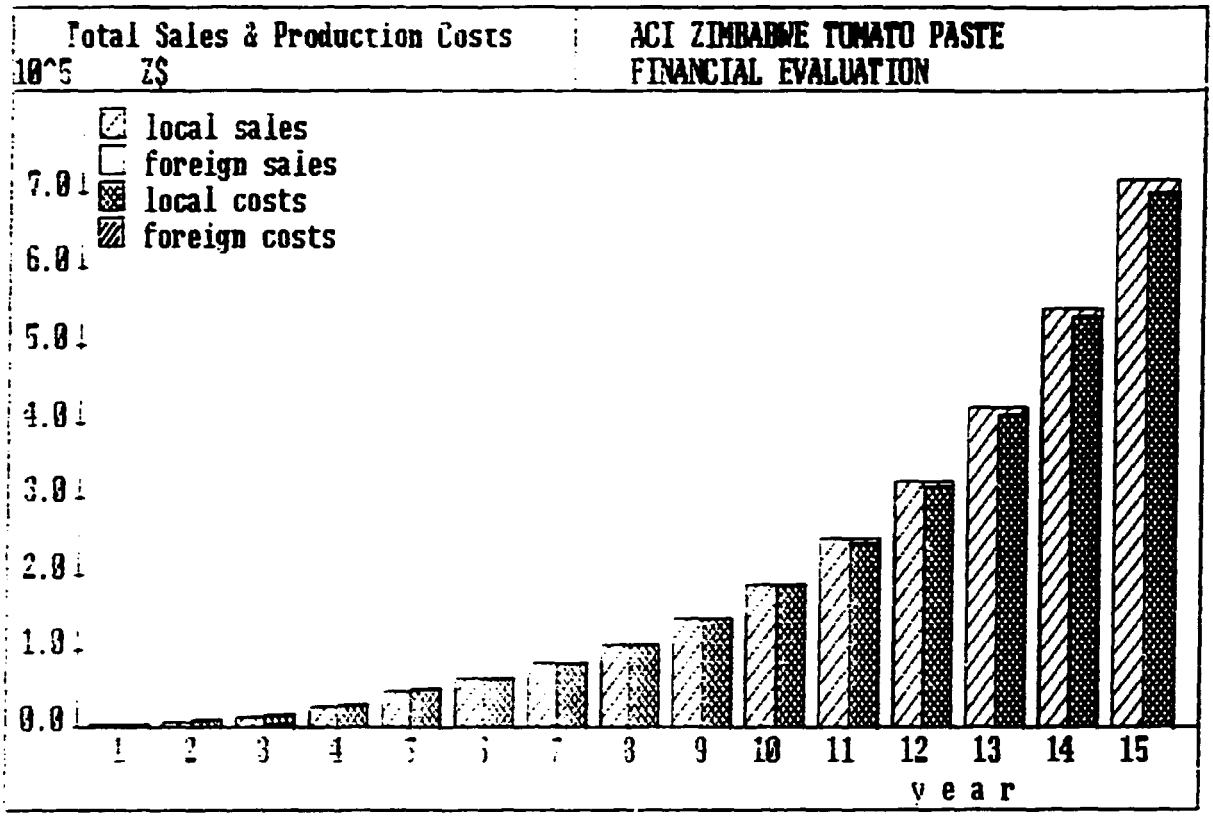
ACI ZIMBABWE TOMATO PASTE --- 25 6 93

COMFAR 2.1 UNIDO

Source of Finance, production in Z$

Year	2006	2007	2008
Equity, ordinary ..	0.000	0.000	0.000
Equity, preference.	0.000	0.000	0.000
Subsidies, grants .	0.000	0.000	0.000
Loan A, foreign .	-617.891	0.000	0.000
Loan B, foreign..	0.000	0.000	0.000
Loan C, foreign .	0.000	0.000	0.000
Loan A, local....	0.000	0.000	0.000
Loan B, local....	0.000	0.000	0.000
Loan C, local....	0.000	0.000	0.000
Total loan	-617.891	0.000	0.000
Current liabilities	1894.488	2283.921	2753.882
Bank overdraft	2774.240	3000.369	4239.539
Total funds	4050.838	5284.290	6993.421

COMFAR 2.1 UNIDO



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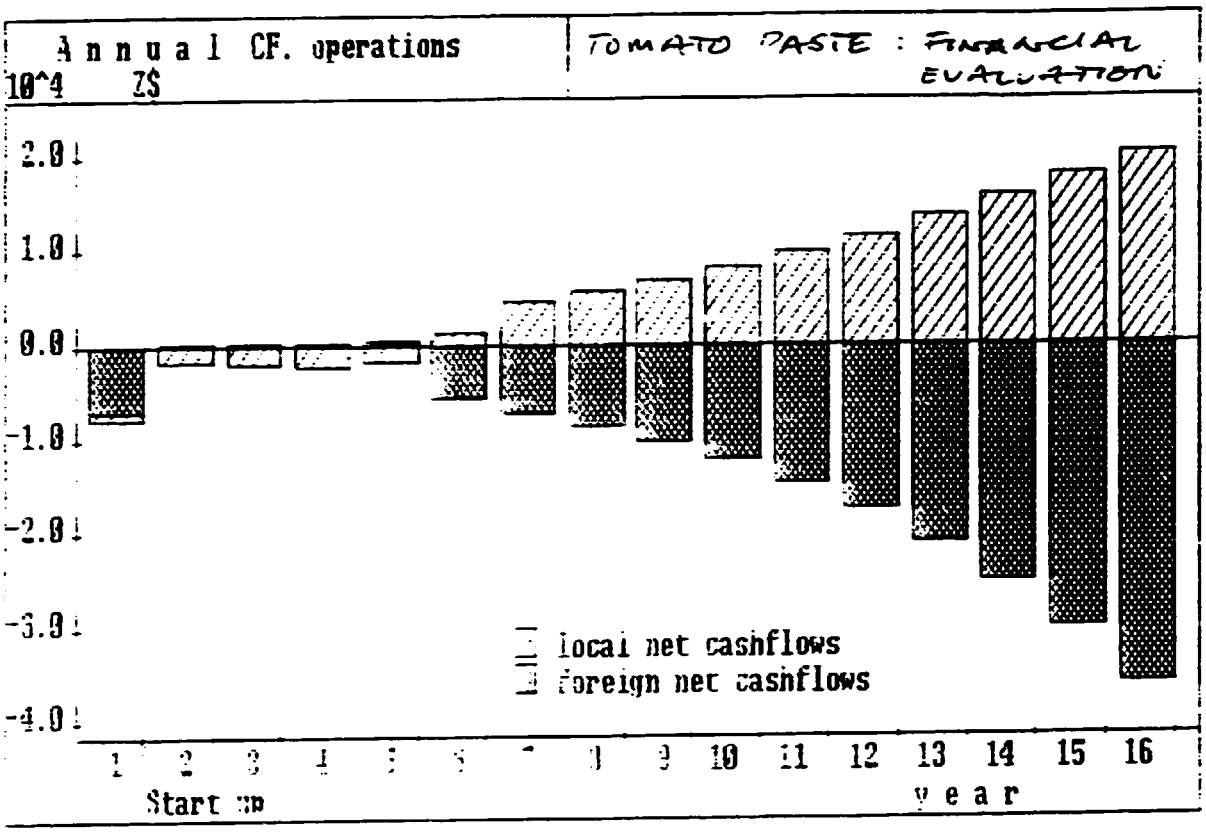


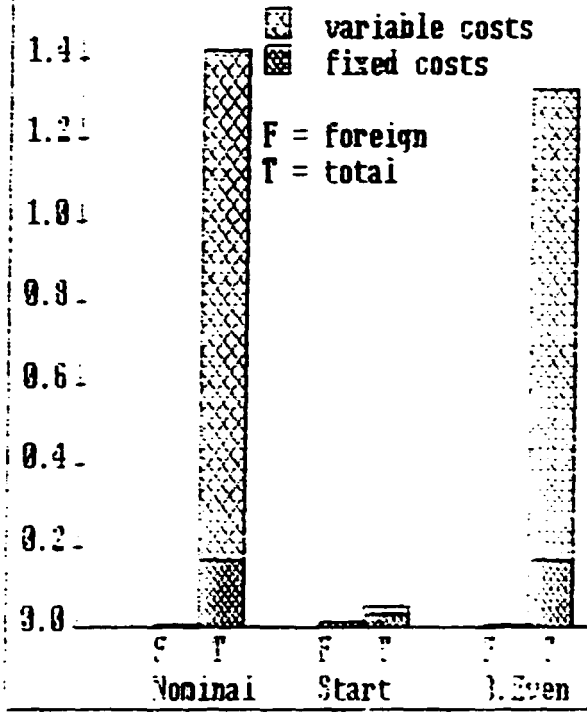
foreign and local (domestic) NET CASHFLOWS of total investment

are shown for the construction and production period

COMFAR 2.1 UNIDO

Structure of Production Costs
10^5 Z$

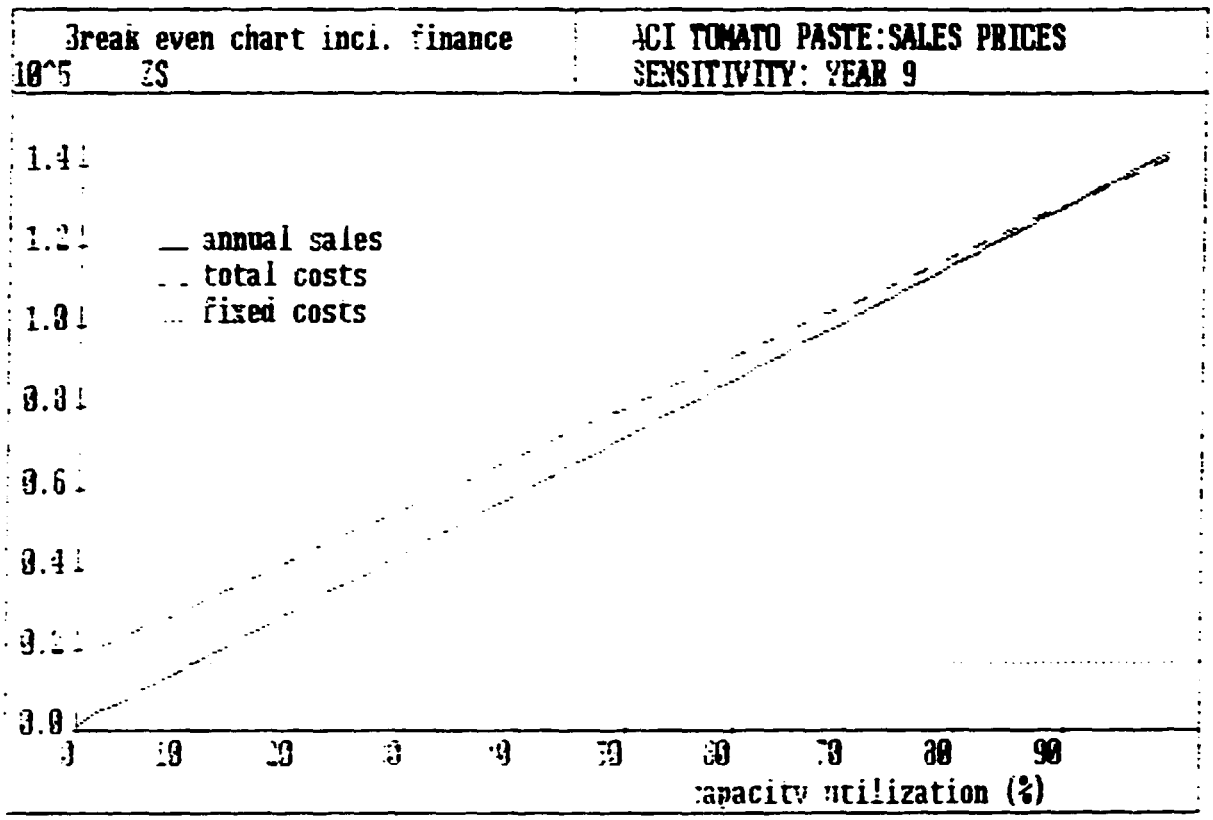
ACI ZIMBABWE TOMATO PASTE
for 9th production year



Nominal	Start up	
39.98	17.98	raw material
45.96	20.67	other RM
0.46	0.21	utilities
2.38	3.93	energy
6.78	16.95	labour
3.74	2.49	maintenance
0.07	1.44	spares
3.46	8.95	overheads
0.00	27.37	depreciation
0.17	0.00	interest
100.00	100.00	Total Prod C.

COMFAR 2.1 UNIDO

COMFAR 2.1 - MANDERSTAN CONSULTING SERVICES, LONDON, ENGLAND



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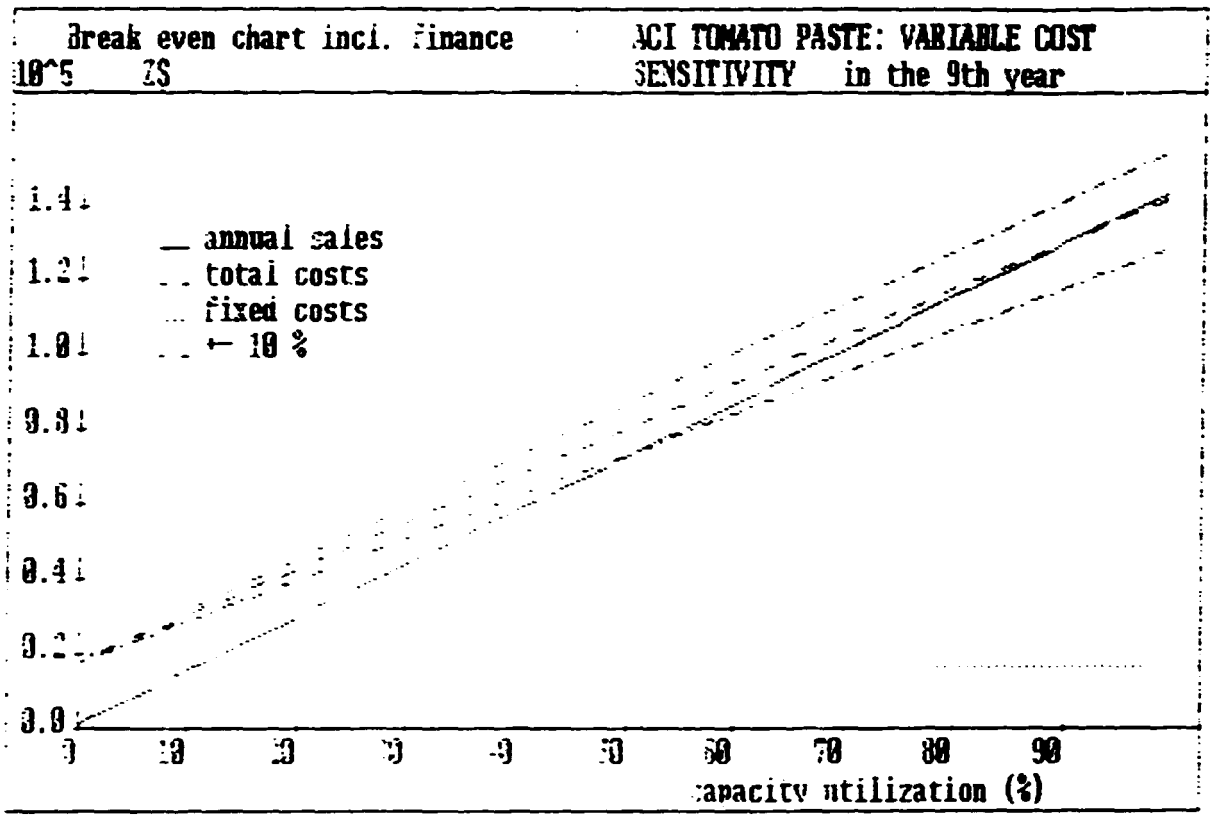
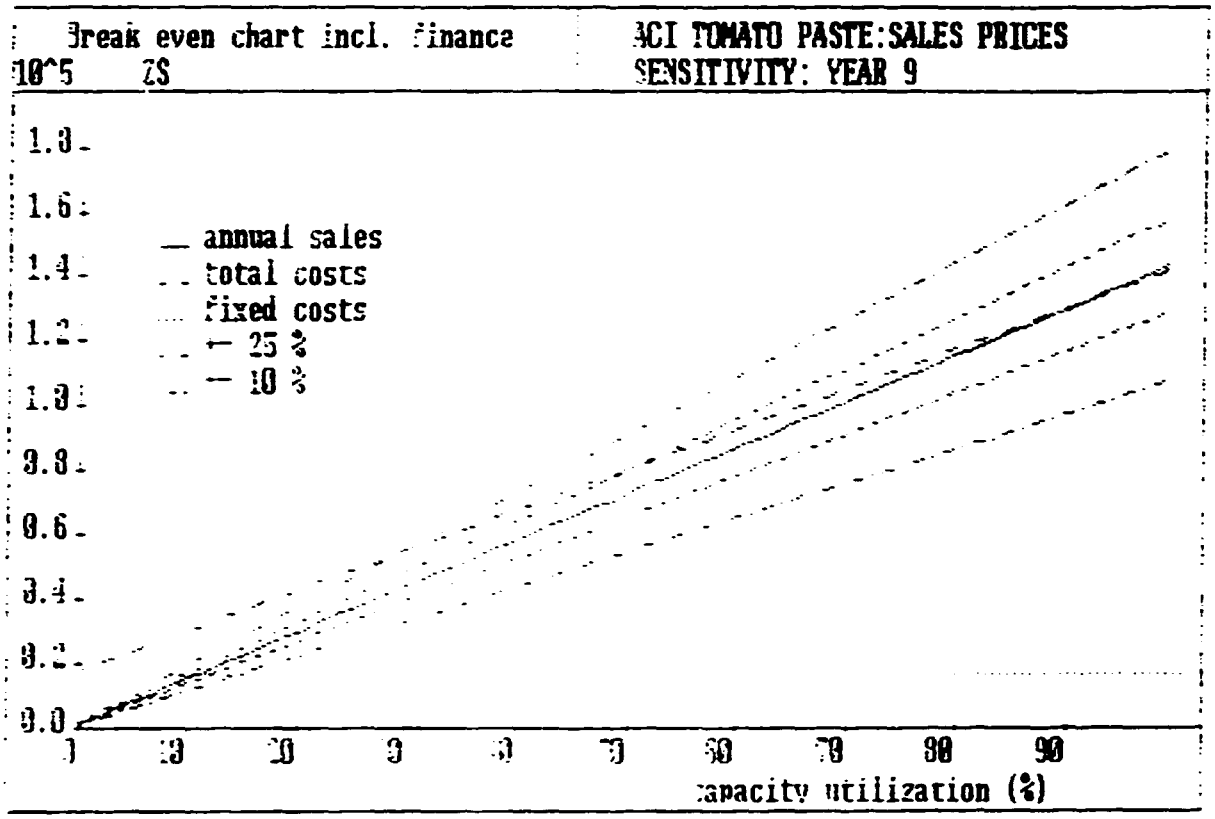


COMFAR 2.1 UNIDO

COMFAR 2.1 - WANDERSTAN CONSULTING SERVICES, LONDON, ENGLAND



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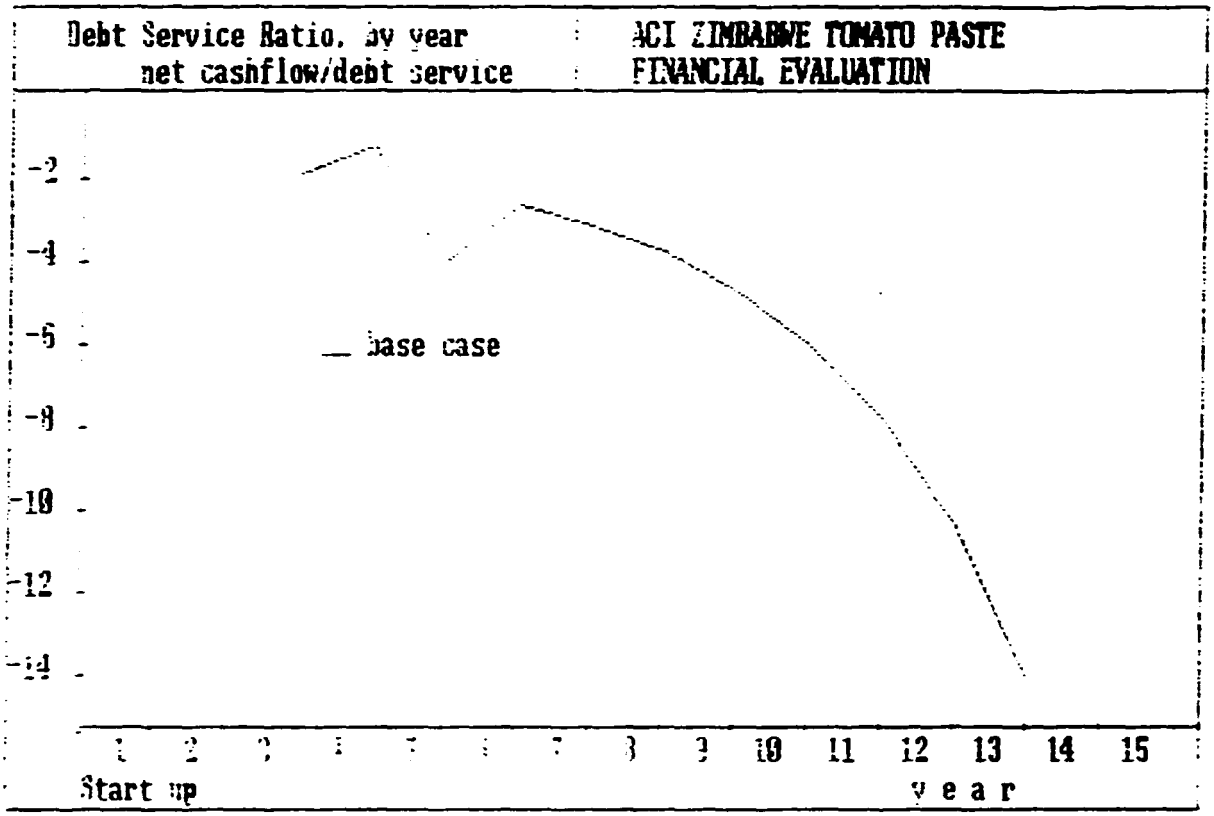

COMFAR 2.1 UNIDO

COMFAR 2.1 - MANDERSTAM CONSULTING SERVICES, LONDON, ENGLAND

ORANGE JUICE
25 6 93
250 ml TETRA PAK JUICE

1 year(s) of construction. 15 years of production
currency conversion rates:
foreign currency 1 unit = 6.4000 units accounting currency
local currency 1 unit = 1.0000 units accounting currency
accounting currency: US

Total initial investment during construction phase

fixed assets:	7197.78	57.289 % foreign
current assets:	0.00	0.000 % foreign
total assets:	7197.78	57.289 % foreign

Source of funds during construction phase

equity & grants:	2062.50	0.000 % foreign
foreign loans :	5135.28	
local loans :	0.00	
total funds :	7197.78	72.040 % foreign

