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FEASIBILITY STUDY ON THE ESTABLISHMENT OF AN ORANGE JUICE PACKING PLANT

PROJECT NO. XA/ZIM/92/609

UNIDO/10/0S/FEAS

(iii) 167p
tables
graphs
diagrams
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etc.

FEASIBILITY STUDY

ON

THE ESTABLISHMENT OF AN ORANGE JUICE PACKING PLANT

PROJECT NO. XA/ZIM/92/609
UNIDO/10/0S/FEAS

ON BEHALF OF

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANISATION
PO BOX 300
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NOVEMBER 1994

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PREFACE

This Study represents an updated version of sections on Orange Juice Packing in the Draft Report on Tomato and Citrus Processing completed 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 above average 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 further developed, first as refined and amended Final Report incorporating both Tomato and Orange Juice studies; and second, as an updated study of the Orange Juice line alone, incorporating new costs estimates provided by the investor ACI and the plant suppliers.

The Final Report was delivered to UNIDO in August 1994. This, the second part on Orange Juice alone, represents a recalculation of the potential returns on the basis of revised costs data. This volume therefore sets out the Feasibility for an Investment in the Aseptic Packing of Orange Juice by ACI in Zimbabwe. Some material researched in 1993 that is common to both the Tomato and Citrus Processing Studies is retained for reference purposes in this volume. The basis for the Marketing and Economic Evaluations have not been researched to change the conclusions reached in the ZTCP Study Final Report, Dec 1993.

NOTES

1. Chapters, sections and paragraphs are notified in numerical sequence, eg 4.3.1., 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.

2. References in the text are denoted [ ] referring the reader to a Chapter, Section and Paragraph elsewhere in the updated ZOJP Study. This is to avoid repetition. References marked { } refer a COMFAR entry for Financial and Economic calculations. References marked ( ) refer the reader to References and Citations in Annex 2.

3. CURRENCY DENOMINATION

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

4. FOREIGN EXCHANGE RATES

The Exchange Rates adopted for the study are those middle rates reigning on 8 June 1994:

One Foreign Currency Unit		Z$
US$	=	8.0
RSA Rand	=	2.19
UK Pound Sterling	=	12.00
DM	=	4.78
Japanese Yen	=	0.076
Italian lira	=	0.0049
Swedish Kroner	=	1.0065

5. ACRONYMS & ABBREVIATIONS

ACI	-	Alisor Canning Industries (Pvt) Ltd
ADA	-	Agricultural Development Authority
CIF	-	Costs of Insurance and Freight
CSO	-	Central Statistics Office
DTT	-	Dilute to taste
EIU	-	Economist Intelligence Unit, UK.
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
UHT	-	Ultra Heat Treatment
ZAP	-	Zimbabwe Association of Packaging
ZIC	-	Zimbabwe Investment Centre
ZTCP	-	Zimbabwe Tomato and Citrus Project
ZOJP	-	Zimbabwe Orange Juice Project

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

6. ACKNOWLEDGEMENTS

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

CHAPTER I

EXECUTIVE SUMMARY

1.1. CONCLUSIONS

1.1.1 Orange Juice Packing

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. This is contrary to the expectations of the investor that a Farm and Factory operation would be feasible.

As supplies of orange concentrate and of fresh orange from sources in Zimbabwe will be limited until 1997/8, ACI may 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.

1.1.2 Summary

	NORTON FARM		ACI FACTORY	
	GROW	MARKET	PROCESS	MARKET
CITRUS	No	No	Yes	Local/PTA

1.2 RECOMMENDATIONS

1.2.1 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 Market and Plant Capacity

The Zimbabwe domestic market for processed foods and beverages is highly fragmented. More research needs to be conducted into its size and characteristics. Demand has been subject to serious purchasing power constraints following the 1991/2 drought, and has reduced processed food sales to an all-time low.

Orange Juice because of its higher market appeal has remained a strong selling line. The local market is not over-supplied. Supplies are either sub-standard or imported from South Africa. 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 plant capacity recommended is 3m litres a year of single strength orange juice. packed in 12 million x 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 Materials and Inputs

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.

The world supply of concentrate dominated by Brazilian output has been historically 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 has one Tetra Pak user in the Dairy Corporation in Zimbabwe its local base in Harare. The company is building a service and maintenance facility in Harare, which would be available to new customers such as ACI.

An alternative plant and packaging supplier Metal Box Liquid Packaging Division offer Combibloc service from their regional centre in Johannesburg.

1.2.4 Location, Site and Environment

The location at Norton favours mixed farming and market gardening, and has all services needed for a packing plant. At 50 kms from Harare the Estate and factory site is near enough to a major Zimbabwe market for selling processed juice. The local skills available to ACI are not yet trained for factory work. ACI will need time to acquire the essential disciplines.

The recommended actions pose no special problems for the environment.

1.2.5 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.

Tetra Pak technology is lower cost in current Z$ terms than the closest alternative equipment supplier, the Combibloc system from the Metal Box Company Liquid Division.

1.2.6 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 Manpower

There is adequate manpower in the Norton area to supply the workforce needed for a new processing plant. Tetra Pak have a training school for specialist staff in South Africa. The training phase may however need to be expanded.

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 Implementation Schedule

An Investment decision in 1994 could lead to plant commissioning early in 1995.

1.2.9 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.

At a 25% discount rate, the Financial rate of return on the investment -IRRE1- is calculated to be 31.05%. The Rate of Return on Equity plus Reserves -IRRE2- is 32.88%. The Internal Rate of Return is 29.01%. The Economic rate of return with imported concentrate and packaging is negative, with foreign exchange cash flows in deficit. When local orange concentrate is substituted for imported concentrate, the forex cash flows, and employment linkages with agriculture, improve considerably.

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):

Table 2.1.1 - Gross Domestic Product, by Sector of Origin, at Factory Cost, Current Prices Z $ m

	YEAR					
	1987	**1988**	**1989**	**1990**	**1991**	**1992**
Agriculture & Forestry	1123	1596	1753	2391	3709	5692
% of total GDP	13	16	15	16	19	22
Manufacturing	2089	2518	3162	3691	5585	7760
Total GDP	8919	10184	12114	14702	19587	25790

Source: CSO Stats Flash. Feb 1993.

2.1.2 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:

Table 2.1.2 - Major Crop Sales

YEAR	COMMUNAL FARMS	COMMERCIAL FARMS	Z$ m
1983	45.6	451.1	496.7
1984	103.2	603.5	706.7
1985p	224.9	861.5	1086.4
1986	221.9	960.5	1182.4

Source: CSO, 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 Z$1.63 bn. Prior to the drought there had been strong growth as well in grain and industrial crops:

2.1.3 Agricultural Output in Zimbabwe

Table 2.1.3 - Agricultural Output in Zimbabwe, (Z$'000)

CROP	1983	1988	1989	1990p
Tobacco	184.162	485,679	576.897	888,583
Maize	69.191	123,980	160.608	127,997
Wheat	26.086	87,747	100.434	147,497
Coffee	14.485	36,585	51,892	50,857
Cotton	57.775	127,553	116,108	106,356
Sugar	90.042	127,454	185,371	215,895
Tomatoes	4,426	7,210	7,628	9,611
Citrus	4,096	9,091	10,625	12,597

Source: CSO. Production Account of Agriculture, Forestry and Fishing (Excluding Communal Lands and Small Scale Market Gardening) 1982-90.(10)

	MEN	WOMEN
Communal Sector	34	49
Modern Sector	43	16
Unemployed	6	6
Economically inactive	17	29
TOTAL	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.

2.3.4.2 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.

2.3.4.3 **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).

2.3.4.4 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 countries developing and developing 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) that 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 was 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 been 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 embarked, through its Research and Development Department, on a prefeasibility study of Fruit and Vegetable processing in Zimbabwe. The study was completed at the end of 1993. A comprehensive feasibility study to determine the technical viability of the project has yet to be carried out.

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:

(a) The raw material base and processing capacity.
(b) Growth point potential.
(c) Institutional context for agro-industrial development.
(d) The informal sector, inc. Communal Farm activity.
(e) Processing and packaging technologies.
(f) 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, [2.5.3].

The Study was updated and used as a basis for the Terms of Reference for the Dec 1993 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. 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

2.5.2 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 tobacco 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.

2.5.3 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 Alison 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 Resettlement Scheme announced in 1991.

2.5.4 Employees

(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, Sarnchi. Bhutan. Both employees have quit ACI since Feb 1993, but ACI intends to replace them as soon as ZOJP is implemented.

2.5.5 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 56-2/87.

CHAPTER III

MARKET AND PLANT CAPACITY

3.1 DEMAND AND MARKET ANALYSIS

A detailed market survey of the product mix potential for AC. 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.

3.2 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.

3.3 DEMAND AND MARKET ANALYSIS

3.3.1 The Market Demand Analysis : Zimbabwe

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 [3.2].

(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, [3.2].

3.3.2 Identification of Products

3.3.2.1 The search for a market niche in 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.

3.3.2.2 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 assumption are fully described in Chapter 5.

3.3.2.3 Tomato Products

Our Market Survey suggested 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, [3.3]. 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 demand. We do not consider growth prospects for peeled and juiced tomato to be strong enough currently to justify investments in plant to produce them.

3.3.2.4 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. 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, [3.3]. The location of any new plant to produce orange concentrate in Zimbabwe should also be carefully related to local supply factors.

3.3.2.5 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, (3.3).

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 aseptic pack. This product is 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 an aseptically packed orange juice.

3.3.2.6 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 new Fruit Juice blends. Recipes that represent later product options are Orange with Grenadilla or Passionfruit Juice, Orange spiked with Ginger, Orange with Cinnamon, Citrus Fruit Cocktails, etc.

3.3.2.7 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 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 yoghurt 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, although the market for these may be small judging from the experience of imported South African 1 Litre packs in Zimbabwe.

3.3.2.8 Pack Size: the Choice of the 250 Ml Pack

Retailers confirmed our finding that 250 ml packs quench the thirst more than the 200 ml packs: that the 250 ml pack `stands head and shoulders above the 200 ml pack: that the 1 litre packs do not sell as well as the 250ml packs: that the 250 ml packs sell six times faster than the 1 litre packs, and that the 200 ml and 1 litre packs might represent unprofitable pack size at this stage of market development.

3.3.2.9 Products Identified for Further Study, by Processing and Packaging Method, for ACI

Table 3.3.2.9

PRODUCTS	PROCESSING METHOD	PACKAGING	CUSTOMS HS CODE
Orange Juice	Filling and sealing	Aseptic Pack	20091900

3.3.2.10 Identified Products, by End-Product Weight in Cartons for Further Study

Table 3.3.2.10

PRODUCTS	PACK	PACK SIZE (ml)	NUMBER OF PACKS PER CARTON	CARTON WEIGHT (kg)
Orange Juice	Tetra Pak	250 ml	12	3.10

3.3.2.11 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 [3.3.2], and the projected growth in the markets in section [3.4.14].

3.3.2.12 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 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).

3.3.2.13 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 buoyant 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.

3.3.3.1 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.

3.3.3.2 **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 3.3.3.3, 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.

3.3.3.3 Distribution of Households in Zimbabwe, by Income Range, 1992

Table 3.3.3.3

INCOME GROUP	UPPER INCOME RANGE (Z$/month)	NUMBER OF HOUSEHOLDS (Millions)	PERCENTAGE	OF WHICH	
				RURAL	URBAN
A	3500+	.021	1	.001	.020
B	2500	.060	2.8	.005	.055
C	1500	.117	5.4	.052	.065
D	750	.689	31.8	.522	.167
E	250	1.280	59	.940	.340
TOTAL		2.167	100	1.52	.647

Source: TDC 1992, (21), and Market Researchers in Harare, (66).

3.3.3.4 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).

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 holidays in South Africa and Europe. [The product range is shown at para 3.4.4 & 3.4.5]].

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. [3.4.5]. 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 customary diet of traditional households in Zimbabwe.

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 confirm.

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 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.

3.3.3.5 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 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).

3.3.3.6 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 processed 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].

3.3.3.7 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.[2.7]. Total catering demand for packed orange juice is estimated at .98 million litres a year, some of it met by Mazowe orange concentrate.

3.3.3.8 Demand by Hotels and Restaurants for Fruit Drinks in Zimbabwe, 1992.

Table 3.3.3.9

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

Source: Hoteliers and Restauranters estimates, HIRAZ (67)

Notes: The 71 hotels are those graded and licensed by the Ministry of the Environment and Tourism, Zimbabwe.

3.3.3.9 Institutional End Users

Industrial packers supplying the catering companies and institutions are either selling direct from the factories or through wholesalers. Some 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.