Cashflow from operations

Year:	1	2	3
operating costs:	9991.71	12186.43	14773.93
depreciation :	972.72	972.72	972.72
interest :	0.00	0.00	414.82
production costs	10964.43	13159.15	16161.47
thereof foreign	67.91 %	65.28 %	62.89 %
total sales :	13132.79	16929.36	21748.25
gross income :	-231.01	843.13	1996.75
net income :	-231.01	511.19	1179.82
cash balance :	-2973.69	1368.59	884.64
net cashflow :	-2973.69	768.59	1770.85

Net Present Value at: 30.00 % = 3470.07
Internal Rate of Return: 35.16 %
Return on equity1: 51.85 %
Return on equity2: 48.22 %

Index of Schedules produced by COMFAR

Total initial investment
Total investment during production
Total production costs
Working Capital requirements
Cashflow Tables
Projected Balance
Net income statement
Source of finance

COMFAR 2.1 UNIDO

COMFAR 2.1 - MANDERSTAM CONSULTING SERVICES, LONDON, ENGLAND

Total Initial Investment in $

ear	1993
Fixed investment costs	
Land, site preparation, development	4.530
Buildings and civil works	2236.000
Auxiliary and service facilities .	426.380
Incorporated fixed assets	773.760
Plant machinery and equipment . . .	3245.440
Total fixed investment costs	6685.780
re-production capital expenditures.	512.000
Net working capital	1.000
otal initial investment costs . . .	7197.780
If it foreign, in $	97.239

COMFAR 2.1 UNIDO

COMFAR 2.1 - MANDERSTAM CONSULTING SERVICES, LONDON, ENGLAND

Total Current Investment in US$

Year	1994	1995	1996	1997	1998
Fixed investment costs					
Land, site preparation, development	0.000	0.000	0.000	0.000	0.000
Buildings and civil works	0.000	0.000	0.000	0.000	0.000
Auxiliary and service facilities	0.000	0.000	0.000	0.000	0.000
Incorporated fixed assets	0.000	0.000	0.000	0.000	0.000
Plant, machinery and equipment	0.000	0.000	0.000	0.000	0.000
Total fixed investment costs	0.000	0.000	0.000	0.000	0.000
Preproduction capitals expenditures.	0.000	0.000	0.000	0.000	0.000
Working capital	3715.407	715.320	796.504	303.440	356.398
Total current investment costs	3715.407	715.320	796.504	303.440	356.398
Of it foreign, %	83.633	71.969	65.706	23.148	20.299

ORANGE JUICE --- 25 6 93

COMFAR 2.1 - MANDERSTAM CONSULTING SERVICES, LONDON, ENGLAND

Total Current Investment in US$

Year	1999	2000	2001	2002	2003
Fixed investment costs					
Land, site preparation, development	0.000	0.000	0.000	0.000	0.000
Buildings and civil works	0.000	0.000	0.000	0.000	0.000
Auxiliary and service facilities	0.000	0.000	0.000	0.000	0.000
Incorporated fixed assets	0.000	0.000	0.000	0.000	0.000
Plant, machinery and equipment	0.000	0.000	0.000	0.000	0.000
Total fixed investment costs	0.000	0.000	0.000	0.000	0.000
Preproduction capitals expenditures.	0.000	0.000	0.000	0.000	0.000
Working capital	420.642	498.684	593.597	709.156	849.999
Total current investment costs	420.642	498.684	593.597	709.156	849.999
Of it foreign, %	17.715	15.391	13.318	11.482	9.867

ORANGE JUICE --- 25 6 93

COMFAR 2.1 UNIDO

COMFAR 2.1 - MANDERSTAM CONSULTING SERVICES, LONDON, ENGLAND

Total Current Investment in US

Year	2004	2005	2006	2007	2008
Fixed investment costs					
Land, site preparation, development	0.000	0.000	0.000	0.000	0.000
Buildings and civil works	0.000	0.000	0.000	0.000	0.000
Auxiliary and service facilities	0.000	0.000	0.000	0.000	0.000
Incorporated fixed assets	0.000	0.000	0.000	0.000	0.000
Plant, machinery and equipment	0.000	0.000	0.000	0.000	0.000
Total fixed investment costs	0.000	0.000	0.000	0.000	0.000
Reproduction capitals expenditures.	0.000	0.000	0.000	0.000	0.000
Working capital	1321.804	1231.559	1487.844	1801.208	2184.624
Total current investment costs	1321.804	1231.559	1487.844	1801.208	2184.624
Of it foreign. %	8.454	7.225	6.160	5.241	4.451

COMFAR 2.1 UNIDO

Total Production Costs in US

Year	1994	1995	1996	1997	1998
of ncm. capacity (single product).	57.093	65.815	74.365	74.365	74.365
Raw material 1	3528.849	4194.084	4886.672	5039.979	5199.225
Other raw materials	4538.048	5573.535	6761.607	7318.459	7986.681
Utilities	23.363	32.319	43.820	52.584	63.101
Energy	499.939	657.268	852.543	985.571	1145.206
Labour, direct	798.580	998.225	1247.781	1559.727	1949.658
Repair, maintenance	64.000	76.800	184.320	221.184	265.421
Spares	78.440	81.507	84.809	88.382	92.267
Factory overheads	10.300	12.000	14.400	17.280	20.736
Factory costs	9541.220	11625.740	14075.950	15283.170	16722.290
Administrative overheads	270.234	336.345	418.694	521.283	649.102
Indir. costs, sales and distribution	180.253	224.351	279.279	347.709	432.967
Direct costs, sales and distribution	19.313	23.176	27.811	33.373	40.047
Depreciation	972.721	972.721	972.721	794.649	260.433
Financial costs	1.000	1.000	414.822	377.111	339.400
Total production costs	10983.740	13182.330	16189.280	17357.290	18444.240
Costs per unit (single product)	1.172	1.220	1.326	1.422	1.511
of it foreign, %	67.966	65.338	62.951	58.414	52.953
of it variable,%	78.326	79.418	77.552	77.231	78.077
Total labour	1200.800	1591.000	1876.250	2345.313	2931.641

Total Production Costs in 1

Year	1999	2000	2001	2002	2003
% of nom. capacity (single product).	74.365	74.365	74.365	74.365	74.365
Raw material 1	5364.857	5537.391	5717.418	5905.627	6102.820
Other raw materials	9788.547	9750.787	10905.470	12291.100	13953.850
Utilities	75.722	90.866	109.039	130.847	157.016
Energy	1336.767	1566.641	1842.489	2173.507	2570.729
Labour, direct	2437.073	3046.341	3807.926	4759.908	5949.885
Repair, maintenance	318.505	382.206	458.647	550.377	660.452
Spares	96.515	101.188	106.355	112.104	118.537
Factory overheads	24.883	29.860	35.832	42.998	51.598
Factory costs	18442.870	20505.280	22983.180	25966.470	29564.890
Administrative overheads	808.375	1006.866	1254.260	1562.638	1947.072
Indir. costs, sales and distribution	539.207	671.606	836.624	1042.320	1298.747
Direct costs, sales and distribution	48.057	57.672	69.203	83.043	99.652
Depreciation	260.433	260.433	130.329	0.225	0.225
Financial costs	301.689	263.978	226.267	188.556	150.844
Total production costs	20400.630	22765.830	25499.860	28843.250	33061.430
Costs per unit (single product)	1.671	1.865	2.089	2.363	2.708
Of it foreign, %	48.458	43.968	39.686	35.486	31.378
Of it variable, %	75.323	74.438	72.830	71.052	68.877
Total labour	3464.591	4330.688	5725.861	7157.326	8946.657

COMFAR 2.1 UNIDO

---------- COMFAR 2.1 - MAUDERSTAM CONSULTING SERVICES, LONDON, ENGLAND -----

Total Production Costs in 1$

Year	2004	2005	2006	2007	2008
% of nom. capacity (single product).	74.365	74.365	74.365	74.365	74.365
Raw material 1	6309.934	6528.066	6758.509	7002.786	7262.696
Other raw materials	15949.150	18343.510	21216.740	24664.630	28802.080
Utilities	188.420	226.104	271.324	325.589	390.707
Energy	3047.395	3619.394	4305.793	5129.472	6117.887
Labour, direct	7437.356	9296.694	11620.870	14526.090	18157.610
Repair, maintenance	792.543	951.051	1141.261	1369.514	1643.417
Spares	125.778	133.972	143.296	153.961	166.219
Factory overheads	61.917	74.301	89.161	106.993	128.392
Factory costs	33912.500	39173.090	45546.960	53279.030	62669.010
Administrative overheads	2426.371	3024.000	3769.243	4698.646	5857.818
Indir. costs, sales and distribution	1618.452	2017.085	2514.182	3134.117	3907.315
Direct costs, sales and distribution	119.578	143.500	172.195	206.633	247.969
Depreciation	0.225	0.225	0.225	0.225	0.225
Financial costs	113.133	75.422	37.711	-0.000	0.000
Total production costs	38190.260	44433.330	52040.520	61318.650	72682.340
Costs per unit (single product)	3.128	3.640	4.263	5.023	5.954
Of it foreign, %	17.541	14.008	20.796	17.912	15.393
Of it variable, %	66.788	64.570	62.483	60.464	58.492
Total labour	11183.320	13979.150	17473.940	21842.430	27303.030

Net Working Capital in 1S

Year			1994	1995	1996	1997	1998
Coverage	mdc	coto					
Current assets &							
Accounts receivable	30	12.0	1032.590	1259.459	1530.330	1682.529	1864.353
Inventory and materials	65	5.6	2229.607	2620.435	3021.178	3085.581	3154.625
Energy	30	12.0	41.662	54.772	71.045	82.131	95.434
Spares	149	2.4	37.237	38.374	39.549	40.764	42.021
Work in progress	30	12.0	795.102	968.812	1172.996	1273.597	1393.525
Finished products	10	36.0	272.540	332.230	402.629	439.012	482.539
Cash in hand	30	12.0	101.771	125.406	162.500	200.655	248.099
Total current assets			4510.508	5399.539	6400.229	6804.269	7280.594
Current liabilities and Accounts payable	30	12.0	795.102	968.812	1172.996	1273.597	1393.525
Net working capital			3715.407	4430.727	5227.232	5530.672	5887.069
Increase in working capital			3715.407	715.320	796.505	303.439	356.397
Net working capital, local			508.113	508.626	1081.781	1314.983	1599.034
Net working capital, foreign			3107.294	3622.101	4145.450	4215.689	4288.036

Note: mdc = minimum days of coverage ; coto = coefficient of turnover .

Net Working Capital in 1S

Year			1999	2000	2001	2002	2003
Coverage	mdc	coto					
Current assets &							
Accounts receivable	30	12.0	2082.134	2343.588	2658.126	3037.226	3494.903
Inventory and materials	65	5.6	3228.989	3309.484	3397.073	3492.907	3598.354
Energy	30	12.0	111.397	130.553	153.541	181.126	214.227
Spares	149	2.4	43.323	44.672	46.071	47.524	49.035
Work in progress	30	12.0	1536.906	1708.773	1915.265	2163.873	2463.741
Finished products	10	36.0	534.757	597.560	673.262	764.697	875.332
Cash in hand	30	12.0	207.113	280.533	471.918	585.663	727.296
Total current assets			7344.619	8515.168	9315.256	10273.020	11422.890
Current liabilities and Accounts payable	30	12.0	1536.906	1708.773	1915.265	2163.873	2463.741
Net working capital			5807.713	6806.395	7399.991	8109.149	8959.148
Increase in working capital			420.644	498.682	593.596	709.158	850.000
Net working capital, local			1945.160	2367.091	2881.634	3509.364	4275.494
Net working capital, foreign			4362.552	4439.304	4518.359	4599.784	4683.654

COMFAR 2.1 UNIDO

COMFAR 2.1 - MANDERSTAM CONSULTING SERVICES, LONDON, ENGLAND

Net Working Capital in 1S

Year			2004	2005	2006	2007	2008
Coverage	mdc	coto					
Current assets &							
Accounts receivable	30	12.0	4048.265	4718.214	5530.295	6515.743	7712.762
Inventory and materials	65	5.6	3715.052	3844.954	3990.398	4154.179	4339.643
Energy	30	12.0	253.950	301.616	358.816	427.456	509.824
Spares	149	2.4	50.609	52.250	53.964	55.760	57.645
Work in progress	30	12.0	2826.041	3264.424	3795.580	4439.919	5222.417
Finished products	10	36.0	1009.413	1172.141	1369.894	1610.491	1903.523
Cash in hand	30	12.0	903.664	1123.335	1396.986	1737.933	2162.788
Total current assets			12806.990	14476.940	16495.940	18941.480	21908.600
Current liabilities and							
Accounts payable	30	12.0	2826.041	3264.424	3795.580	4439.919	5222.417
Net working capital			9980.952	11212.510	12700.360	14501.560	16686.180
Increase in working capital			1821.304	1231.560	1487.844	1801.206	2184.622
Net working capital, local			5210.913	6353.454	7749.692	9456.506	11543.900
Net working capital, foreign			4770.039	4859.016	4950.662	5045.057	5142.284

Note: mdc = minimum days of coverage ; coto = coefficient of turnover .

COMFAR 2.1 UNIDO

---------- COMFAR 2.1 - SANDERSTAM CONSULTING SERVICES, LONDON, ENGLAND ----

Cashflow Tables, construction [illegible] 3S

Year	1993
Total cash inflow . .	7197.780
Financial resources .	7197.780
Sales, net of tax . .	0.000
Total cash outflow . .	7197.780
Total assets	7197.780
Operating costs . . .	0.000
Cost of finance . . .	0.000
Repayment	0.000
Corporate tax . . .	0.000
Dividends paid . . .	0.000
Surplus (deficit) .	0.000
Cumulated cash balance	0.000
Inflow, local	2012.500
Outflow, local	3074.260
Surplus (deficit) .	-1061.760
Inflow, foreign . . .	5185.280
Outflow, foreign . . .	4123.521
Surplus (deficit) .	1061.760
Net cashflow	-7197.780
Cumulated net cashflow	-7197.780

COMFAR 2.1 UNIDO

COMFAR 2.1 - MANDERSTAM CONSULTING SERVICES, LONDON, ENGLAND

Cashflow tables, production in $

Year	1994	1995	1996	1997	1998	1999
Total cash inflow	11547.830	14799.160	18390.210	21294.160	24903.640	29215.830
Financial resources	795.102	773.710	204.185	100.601	119.927	143.381
Sales, net of tax	10752.730	14025.450	18186.030	21193.560	24783.720	29072.450
Total cash outflow	14521.530	13430.580	17505.570	19446.810	22141.550	25118.570
Total assets	4510.509	889.030	1000.689	404.041	476.325	564.024
Operating costs	10011.020	12209.610	14801.740	16185.530	17844.410	19838.510
Cost of finance	0.000	0.000	414.822	377.111	339.400	301.689
Repayment	0.000	0.000	471.389	471.389	471.389	471.389
Corporate tax	0.000	331.935	816.930	1552.739	2554.021	3486.957
Dividends paid	0.000	0.000	0.000	456.000	456.000	456.000
Surplus (deficit)	-2973.696	1368.589	884.643	1847.352	2762.098	4097.260
Cumulated cash balance	-2973.696	-1605.107	-720.465	1126.887	3888.984	7986.244
Inflow, local	7865.131	11310.310	14589.330	17466.800	20961.460	25155.380
Outflow, local	4069.741	4892.727	6908.323	9277.242	11855.000	14710.400
Surplus (deficit)	3795.360	6418.134	7681.011	8189.559	9106.462	10444.980
Inflow, foreign	3682.734	3488.253	3800.875	3827.362	3942.183	4060.448
Outflow, foreign	10451.730	8537.648	10597.240	10169.570	10286.550	10408.170
Surplus (deficit)	-6769.055	-5049.594	-6796.367	-6342.208	-6344.366	-6347.718
Net cashflow	-2973.696	768.589	1770.855	3151.851	4028.887	5326.338
Cumulated net cashflow	-10171.480	-9402.388	-7632.032	-4480.182	-451.294	4875.044

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COMFAR 2.1 UNIDO

COMFAR 2.1 - WANDERSTAM CONSULTING SERVICES, LONDON, ENGLAND

Cashflow tables, production in 3S

Year	2000	2001	2002	2003	2004	2005
Total cash inflow	34370.750	40536.450	47914.600	56747.210	67324.700	79995.630
Financial resources	171.867	206.492	248.607	299.868	362.301	438.383
Sales, net of tax	34198.880	40329.960	47666.000	56447.350	66962.400	79557.240
Total cash outflow	23694.790	33047.290	38275.560	44511.050	52028.610	61098.230
Total assets	670.559	800.089	957.765	1149.867	1384.104	1669.942
Operating costs	22241.420	25143.270	28654.460	32910.360	38076.890	44357.680
Cost of finance	263.978	226.267	188.556	150.844	113.133	75.422
Repayment	471.389	471.389	471.389	471.389	471.389	471.389
Corporate tax	4591.452	5950.270	7547.330	9372.600	11527.090	14067.800
Dividends paid	456.000	456.000	456.000	456.000	456.000	456.000
Surplus (deficit)	5675.959	7489.168	9639.098	12236.160	15296.090	18897.390
Cumulated cash balance	13662.200	21151.370	30790.470	43026.630	58322.710	77220.110
Inflow, local	30188.490	36228.730	43477.640	52177.140	62617.530	75147.230
Outflow, local	18160.220	22381.490	27473.220	33567.160	40937.710	49854.800
Surplus (deficit)	12028.260	13847.230	16004.420	18609.990	21679.820	25292.430
Inflow, foreign	4182.262	4307.723	4436.961	4570.070	4707.172	4848.387
Outflow, foreign	10534.570	10665.800	10802.330	10943.900	11090.900	11243.430
Surplus (deficit)	-6352.304	-6358.076	-6365.369	-6373.827	-6383.723	-6395.044
Net cashflow	9867.326	9642.824	10755.040	13314.390	16336.620	19900.200
Cumulated net cashflow	11742.370	20385.200	31140.240	44454.630	60791.250	80691.450

ORANGE JUICE --- 25 6 93

Cashflow tables, production in 1$

Year	2006	2007	2008
Total cash inflow . .	95178.280	113374.700	135187.300
Financial resources .	531.156	644.339	782.499
Sales, net of tax . .	94647.130	112730.300	134404.800
Total cash outflow . .	72047.550	84802.850	100812.400
Total assets	2019.000	2445.548	2967.121
Operating costs . . .	52002.580	61318.410	72682.110
Cost of finance . . .	37.711	-0.000	0.000
Repayment	471.389	0.000	0.000
Corporate tax . . .	17060.880	20582.900	24707.210
Dividends paid . . .	456.000	456.000	456.000
Surplus (deficit) .	23130.730	28571.800	34374.860
Cumulated cash balance	100350.800	128922.600	163297.500
Inflow, local	90184.440	108231.000	129889.300
Outflow, local	50645.880	60708.450	39510.150
Surplus (deficit) .	39538.560	34522.560	40379.186
Inflow, foreign . . .	4993.838	5143.653	5297.962
Outflow, foreign . . .	11401.680	11894.410	11302.300
Surplus (deficit) .	-6407.837	-6950.755	-6004.337
Net cashflow	24095.830	29027.810	34830.850
Cumulated net cashflow	104787.300	133815.100	168645.900

COMFAR 2.1 UNIDO

---------- COMFAR 2.1 - WANDERSTAM CONSULTING SERVICES, LONDON, ENGLAND ----

Cashflow Discounting:

a) Equity paid versus Net income flow:
Net present value ..... 9561.76 at 10.00 %
Internal Rate of Return (IRRE1) .. 51.85 %

b) Net Worth versus Net cash return:
Net present value ..... 7193.38 at 10.00 %
Internal Rate of Return (IRRE2) .. 48.22 %

c) Internal Rate of Return on total investment:
Net present value ..... 3470.07 at 10.00 %
Internal Rate of Return (IRR) .. 35.16 %

Net Worth = Equity paid plus reserves

COMFAR 2.1 UNIDO

---------- COMFAR 2.1 - HALDENSTAM CONSULTING SERVICES, LONDON, ENGLAND -----

Projected Balance Sheets, construction in 1$

Year	1993
Total assets	7197.780
Fixed assets, net of depreciation	0.000
Construction in progress	7197.780
Current assets	0.000
Cash, bank	0.000
Cash surplus, finance available	0.000
Loss carried forward	0.000
Loss	0.000
Total liabilities	7197.780
Equity capital	2012.500
Reserves, retained profit	0.000
Profit	0.000
Long and medium term debt	5185.280
Current liabilities	0.000
Bank overdraft, finance required	0.000
Total debt	5185.280
Equity, % of liabilities	27.960

	1999	2000	2001	2002	2003
Total debt	4836.629	4537.107	4272.210	4049.428	3877.907
Equity, % of liabilities	13.571	10.311	7.799	5.925	4.545

Projected Balance Sheets, Production in 1S

Year	2004	2005	2006	2007	2008
Total assets	74158.380	94725.480	119875.000	150892.100	188233.800
Fixed assets, net of depreciation	2572.664	2572.439	2572.214	2571.989	2571.764
Construction in progress	0.000	0.000	0.000	0.000	0.000
Current assets	11903.330	13353.600	15098.950	17203.550	19745.810
Cash, bank	903.664	1123.335	1396.986	1737.933	2162.788
Cash surplus, finance available .	58778.720	77676.110	100806.800	129378.600	163753.500
Loss carried forward	0.000	0.000	0.000	0.000	0.000
Loss	0.000	0.000	0.000	0.000	0.000
Total liabilities	74158.380	94725.480	119875.000	150892.100	188233.800
Equity capital	2612.500	2612.500	2612.500	2612.500	2612.500
Reserves, retained profit	50532.000	67921.050	87921.170	113010.900	143383.700
Profit	17245.060	22356.120	25545.730	30828.770	37015.240
Long and medium term debt	342.779	971.339	-0.000	-0.000	-0.000
Current liabilities	2826.041	3864.424	3795.580	4439.918	5222.417
Bank overdraft, finance required.	0.000	0.000	0.000	0.000	0.000
Total debt	3768.819	3735.813	3795.579	4439.918	5222.417
Equity, % of liabilities	3.523	2.758	2.179	1.731	1.388

COMFAR 2.1 UNIDO

COMFAR 2.1 - MANDERSTAM CONSULTING SERVICES, LONDON, ENGLAND

Net Income Statement in US

Year	1994	1995	1996	1997	1998
Total sales, incl. sales tax	13132.790	16929.360	21748.250	25198.380	29311.540
Less: variable costs, incl. sales tax.	10983.380	13376.860	16125.770	17424.090	18949.250
Variable margin	2149.410	3552.501	5622.485	7774.291	10362.290
As % of total sales	16.367	20.984	25.853	30.852	35.352
Non-variable costs, incl. depreciation	2380.418	2709.376	3210.917	3560.910	3683.420
Operational margin	-231.008	843.125	2411.569	4213.381	6678.873
As % of total sales	-1.759	4.980	11.089	16.721	22.786
Cost of finance	0.000	0.000	414.822	377.111	339.400
Gross profit	-231.008	843.125	1996.746	3836.270	6339.473
Allowances	12.173	13.287	13.422	13.422	13.422
Taxable profit	-243.181	829.838	1983.324	3822.847	6326.051
Tax	0.000	331.935	816.930	1552.739	2554.021
Net profit	-231.008	511.190	1179.817	2283.531	3785.452
Dividends paid	0.000	0.000	0.000	456.000	456.000
Undistributed profit	-231.008	511.190	1179.817	1827.531	3329.452
Accumulated undistributed profit	-231.008	280.182	1459.999	3287.529	6616.981
Gross profit, % of total sales	-1.759	4.980	9.181	15.224	21.628
Net profit, % of total sales	-1.759	3.020	5.425	9.062	12.915
ROE, Net profit, % of equity	-11.479	19.567	45.160	87.408	144.898
ROI, Net profit+interest, % of invest.	-1.117	4.396	12.634	20.903	31.524

COMFAR 2.1 UNIDO

COMFAR 2.1 - MANDERSTAM CONSULTING SERVICES, LONDON, ENGLAND

Net Income Statement in US

Year	1999	2000	2001	2002	2003
Total sales, incl. sales tax	34219.550	40080.520	47084.200	55458.250	65475.820
Less: variable costs, incl. sales tax.	20745.650	22866.510	25375.690	28349.760	31880.600
Variable margin	13473.900	17214.010	21708.520	27108.490	33595.220
As % of total sales	39.375	42.949	46.106	48.881	51.309
Non-variable costs, incl. depreciation	4500.395	5516.981	6652.151	8097.187	10058.450
Operational margin	8973.504	11697.030	15056.360	19011.300	23536.770
As % of total sales	26.223	29.184	31.978	34.280	35.947
Cost of finance	301.689	263.978	226.267	188.556	150.844
Gross profit	8671.814	11433.050	14830.100	18822.750	23385.920
Allowances	13.422	13.422	13.422	13.422	13.422
Taxable profit	8658.393	11419.630	14816.680	18809.320	23372.500
Tax	3486.957	4591.452	5950.270	7547.330	9372.600
Net profit	5184.857	6841.599	8879.828	11275.420	14013.320
Dividends paid	456.000	456.000	456.000	456.000	456.000
Undistributed profit	4728.957	6385.599	8423.828	10819.420	13557.320
Accumulated undistributed profit	11345.340	17731.440	26155.270	36974.680	50532.000
Gross profit, % of total sales	25.342	28.525	31.497	33.940	35.717
Net profit, % of total sales	15.152	17.070	18.859	20.331	21.402
ROE, Net profit, % of equity	198.463	261.879	339.898	431.595	536.395
ROI, Net profit+interest, % of invest.	40.625	50.739	62.380	74.894	87.666

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COMFAR 2.1 UNIDO

---------- COMFAR 2.1 - MANDERSTAM CONSULTING SERVICES, LONDON, ENGLAND -----

Net Income Statement in US

Year	2004	2005	2006	2007	2008
Total sales, incl. sales tax	77464.690	91818.130	109008.100	129600.800	154275.800
Less: variable costs, incl. sales tax.	36078.440	41075.480	47030.340	54133.370	62612.910
Variable margin	41386.250	50742.660	61977.750	75467.440	91662.930
As % of total sales	53.426	55.264	56.856	58.231	59.415
Non-variable costs, incl. depreciation	12500.970	15543.320	19333.430	24055.770	29940.470
Operational margin	28885.280	35199.340	42644.320	51411.660	61722.460
As % of total sales	37.288	38.336	39.120	39.669	40.008
Cost of finance	113.133	75.422	37.711	-0.000	0.000
Gross profit	28772.140	35123.910	42606.610	51411.670	61722.460
Allowances	13.422	13.422	13.422	13.422	13.422
Taxable profit	28758.720	35110.490	42593.190	51398.250	61709.040
Tax	11527.690	14067.800	17060.880	20582.900	24707.210
Net profit	17245.050	21056.120	25545.730	30828.770	37015.240
Dividends paid	456.000	456.000	456.000	456.000	456.000
Undistributed profit	16789.060	20600.120	25089.730	30372.770	36559.240
Accumulated undistributed profit	97321.050	117921.170	143010.900	173383.700	209942.900
Gross profit, % of total sales	37.142	38.254	39.086	39.669	40.008
Net profit, % of total sales	22.262	22.932	23.435	23.787	23.993
ROE, Net profit, % of equity	860.098	805.976	977.827	1180.048	1416.851
ROI, Net profit+interest, % of invest.	121.345	114.781	128.572	142.072	154.979

ORANGE JUICE --- 25 6 '03

COMFAR 2.1 UNIDO

---------- COMFAR 2.1 - MANDERSTAM CONSULTING SERVICES, LONDON, ENGLAND -----

Source of Finance, construction in US$

Year	1993
Equity, ordinary ..	2012.500
Equity, preference.	0.000
Subsidies, grants .	0.000
Loan A, foreign .	5185.280
Loan B, foreign..	0.000
Loan C, foreign .	0.000
Loan A, local....	0.000
Loan B, local....	0.000
Loan C, local....	0.000
Total loan	5185.280
Current liabilities	0.000
Bank overdraft	0.000
Total funds	7197.780

COMFAR 2.1 UNIDO

COMFAR 2.1 - MANDERSTAM CONSULTING SERVICES, LONDON, ENGLAND

Source of Finance, production in US$

Year	1994	1995	1996	1997	1998	1999
Equity, ordinary ..	0.000	500.000	0.000	0.000	0.000	0.000
Equity, preference.	0.000	0.000	0.000	0.000	0.000	0.000
Subsidies, grants .	0.000	0.000	0.000	0.000	0.000	0.000
Loan A, foreign .	0.000	0.000	-471.389	-471.389	-471.389	-471.389
Loan B, foreign..	0.000	0.000	0.000	0.000	0.000	0.000
Loan C, foreign .	0.000	0.000	0.000	0.000	0.000	0.000
Loan A, local....	0.000	0.000	0.000	0.000	0.000	0.000
Loan B, local....	0.000	0.000	0.000	0.000	0.000	0.000
Loan C, local....	0.000	0.000	0.000	0.000	0.000	0.000
Total loan	0.000	0.000	-471.389	-471.389	-471.389	-471.389
Current liabilities	795.102	173.710	204.185	100.601	119.927	143.381
Bank overdraft	2973.694	-1368.591	-884.646	-720.458	0.000	0.000
Total funds	3768.796	-994.881	-1151.850	-1091.246	-351.462	-328.008

ORANGE JUICE --- 25 6 93

COMFAR 2.1 - MANDERSTAM CONSULTING SERVICES, LONDON, ENGLAND

Source of Finance, production in US$

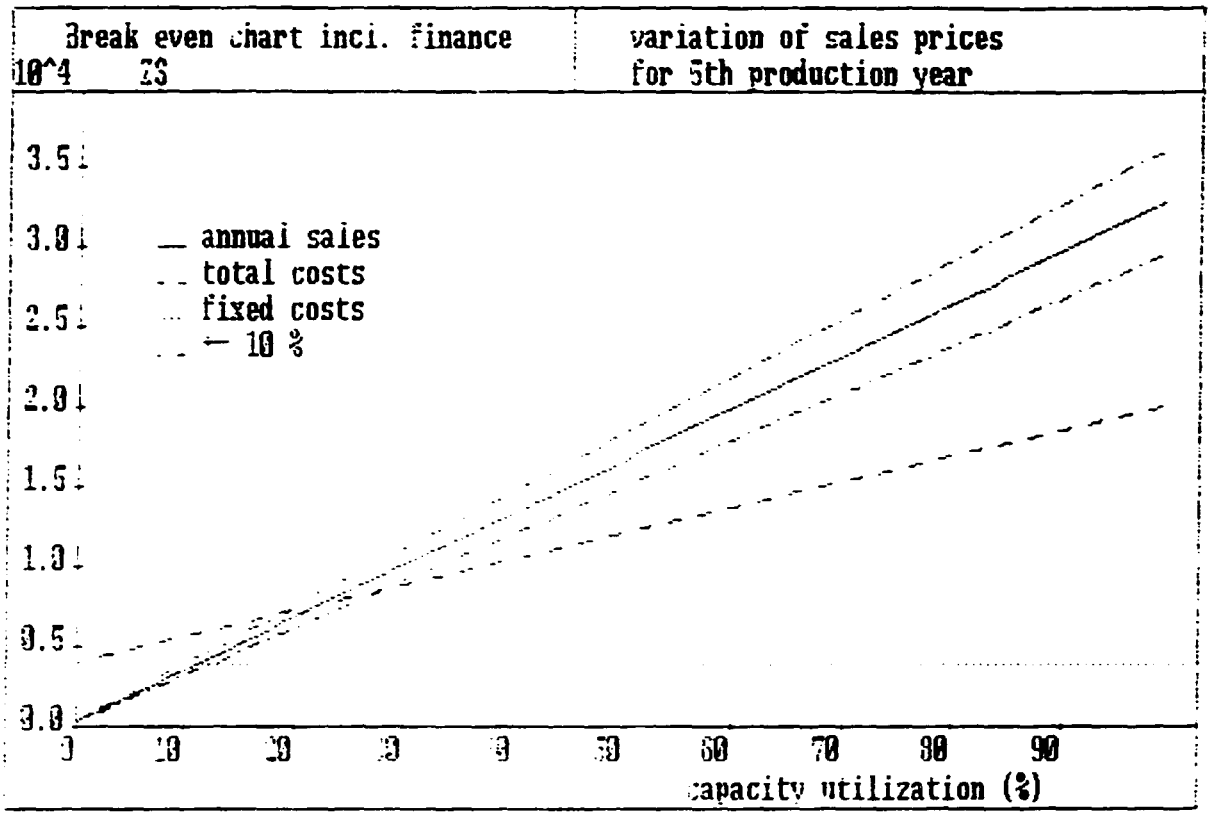
Year	2000	2001	2002	2003	2004	2005
Equity, ordinary ..	0.000	0.000	0.000	0.000	0.000	0.000
Equity, preference.	0.000	0.000	0.000	0.000	0.000	0.000
Subsidies, grants .	0.000	0.000	0.000	0.000	0.000	0.000
Loan A, foreign .	-471.389	-471.389	-471.389	-471.389	-471.389	-471.389
Loan B, foreign..	0.000	0.000	0.000	0.000	0.000	0.000
Loan C, foreign .	0.000	0.000	0.000	0.000	0.000	0.000
Loan A, local....	0.000	0.000	0.000	0.000	0.000	0.000
Loan B, local....	0.000	0.000	0.000	0.000	0.000	0.000
Loan C, local....	0.000	0.000	0.000	0.000	0.000	0.000
Total loan	-471.389	-471.389	-471.389	-471.389	-471.389	-471.389
Current liabilities	171.867	206.492	248.607	299.868	362.301	438.383
Bank overdraft	0.000	0.000	0.000	0.000	0.000	0.000
Total funds	-299.522	-264.897	-222.782	-171.521	-109.089	-33.006

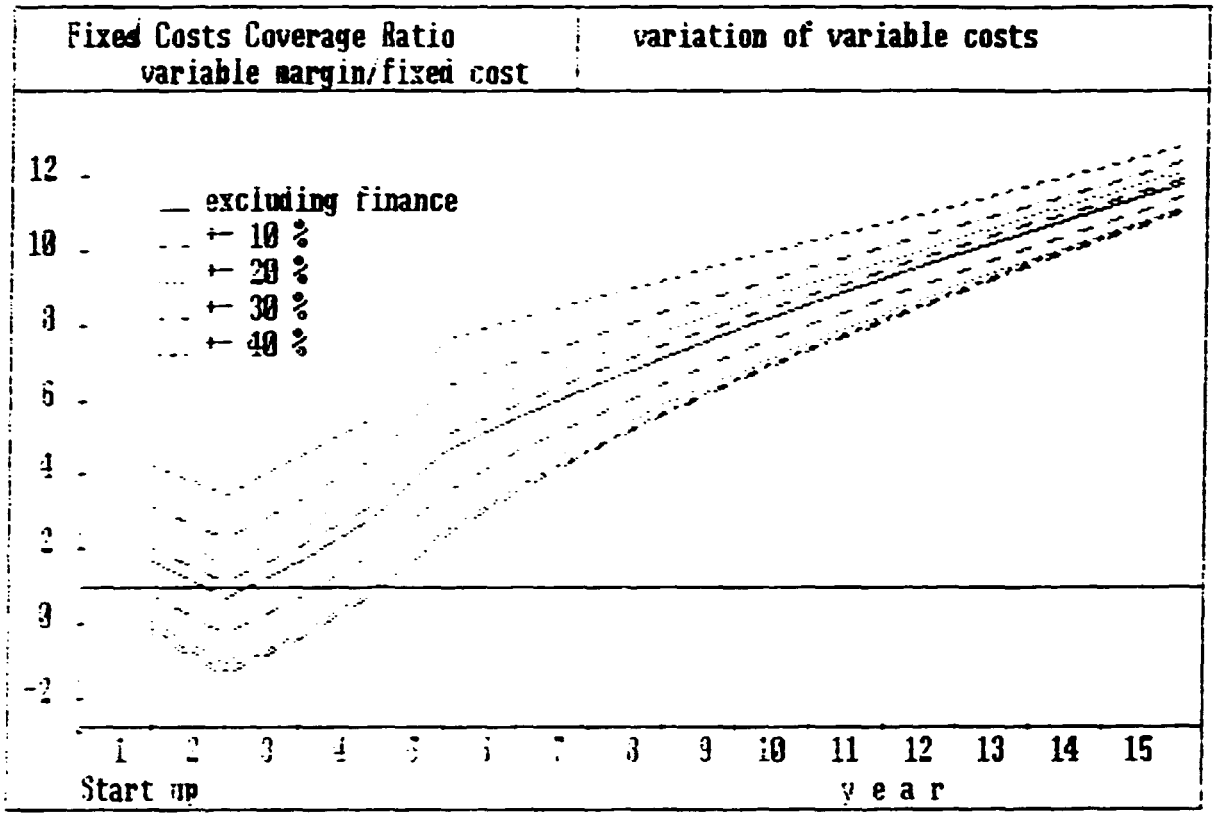
ORANGE JUICE --- 25 6 93

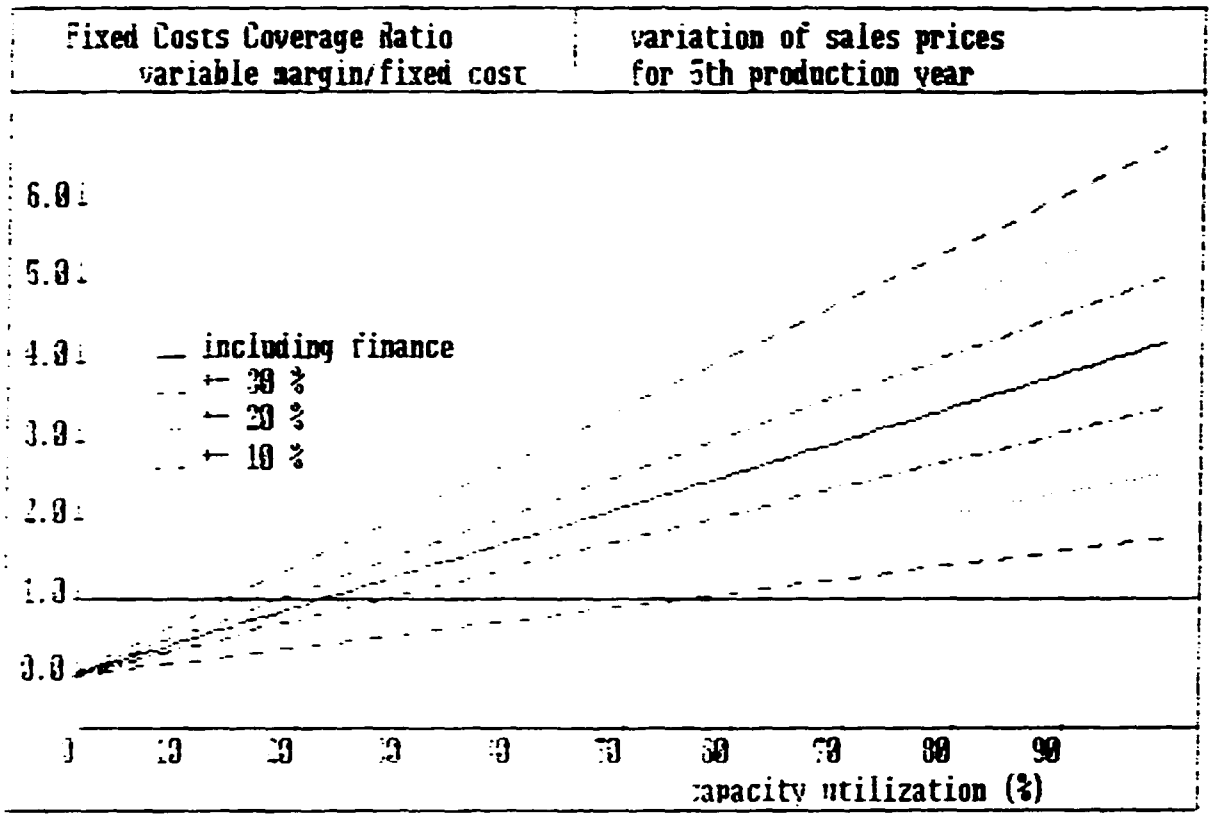
Source of Finance, production in Z$

Year	2006	2007	2008
Equity, ordinary ..	0.000	0.000	0.000
Equity, preference.	0.000	0.000	0.000
Subsidies, grants .	0.000	0.000	0.000
Loan A, foreign .	-471.389	0.000	0.000
Loan B, foreign..	0.000	0.000	0.000
Loan C, foreign .	0.000	0.000	0.000
Loan A, local....	0.000	0.000	0.000
Loan B, local....	0.000	0.000	0.000
Loan C, local....	0.000	0.000	0.000
Total loan	-471.389	0.000	0.000
Current liabilities	531.156	844.339	782.499
Bank overdraft	0.000	0.000	0.000
Total funds	59.766	844.339	782.499