3.3.3.10 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).

3.3.3.11 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 processors 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:

3.3.3.12 Estimated Sales of Cans by Carnaud Metal Box for Food Packing, by End Use, Zimbabwe 1992

Table 3.3.3.12

PRODUCT	CANS (m)	TONNES
Tomato based, of which:	12.2	2990
Tomato products	6.0	1590
Other Vegetables	5.9	2598
Jam	7.4	4030
Fruit	4.0	1834
Meat	14.1	3042
Total	43.6	14485

Source: Retail Trade. Zimbabwe.

3.3.3.13 Domestic Demand for Fruit Based Drinks Sales Volume Estimates, By Market Segment. Zimbabwe, 1992

Table 3.3.3.13

MARKET SEGMENT	POPULATION SERVED (m)	PER CAPITA CONSUMPTION (litres pa)	TOTAL SALES (tpa 000)	%
Households	10.4	4.33	45	41
of which.				
AB	.389	18.00	7	6
CE	10.012	3.8	38	35
Hotels and Restaurants	5.12	7.23	37	34
Institutional	na		28	25
TOTAL			110	100

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

3.4 SALES FORECAST AND MARKETING OF PRODUCTS

3.4.1 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 [3.4.4 & 3.4.7].

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 cartelization practices, such as trade agreements on price and market share. The use of low grade tomatoes for processing and of preservatives for fruit juice products provides all competition with great scope for quality improvements.

3.4.2 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 some of which is comminuted, and some processed 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.

3.4.3 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.

3.4.4 Citrus Products, Retailed in Zimbabwe, 1993

Lemon Juice	200g	ftpb	9.59	GOURMET Solomio Z
Lemon Barley	375ml	stpb	4.59	PURITY Reckit & Colman Z
Orange Barley	375ml	stpb	4.50	PURITY Reckit & Colman Z
Pure Juice	250ml	ftpb	1.70	SUNSPLASH Af. Dis Z
Fruit Mix	250ml	ptfb	2.80	CASCADE Lyons Z
Orange Crush	500ml	scpb	3.30	MAZOE Schweppes Z
Grapefruit Segments	425g	can	4.95	CASHEL VALLEY Lemco Z
Fresh Lemon	1kg	loose	6.80	Local Growers Z
Fresh Orange	1kg	loose	5.80	Local Growers Z

3.4.5 Orange Drinks Imported Into Zimbabwe

Juice	1 litre tetp	12.80	LIQUI-FRUIT Ceres RSA
Juice	200 tetp	4.00	
Orange juice	250 ml tetp	4.00	FRESH-UP 100 Fresh-up RSA
Orange drink	340 ml can	2.30	FANTA Kgalagadi Beverages Botswana
Orange juice	250 ml comb	4.40	ORANGE-SIP Woolworths RSA

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, Feb & May 1993

3.4.6 **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.

3.4.7 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, [3.4.6]. 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, [3.4.21]. The total output from the industry is estimated at 110.4 million litres in 1992:

3.4.8 **Sources of Fruit Based Drinks Supply and Their Market Shares, Zimbabwe, 1992**

Table 3.4.8

SOURCE	VOLUME SUPPLIED (millions of litres)	%
Market Leaders	88	80
Other Domestic	18.7	17
Imported	3.3	3
Total	110.0	100

Source: Retailers and Manufacturers, Harare

3.4.9 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.

3.4.10 The Need to Establish Competitive Standards

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 Economist Intelligence Unit 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%, [3.4.5]. 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:

3.4.11 Imports of Selected Food Products Into Zimbabwe 1991

Table 3.4.11

PRODUCT	HS CODE	SOURCE	VOLUME	VALUE (Z$ CIF)
Preserved Tomatoes	20021000	UK	150 kgs	340
Other Preserved Tomatoes	20029000	Botswana RSA Zambia	11,400 kgs 5 kgs 24 kgs	9,603 47 88
Orange Juice, other than fresh & frozen	20091900	Australia Germany UK Mozambique RSA	198 litres 0 litres 363 litres 1,200 litres 1 litre	668 5 3,295 2,188 124

Source: CSO (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.

3.4.12 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.

3.4.13 Effects of the Drought

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).

3.4.14 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 buoyant 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:

3.4.15 The Projected Domestic Demand for Fruit Drinks

From the market analysis [3.3.3.13] 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.

3.4.16 **Projected Domestic Demand for Fruit Drinks, 1993-2004, Millions of Litres**

Table 3.4.16

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 3.4.36.

3.4.17 **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 Fruit Juices, and the Regional Market in the PTA, SADC and other Southern African countries adjacent to Zimbabwe.

3.4.18 **Export Promotion**

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,[10.2.5].

3.4.19 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:

3.4.20 **Exports From Zimbabwe of Selected Products to Illustrative Countries, 1991**

Table 3.4.20

PRODUCT	DESTINATION	VOLUME (kg)	VALUE (Z$)
Preserved Tomato	all	4,631	139,593
of which:	Mauritius	1,440	102,266
	Germany	2,808	31,763
Other Preserved Tomato	all	14,502	139,593
of which:	Malawi	13,164	105,644
	Portugal	1,281	7,912
Orange Juices	all	*319,063	1,312,684
of which:	Botswana	*171,263	300,851
	Mozambique	*44,110	72,856
	South Africa	*37,220	316,161
	Netherlands	*51,840	583,892

* These quantities are in litres.

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

3.4.21 **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).

3.4.22 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.

3.4.23 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 competitively 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).

3.4.24 **Internationally Traded Orange Drinks Selected Retail Outlets, May 1993**

TYPE	VOLUME	PACK	US$	SOURCE
Carbonated	2 l	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 l	stgb	0.96	Somerfield UK
Orange Drink	195 l	fcpb	0.29	Barraclough UK
Orange Juice	700ml	tetp	1.19	Dittmeyer FDR
Orange Juice	1 l	tetp	1.19	Britvic UK
Orangeade	330 ml	pttc	0.39	HP Bulmer UK
Orange Juice	500 ml	ftpb	2.03	Johnsons UK
Orange Juice	170 ml	pttc	0.63	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.

3.4.25 **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 % of Zimbabwe's Exports to the Region (18)
Botswana	18.7 %
Malawi	15.2 %
Mozambique	11.6 %
Zambia	11.0 %
Kenya	3.9 %
Zaire	3.1 %
Tanzania	2.6 %
Uganda	1.2 %

3.4.26 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.