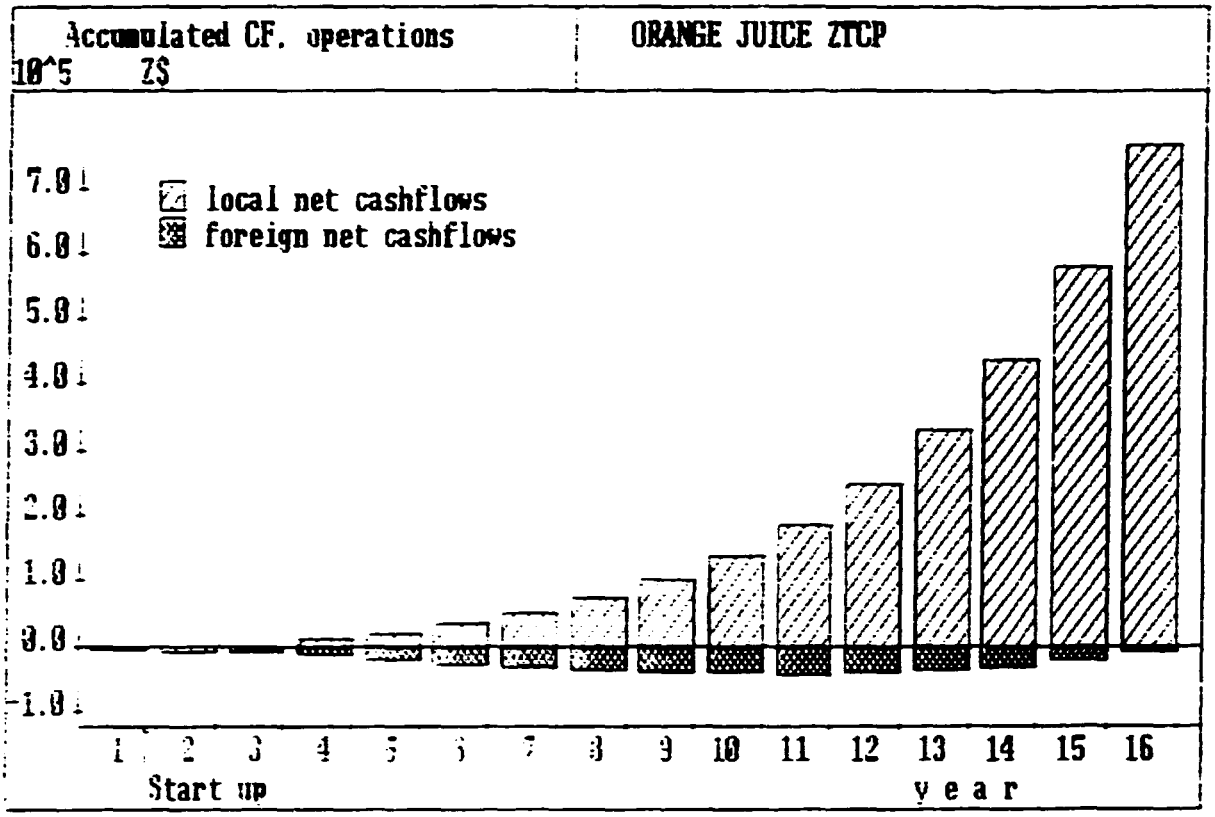
COMFAR 2.1 UNIDO

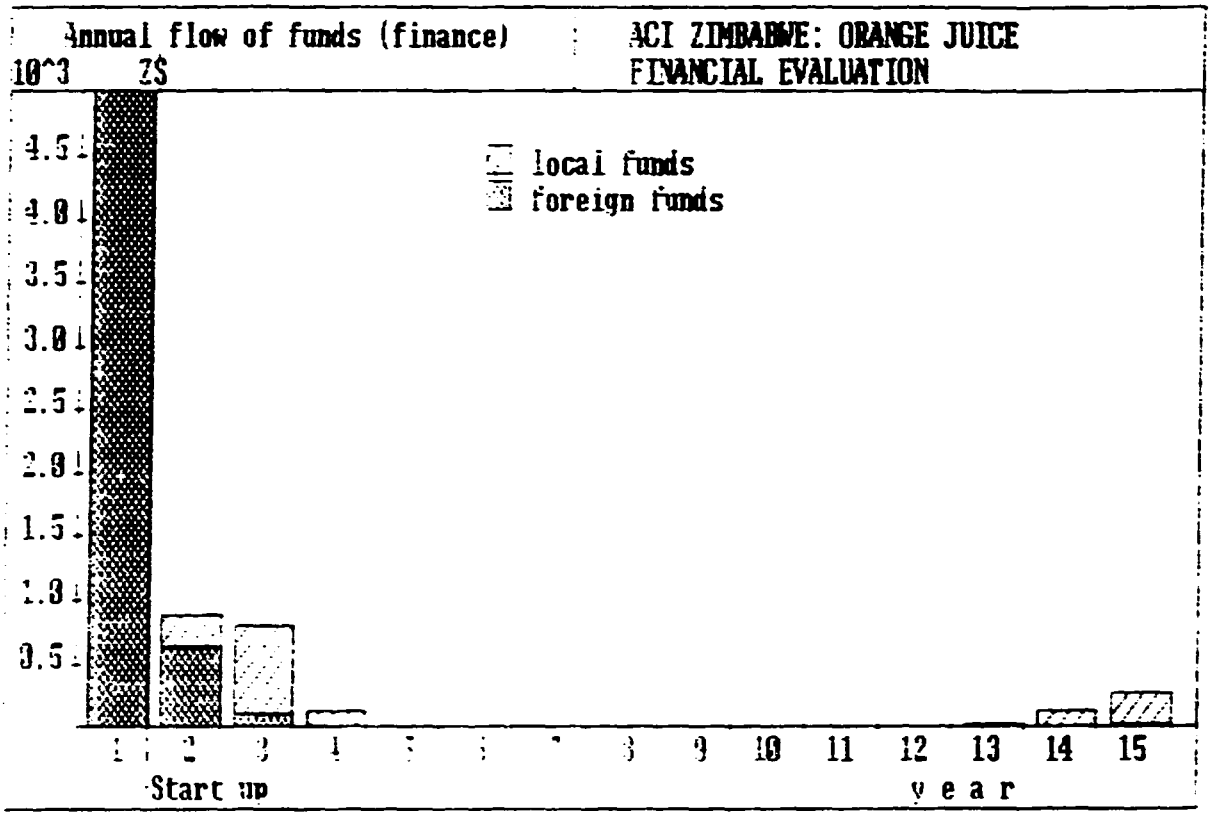


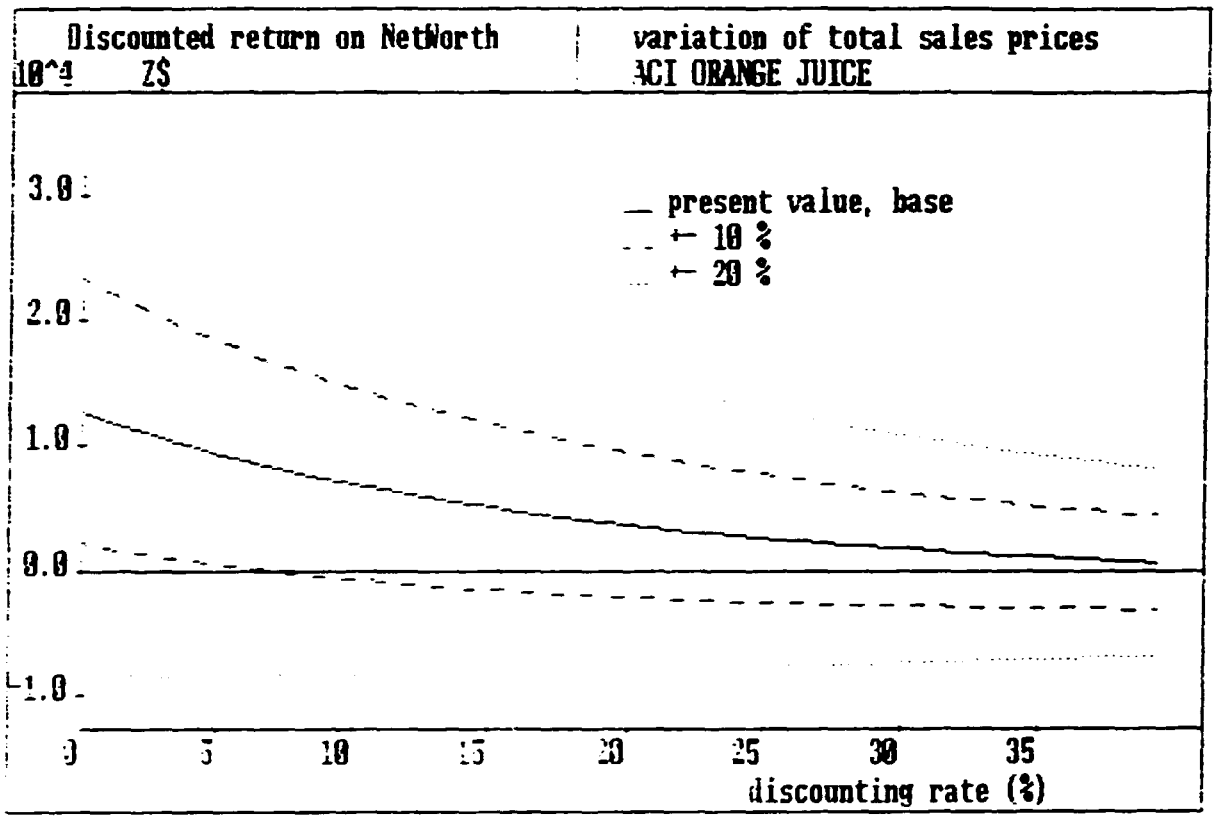

Fixed Costs Coverage Ratio
variable margin/fixed cost
variation of variable costs
12
10
8
6
4
2
0
-2
excluding finance
+ 10 %
+ 20 %
+ 30 %
+ 40 %
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Start up
year


Fixed Costs Coverage Ratio
variable margin/fixed cost
variation of sales prices
for 5th production year
6.0
5.0
4.0
3.0
2.0
1.0
0.0
including finance
← 30 %
← 20 %
← 10 %
0
10
20
30
40
50
60
70
80
90
capacity utilization (%)

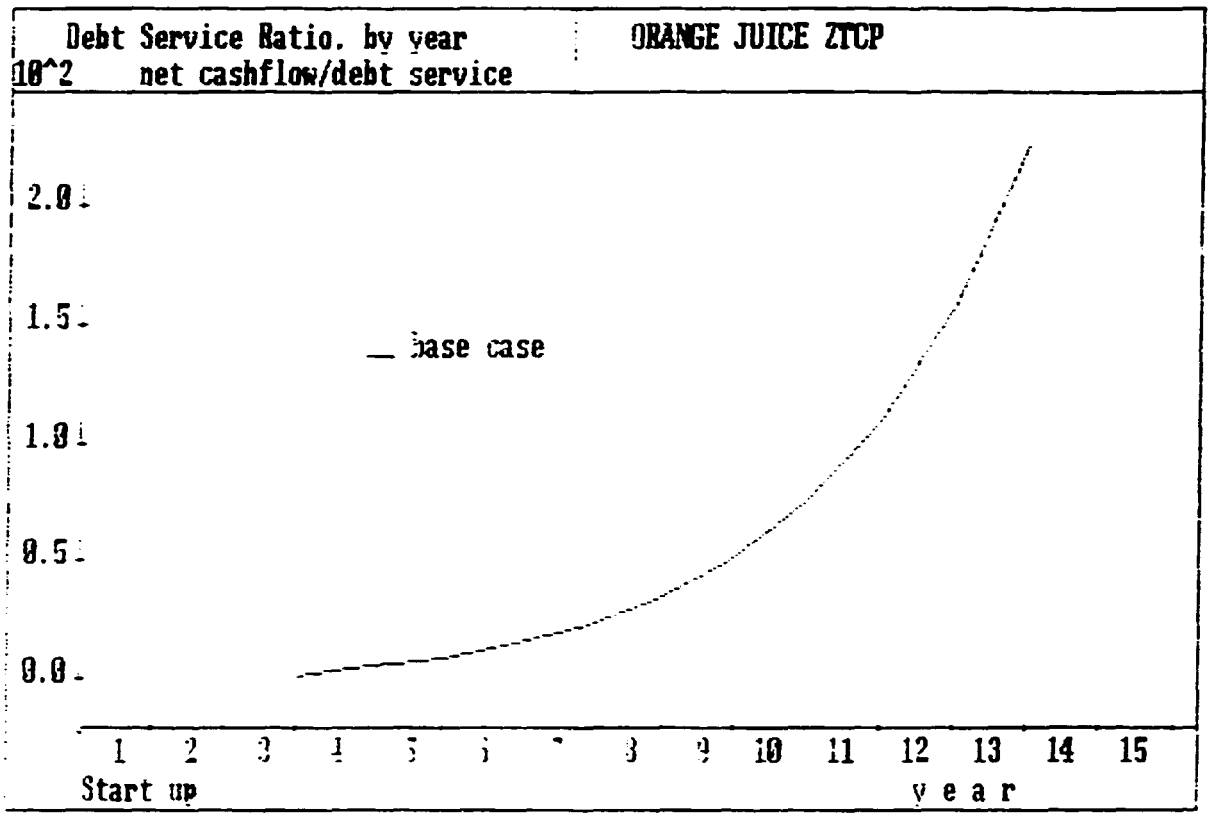
COMFAR 2.1 UNIDO



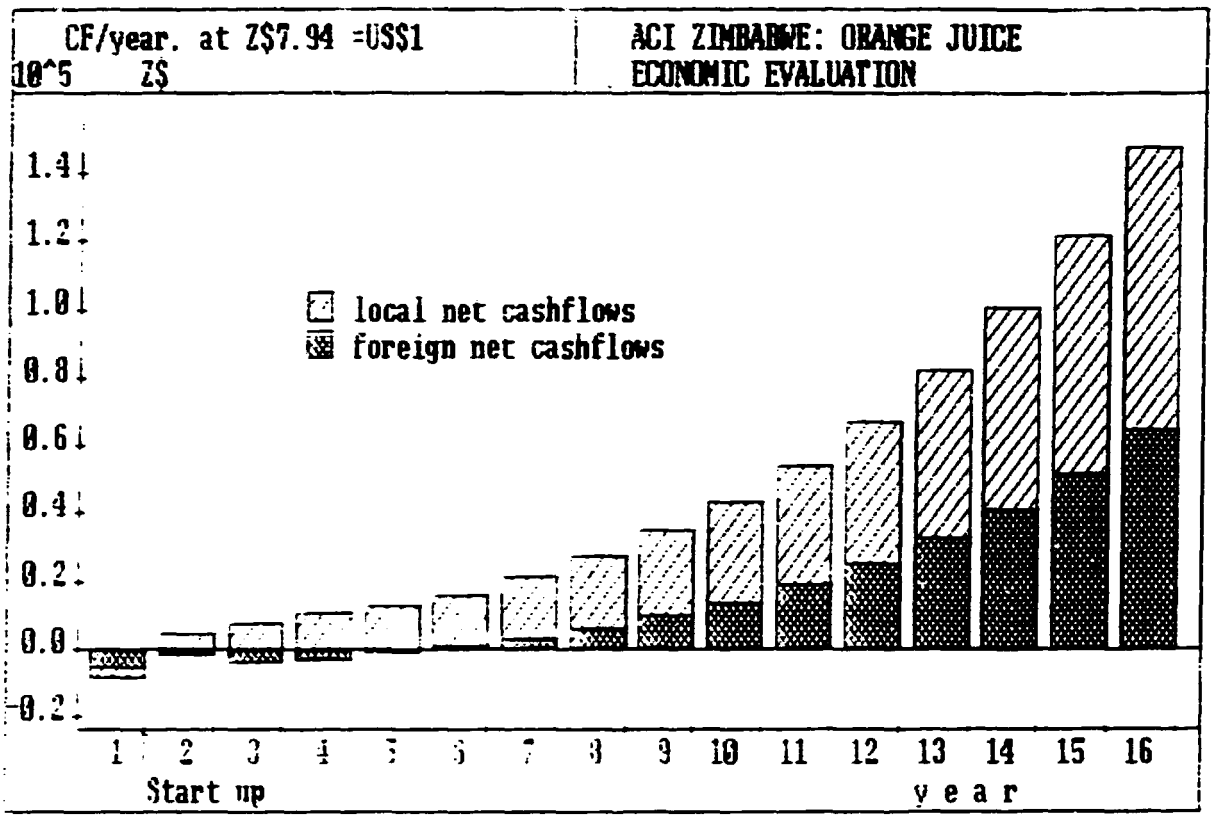

Annual flow of funds (finance)
ACI ZIMBABWE: ORANGE JUICE
FINANCIAL EVALUATION
10^3 Z$
local funds
foreign funds
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Start up
year


Discounted return on NetWorth
10^4 Z$
variation of total sales prices
ACI ORANGE JUICE
3.0
2.0
1.0
0.0
-1.0
present value, base
← 10 %
← 20 %
0
5
10
15
20
25
30
35
discounting rate (%)

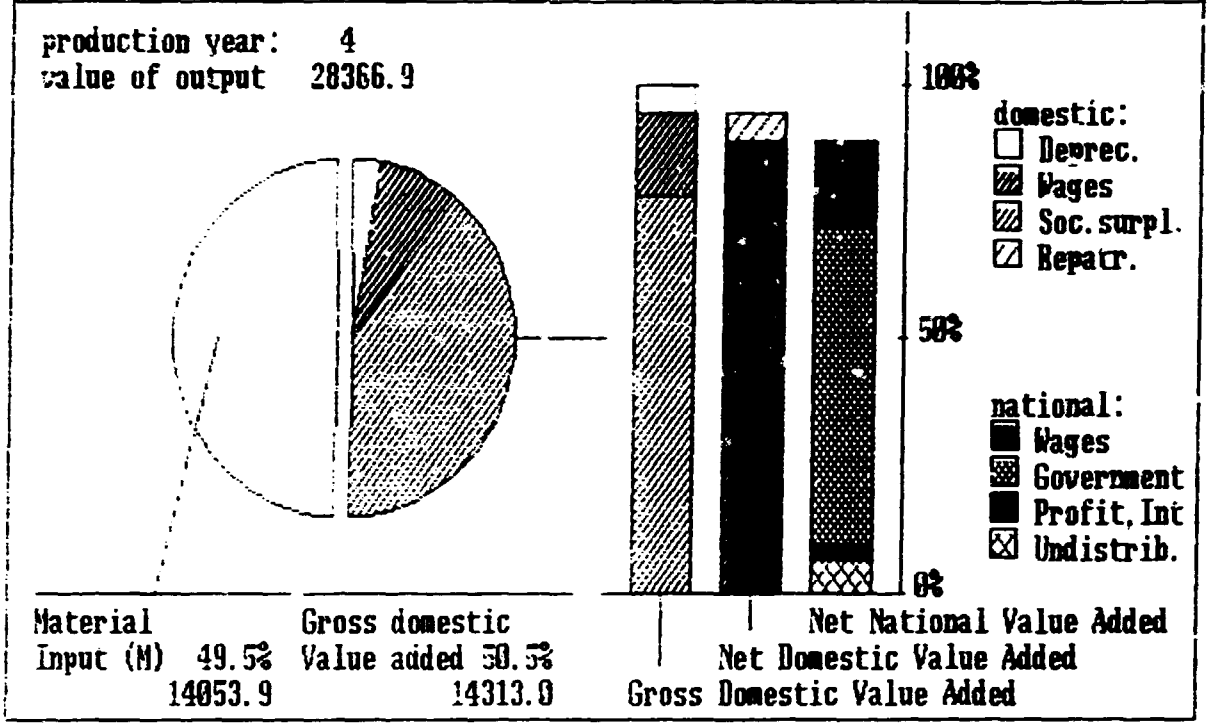
COMFAR 2.1 UNIDO



COMFAR 2.1 UNIDO



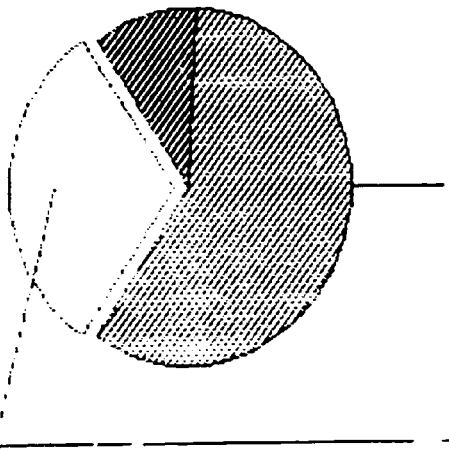
Structure of value added Z$	ORANGE JUICE PROJECT: ECONOMIC EVALUATION for 4th YEAR



Structure of value added
Z$

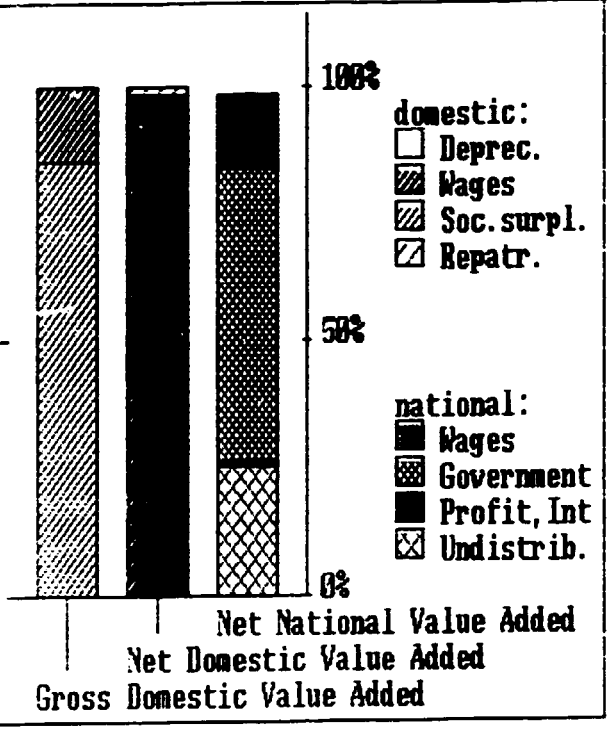
ORANGE JUICE PROJECT: ECONOMIC EVALUATION for 9th YEAR

production year: 9
value of output 70585.8



Material Input (M) 31.1% 21962.1

Gross domestic Value added 68.9% 48623.8



PART OF

FEASIBILITY STUDY FOR THE ESTABLISHMENT OF A CITRUS FRUIT AND TOMATO PROCESSING PLANT IN ZIMBABWE AND THE PARTICIPATION OF WOMEN IN SUCH A PROJECT

UNIDO PROJECT REFERENCE :

XA/ZIM/92/609/17-52/J14101

TABLE OF CONTENTS

WOMEN INVOLVEMENT IN AGRICULTURAL ACTIVITY IN ZIMBABWE

Preamble

This report covers a wide area of women's involvement in agricultural activities, women's organizations and their training needs on various aspects in Zimbabwe. It reviews the whole subject with the aid of statistical and other data where available. Although statistics in Zimbabwe are collected on a gender basis in some areas analysis and assessment is hardly done according to gender. For the assessment therefore, used supporting statistics where they are available and general information in those areas where gender-desegregated data are not available.

The report follows the format recommended by UNIDO's job description Ref: XA/ZIM/92/609/17-52/J14101.

BACKGROUND AND INTRODUCTION

Zimbabwe is located in the middle of Southern Africa bounded by Zambia in the north, South Africa in the south, Mozambique in the east and Botswana in the west. Zimbabwe was colonized by the British in 1897 and gained independence from Britain in 1980. (See attached Map No.1).

The 1992 census estimated that the population of Zimbabwe was 10.4 million people. Of this population 5.3 million are female and 5.07 male and the sex ratio is 95 males per 100 females. Attached Map No.2 and 3 shows the Sex and Age Structure and Sex Ratio in 1982. Map No.4 also shows proportion of females in the 15-59 age group total female population.

The average intercensal growth rate of the population was 3.13% which took place between 1982 and 1992. The average household size is 4.8 with a population density of 26.62 persons per square kilometre. The population constituted 2.2 million households in an area of 390757 square kilometres. Attached Map No.5 shows the trend of population growth.

About 56% of the total population is aged between 16 and 64. Zimbabwe still has a predominantly rural population with only 25% of the population living in urban areas and 75% of the population in rural areas. (See Map No.6). There has been a historically based sexual bias in the urban areas where till recently, the urban population were predominantly male. This was due to rural to urban migration during the colonial era and this migration was dominated by men with women, children and elderly people residing in rural area.

The two cities of Harare and Bulawayo account for at least 60% of the total urban population and the urban population growth rate is estimated between 5% and 7.2% aithough this is widely regarded as an under-estimate. By 1992, the population of Harare was 1.47 million and is still growing. Map No.7 shows the distribution of urban centres with population in 1982.

Zimbabwe's GNP per capita stood at Z$1000 (US$650) in 1989 while the economy grew at an average of 4.1% per annum between 1980 and 1988. Until 1989, Zimbabwe was classified as a lower middle income developing country but has since been downgraded to the category of low-income developing countries. The

major economic sector is manufacturing which now accounts for about 25% of the GNP while agriculture contributes 13%, mining 7% and services 13%. The average rural per capita income in the peasant farming areas (called communal farming areas) is between Z$200 and Z$400, a third of which originates from wage labour and crop sales while the remaining two thirds originated from subsistence agriculture. Attached Map No.8 shows the employed population in 1982.

Land holdings are highly skewed in favour of large scale commercial farmers with freehold rights. The majority of whom are white individuals and corporations who comprise less than 0.01% of the population and own about 50% of all arable land while the other 50% is divided between about 3 million peasant farmers who work the land under communal tenure that gives them use right only. In the communal lands, men have primary land use rights while women have secondary land use rights. This means that women normally get land through men in marriage as wives rather than in their own right as peasant farmers.

There has been limited foreign investment in the economy and this has reduced the possibilities for improving export performance in industry and manufacturing. These problems culminated in the implementation of a structural adjustment programme with price decontrols, removal of subsidies to consumers, liberalization of the economy and the relaxation of labour and other regulations relating to production. The result of the structural adjustment programme has been the sky-rocketing of commodity prices, retrenchment of workers as labour regulations are relaxed and high inflation which reached a record of 43% in 1992. Some of the social development gains of the first five years of independence have been reversed. Rural women in the poorer strata of their communities, the unemployed, the elderly and the landless have been hit hard by these economic developments as real incomes have declined since 1980 for most workers in the waged and un-waged sectors of the economy.

WOMEN PROTECTION IN ZIMBABWE

The Zimbabwe legal system is built on the colonial systems. This means that the state legal system still provides for the recognition of two predominant legal systems: customary law which is used to govern the lives of the majority of black people and general law which is based on Roman Dutch Law and is applied to the white settler community and to affluent blacks. The two systems co-exist in almost all fields including personal law thus making lives of women subject to a dual legal system.

The Government of Zimbabwe ratified the convention in June 1991. The Government promises, in terms of the convention to establish equality for women in the political, economic, social, cultural and civil spheres. The Government also promises to pass laws that remove women's subordinate status and to establish institutions and to undertake other measures that further women's advancement. Thus the Government must take steps to ban all cultural practice and beliefs which perpetuate the subordination of women. The Government is also called upon by the convention to look into the problems of all women including those faced by rural women.

THE LEGAL STATUS OF WOMEN IN ZIMBABWE

Up to 1982 women in Zimbabwe were minors in perpetuity. However, with the advent of National Independence and the subsequent enactment of the Legal Age of Majority Act No. 15 of 1982 women became majors in their own right. In the new Act the Age of Majority was also reduced from twenty one (21) to Eighteen (18) years.

In matrimonial matters too the status of women in Zimbabwe was enhanced by enactment of the new Matrimonial Causes Act No. 16 of 1985 which gave women and men equal responsibilities in marriage, divorce, judicial separation and nullity of marriage. This equality was achieved by the amendment of Section 16 of the African Marriage Act (Chapter 238) and the repeal of the Matrimonial Causes Act (Chapter 39).

In terms of the work place these equalizing legislation meant equal opportunities for women relative to their male counterparts for similar jobs provided the requisite qualifications were met. Thus the enactment of the Minimum Wages Act did not distinguish between men and women but simply referred to minimum wage earners by their functions. This meant that regardless of gender, women would be remunerated int he same way as men if they performed similar tasks.

Discrimination on the basis of sex is defined in the Labour Relations Act No. 16/85 Section 5(1) prohibits an employer from discriminating on the basis of sex in job advertisements and recruitment. The section also prohibits discrimination in wage determination, provision of training facilities and advancement opportunities and in the provision of other employment facilities. Table 9 shows the wages pattern for different class of employment.

The Equal Pay Act of 1981 entitled women to earn the same pay for the same type of work regardless of the race and sex. Annex 1 shows wages paid to permanent employees without any sex discrimination.

These are many legal and social measures that have been taken to change the social and cultural patterns to help women to assert themselves, to become economically independent.

WOMEN'S PARTICIPATION IN AGRICULTURE

1. Census statistics have shown that there are more women than men in Zimbabwe. The overall sex-ratio in the 1992 census was 95 males per 100 females. Also see Map No.2 and 3 for 1982 census.

2. Demographic distribution show that more people stay in communal lands than in cities and towns. It is also a fact that communal lands population depends entirely on subsistence and commercial agriculture. This means that every woman brought up in communal lands has to acquire some agricultural experience out of necessity and tradition. As most men migrate to urban centres to find employment more and more women become responsible for the agricultural operations in their families. (See Map No. 7 and 8).

3. Statistics also show that agriculture (and allied agro-based industries) is the largest employer of labour in Zimbabwe. (See Table No.2).

4. Women in Zimbabwe contribute immensely to the economy. As communal farmers, they are responsible for the entire agricultural production in the absence of men. Since the advent of colonialism, the Zimbabwean society has been characterized by male rural to migration. Male migration has thus left women totally responsible for the subsistence of the family. With a growing market economy, women communal farmers have been pushed to producing not simply for consumption but for sale as well.

5. Most rural women are classified as housewives, unemployed or economically inactive when they are in subsistence agriculture, unpaid domestic work and is casual or seasonal wage labour in agriculture simultaneously or in varying combinations of these activities.

6. Women have comprised the bulk of the adult rural population, growing crops, weeding and harvesting them and processing them for marketing and domestic consumption. In addition to agricultural and domestic work, most rural women have to mind children and livestock in order to allow primary school age children to take advantage of the free primary

schooling on offer.

7. The women are taking part in seasonal, casual and temporary work in agriculture in order to supplement their meagre incomes in rural areas.

8. Table No.1 shows comparative women employment in different sectors of agriculture.

9. In the commercial farm areas, there is increased use of the labour of women and the numbers of permanent female employees have declined since 1979. Women in rural areas have access to rural markets for specified fees per month.

10. In some areas, rural women have organized self-help groups in order to make use of economies of scale in purchasing inputs and marketing agricultural produce. Then the Ministry of Community Development and Women's Affairs, local and foreign NGOs and community leaders in many parts of the country helped to encourage women to organize in groups to embark upon projects for income generation. Some of these projects were not sustainable since they were a response to available funds rather than felt but some of those which are based on communities of interest and common goals have survived. Many religious groups have formed co-operatives, savings clubs and revolving funds for procuring capital goods and equipment for agriculture and small scale industry on a household basis. There are many individual women who are embarking on income generating and entrepreneurial activities in rural areas.

11. Women's access to land in rural areas is mediated through men, fathers and husbands. This makes for women's dependence on men at every stage of women's lives since women in the communal farming areas cannot have access to land in their own right. The categories of land in which women can own or use land directly in their own names, are in the commercial farming areas where land can be bought and held on a freehold basis. The land tenure system operates against the interest of women.

12. In the commercial farming areas where land is held on freehold, there are very few women who can afford to buy land in their own right. Most

of the rural women on these farms are wives, sisters, daughters, kin or labourers of the male farm owners who hold titles to the commercial farmland.

13. Rural women still experience problems in the marketing of produce since the authority structures in households dictate that the marketing be carried out in the name of men. The loans are procured in the names of men who own cattle and other capital goods. The cheques are then issued in the names of the men who are usually the holders of marketing board cards and the official loan receipts. Generally, communal and resettlement farmers get less than 30% of the loan sums available to farmers while the bulk of loan funds are utilized by the commercial farmers. A small proportion of the women farmers have managed to get marketing cards to sell their produce. These are usually women with master farming certificates or those who have the skills and can afford the inputs which allow them to realize surpluses after their consumption needs are met.

14. The precarious incomes of poor rural women, some of whom head households, make it difficult for most of the poor women to live with dignity in their communities.

15. The situations of rural women obviously differ by social stratum but it is quite clear that the concentration of services in urban areas does disadvantage rural women particularly the ones from poor households since they have low incomes and no direct access to land and they pay relatively higher prices than their urban counterparts for purchased goods.

16. There is still a lot of room for initiatives by Government and other organizations to tackle the issue of the low incomes of rural women, their inability to access the means of production directly and the absence of well paid employment, and valued services for most of them.

The women of Zimbabwe have historically played key roles in the Zimbabwean economy as contributors to their society and as caretakers of the family. They continue to be involved in a wide spectrum of activities such as

subsistence and cash crop farming trades and services in addition to their numerous household obligations. Zimbabwean women are starting to get acknowledged as the ones who predominantly produce food crops. In spite of their significant roles in agriculture, there are certain constraints which have to be rectified to smoothed their progress.

Industries that most attract female employment are food processing related.

THE SITUATION OF RURAL WOMEN

Zimbabwe's agriculture is distinctly divided into two groups, the commercial and communal farming. Commercial farming which occupies 50% of arable land accounts for the bulk of cash crops and livestock produce and contributes to a great share of formal employment in the farming sector. It is characterized by large scale modern farms producing such crops as beef, tobacco, cotton etc. Communal farming on the other hand, occupies 74% of the poorer ecological zones with poor soil and poor rainfall.

The majority, over 70% of the population and women in particular are crowded in these communal areas producing mainly the stable food crops including maize, sorghum, groundnut and millet.

TRADITIONAL PROCESSING OF CROPS

Women in rural areas continue to play an important role in processing of the food products consumed and to a great degree are involved in the primary processing of cash crops.

FACTORS HINDERING AND/OR FACILITATING WOMEN'S PARTICIPATION IN AGRICULTURE

The Government of Zimbabwe has, since independence, created a positive environment towards increasing women's active participation in all aspects of the country's development. It has enacted various legislation connected with the eradication of discriminatory tendencies between different sexes. Such acts includes Sex-disqualification Removal Act, Minimum Wage Act and Industrial Constitution Amendment Act.

Traditional and cultural attitudes that are harboured by both men and women towards women's need for work outside home still undermines their full participation in industries, offices etc. and hence they have more scope to work in communal farms etc.

Education is one key element that opens avenues for fruitful employment, and this is one area where historically women in Zimbabwe particularly black women were neglected. The historical gender imbalances have been responsible for keeping many women out of the better ranks in the modern work fields.

Since independence, the Government has increased its efforts to ensure equal educational opportunities to all its citizens by introducing free not compulsory education to all.

The Legal Age of Majority Act 1982 among other things enables women to own property in their own rights, sue and be sued as individual and provides freedom from parental control at the age of eighteen. The Matrimony Causes Act of 1985 attempts to eradicate injustices inherent in the customary laws particularly property distribution in case of divorce. The Minimum Wage Act instituted minimum wages for unskilled workers of which women are the great majority. Maternity leave regulations allow women 90 days maternity leave without loosing their jobs.

There is an increased awareness not only globally or regionally but also on a national level on the need to involve women who form the majority of the population in agriculture into activities related to agro-industrial production, marketing and distribution. Knowing that agro-industries are key

industries in the economy and that women have traditionally and presently continue to play a key role in agriculture in rural areas increasing their participation will ensure increased production and incomes.

Women's central role in the economy is that of producer and household manger, but it remains a truism that although they do most of the work they do not have the same automatic access to land (the means of production) as men and they own fewer assets (livestock, tools and goods) than men. Other structural constraints to enhancing the economic and social status of women include:

1. Poor access to information.
2. Low levels of education.
3. Male driven agricultural extension services which tend to only recognize men as decision makers in agriculture.
4. Absence of appropriate agricultural technology, for example lighter weight ploughs for women and weed control systems.
5. Absence of non-farm sources of cash able to realize a reasonable cash income. This reflects a lack of local economy (informal trading, small businesses etc.) for women to participate in.
6. Few sources of credit.
7. The high-jacking of campfire by wildlife conservation interests - hunting is traditionally the territory of men. Wild food collection is traditionally the territory of women and were campfire to broaden its scope to include the commercial use of trees, plants etc. this could promote women's economic interests.

The only access women have to cash is from brewing, selling vegetables and chickens. These amount to a small but regular income which the woman has control of. Larger marketable assets are controlled by men who also have access to fishing and employment, off-farm income. The sale of goats, brewing and a cash income are important sources of lump sum income for the household, especially in grain deficit periods.

ASSESSMENT OF CULTURAL ACCEPTANCE OF NEW, IMPROVED TECHNOLOGY IN RURAL COMMUNITIES

Nationwide land husbandry has been accepted and this is evidenced by mass introduction of contour and ridges in all communal farmlands around forty years ago.

Second aspect, since some time, there has been a modern communal farmer through competition of the master farmer plan.

Thirdly, wide acceptance of demand for extension officers in the agricultural field and government has responded to this by creating a division of Extension Services under the Ministry of Agriculture called Agritex.

There is basically a new and modern culture in farming methods that has developed in the last fifty years and it has been backed by every government during that time.

The impact of the drought draws attention to the economic role of women as farmers and the need to strengthen this role if their well-being is to be improved. Crop failure throughout the country was 92% in 1991/92 and over 50% of farmers are women. Women need to be a focal point in the delivery of agricultural extension advice and input.

Below is a list of strategies women farmers are pursuing or envisage would help them increase food production or improve food security:

1. Acquisition of draft power and ploughs to increase the area under cultivation.
2. Gardens at wells and dams to grow vegetables.
3. Field crops - ground nuts, bambara nuts, fruit trees.
   - cash crops, cotton and sunflower.
   - high yielding short maturing varieties.
4. Pest control measures.
5. Solar powered electric fences around arable land.
6. Education for children to acquire jobs and to support parents.
7. Employment for a cash income.

8. Increased brewing - to give women a cash income.
9. Income generating projects/small businesses for women for a cash income.

With respect to agriculture production the trend is towards increasing the area under production. Agritex estimate that cropped hectarage has increased for the 1992/93 season, especially that of maize because of the amount of free maize seed distributed by Agritex. Unfortunately increasing cropped area increases labour demands, especially for weeding. Intensifying production (for example using the techniques of low input agriculture) would be more labour saving, and it makes sense because most household are dependent on hoe cultivation.

Table No.1

WOMEN'S EMPLOYMENT IN DIFFERENT SECTORS OF AGRICULTURE

		1988	1989	1990
Small scale commercial farms	<16	27 085	26 082	25 251
	>16	104 624	95 406	88 513
Permanent		2 840	865	606
Casual		13 304	9 826	7 014
Resettlement schemes	<16	88 483	88 350	99 588
	>16	246 411	247 454	287 762
Permanent		153	529	212
Casual		2 593	1 844	4 092
Irrigation schemes Excluding A D A	<16	14 800	16 303	16 055
	>16	44 288	51 193	62 325
Permanent		523	593	236
Casual		651	1 029	1 305

WOMEN'S ORGANIZATIONS IN ZIMBABWE

It is only in the women's organizations and those that deal with charity and welfare that women predominate. These tend to be voluntary and non-governmental organizations with only an indirect effect on Government policy making organs. Within government, women tend to be concentrated in the clerical and secretarial positions so that their impact on planning and policy making is mutual. This leads to the marked absence of women at the policy making levels in government and in the private sector in Zimbabwe. Most of the input from women comes via the non-governmental organizations in which women predominate in membership and activity.

There are over 200 non-governmental organizations that focus on and campaign for the rights of women in Zimbabwe. Different organizations use different approaches. Some are welfarist in their approach concentrating more on the provision of income generating opportunities and thus the raising of women's economic status as a prelude to their emancipation. Yet another group believes in the empowerment of women through strategies that link law and development. Most are aimed at the very poorest of women, particularly those in the rural areas.

The Government of Zimbabwe also has organs whose sole responsibility is to look into issue pertaining to women. The Ministry of Community Development and Women's Affairs was established in 1981 to look into women's specific problems and raising of women's economic, cultural and social status. Now a department in the President's Office, it remains the primary government organ looking at women's problems in Zimbabwe. Other statutory bodies such as the Ombudsman's Office look at people's general grievances including those of women.

Following is the list of some important and major women's organizations in Zimbabwe:

WOMEN'S ORGANIZATIONS

Federation of Africa Media Women
Zimbabwean Women in Contemporary Culture Trust
Zimbabwe Women's Resource Centre and Network
Zimbabwe Women Writers
Associations of Women's Clubs
National Association of Non-Governmental Organizations
United Nations Development Fund for Women
Women's Action Group
Women and Law in Southern Africa Research Project
Zimbabwe Women's Bureau
Catholic Women's Club (Zimbabwe)
Gatehouse Training and Rehabilitation Centre
Women's Affairs Department (in the Ministry of National Affairs)
Gracious Women's Fellowship International
Hellenic Ladies Association
Home League for Women: Salvation Army
Kuyedza Women's Club
National Council of Negro Women/Southern Africa Regional Office
National Federation of Women's Institute in Zimbabwe
Young Women's Christian Association
Zimbabwe Annual Conference of the United Methodist Ministry to Women
Archdiocesan Christian Communities Spiritual & Pastoral Centre
National Training Centre for Rural Women
Women's Leadership Development Programme Ranche House College
Women's Desk & Coordinator of Women's Projects of Zimbabwe Congress of TU
Women's Training & Development Programme of Zimbabwe Council of Churches
Union of Jewish Women
Women's Voluntary Services of Zimbabwe
Zimbabwe Women's Finance Trust
Family Counselling Unit
Musasa Project for Women
Women and AIDS Support Network
Women Law and Development in Africa
National Federation of Business Professional Women of Zimbabwe
Women's Forum & Women's Studies Association

WOMEN'S GROUPS IN ZIMBABWE

Women's groups have been instrumental in leading and stimulating the debates about social change and the stereotyping of men and women. These debates have been useful in as far as they have revealed different ways in which men and women of different classes, ages and races perceive the changes taking place in post-independence Zimbabwe.

With regard to occupations and jobs, there is still a traditional division of work with women bunching in the more traditional service occupations such as teaching and nursing which men are still more likely than women to go into construction, banking, scientific and technical work. Table 2 below shows the distribution of men and women in the different economic sectors in Zimbabwe as of 1987. In general, there is not much of a departure from the sexual divisions of labour that prevailed by gender in 1980 at independence. Boys and girls are still expected to perform sex-differentiated tasks with girls doing domestic chores, child-minding and helping with agricultural work with boys performing livestock tending and helping with ploughing.

Table No.2

DISTRIBUTION OF MEN AND WOMEN IN THE DIFFERENT ECONOMIC SECTORS

Occupation	Total No.	% Females	Distrib. Total
Professional, technical and related worker	140,102	38,8	4,6
Administrative and managerial works	25,499	13,9	0,8
Clerical and related workers	112,006	27,0	3,7
Sales workers	86,962	43,8	2,9
Service workers	232,511	29,9	7,7
Agric., animal husbandry & forestry workers	2,083,876	56,2	68,9
Production and related workers	301,055	16,2	9,9
Workers not classified	43,864	43,3	1,4
TOTAL	3,025,875	47,4	100,0

Thus, the law of Zimbabwe does not bar women from performing any kind of work and does not allow discrimination against women at work places.

The following section shows the division of labour and responsibilities in farm work as well as in house work in rural communities.

DIVISION OF LABOUR AND RESPONSIBILITIES

Task	Division of Labour	Tools
Farm work 1. Land clearing	Men and women responsible for respective fields.	Axes
2. Hoeing and planting	Men and women responsible for respective fields. But wives assist their husbands in their fields 3-4 days/week.	Hoes
3. Ploughing	Usually done by men, men may plough their wives fields. A few women plough.	Plough
4. Inputs are purchased by men for both fields.		
5. Weeding	As for hoeing and planting.	Hoes
6. Harvesting	Women on both their own fields and men's fields.	Knives Hoes
7. Threshing shelling	Women thresh and shell grain from both fields.	Hands
8. Winnowing	Women on both fields.	Baskets
9. Stover collection	Women collect millet and sorghum stover from both fields to construct bathing rooms and fences.	Heads
10. Gardens	Men and women responsible for respective gardens.	Hoes
11. Herding	Women and children	
Housework 12. Domestic work	Women and children.	
13. Fetching water and firewood	Women and children.	Buckets Heads
14. Child care	Women and children.	
15. Hut and granary construction	Men and women are responsible for collecting grass and poles for construction. Men put on roofs. Women smear mud.	
Other sources of food and cash 16. Wild foods	Collection - mainly women. Men hunt.	Axes, hoes. Spears

17. Fishing	Men.	Dug out boats,nets
18. Livestock	Men and women have control over sales of their respective herds.	
19. Off-farm labour	Men.	
20. Food for work	Mostly women.	
21. Income control	Men and women have control over the use of their respective granaries. Men control cash crop income.	

TRAINING NEEDS OF THE WOMEN ORGANIZATIONS

The education system of Zimbabwe still bears the mark of the colonial part when blacks were discriminated against in terms of quality and expenditure on pupils, schools and staff. It was only in 1980 that education system was unified by race although the class-based differences in schools persist.

The duration of primary schooling is 7 years and in secondary school, students can attend up to six years in order attain an 'A' level certificate. It is possible to terminate studies after four years of secondary schooling at which point a student can obtain 'O' level certification if they are successful in the examinations. It is also possible for students to attend secondary school for only two years and obtain a Zimbabwe Junior Certificate. However, because of the inflation of educational qualifications necessary for entry into any professional vocational or technical course, the ZJC is increasingly becoming redundant as an educational qualification. Most training programmes admit students with good 'O' and 'A' level qualifications.

University enrolment for degree study normally requires at least two 'A' level passes but the inflation in education qualification which has resulted from pressure on two few places by too many qualified students has necessitated achievement at very high level in 'A' levels if a student is to be admitted for degree study. There are programmes for non-formal education for those people who might not be literate, for those desiring new skills without professional certification and for those people who cannot manage to fit into or attend the formal education programmes in various institutions.

In order to equalize access to education by race, class and gender, the Government of Zimbabwe introduced free compulsory primary schooling for all children. In practice, the pupils were expected to pay levies for maintaining schools and they had to buy uniforms since all schools insist that children wear uniforms. In addition to levies and general purpose funds, the colonially based differences in the quality of school laboratories, classrooms and staff persisted and had several impacts on students and their types and levels of achievement.

Table No.3

THE PERCENTAGE ENROLMENT IN PRIMARY SCHOOL
BY SEX 1981-1989

Year	% of Women	% of Men	Total Figures
1981	47.9	52.1	1,715,000
1982	48.0	52.0	1,907,000
1983	48.1	51.9	2,044,000
1984	48.3	51.7	2,132,000
1985	48.5	51.5	2,216,000
1986	48.8	51.2	2,265,000
1987	49.1	50.9	2,251,300
1988	49.2	50.8	2,212,100
1989	49.5	50.5	2,233,300

Table 3 shows the enrolment in primary school by sex between 1981 and 1989. Primary school enrolment rose between 1979 and 1989 with a 161% increase in numbers of male pupils and a 195% increase in the numbers of male pupils. By 1989, there were equal numbers of male and female pupils in primary school.

It is important to examine the pass rates of girls and boys at secondary school in order to understand the process of female under representation at most levels of education system. In 1986 and 1987, 7% of the female candidates obtained a full certificate at 'O' level, that is passing five or more subjects whereas 15% of the male candidates obtained a full certificate. Generally, girls do not perform as well as boys in the sciences and in mathematics. However, the few girls who attempted sciences outperformed boys in these subjects so it is important to find out what subject specific issues determine performance on basis of gender. Girls also perfoimed better than boys in vernacular languages.

In university and tertiary education, the proportions of women in the total enrolment are even smaller than ones in secondary school. In tertiary education, enrolment increased right-fold between 1980 and 1990 with about 48% of the students enrolled in the technical areas.

Table 4 shows women's enrolment in teacher, university and technical education. It must be noted that the classification 'technical' includes

typing and secretarial training and this gives an inaccurate picture of the actual numbers of pupils in the 'hard' areas. In agricultural training, women comprise 33% of the trainees while in other areas, the percentages of women are much lower.

Table 5 shows the enrolment of women in the engineering fields in technical colleges in 1989 to 1992. This table gives a more accurate picture of the enrolment of women in the scientific and technical areas in technical colleges.

In university education, total enrolment rose from 1,481 in 1979 to 9,000 in 1991. Most of the student are enrolled in non-technical areas such as arts education and social studies. The male to female ratio is 4:1 at the universities.

Table 6 shows female enrolment by faculty at the University of Zimbabwe between 1989 and 1992.

Tables 7 and 8 shows the classification of undergraduate degrees by gender and faculty in 1986 and 1987. It is from the ranks of new graduates that the employers select employees for staffing managerial and academic posts. At post graduate level, for the two years that were examined, the ratio of men to women was 5:1 but women continued to perform better than men with the proportion of women passing with merit at 17.6% compared to 12.5% by men. The percentage of males who fail/referred was 19.4% compared to 17.5% for females.

In the field of agriculture there is a good network provided by the government for training of communal and rural women. This is generally done through Agriculture Extension Services like Agritex etc.

The Extension Service basically runs its own groups in the communal areas. Training is centred in these groups as well as master farmer groups.

In most rural groups women have received training in all the components of agriculture. They have a good understanding of group work and are motivated and ready to work with any team or farm etc.

Possible training for rural women includes small scale farming groups,fishing, animal husbandry, poultry farming etc. Due to availability of Extension Service like Agritex, women in rural areas are practically trained in all above fields and are engaged gainfully, either individually, in groups and as co-operatives.

CONCLUSIONS

Women in Zimbabwe have since independence made great strides in reversing the pre-independence negative policies of restrictions and subordinations that have kept them in poverty and from joining the main stream of development. Historical marks like educational depravation and denial of proper infrastructures cannot be quickly erased and have to a great degree contributed to the women's conspicuously low participation in agriculture. Thus, although agriculture form a significant share of GDP and account for a high proportion of national employment, women who constitute the majority of the population accounted for only 50%.

Most women in agriculture are of low skilled and unskilled, and are engaged in rural communal and commercial farms.