3.4.27 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).

3.4.28 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.

3.4.29 <u>The PTA Market</u>

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.

3.4.30 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.

3.4.31 Projections of Exports of Selected Products Into All Markets From Zimbabwe, 1992-2003

YEAR	PROCESSED TOMATO (tpa)	FRUIT DRINKS (litres '000)
1993	20.1	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.

3.4.32 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 stable economic relationship with South Africa is secured, 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 .33 Regional markets have suffered the same climatic and economic set-backs 1991/2 as Zimbabwe. Moreover, new and aggressive marketing by Ceres for aseptically-packed fruit juices will restrict sales opportunities for ACI.

Whatever the Regional trade liberalisation agreements, new suppliers will meet strong competition in Regional markets. Existing exporters from Zimbabwe have found no easy market entry, despite Zimbabwe $ devaluation. Zimbabwe's export potential given new incentives is put by exporters at 6% in value terms a year, but ACI's market penetration could be greater if the company's export contacts are used to maximum effect.

3.4.34 **The Export Potential in Selected Regional Markets for ACI Sales of Orange Juice, 1994**

Table 3.4.34

COUNTRY	SEE NOTES				
	1	2	3	4	5
RSA	37.00	11	407	0.3	0.07
Botswana	1.4	5	7	0.2	2.9
Malawi	9.02	4	36	0.1	0.28
Mozambique	16.65	2	33.3	0.1	0.3
Zambia	8.73	4	34.92	0.06	0.17
Namibia	1.9	2	3.8	0.05	1.32
Total ACI				0.81	

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)

3.4.35 **Projections of ACI Sales of Orange Juice to the Regional Market, PTA SDCC & RSA, 1994**

Table 3.4.35

	1994		1995		1996-2008	
	Cartons ('000)	Litres ('000)	Cartons ('000)	Litres ('000)	Cartons ('000)	Litres ('000)
RSA	100	300				
Botswana	66.6	200				
Malawi	33.3	100				
Mozambique	33.3	100				
Zambia	16.6	50				
Namibia	16.6	50				
Totals	270.0	810	286.3	858.9	303.47	910.42
250ml Packs ('000)	3240		3435.6		3641.64	
US$	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

3.4.36 **Consolidated Projections of Domestic and Export Market for Zimbabwe Fruit Drink Products, 1992- 2003, From [Tables 3.4.16 & 3.4.31]**

Table 3.4.36

YEAR	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

3.4.37 **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 and blended other fruit juices can be adjusted to match market taste and production costs. ACI is advised to ensure product contents match product description and pack labelling exactly, since this will be a selling point for the product that differentiates it from other suppliers' fruit juice products.

3.4.38 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 beverage industry appear to have applied to ZIC for investment licences. (13). Since Dec 1993. there has been one application to IFC for loan funding to produce a Tetra Pak Orange Juice. Capacity in Zimbabwe is however expected to remain relatively constant against rising demand:

3.4.39 **Projected Supply of Fruit Juice Drinks for the Zimbabwe Market, by Source of Supply, 1992-2003**

Table 3.4.39

YEAR	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.

3.4.40 *Table 3.4.40*

LEGEND:

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	Col 5

YEAR	MILLIONS OF LITRES				
	1	2	3	4	5
1992	4.8	2.59	-	-	-
1993	9.4	2.74	-	1.096	-
1994	16.1	2.91	-	1.166	-
1995	23.5	3.08	1.590	1.236	0.810
1996	29.9	3.26	1.842	1.310	0.858
1997	37.6	3.46	2.090	1.387	0.910
1998	53.5	3.68	2.090	1.470	0.910
1999	62.1	3.91	2.090	1.558	0.910
2000	71.3	4.14	2.090	1.651	0.910
2001	78.9	4.39	2.090	1.750	0.910
2002	89.0	4.65	2.090	1.855	0.910
2003	98.8	4.93	2.090	1.966	0.910
2004	109.6	5.23	2.090	2.083	0.910
2005	121.7	5.54	2.090	2.208	0.910
2006	135.1	5.87	2.090	2.340	0.910
2007	149.9	6.22	2.090	2.480	0.910
2008	166.4	6.59	2.090	2.628	0.910

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.

3.4.41 ACI Orange Juice Sales Forecasts, Domestic and Export, and Market Share, 1995-1997, At 1994 Prices [3,4,34,35 &38]

Table 3.4.41

	1994	1995	1996	1997
Total Zimbabwe Market				
Fruit Drinks (litres m)	124.0	131.0	139.0	147.3
of which:				
Orange Juice (litres m)	2.91	3.08	3.26	3.46
% of all Fruit drinks	2.35			
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
Revenue (Z$'000)		9794.40	11341.18	12871.87
ACI Export Sales				
litres ('000)		810.0	858.9	910.42
250ml packs ('000)		3240.0	3435.6	3641.64
12 pack trays ('000)		270.0	286.3	303.47
Revenue:				
US$ ('000)		696.36	735.22	779.31
Z$ ('000)		5570.00	5881.76	6234.48
Total ACI Sales				
litres ('000)		2400	2700	3000
250ml packs ('000)		9600	10800	12000
12 pack trays ('000)		800	900	1000
Total Revenue (Z$)		15364.44	17222.94	19106.35
% of Nominal		55	63	72
Costs per pack (Z$)		1.36	1.43	1.57

3.4.42 **Citrus Product: Recommendation for Orange Juice**

The recommendation is to produce and market a pure orange juice from imported concentrate, switching to locally supplied concentrate as soon as it becomes available. The production method recommended is aseptic packing technology.

The initial capacity should be 3 million litres a year, packed in 12 million x 250 ml packs, from a modern, well-serviced plant working an 8 hour shift for 250 days a year.

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.

3.4.43 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 in food hygiene and quality control.

3.5 THE SALES PROGRAMME

3.5.1 The Marketing Strategy

3.5.5.1 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.

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 comminuted 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.

3.5.1.2 The Organisational Set-Up for Distribution and Product Pricing

(a) ACI has an existing management and marketing structure that will organise domestic and export distribution and sales. ACI's General Manager will tour sales centres in Zimbabwe and the Region to establish product outlets.

(b) DISTRIBUTION, at 100% production:

Table 3.5.1.2 (a)

PRODUCT	TONNES	PACKS ('000)	TRAYS ('000)	TRAYS ('000)	
				DOMESTIC	EXPORT
Orange Juice	3000	12000	1000	696.56	303.47

At full production, if the market is sustained as projected, domestic sales will absorb nearly 70% of output, and exports 30%.

(c) PRODUCT PRICING.

The 250 ml product is priced to give adequate margins to manufacturer, wholesaler and retailer. At an ex works price of Z$1.54 per pack in the first year of production, ACI will make a Z$ 0.132 on every pack sold a margin of 18%, and a 31% rate of return on equity, [Cap 10].

At a recommended retail price in the domestic market of Z$ 2.70 per pack, a margin of Z$ 1.16 or 75% is available for distribution, wholesaling and retailer. In the export market, saving of 17-20% on wholesaling margins will enable ACI to command a higher ex works price, projected at US$0.214 per pack from 1995. Sales at US$ 0.214 a pack give an average margin of Z$ 0.988, or 58% per pack sold at the equivalent of Z$ 2.70. Price elasticity in the export markets comparable to Zimbabwe's mean that sales increases following Z$ devaluation can more than offset losses on the translation of foreign exchange revenues into Z$.

(d) PRODUCT PRICE RECOMMENDATIONS Z$ per unit at June 1994 prices.

Table 3.5.1.2 (d)

PRODUCT	PRODUCTION UNIT COST 1995	EX WORKS PRICE	RECOMMENDED RETAIL PRICE
250ml pack	1.172	1.54	2.70
12 pack tray	14.064	18.48	32.40

The projected pack price has been increased by Z$ 0.171 or 12.5% on the price at which ACI would have made profits in orange juice packing had the project been implemented in 1993. The price sensitivity of both domestic and export markets entails strict costs control and paring of margins to win market share. ACI's product price must stand comparison with competing products on the shelves. The main alternative at the top end of the market is the imported CERES orange juice; at the bottom end, MAZOE's orange crush. Against either of these products, ACI's 250 ml Orange Juice will look better value, - cheaper and larger than the CERES 200 ml, more affordable than the CERES 1 Litre, and better quality as well as cheaper than the MOZOE Orange Crush:

(e) COMPARATIVE PRICES Z$ at June 1994 prices

Table 3.5.1.2 (e)

	MAZOE	CERES Orange Juice	
	1 litre DTT	1 litre	200ml
Price per unit	7.90	10.80	3.40
Price per 250ml of product	1.975	2.70	4.25

(f) Discounts and Commissions [see 3.5.1.2.]

(g) Promotional Efforts [see 3.4.]

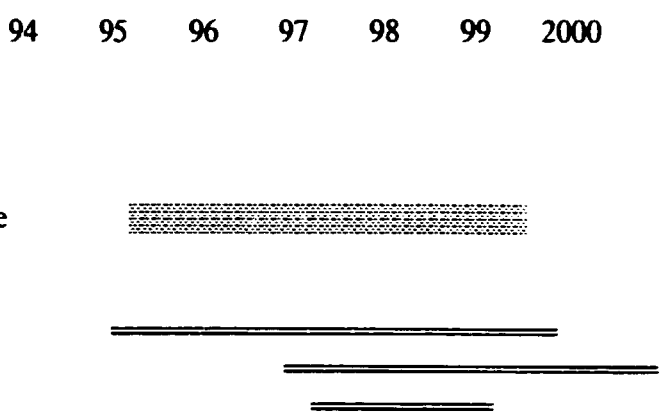
3.5.2 Annual Sales Revenues [3.4.39.]{Also Annex 14}

3.5.3 Sales and Distribution Costs [3.5.1.2.]

3.6.1 **Production Programme**

The factory production programme is based on a working year of 250 days, with 115 days for downtime, maintenance and workers' holidays. In the barchart below, the Orange Juice packing programme is shown as continuous, but breaks will occur annually for plant maintenance.(▒▒). Marketing activity follows (═).

ACTIVITY, BY YEAR, 1993-2000.



3.6.2 The production plan is to have the Orange juice line installed by January 1995, and to embark on domestic marketing to secure a six months' build-up of domestic sales during the last quarter of 1994. By Jan 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.

3.6.3 **The Annual Production Programme**

[See 3.8.2.]

3.6.4 **Farm Output: the Annual Production Programme**

[For details of Farm inputs and outputs, see ZTCP Volume One, Dec 1993, Final Report July 1994].

3.6.5 **Factory Outputs**

[See 3.8.2.]

3.7 PRODUCT DESCRIPTION, SPECIFICATION AND INPUT SPECS

3.7.1 Description

[See 3.3.2.9.]

3.7.2 Specification

[See 4.3.3.]

3.7.3 Inputs for Orange Juice

(i) Raw materials/8 hour shift

Concentrate	:	1.65 t
Water FQ	:	

(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

3.7.4 Raw Material Requirements for ACI Products, Tonnes A Year, From All Sources

PRODUCT	INPUT TOTAL	From Farm	Bought-in
Orange Juice concentrate		-	500

3.8 PLANT CAPACITY

3.8.1 Parameters for the Determination of Capacity: 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 estimated 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].

3.8.2 Normal Plant Capacity by Product

	Tonnes			
	INPUT		OUTPUT	
	TPH	TPA	TPH	TPA
Orange Juice	0.188	500	1,122	3,000

Note: Output based on 250 working days pa. Total number of 8 hour shifts for orange juice is 334.

The initial capacity is planned for one filling machine to erect and fill 250ml Tetrabrik packs at a rate of 4500/hour, using 1125 litre single strength juice/hr. made up by diluting concentrates, operating for 334 shifts a year. To achieve this, at certain times of the year, it will be necessary for 6-day or double shift working, depending on sales requirements. The reference capacity of the plant is 3m litres of product in 12 million 250 ml packs a year. Working 3 shifts/day would produce 9m litres, representing about 7% of the 1994 market demand for all fruit drinks.

If there is a later demand for 1 litre packs, a second filling machine and line would be installed, operating at 3500 x 1 litre packs/hour.

CHAPTER IV

MATERIALS AND INPUTS

4.1. RAW MATERIAL AVAILABILITY

4.1.2. Citrus availability

From 1. The 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 3-4 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 have been 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.

Table 4.1.2.2

Zimbabwe citrus fruit output: projections 1992-2000 by Grade of Fruit, in tonnes of whole fresh fruit Col 1-4, Processing Grade Col 5, and tonnes of single strength juice, Col 6.