Positive government policies towards women's increased involvement have resulted in a number of legislation to remove discriminatory laws. These laws limited women's participation in employment but many factors notably traditional, cultural attitudes as well as economic factors still impede women's full realization of these efforts. Consequently women fail to actively participate in labour union activities and particularly to compete for leadership roles that would give them more say and influence in the decisions. Many women still live in rural areas where poor infrastructural facilities keep them away from effective participation in agro-industries. Though extension services have been provided, some of the criteria used for benefitting these have kept many women away from utilizing them.

The informal sector seems to provide an easy outlet for t he majority of women both in rural and urban areas where there is relative ease of entry and women's problems of dual roles are accommodated. However, there efforts have tended to be marginal for lack of direction, sufficient training, poor physical infrastructure and insufficient funds.

In face of relatively decreasing opportunities for women in urban modern sector industries and continued abundance of women in rural areas, increased rural agriculture and agro industries seem to be the logical direction for achieving increased women's participation in agriculture and agro industries.

The women need to be able to process their products using more modern technologies and thereby release and realize the benefits from agro industrialization.

The following recommendations encompass three means of improving women's incomes:

1. Improving agricultural production.
2. Natural resource utilization in communal and rural areas.
3. Promoting small businesses based on agriculture and processing.

Most of the recommendations are addressed to all agencies interested in promoting the women's economy and their family welfare. They do not constitute a package and no reference is made to how these recommendations could be implemented. They are needs and suggestions which arise out of the above work.

RECOMMENDATIONS

1. It is recommended that all agencies in the country try to integrate their activities to focus on improving women's role in agriculture.

2. At least one NGO adopts an agricultural focus to work towards improving agro-industrial need with government agencies and departments involving women.

3. Government should facilitate small-medium size food industries around communal and commercial farms for helping rural, communal women farmers and cooperatives.

4. Government should create food processing centres and create relevant infrastructure within rural reach.

5. Training centres should also open in the progressive agricultural areas to train the women in the respective technology.

6. That suitable and possible financial backing should be given to new women entrepreneurs.

7. That small agri-food businesses must be protected to improve the economic resource base of women.

8. There must be a constant review and control as to feasibility of these projects and their marketability.

9. To adopt alternative means of women employment like food processing units where maximum employees are women.

10. To create a balance between agriculture and industries in rural areas for proper distribution of profits within specified sector.

MAIN REFERENCES

1. Zimbabwe in Maps, Central Statistical Office.

2. Crops Production on Large Scale Commercial Farm 1989, Central Statistical Office.

3. The Role of Women in Agro-Industries in Four Eastern and Southern Africa Countries, (UNEC for Africa).

4. The Convention in the Elimination of all forms of Discrimination Against Women.

5. Rural Development Demonstration Project for Women.

6. Resources for Women in Zimbabwe and Directory.

TABLE NO.4
Women Participation in Higher Education

	Teacher Education			University Education			Technical Education		
Year	Female	Total	%	Female	Total	%	Female	Toyal	%
79	1,587	3,082	51.49	508	1,941	26.17			
80	1,528	2,829	54.01	494	2,240	22.05			
81	1,726	3,610	47.81	569	2,525	22.53	DATA FOR THESE YEARS		
82	2,142	4,873	43.96	680	3,091	22.0	ARE NOT AVAILABLE		
83	2,646	6,502	40.7	805	3,620	22.24			
84	3,177	7,734	41.08	933	4,131	22.59			
85	2,496	5,513	45.27	1,110	4,742	23.41			
86	3,607	8,649	41.70	1,400	5,886	23.79			
87	5,455	14,450	37.75	1,676	6,873	24.39			
88	7,003	16,167	43.32	1,930	7,699	25.07			
89	6,713	16,231	41.36	2,235	9,288	24.06	3595	9385	38.31
90	7,032	16,179	43.46	2,194	9,017	24.33	2660	10664	24.94
91	6,037	13,492	44.75	2,140	8,635	24.78	3717	12684	29.30
92	6,377	14,069	45.33	2,135	8,456	25.25	3277	11846	27.66
TOTAL	*57,526*	*133,380*	*44.43*	*18,809*	*78,144*	*23.75*	*13,249*	*44,579*	*30.05*

TABLE NO.5
Proportion of Women Enrollment in Engineering Fields in Technical Colleges

Year	AUTOMOTIVE				MECHANICAL			
	Female	Male	Total	Female %	Female	Male	Total	Female%
1989	12	484	496	2.42	9	425	434	2.07
1990	16	802	818	1.96	33	517	550	6.00
1991	11	682	693	1.59	16	524	540	2.96
1992	17	895	912	1.86	28	1,237	1,265	2.21
TOTAL	*56*	*2,863*	*2,919*	*1.96*	*86*	*2,702*	*2,789*	*3.08*

YEAR	ELECTRICAL				CIVIL			
	Female	Male	Total	Female%	Female	Male	Total	Female%
1989	24	274	298	8.05	15	333	348	4.31
1990	32	671	703	4.55	13	747	760	1.71
1991	21	269	290	7.24	25	230	255	9.80
1992	57	901	958	5.95	52	313	365	14.25
TOTAL	*134*	*2,115*	*2,249*	*6.45*	*105*	*1,623*	*1,728*	*7.52*

TABLE NO.6

Female Enrolments at University by Faculty

	1989				1990				1991				1992			
Faculty	**Male**	**Female**	**Total**	**Female%**	**Male**	**Female**	**Total**	**Female%**	**Male**	**Female**	**Total**	**Female%**	**Male**	**Female**	**Total**	**Female%**
Agriculture	308	53	361	14.68	296	56	352	15.91	278	61	339	17.99	310	76	386	20.10
Arts	681	419	1,100	38.09	812	493	1,305	37.76	694	486	1,180	41.19	867	464	1,331	34.86
Commerce	608	180	788	22.84	633	198	831	23.83	569	486	762	25.33	734	278	1,012	27.47
Education	239	55	294	18.71	535	179	714	25.07	253	165	418	39.47	569	214	783	27.33
Engineering	632	9	641	1.4	660	17	677	2.51	660	14	674	2.08	942	27	969	2.79
Law	223	102	325	31.36	227	112	339	33.04	238	119	357	33.33	217	99	316	31.33
Medicine	373	141	514	27.43	502	217	719	30.18	519	233	752	30.98	568	274	842	32.54
Science	603	132	735	17.96	619	129	748	17.25	592	131	723	18.12	708	184	892	20.63
Social Studies	1,101	412	1,513	27.23	1,316	528	1,844	28.63	1,236	534	1,772	30.14	1,175	539	1,714	31.45
Vet. Science	105	18	123	14.63	120	15	135	11.11	125	19	144	13.19	120	18	138	13.04
B. Tech	950	209	1,159	18.03	1,103	250	1,353	18.48	859	185	1,044	17.72				
TOTAL	5,823	1,730	7,553	22.90	6,823	2,194	9,017	24.33	6,025	2,140	8,165	26.21	6,210	2,175	8,385	25.94

TABLE NO.7

Classification of undergraduate degrees by gender:1986 and 1987.

ALL FACULTIES

Undergraduate Degree	GENDER				TOTAL	
Classification	MALE		FEMALE			
	N	%	N	%	N	%
1	19	1,0	4	0,6	23	0,9
2.1	335	17,1	123	18,1	458	17,4
2.2	1010	51,6	377	55,5	1387	52,6
3	381	19,5	118	17,4	499	18,9
Fail	211	10,8	57	8,4	268	10,2
Total	1956	100,0	679	100,0	2365	100,0

N.B. Fail also includes referred students

Chi-square = 1,636 df =4 P = .76

TABLE NO.8

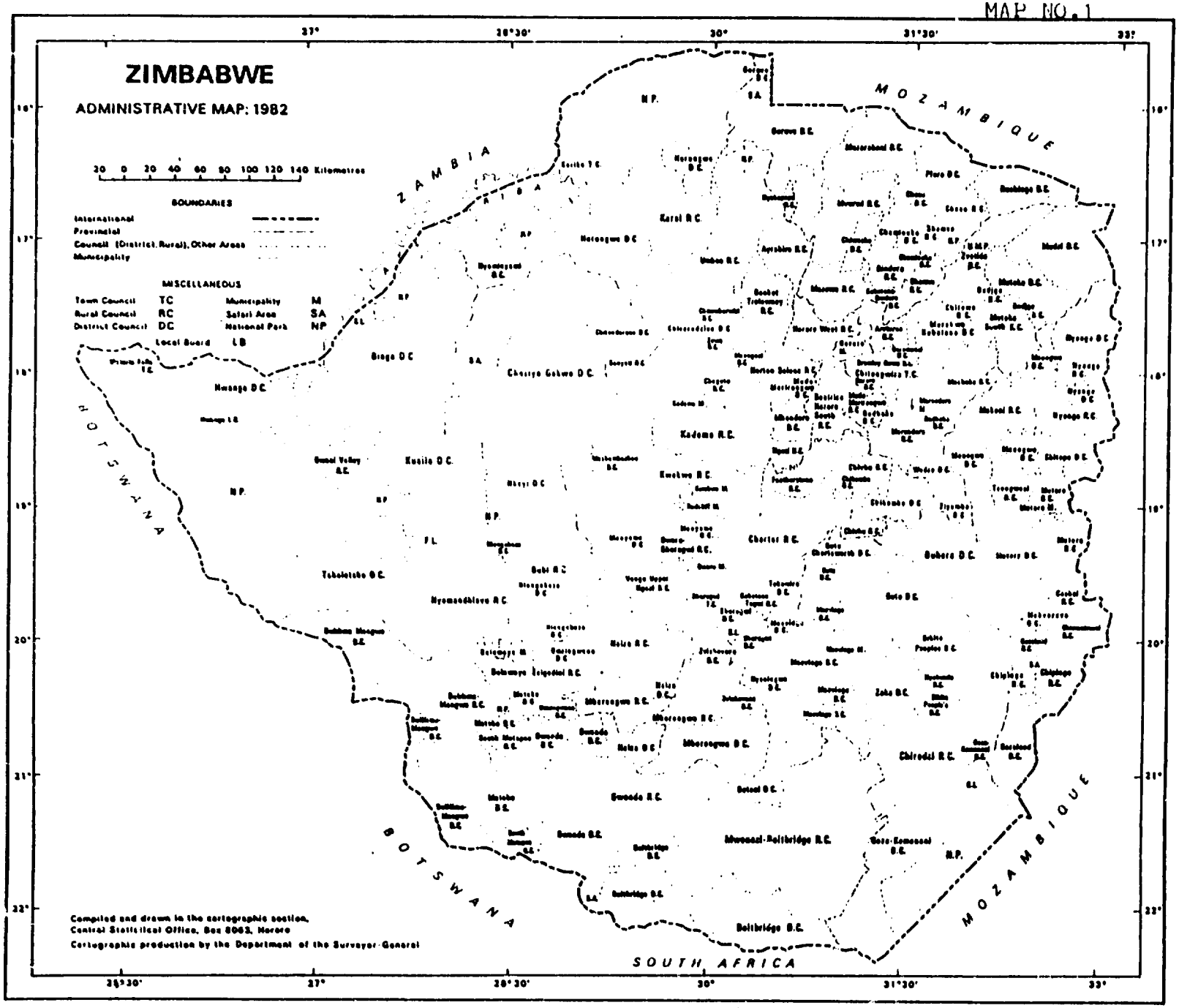
Undergraduate degree classification (2.1 or better) by gender and faculty 1986-1987.

FACULTY	% MALE	% FEMALE
Agriculture	30,5	44,4
Arts	27,5	21,5
Commerce and Law	24,4	25,9
Education	7,6	10,8
Engineering	21,9	33,3
Medicine	4,7	2,5
Science	12,3	28,9
Social Studies	15,4	11,7
Veterinary Science	16,6	0,0

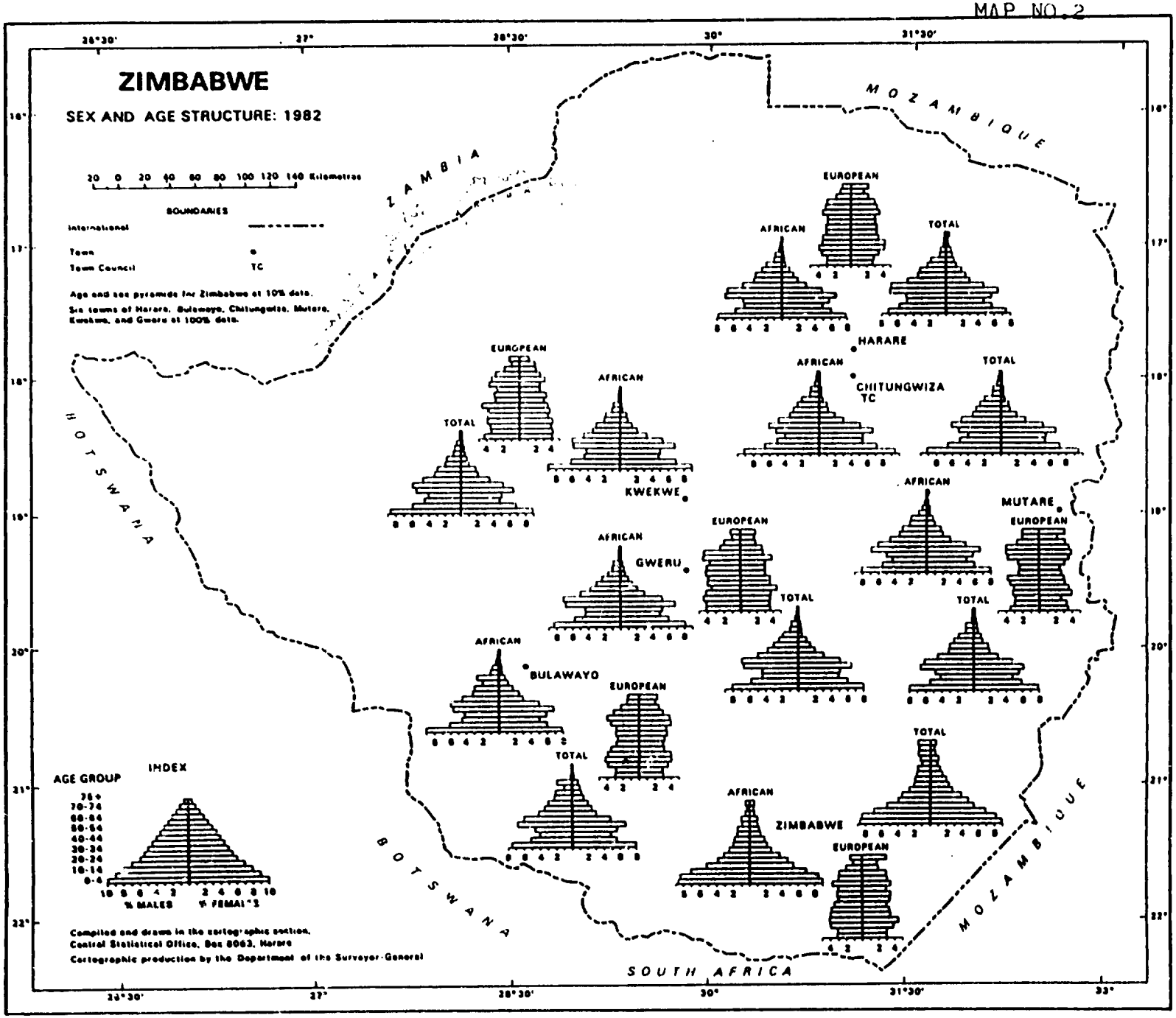
Table 9 - Permanent employees: Classified by wages and by Province as at June 30, 1989

Cash wages paid		Manicaland	Mashonaland West	Mashonaland East	Mashonaland Central	Matabeleland North	Matabeleland South	Midlands	Masvingo	Total
Under $50	Farm count	12	9	16	7	*	6	*	*	56
	Total number of persons	98	20	38	17	15	26	19	2	235
$50 and under $55	Farm count	9	15	12	5	*	6	*	*	52
	Total number of persons	47	27	32	8	1	8	8	8	139
$55 and under $60	Farm count	10	21	9	12	*	-	4	*	60
	Total number of persons	52	50	14	34	3	-	11	1	165
$60 and under $75	Farm count	25	50	37	36	19	15	26	7	215
	Total number of persons	165	274	89	135	58	27	57	83	888
$75 and under $100	Farm count	83	205	155	93	57	40	86	28	747
	Total number of persons	872	2 722	1 647	788	313	203	440	237	7 228
$100 and under $150	Farm count	483	954	858	441	232	274	474	233	3 940
	Total number of persons	13 310	323 612	23 957	21 609	2 745	3 650	4 790	4 492	106 818
$150 and under $250	Farm count	205	461	404	276	77	84	98	106	1 709
	Total number of persons	4 175	2 000	2 795	1 711	374	345	524	11 575	23 499
$250 and under $500	Farm count	113	199	195	147	35	37	37	52	815
	Total number of persons	1 406	517	801	345	121	147	92	2 903	6 322
$500 and under $750	Farm count	43	84	83	43	16	22	16	22	329
	Total number of persons	235	136	250	80	80	39	49	305	1 169
$750 and under $1 100	Farm count	31	46	51	24	7	3	12	18	192
	Total number of persons	126	87	149	31	28	6	29	173	629
$1 000 and under $1 500	Farm count	23	28	62	24	8	10	6	20	181
	Total number of persons	75	63	149	41	16	11	12	182	549
$1 500 and over	Farm count	20	22	46	14	9	3	10	11	135
	Total number of persons	75	55	100	66	14	9	17	414	747
Total	Farm count	516	982	913	447	269	310	543	247	4 227
	Total number of persons	20 585	38 512	30 092	2 486	3 772	4 517	6 052	20 375	148 770

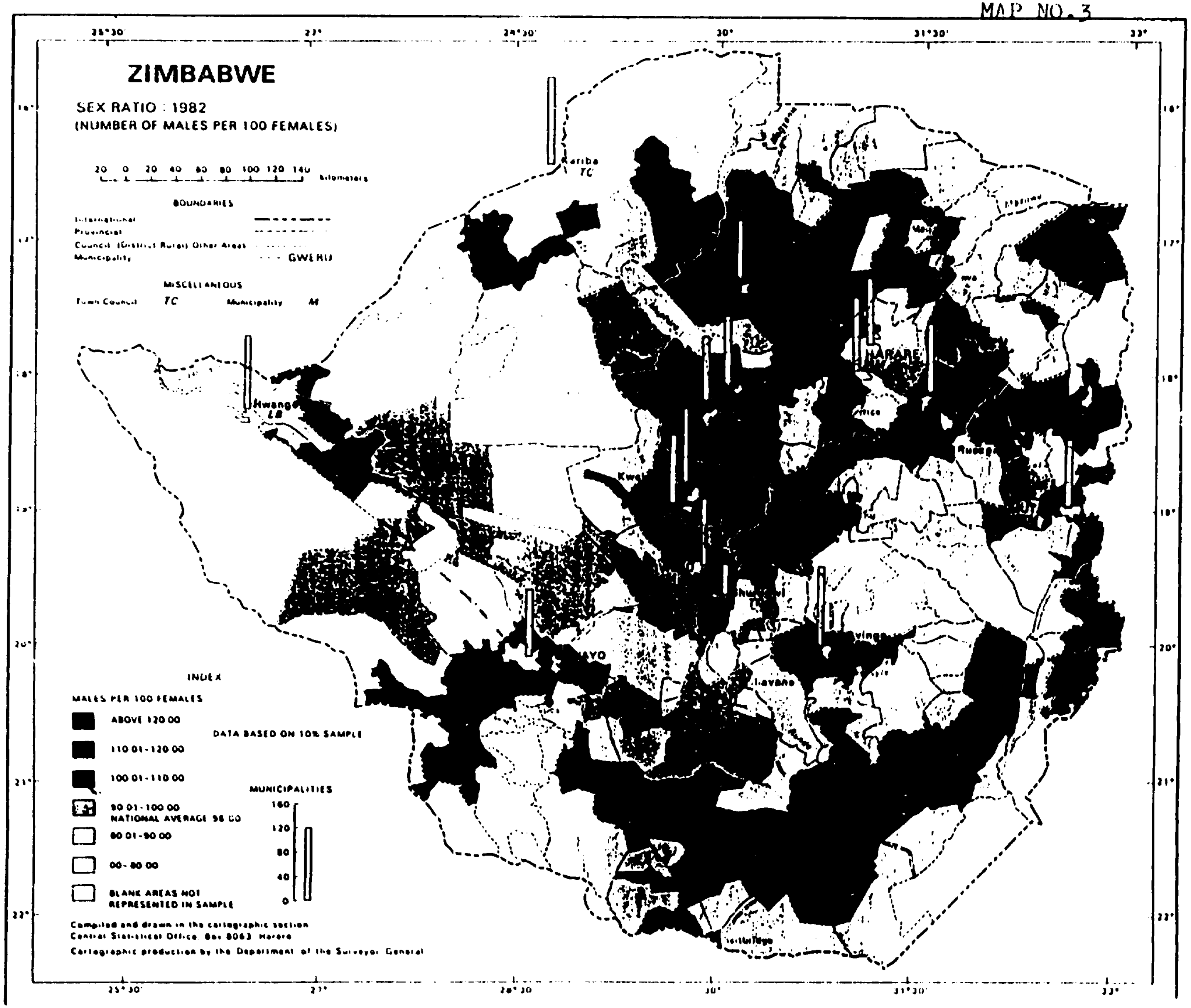
MAP NO. 1


ZIMBABWE
ADMINISTRATIVE MAP: 1982
20 0 20 40 60 80 100 120 140 Kilometres
BOUNDARIES
International
Provincial
Council (District, Rural), Other Areas
Municipality
MISCELLANEOUS
Town Council TC
Rural Council RC
District Council DC
Local Board LB
Municipality M
Safari Area SA
National Park NP
ZAMBIA
MOZAMBIQUE
BOTSWANA
SOUTH AFRICA
Compiled and drawn in the cartographic section,
Central Statistical Office, Box 8063, Harare
Cartographic production by the Department of the Surveyor-General

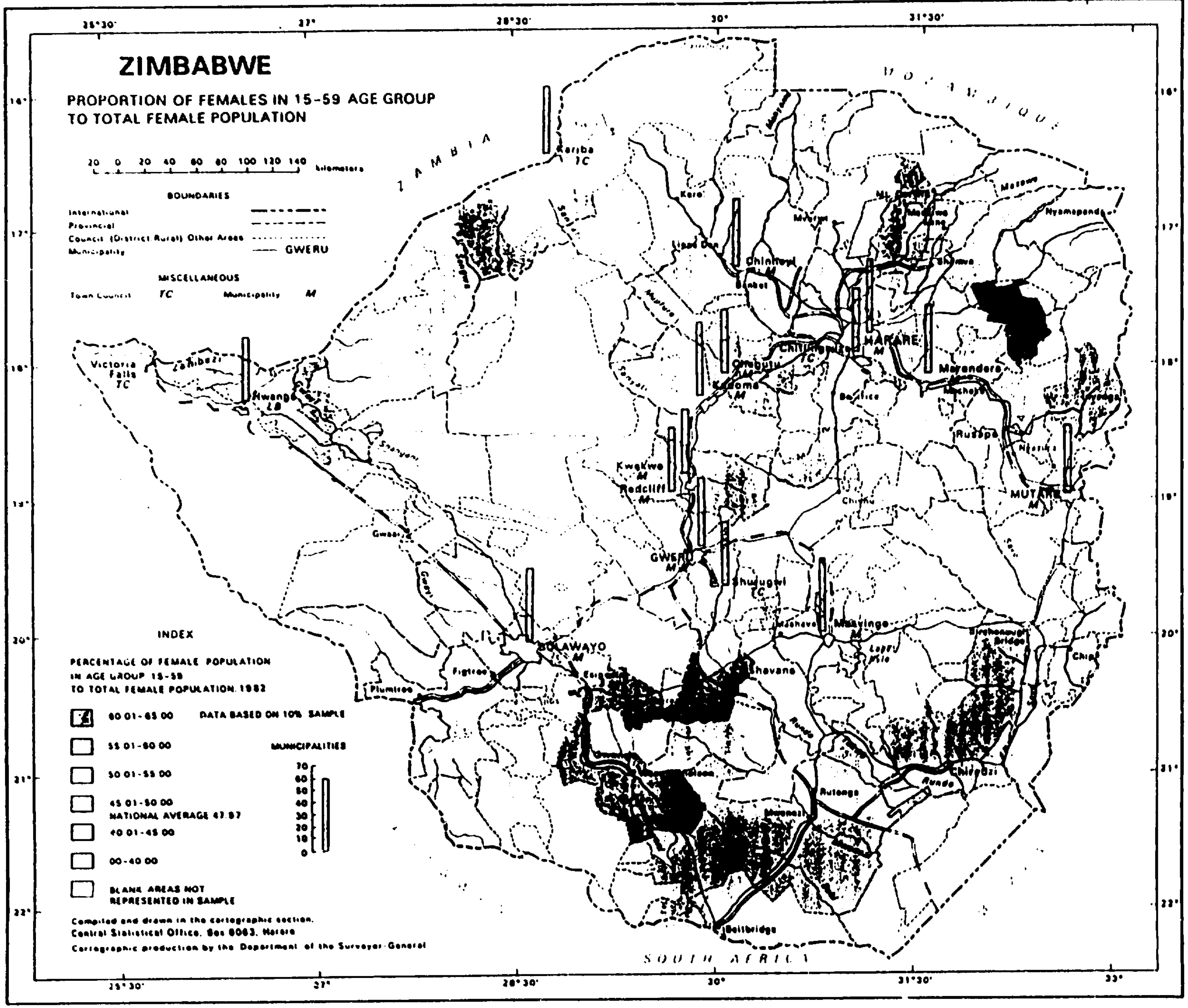
MAP NO. 2


ZIMBABWE
SEX AND AGE STRUCTURE: 1982
20 0 20 40 60 80 100 120 140 Kilometres
BOUNDARIES
International
Town
Town Council
TC
Age and sex pyramids for Zimbabwe at 10% data.
Six towns of Harare, Bulawayo, Chitungwiza, Mutare, Kwekwe, and Gweru at 100% data.
ZAMBIA
MOZAMBIQUE
BOTSWANA
SOUTH AFRICA
HARARE
CHITUNGWIZA TC
MUTARE
KWEKWE
GWERU
BULAWAYO
ZIMBABWE
EUROPEAN
AFRICAN
TOTAL
INDEX
AGE GROUP
75+
70-74
65-69
60-64
55-59
50-54
45-49
40-44
35-39
30-34
25-29
20-24
15-19
10-14
5-9
0-4
% MALES
% FEMALES
Compiled and drawn in the cartographic section,
Central Statistical Office, Box 8063, Harare
Cartographic production by the Department of the Surveyor-General

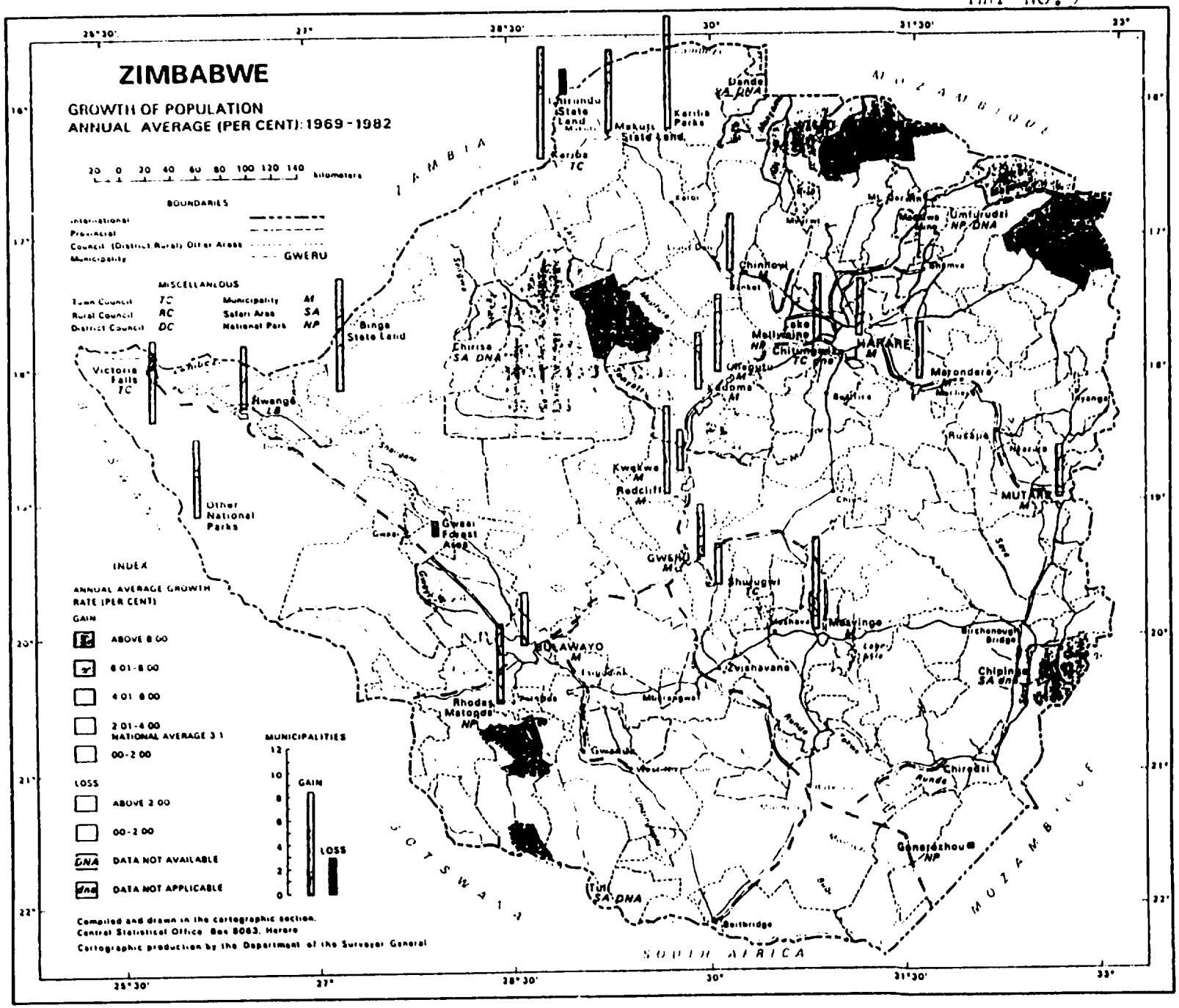
MAP NO. 3


ZIMBABWE
SEX RATIO : 1982
(NUMBER OF MALES PER 100 FEMALES)
20 0 20 40 60 80 100 120 140 kilometers
BOUNDARIES
International
Provincial
Council (District Rural) Other Areas
Municipality
GWERU
MISCELLANEOUS
Town Council TC
Municipality M
INDEX
MALES PER 100 FEMALES
ABOVE 120.00
110.01-120.00
100.01-110.00
90.01-100.00
NATIONAL AVERAGE 98.00
80.01-90.00
00-80.00
BLANK AREAS NOT REPRESENTED IN SAMPLE
DATA BASED ON 10% SAMPLE
MUNICIPALITIES
160
120
80
40
0
Compiled and drawn in the cartographic section
Central Statistical Office, Box 8063, Harare
Cartographic production by the Department of the Surveyor General
Kariba
TC
Hwange
HARARE
25°30'
27°
28°30'
30°
31°30'
33°
16°
17°
18°
19°
20°
21°
22°

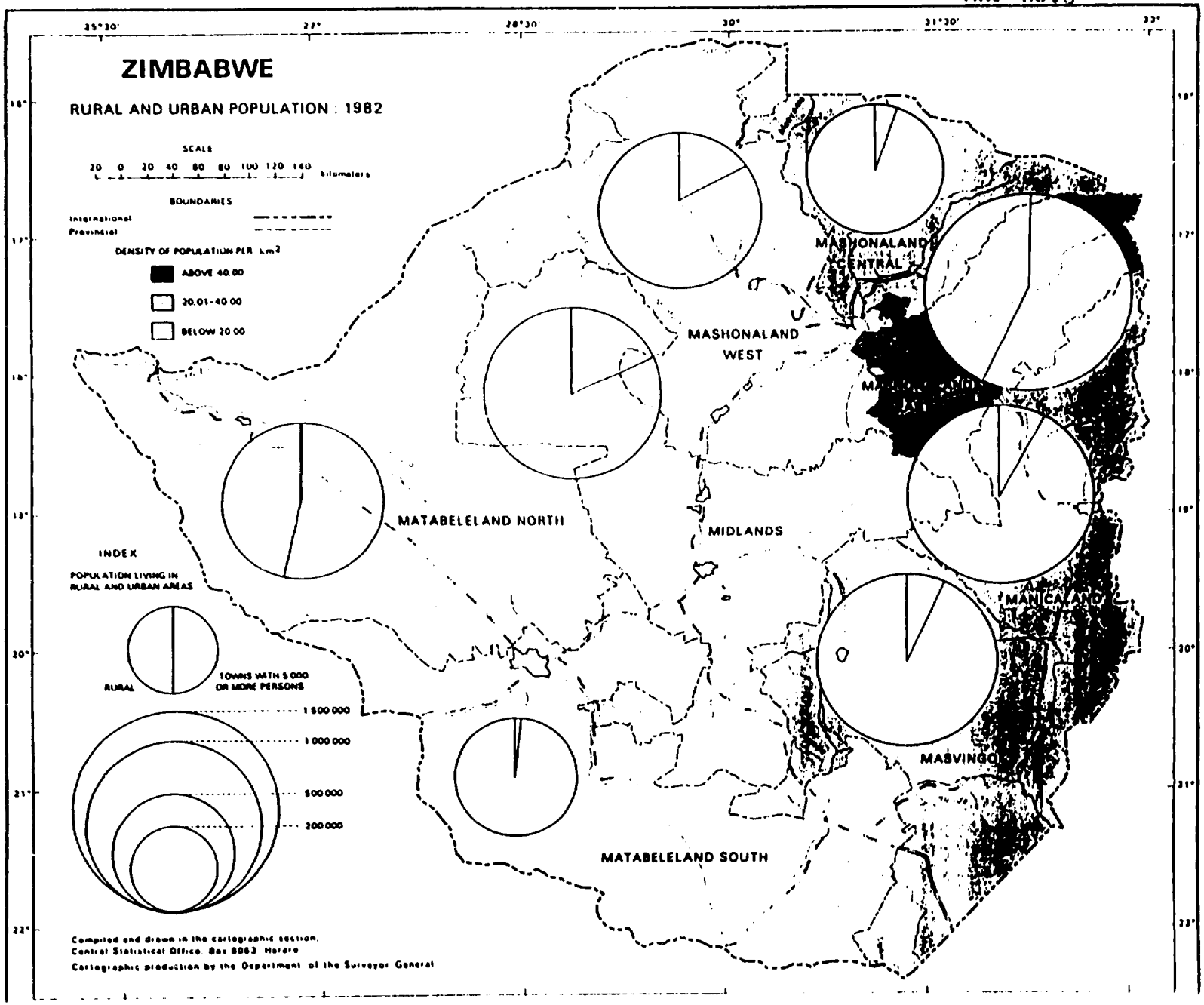
MAP NO.4


ZIMBABWE
PROPORTION OF FEMALES IN 15-59 AGE GROUP
TO TOTAL FEMALE POPULATION
20 0 20 40 60 80 100 120 140 kilometers
BOUNDARIES
International
Provincial
Council (District Rural) Other Areas
Municipality
GWERU
MISCELLANEOUS
Town Council TC
Municipality M
INDEX
PERCENTAGE OF FEMALE POPULATION IN AGE GROUP 15-59 TO TOTAL FEMALE POPULATION 1982
60 01-65 00
DATA BASED ON 10% SAMPLE
55 01-60 00
50 01-55 00
45 01-50 00
NATIONAL AVERAGE 47.97
40 01-45 00
00-40 00
BLANK AREAS NOT REPRESENTED IN SAMPLE
MUNICIPALITIES
70
60
50
40
30
20
10
0
Compiled and drawn in the cartographic section, Central Statistical Office, Box 8063, Harare
Cartographic production by the Department of the Surveyor-General
ZAMBIA
MOZAMBIQUE
SOUTH AFRICA
Kariba TC
Victoria Falls TC
Hwange LB
Chinhoyi M
HARARE M
Chitungwiza TC
Chegutu M
Kadoma M
Kwekwe M
Redcliff M
GWERU M
Shurugwi TC
Masvingo M
BULAWAYO M
MUTARE M
Marondera
Rusape
Beitbridge
Chiredzi
Shabani
Plumtree
Figtree
Nyamapanda
Zambezi
Gwaai
Birchenough Bridge
Chipinge
Rutenga
Runde
Chivhu
Karoi
Mvurwi
Shamva
Bindura
Lion's Den
Mazowe
Sanyati
Munyati
Shangani
Gweru
Lundi
Lupane
25°30'
27°
28°30'
30°
31°30'
33°
16°
17°
18°
19°
20°
21°
22°

MAP NO. 5


ZIMBABWE
GROWTH OF POPULATION
ANNUAL AVERAGE (PER CENT): 1969 - 1982
BOUNDARIES
MISCELLANEOUS
INDEX
ANNUAL AVERAGE GROWTH RATE (PER CENT)
GAIN
LOSS
MUNICIPALITIES
Compiled and drawn in the cartographic section, Central Statistical Office Box 8063, Harare
Cartographic production by the Department of the Surveyor General
ZAMBIA
MOZAMBIQUE
BOTSWANA
SOUTH AFRICA
HARARE
BULAWAYO
GWERU
MUTARE
Victoria Falls
Binga State Land
Other National Parks
Gwaai Forest Area
Rhodes Matopos NP
Chirisa SA DNA
Kwekwe
Redcliff
Shurugwi
Masvingo
Chipinge
Gonarezhou NP
Umfurudzi NP DNA
Lake Mcilwaine NP
Tuli SA DNA

MAP NO.6


ZIMBABWE
RURAL AND URBAN POPULATION : 1982
SCALE
20 0 20 40 60 80 100 120 140 kilometers
BOUNDARIES
International
Provincial
DENSITY OF POPULATION PER Km²
ABOVE 40.00
20.01-40.00
BELOW 20.00
INDEX
POPULATION LIVING IN RURAL AND URBAN AREAS
RURAL
TOWNS WITH 5 000 OR MORE PERSONS
1 500 000
1 000 000
500 000
200 000
MASHONALAND CENTRAL
MASHONALAND WEST
MATABELELAND NORTH
MIDLANDS
MANICALAND
MASVINGO
MATABELELAND SOUTH
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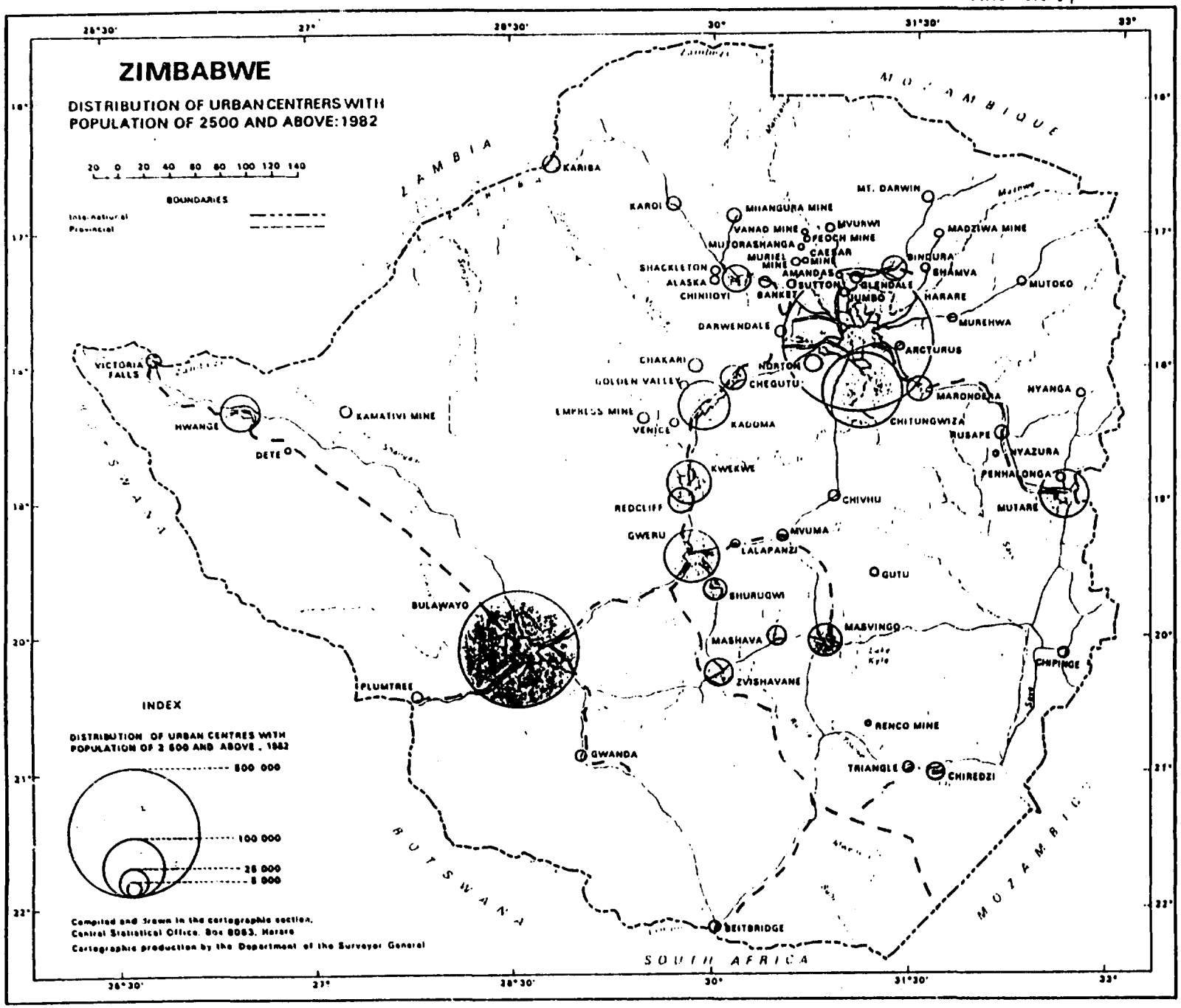
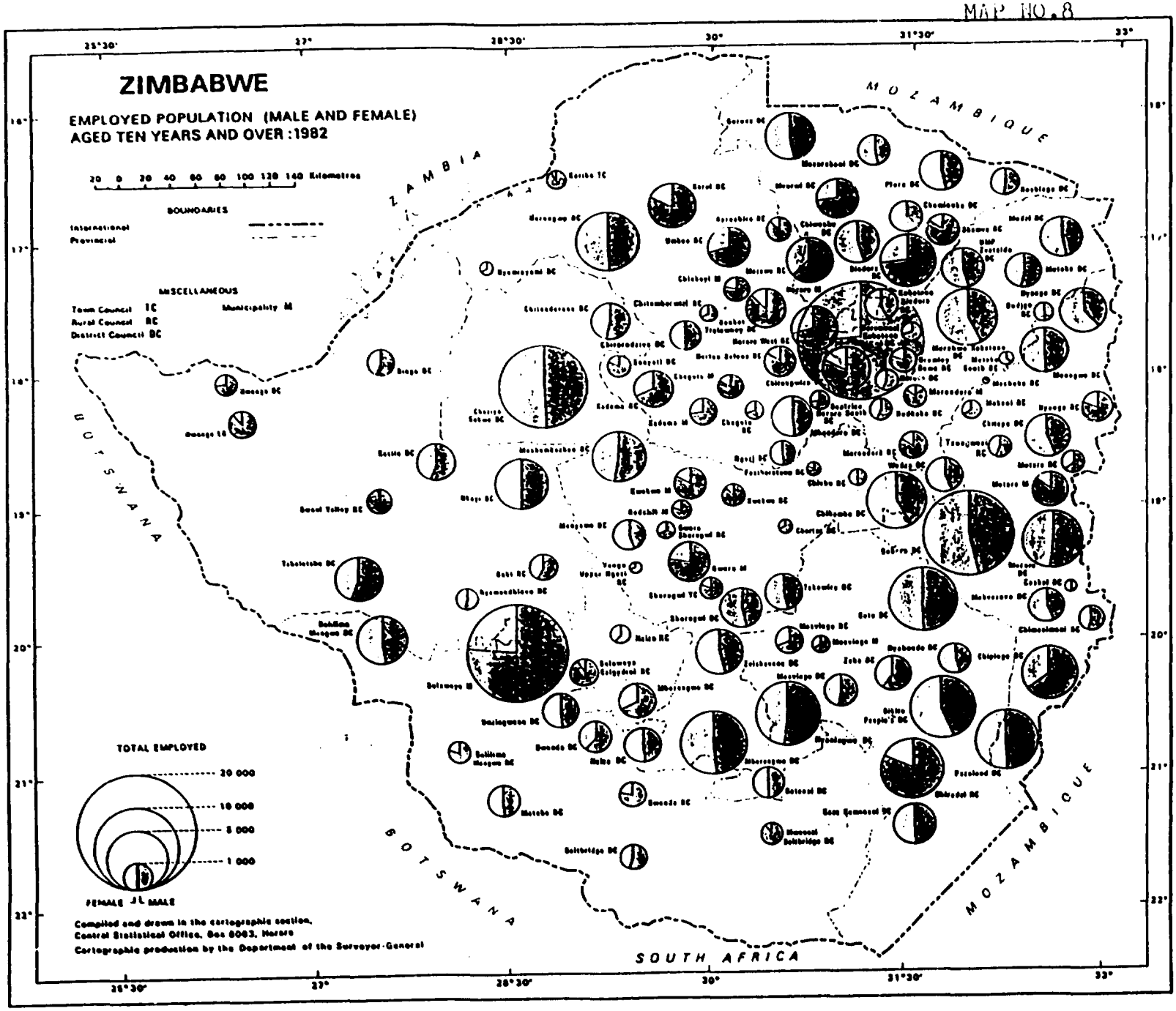
MAP NO. 7


ZIMBABWE
DISTRIBUTION OF URBAN CENTRERS WITH POPULATION OF 2500 AND ABOVE: 1982
20 0 20 40 60 80 100 120 140
BOUNDARIES
International
Provincial
ZAMBIA
BOTSWANA
MOZAMBIQUE
SOUTH AFRICA
KARIBA
KAROI
MT. DARWIN
MHANGURA MINE
VANAD MINE
MVURWI
MUTORASHANGA
FEOCH MINE
MADZIWA MINE
MURIEL MINE
CAESAR MINE
SHACKLETON
ALASKA
CHINHOYI
BANKET
AMANDAS
SUTTON
GLENDALE
JUMBO
BINDURA
SHAMVA
MUTOKO
HARARE
MUREHWA
DARWENDALE
ARCTURUS
CHAKARI
NORTON
GOLDEN VALLEY
CHEGUTU
MARONDERA
NYANGA
VICTORIA FALLS
KAMATIVI MINE
EMPRESS MINE
VENICE
KADOMA
CHITUNGWIZA
RUSAPE
NYAZURA
HWANGE
DETE
KWEKWE
PENHALONGA
REDCLIFF
CHIVHU
MUTARE
GWERU
MVUMA
LALAPANZI
GUTU
SHURUGWI
BULAWAYO
MASVINGO
MASHAVA
CHIPINGE
ZVISHAVANE
PLUMTREE
RENCO MINE
GWANDA
TRIANGLE
CHIREDZI
BEITBRIDGE
INDEX
DISTRIBUTION OF URBAN CENTRES WITH POPULATION OF 2 500 AND ABOVE, 1982
800 000
100 000
25 000
5 000
Compiled and drawn in the cartographic section, Central Statistical Office, Box 8063, Harare
Cartographic production by the Department of the Surveyor General

MAP NO. 8


ZIMBABWE
EMPLOYED POPULATION (MALE AND FEMALE)
AGED TEN YEARS AND OVER : 1982
20 0 20 40 60 80 100 120 140 Kilometres
BOUNDARIES
International
Provincial
MISCELLANEOUS
Town Council TC
Municipality M
Rural Council RC
District Council DC
TOTAL EMPLOYED
20 000
10 000
5 000
1 000
FEMALE
MALE
Compiled and drawn in the cartographic section,
Central Statistical Office, Box 8063, Harare
Cartographic production by the Department of the Surveyor-General
ZAMBIA
MOZAMBIQUE
BOTSWANA
SOUTH AFRICA
25°30'
27°
28°30'
30°
31°30'
33°
16°
17°
18°
19°
20°
21°
22°

ANNEX 17

14 July 1992

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

Terms of Reference

Feasibility Study for the Establishment of a Citrus Fruit and Tomato Processing Plant

Project: XA/ZIM/92/609

Backstopping officer: P. Scott, IO/OS/FEAS

I BACKGROUND AND JUSTIFICATION

a. BACKGROUND

Like most developing countries in Africa, Zimbabwe's economy relies heavily on the export of agricultural products and minerals. The agricultural sector which consists of commercial agriculture and communal lands remains a strong sector of the economy, while the contribution of the mining sector is the next most important. Manufacturing, another important sector of the economy, is mainly dominated by the metallurgical industries; other important branches of industry include food products, chemicals and petroleum products as well as textiles. The main manufactured exports consist of metals and metal products.