1	2	3	4	5	6
YEAR	TOTAL SUPPLY	OF WHICH GRADE 1	GRADE 2	PROCESSING JUICE	
1992	29925	17955	3591	8379	3352
1993	45175	27105	5421	12649	5060
1994	7333	44000	8800	20533	8213
1995	105583	63350	9328	32905	13162
1996	139167	83500	9515	46152	18461
1997	171167	102700	9705	84570	23505
1998	203750	122250	9899	71601	28640
1999	236667	142000	10097	84570	33828
2000	266667	160000	10299	96369	38548

Source: Cols 1-4, Horticultural Export Marketing Study,(54).
Cols 5,6 Manderstam Consulting Services.

4.1.2.3. Citrus Concentrate Availability

Fruit concentrates have been readily available on the international market, and the long term price trend has been downward. Current prices reigning mid 1994 have increased on the 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).

Since 1993, the prices have risen to around US$2000 a tonne reflecting poor weather conditions in the principal supplying country, Brazil.

The principal supplier in Zimbabwe is Mazowe Estates, an Anglo American investment some 40 kms north of Harare. Its products and prices at Dec 1993 were:

65 ° Brix orange concentrates in drums at Z$ 14,750 per tonne
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. Indications are that 1994 price for locally sourced concentrate would be Z$16.500 per tonne, about 15% below the adopted import price of Z$ 19,507 a tonne. [4.9.1].

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 20% import duty at Beit Bridge, and 10% transport charge.

4.2 RAW MATERIAL SPECIFICATION

4.2.1 Citrus Concentrate:

The potential for local , aseptically-packaged, good quality orange juice has been identified by MCS for ACI, 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 and 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 NATIONAL AND INTERNATIONAL STANDARDS

4.3.1 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

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

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

Table 4.3.3. International Standards

For Concentrates: Purée	8-24% TSS	57-1981
Paste	>24% TSS	
Double Concentrates	28-23% 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 4.2.]

4.4.1 Orange Juice

[For details of supply sources see 4.1.2]

1. Flexible packaging - supplier Tetra Pak flexo claycoated duplex film - 230/240 GM. 2 Polyethene coated board imported under HS Code 48.11.
2. Orange Juice concentrate [see 4.2.1.].
3. Water -FQ = Food Quality Own supply. Potable
4. Packing trays - Hunyani
   plain die-cut trays 125K/B/125K
5. Shrinkwrap - supplier - Saltrama plastics, Harare
   450mm x 1500m 25 micron polyethene
6. Hot Melt Glue. Many suppliers in the Region.
7. Straws - local supplier or import from South Africa, Portugal or Korea.
8. PPP strip - supplier Tetra Pak

4.5 FACTORY SERVICES

1. Water - own supply, potable and general service.
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 [4.8.2.5]
   Water - Soakaway
7. Security - own resources
8. Insurance

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 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.

4.6.1.1 Minimum delivery quantities

Packaging film	- 30 reels equivalent to 180,000 packs
Straws	- 16 cartons each containing 3 x 8000 straws for 384,000 packs
PPP strips	- as required
Hot melt glue	- as required
Trays	- as required
Shrinkwrap	- as required

4.7 CONSUMPTION COEFFICIENTS

Raw materials, consumables and factory services, by volume per tonne of product.

ACI INPUT VOLUMES

4.7.1 Orange juice

	% input/t
Concentrate	0.167
Water	0.833
	input/t
Packing film*	
Trays	3920
Straws	145
PPP Strips	3920
Hot melt glue	3920
Shrink film	47.85m^2
*1 reel = 6200 packs	
Water GP	530 L
Steam	2.2t
Electricity	53 KW
Coal	0.18t
Waste	-
Storage	0.98m^3
Insurance [4.5]	

4.8 SUPPLY SOURCES FOR (1) RAW MATERIALS, (2) FACTORY SERVICES AND (3) CONSUMABLES

4.8.1 For Raw Materials [see 4.1.2]

4.8.2 Factory Utilities & Services

4.8.2.1 Water

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.

4.8.2.2 Steam

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].

4.8.2.3 Security

As for the Norton Estate.

4.8.2.4 Insurance

Insurance cover through Kantharia Insurance Brokers, Harare.

4.8.2.5 Waste Disposal

Waste Disposal will be by an animal feed company.

4.8.2.6 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.

4.8.2.7 Engineering maintenance

ACI on-site workshop.

4.8.3 Consumables: Sources for Consumables

4.8.3.1 Cans

Carnaud Metal Box PO Box St Southerton, Harare. Fax 65469.

4.8.3.2 **Packs**
Tetra Pak (83), Metal Box (85).

4.8.3.3 **Salt**
Blue Ribbon Foods Ltd

4.8.3.4 **Water**
ACI's own boreholes, filtration plant and recycled evaporator water.

4.8.3.5 **Cartons**
Hunyani, 27g Cripps Road, Grantside, Harare.

4.8.3.6 **Shrink Film.**
Saltrama Plastics, Harare

4.9 UNIT PRICES FOR RAW MATERIALS, CONSUMABLES AND FACTORY SERVICES

4.9.1 Prices for Raw Materials, Consumables and Factory Services are to be annually contracted in order to ensure adequate supply volumes and specifications. 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 US$1 = Z$8 at June 1994

Table 4.9.1

Unit costs for ACI factory production, trough and peak prices reported Feb 1993, Cols 3, 4. ZOJP adopted prices June 1994. Col 5.

1	2	3	4	5
ITEM	UNIT	THROUGH PRICE 1993 Z$	PEAK PRICE 1993 Z$	ADOPTED ZOJP JUNE 94 Z$
1. RAW MATERIALS				
Orange Juice				
Conc.	Tonne			
Imported	(64)	7680	13824	19507
Mazoe		14750	16500	
Local sources	(94)			16500
2. CONSUMABLES				
Tetra Pak	(66)			
Imported				
250 ml	pack	.26	1.118	0.37
Straws	1000	20.57	22.71	25.44
PPP Strips	1000	12.53	13.69	14.03
Locally sourced				
Hot melt glue	1000		1.60	1.92
Water (FQ)	1000 M^3		15.00	18.00
Trays	12 pack		1.93	2.32
Shrinkwrap	1000		.48	.58

3. FACTORY SERVICES

1	2	3	4	5
ITEM	UNIT	THROUGH PRICE 1993 Z$	PEAK PRICE 1993 Z$	ADOPTED ZOJP JUNE 94 Z$
Coal, delivered tonne			201.60	241.92
Water (GP)	1000 M^3		12.00	14.40
Maintenance				
Security				
Insurance (see 4.5)				
Transport				
Distribution on ex-works price				20%
Shipping per 20ft container				20-29,000
Electricity per Kwh < 300 KvA				0.1876
per month fixed				42.00
per Kwh > 300 KvA				
at peak 6am-9pm				1.15
other times				3.93
per month fixed				150.00

Note:

Average Prices are suppliers' lowest or best manufacturers' price obtainable, inflated by 20% ACI's estimate of costs inflation 1993/4. New tariffs for electricity have not been estimated, but energy costs have been raised 20% on their level for the June 1993 ZTCP Study. Adopted prices are CIF plus duty and delivery.