There is, however, very little connection between the modern sector, which is located in the urban areas, and the rural areas which still remain undeveloped with very little economic activity taking place. In view of this, on gaining independence in 1980, the new Government of Zimbabwe committed itself to rapid transformation of the economy, particularly for the benefit of the rural population. A lot of emphasis was placed on land reform and its effective use. In this context the small-scale farmers, cooperatives and communal farmers have as a result been able to increase their capacity to grow large quantities of horticultural products mainly fruit and vegetables.

Because of the perishable nature of products such as fruits and vegetables there is a lot of spoilage caused by inadequate means of transportation to the markets as well as the inadequate marketing strategies among the producers. To help in addressing these shortcomings and in line with the government's policy to decentralize the economic activities to the rural areas, Alison Canning (Pvt.) Ltd. is planning to establish a tomato and fruit processing plant in the Norton area. In order to assure regular and adequate supply of the raw materials the project is planned to be undertaken with the cooperation of Alison Farm (Pvt.) Limited, another private company whose farm is also located in Norton. Norton is located about 40 km from the capital, Harare. It is, intended to supplement Alison farms' own production with supplies from interested small-scale farmers and cooperatives, such as the Zvimba communal farms, located within easy reach of Norton.

Alison Canning Pvt. Ltd. is a wholly owned Zimbabwean company well established in the transport and agricultural sectors. Another company within the same group, Alison Farms Ltd. owns 6,000 hectares of land and are seeking to diversify their operations. They have earmarked 107 hectares for growing tomatoes.

The proposed project is divided into two phases, short term and long term. The short term phase is the processing of tomatoes which has a short growing period of about three months. On the other hand the long term phase envisages the planting of orchards with the eventual aim of processing canned juice. However, it takes four years from the establishment of orchards to the production of fruits for processing. It is therefore envisaged that in the initial years primarily tomatoes will be available for processing.

Alison Canning has already undertaken preliminary investigations aimed at establishing the viability of the proposed plant. To this end a pre-feasibility study which was carried out in 1986-1989 indicated that the establishment of a processing plant would be a sound investment. The study

is mainly focused on the viability of growing tomatoes in Norton. The conclusion was that the climatic and soil conditions are good for growing tomatoes commercially. The study also included a brief analysis of the local market, the proposed site for the plant, labour availability and economic advantages of establishing the plant. All aspects were found to be favourable. The staff of Alison Farms is familiar with growing tomatoes and the investor, Alison Canning (Pvt.) Ltd. have at their disposal adequate capital funds available for making the foreseen investment.

b. JUSTIFICATION

In addition to earning the much needed foreign exchange through exports, the purchase and delivery of the raw materials will promote the increased cultivation of the cash-crop base as well as encourage economic activity among the local community in Norton. This will in turn increase the employment opportunities as well as improve the living standards of the people. It should be noted that this agro-industrial project is of special importance for the employment of women. Female employment in the formal economy of Zimbabwe in 1983 was some 15.3% (169,000 women) of the total employment. Women's participation in agriculture was more than double the average, whereas in manufacturing it was far below average, namely 7.1%. In the informal sector the women's average is even larger than in the formal sector. As a lot of small-scale farmers and co-operatives involve women as suppliers of agricultural products, this project could contribute to the further improvement of the position of women in the agricultural sector. Another consideration taken into account is the fact that once the production is established there already exists an immediate local market for canned tomatoes while choice grade peeled tomatoes will be exclusively for exports.

The proposed operation will consist of a complete plant for the continuous processing of citrus fruits and tomatoes from the storage bins to the finished products. These will consist of high quality concentrate juices, sauces, puree paste and other canned products, to which finishing components such as sugar and acid etc. would be added in order to obtain the required quality and taste of the final products. It is estimated that the initial employment level will be 24 persons, to be increased to about 180 skilled and unskilled persons between the third and fourth year of production. The envisaged exports will result in foreign exchange earnings of around US$11,180,000 over a period of five years. The plant will also manufacture its own cans for packaging purposes.

The Government of Zimbabwe supports the development of this project and the Ministry of Finance, Economic Planning and Development in a letter dated March 22, 1990 requested UNIDO's assistance in carrying out a feasibility study. It is foreseen that the successful implementation of this project would have a significant impact on economic activity in the rural community and on export earnings.

UNIDO's assistance in undertaking a feasibility study is being sought in order to enable the Government and Alison Canning (Pvt.) Ltd. to take a final decision on whether to go ahead with the project. The study should also look into the most economic way of implementing the project taking into account the technical, economic, employment generation and the technology aspects.

II. PURPOSE OF THE PROJECT

The purpose of this project is to prepare a feasibility study for the processing of citrus fruit and tomatoes in Zimbabwe, in order to enable Alison Canning (Pvt.) Ltd. to take an investment decision in respect of the planned citrus fruit and tomato processing plant. The study will also include gender specific data on the food processing sector and specify how (rural) women will be effected by the project and how they will participate in the production process.

III. RESPONSIBILITIES OF THE CONTRACTOR

Statement of work: The subcontractor will prepare a feasibility study for the establishment of a citrus fruit and tomato processing plant following the approach and methodology of the UNIDO "Manual for the Preparation of Industrial Feasibility Studies", ID/372 and it will use UNIDO COMFAR software for the financial and economic evaluation of the investment including sensitivity analysis.

Accordingly, the study will consist of the following ten chapters corresponding to Part Two of the Manual, each providing detailed information and in-depth analysis of the enquiries performed, and analysis of the most attractive proposal and recommendations for follow-up action. The study will also include annexes: financial tables: economic statistical tables, charts, and diagrams; engineering designs, drawings, and maps; etc. The subcontractor is required to undertake the work specified below, bearing in mind that the list of activities is not exhaustive. The Subcontractor will work with and fully incorporate the work of the National Expert on Women in Development who will be responsible for the assessment of the possible role of women in the project. Three annexes are attached to the Terms of Reference: Annex A - General Time Schedule, Annex B - Other Provisions,and Annex C - Guidelines for the Preparation of Industrial Feasibility Studies for Consulting Firms.

CHAPTER I - Executive Summary

The subcontractor is required to summarize the definitive conclusions and recommendations in each of the chapters of the study in order to give the decision-makers a clear idea about all of its critical aspects.

CHAPTER II - Project Background and History

The subcontractor is required to:

1. Describe the characteristics of the agricultural sector with regard to crop production and the manufacturing sector, its role in the national economy and related Government policies;

2. Describe the place and role of the food processing sub-sector in the industrial sector and describe its size, structure, and growth rate;

3. Provide gender disaggregated socio- economic basic data on population, education and employment of the food processing sub-sector and the agricultural sector with regard to the production of the raw materials.

4. Present a summary of previous activities and investigations carried out by the Government and Alison companies and of the justifications which lead to the decision to elaborate a more detailed study.

5. Describe the company Alison Canning (Pvt.) Ltd., its activities, size in production and turnover, number of employees, ownership, etc.

CHAPTER III - Market and Plant Capacity

The subcontractor is required to carry out a detailed market survey which will result in identifying the product mix and their specifications, the users, and the size of the existing and potential market. In particular, the subcontractor is required to:

A. Demand and Market Analysis

Determine types of final products according to the type of processing and conservation, assess local current demand and projected demand for every category of product for the lifetime of the project. The tabulations and totals could be sub-divided into those required for:

Type of Product
a) juice
b) concentrate/paste
c) entire/half/mashed
d) nectar/syrup/flake
e) jam/marmalade

Type of Packaging:
a) can
b) drums
c) bottles
d) flexible pouch

Processing:
a) freezing
b) hot filling
c) vacuum concentation
d) drying

Ascertain existing domestic sources of supply of the selected products, volume, and prices.

B. Sales Forecast and Marketing of Products

a) Estimate the domestic market penetration for every type of product and their export potential to neighbouring states, countries, PTA and eventually EEC countries; analyze domestic and international competition.

b) Determine and explain in detail a sales programme using tables and graphs as appropriate to show development throughout the life of the project.

c) Select and explain in detail a marketing strategy and describe the following aspects of the marketing strategy: organizational set-up of distribution and sales, product pricing, discounts and commissions, and the promotional efforts during the pre-production and production stages.

d) Estimate annual sales revenues for the lifetime of the project based on the sales programme and the marketing strategy.

e) Estimate annual sales and distribution costs for the lifetime of the project.

C. Production Programme

a) Describe and analyze the annual production programme of the selected products bearing in mind anticipated sales, minimum storage requirements, parameters of plant capacity, etc.

b) Describe each product in terms of quality, technical specifications, and raw material requirements.

D. Plant capacity

a) Identify the parameters to use in determining plant capacity;

b) Select and describe in detail the feasible normal plant capacity which should be based on the parameters of the production programme and the parameters of minimum economic plant size, bearing in mind that the plant should be a small - to medium-scale.

CHAPTER IV- Materials and Inputs

The subcontractor should ascertain whether the required raw materials and other inputs necessary for the normal operation of the plant throughout the year are available. Taking into account the production programme, the product mix and the plant capacity, the subcontractor is required to provide:

- Qualitative specifications of unprocessed raw materials which will cover the profile of the required production programme, quoting national and international standards.

- Qualitative specifications of process materials and additives required for conservation (e.g. preservatives, chemicals, etc.).

- Qualitative specification of factory supplies required for continuous installation operation.

- Supply programme of the raw materials, process materials, and factory supplies, taking into consideration economy of the storage and transportation costs at certain batch size.

- Consumption co-efficients and figures for the raw materials, process materials, and factory suppliers per unit of product, as well as, per year consumption for each product at feasible operation time.

- Sources of supply of the raw materials, process materials, and factory supplies, seasonal distribution of availability of the agricultural products, mode of collection and obtaining raw materials, describe main suppliers and organizations/cooperatives producing the raw materials.

- Unit prices of the raw materials, process materials, and factory suppliers; indication of price trends in the last five years. The unit price of each raw material (tomatoes, citrus fruit, etc.) to include a break down of structure of the production costs (variable costs, fixed costs, foreign and local cost components, direct and indirect costs).

- Specification of quality and consumption figures for utilities: water, steam, electrical power, fuel, special gasses, and cooling agents.

- Estimate of unit prices and the annual cost for each input and describe the factors affecting the cost of materials including the sensitivity analysis.

CHAPTER V - Location, Site and Environment

The Subcontractor is required to:

1. Select and describe in detail the chosen optimum location and state the reasons for selection and its advantages with particular attention given to the fact that high tension electricity, drainage, access to raw materials, and water are essential. List and describe local conditions including climate, site, and terrain; transport facilities and access in terms of roads capable of carrying heavy loads; water and power supply; waste disposal, manpower; living and other conditions.

2. Prepare environmental impact assessment.

3. Estimate the cost of land, site preparation and other related costs.

CHAPTER VI - Project Engineering

This component of the study will define the technical aspects of the project. The Subcontractor is required to:

1. Select, compile, and describe in detail an optimum plant layout, state the reasons for their selection and show the selected layout by appropriate drawings;

2. Select and describe in detail the optimum scope of the project; state reasons for the selection; use physical plant layout drawing to show the scope of project and project components; and number and list the project components required to serve as basis for further engineering and cost estimates;

3. Select and describe in detail the optimum technology and state the reasons for the selection (e.g. labour/capital type, source, specification, and cost. Illustrate with price flow chart;

4. Select and describe in detail optimum equipment, preferably conventional equipment which can be produced locally; state reasons for the selection; describe the selected equipment stating number, type, technical specifications, capacity, source and cost estimate. Cost estimates should be based on quotations obtained from manufactures and classified into one of the following categories: production equipment, auxiliary equipment, and service equipment including a stock of spare parts and tools.

5. Select and describe in detail optimum civil works and estimate the cost of civil and other engineering works based on quotations from design and construction contractors and classified into: works for site preparation and development, buildings and special civil works, and outdoor works. Illustrate with a basic layout of buildings and workshops.

CHAPTER VII - Plant Organization and Overhead Costs

The subcontractor is required to:

1. Select and describe in detail the composition of cost centres (e.g. production, services, administration and quality control) and state reasons for selection;

2. Select and describe in detail the composition of overhead cost items (e.g. factory overheads, administrative overheads, depreciation charges, and financial costs) and state reasons for selection;

3. Illustrate with an organizational chart.

CHAPTER VIII - Manpower

The subcontractor is required to:

1. Prepare appropriate staffing tables - one for labour and the second for staff; describe and justify in detail each staffing table and estimate annual costs, at feasible normal capacity of labour and of local staff.

2. Ascertain the availability of qualified women personnel for pre-production and for the operational period and assess training requirements both on-the-job and abroad; estimate the costs thereof.

3. Discuss and recommend the need (if any) for foreign management contract/technical assistance from plant supplier and/or others.

CHAPTER IX - Implementation Schedule

The subcontractor is required to:

1. Select and describe in detail the optimum implementation programme and time schedule, list activities, and show their sequence in bar diagrams and/or networks. State reasons for selection.

2. Estimate the cost of project implementation based on the activities listed above. Project implementation costs being pre-production costs, are to be capitalized and amortised over a period of time. They may be broken down as follows: project implementation management; detailed engineering of equipment and civil works; tendering and evaluation of bids; supervision and coordination of construction; installation; testing; trial runs; start-up; and commissioning; build-up of administration, recruitment, and training of staff and labour; arrangement of supplies; and arrangement for marketing.

CHAPTER X - Financial and Economic Evaluation

The Subcontractor is required to carry out (i) financial and commercial profitability analysis from the point of the investor utilizing the COMFAR software for computing financial tables and for sensitivity analysis, and (ii) economic evaluation from the national point of view. For the purpose of this evaluation it is to be assumed that the project will have a life of fifteen years.

(i) Financial and commercial profitability analysis

1. Calculate total investment costs by summarizing all investment components as described in previous chapters, including the working capital requirements;

2. Project annual investment expenditures during the construction period and where necessary during the production period;

3. Calculate total production costs; project production costs from start-up and throughout the life of the project; estimate unit costs;

4. Describe and justify assumed or actual sources of finance; prepare cash-flow table for financial planning; ascertain whether financial resources adequately cover the project needs throughout its life; and estimate annual financial costs;

5. (i) For the financial evaluation prepare (a) project balance sheet and (b) project income statement; interpret the financial statements by using relevant ratios in order to measure and analyze liquidity, debt service, profitability, and total debt coverage;

   (ii) For the investment profitability evaluation prepare projected cash-flow table; analyze the investment profitability through
   (a) simple methods comprising simple rate of return on total investment and on equity capital, and pay back period; and
   (b)discounted cash-flow methods comprising net present value and the internal rate of return (IRR) on total investment and on equity; compare the financial analysis ratios and the cash-flow data of this project with those of other producers in the same industry (if any);

6. Carry out sensitivity analysis by assuming higher and lower values of those variables or factors that could have a decisive influence on profitability. Compute and analyze (a) the break-even volume and the effect on the IRR and net cash inflows of incremental volume increases, and (b) the price break-even point and the effect on net cash-flows of incremental price increases from break-even price; analyze the effect of plant under-utilization of price decreases and exchange rate fluctuations.

(ii) Economic evaluation

The subcontractor is required to analyze the project's contribution to the State and/or national economy by applying cost-benefit techniques (e.g. identify benefits and costs to be measured, and foreign exchange earnings/savings). Implications for infrastructure, improved technical know-how, and for the environment may be included. The economic implications for the Norton region and the national economy of actively integrating women into the manufacturing sector should be described in detail.

ANNEXES:

The subcontractor should include tables, charts, schedules, diagrams, maps, drawings/designs, layouts, and flowsheets in the annexes.

MAIN REFERENCES

1. Zimbabwe in Maps, Central Statistical Office.

2. Crops Production on Large Scale Commercial Farm 1989, Central Statistical Office.

3. The Role of Women in Agro-Industries in Four Eastern and Southern Africa Countries, (UNEC for Africa).

4. The Convention in the Elimination of all forms of Discrimination Against Women.

5. Rural Development Demonstration Project for Women.

6. Resources for Women in Zimbabwe and Directory.

National Employment Council wage increases 1992/93

ALB notice

All farm employees falling under the Employment Council's agricultural regulations will be entitled to a wage increase with effect from 1 September 1992. The increase has been spread over two periods payable on 1 September, 1992 and 1 May, 1993. All allowances will remain as in 1991.

MINIMUM WAGE INCREASES FOR EMPLOYEES PRESENTLY EARNING THE MINIMUM WAGE

FIRST INCREASE

From 1 September 1992 the new minimum wage for an employee, for the period 1.9.92 to 30.4.93, whose grade is stated in Column 1 *(below)* and who is earning the amount detailed in Column 2 shall be the amount in Column 3:

Column 1	Column 2 (currently earning)	Column 3 (new wage)
Grade 1	$157,41	$170,00
2	169,22	183,00
3	181,02	196,00
4	190,07	205,00
5	199,12	215,00
6	208,17	225,00
7	223,97	242,00

SECOND INCREASE

From 1 May 1993 all employees will be entitled to a further wage increase. In terms of the agreement reached, the new minimum wage for an employee for the period 1.5.93 to 31.8.93 whose grade is stated in Column 1 *(below)* and who is earning the amount detailed in Column 2 shall be the amount appearing in Column 3:

Column 1	Column 2 (earning as at 30.4.93)	Column 3 (new wage)
Grade 1	$170,00	$185,00
2	183,00	199,00
3	196,00	213,00
4	205,00	223,00
5	215,00	234,00
6	225,00	245,00
7	242,00	263,00

MINIMUM WAGE INCREASE FOR EMPLOYEES PRESENTLY EARNING *MORE* THAN THE MINIMUM WAGE

FIRST INCREASE

The new minimum wage for an employee for the period 1.9.92 to 30.4.93 whose grade is stated in Col. 1 *(below)* and who is presently earning *MORE* than the amount detailed in Col. 2 shall be their present wage increased by at least the amount in Col. 3:

Column 1	Column 2 (currently earning)	Column 3 (new wage)
Grade 1	$157,41	**$12,59**
2	169,22	**13,53**
3	181,02	**14,48**
4	190,07	**15,20**
5	199,12	**15,93**
6	208,17	**16,65**
7	223,97	**17,91**

NB. *Please note that wages must be rounded off to the nearest dollar.* **Example:** *A Grade 1 employee who is presently earning $165,00 must receive at least a $12,59 increase. This brings his wage up to $177,59 which must be rounded off to the nearest dollar which means that the employee must be paid a minimum wage of $178,00.*

SECOND INCREASE

The new minimum wage for an employee for the period 1.5.93 to 31.8.93 whose grade is stated in Col. 1 *(below)* and who immediately prior to that date will be earning more than the amount detailed in Col. 2, shall be their wage as at 30.4.93 increased by at *least* the amount appearing in Col. 3:

Column 1	Column 2 (earning as at 30.4.93)	Column 3 (new wage)
Grade 1	$170,00	**$15,00**
2	183,00	**16,15**
3	196,00	**17,29**
4	205,00	**18,09**
5	215,00	**18,97**
6	225,00	**19,85**
7	242,00	**21,35**

Example: *To use the same example as before, a Grade 1 employee who is earning $178,00 as at the 30.4.93 must receive at least a $15,00 increase on the 1.5.93. Therefore his wage would become $193,00.*

NB. *Please note that here again all wages must be rounded off to the nearest dollar.* ■

TABLE NO. 1

LOCAL EMPLOYMENT IN DIFFERENT SECTORS OF AGRICULTURE.

		1988	1989	1990
SMALL SCALE COMMERCIAL FARMS	16	22085	26082	25251
	16	134624	135406	88513
Permanent		3840	165	506
Casual		1304	9826	7014
RESETTLEMENT SCHEMES	16	18483	18350	19588
	16	246411	247454	237762
Permanent		153	529	212
Casual		2593	1844	4092
IRRIGATION SCHEMES	16	14800	16303	16055
EXCLUDING A D A	16	44288	51193	62325
PERMANENT		528	593	236
Casual		651	1029	1305