4.10 UNIT PRICE

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 REQUIREMENTS FOR FACTORY UTILITIES/SERVICES:

Water, Steam, Electricity, Fuel, Coolants [See 4.5 and 4.7]

4.12 UNIT AND ANNUAL INPUT COST DETERMINANTS

Factors Affecting Input Costs are:

i. Seasonal and annual fluctuations in rainfall and temperature affect crop yields. Some evidence suggests drought conditions can be expected in Zimbabwe every four years. Drought conditions in source countries mainly Brazil for orange concentrate increase the world price.

ii. Competing fruit drink factories responding to demand recovery may bid up prices of locally sourced materials.

iii. Transport costs inflated 50% since Feb 1992 to June 93, and are reported to be rising still. 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. New Zimbabwe supplies of canned juice cannot be ruled out.

v. The 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 may reduce imported input costs.

vi. Zimbabwe changes in the inflation rate affect all input prices, but may be offset by product price increases.[see Cap 10].

CHAPTER V

LOCATION, SITE AND ENVIRONMENT

5.1.1 The Location: reasons for its selection.

Alison Farms (Pvt) owns two adjacent properties at Norton, 50 km from Harare, which would provide the site for an Orange Juice Packing plant.

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

Table 5.1.1 Norton Farm

1. Clifford	1426.79 ha	APRef 1011 to 1014 and 1125 to 1127, 1965
2. John O'Groats	669.50 ha	APRef 731 to 734 and 811 to 812.
Total	2096.92	

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.

The proposed plant site at Norton is served by a Class 1, two-lane metalled road from Harare, and by murram farm roads. The farm is also adjacent to 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.

5.1.2 Access to raw materials

Citrus

Trials plantations of citrus (lemons and oranges) have been established on the Estate over the past 3-4 years, but the growth and yield potential are judged insufficient to warrant bulk production. The trees have not received optimal management in terms of irrigation, nutrition or pruning, [see 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, but was presumably located there before the best citrus growing areas in Zimbabwe were identified. Yields are reported to be below maximum potential.

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.

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 tobacco, maize, and livestock 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, the improved prospects for tobacco, and the lack of advantage for citrus, priority should be given by ACI to its 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.

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.

5.1.3 Climatic and Soil Conditions

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 5.1.4.

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.

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 nc 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.

Table 5.1.3
Land areas by soil classification (hectares).

1	2	3	4
Class	Clifford	John O'Groat	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**

Altitude - 1360 metres with relatively little variation.

5.1.4 **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.

Climate - Norton Farm.

Temperature - average annual - 18.5° C.

Rainfall - annual mean - 844mm

5.1.5 Rainfall Distribution

Table 5.1.5.1

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].

Table 5.1.5.2
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	24.4	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.

5.1.6 Water and Power 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) was Z$12.00 per 1000 cubic metres, increased by ACI estimates to Z$14.4 in June 1994..

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.

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.

5.1.7 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 outlay 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 Orange Juice product is to be packed in 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.

5.1.8 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].

The employment of a manager with experience and technical knowledge of tomato production, qualified to UK HND or graduate level or equivalent, is therefore necessary.

5.1.9 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.

5.2 ENVIRONMENT IMPACT ASSESSMENT

The soils of the Estate are of relatively low inherent fertility and subject to risk of erosion, especially if overcropped.

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.

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

5.3 COSTS OF LAND AND SITE PREPARATION

5.3.1 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.

5.3.2 The Costs of Site Preparation

The cost of site preparation are similarly below those for Greenfield sites in the Norton area, for the reason that a level site nearby 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:

5.3.3 Orange Juice

Table 5.3.3.

	Unit Cost	Size	Total
	Z$		
Shed	10,650 m2	210 m2	2,236,500

The cost of erection and civil works is included,{L12}.

CHAPTER VI

PROJECT ENGINEERING

6.1 THE PLANT: PLANT SELECTION CRITERIA

6.1.1 Orange Juice packing

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.

Canned orange juice requires the use of can opener, and the product is not readily drunk direct from the can, though this is sometimes done. In the RTD market which is available for aseptically-packed juices, ACI's product will have a straw with which the pack is pierced for drinking.

The technology for aseptic packing requires only a simple process for diluting the concentrate, and in distribution does not need the cold chain or in-mix of preservatives required for most Zimbabwe fruit-based beverages. 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 concentrate is pumped from aseptic barrels into a mixing tank, diluted with water, pasteurised in a heat exchanger, aseptically filled into 250 ml packs, then packed into trays, and shrinkwrapped.

Of the available technologies for aseptic packing, Tetra Pak technology is recommended because it is already in Zimbabwe for milk products produced by the Dairy Corporation.

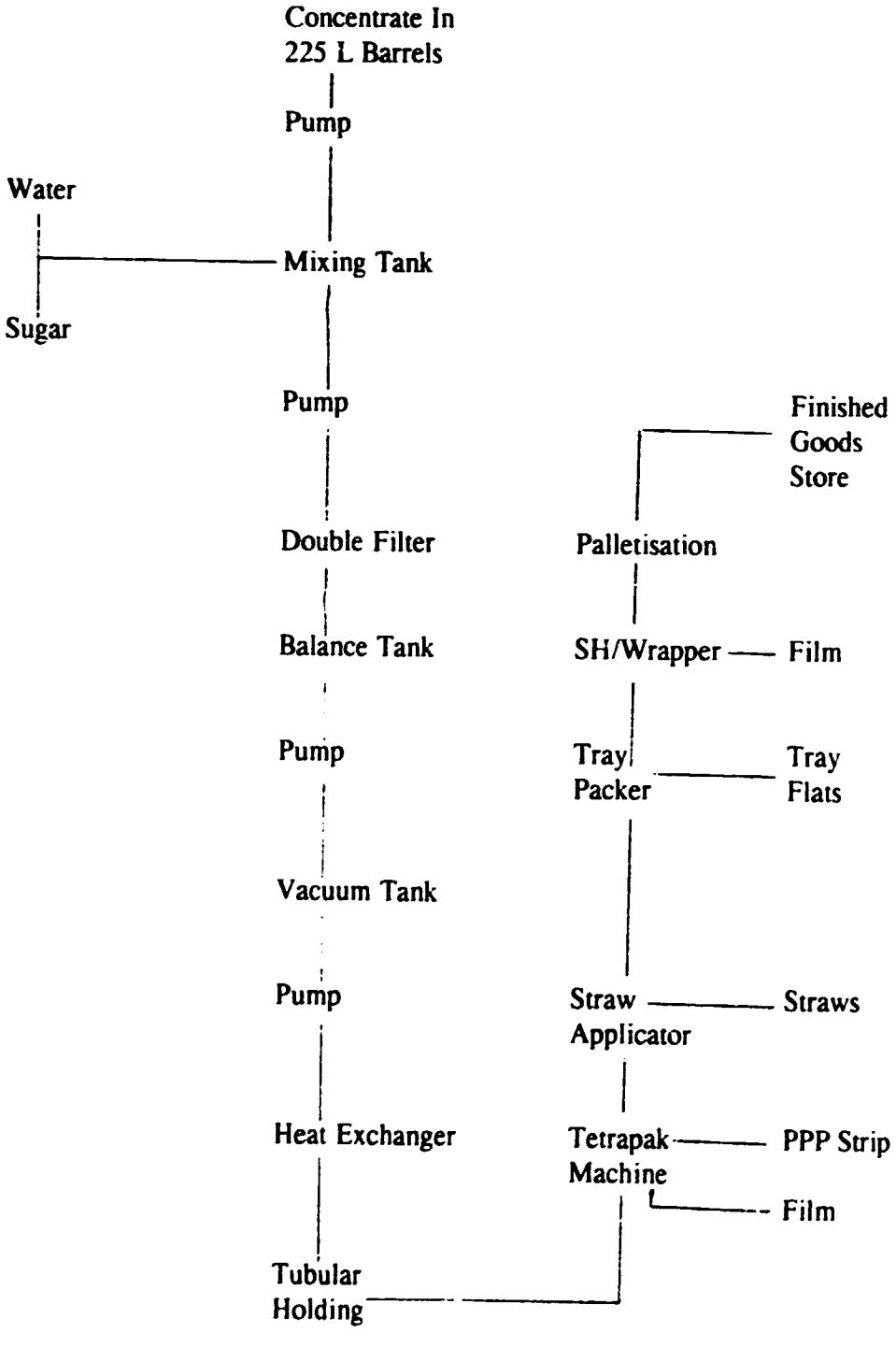
An alternative plant supplier is the Metal Box Liquid Packaging Division whose nearest base is in Johannesburg,(85).. Although its Combibloc packaging technology is believed to be comparable to Tetra Pak's, it has not been selected for this plant on grounds of higher cost, [4.8].

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

6.1.2 The Plant Layout - See Annex 13

6.1.3 Scope of the Project: Production Flow Diagram

Flow diagram for Orange Juice:



6.2 THE SCOPE OF THE PROJECT:

Components list and selection criteria

6.2.1 Orange Juice packing

The equipment listed is only capable of packing one size of pack. Further investment in another filling line would be required to pack any other size. The packing technology is however straightforward. The 250 ml line selected can pack other types of juice, or mixtures of flavour, on the same line. This would allow some flexibility in future. The minimum run for any one product line is 200,000 packs with the same printing. Some variation to print packs for different products is possible through co-printing.

6.2.2 Components list, [see 6.4]

6.3 OPTIMUM TECHNOLOGY SELECTION CRITERIA:

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 FACTORY EQUIPMENT LIST & COST ESTIMATES FOR THE ORANGE JUICE TETRA PAK LINE

COST ESTIMATES	FOREIGN
From Tetra Pak 2.6.92	SEK 000
1. Stilldrink Mixing & process Equipment	
Mixing Equipment	750.
Process Equipment	
Tyipe Steridrink spiroflo	1300.
CIP (Cleaning)type Alcip	
2. Filling and distribution Equipment	
Filling machine Type TBA/3j	2307.

	Tera straw applicator Type 36	437.
	Tetra tray packer type 31	857.
	Tetra Tray shrink Type 51	669.
3.	Aseptic Filling Line	
	Pipes, valves and fittings	42.370
4.	Installation	
	Mixing and process	371.
	Filling and distribution	200.
5.	Commissioning, training and docs.	209.500
	TOTAL BUDGET PRICE SEK	5185.870
	Carried forward SEK	5185.870
	15% CIF (See 6.4.1)	777.880
	Sub-Total	5963.751
	10% contingency (See Note 6.4.2)	596.375
	TOTAL SEK	6560.126
	= Z$	6602.767
	=US$ (18)	825.345

Cost Estimates	Local Z$000	Foreign US$
Carried forward		825.345
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)	256.000	
Pre-production expenditures		
Foreign Costs (L11)		
Local Costs (L23)		
Implementation Costs (9.3)	23.300	
Sub-Total US $	339.300	57.200
Plant Cost		
Total foreign		825.345
local	339.300	
Total cost in US $		867.758
in Z $	6942.059	

6.4.1 Note: The Equipment Budget quotation from is from Tetra Pak, Harare (83). Items 1 in the schedule are ex Sweden, but Items 2,3,4 and 5 may be supplied from Tetra Pak, Pinetown South Africa. The prices quoted are FOB/FCA in Swedish Kroner at the respective ports of departure. Freight and Insurance is estimated at 15%.

6.4.2 Duties and Taxes are estimated at 10%. Installation and Basic Training costs are included in the Plant Cost. Additional Training at Tetra Pak Pinetown is not estimated or costed for ZOJP.

6.4.3 **Technical Options**

Additional or alternative equipment for which quotes were obtained:

6.4.3.1 **Uht Juice Plant.**

Offered by APV Zimbabwe through Metal Box Liquid Packaging division, as part of the Combibloc system, (85). The Ultra Heat Treatment plant includes a tubular Pasteurising Unit for single strength Juice of 15 degree Brix that may contain 5% pulp fibre, rated at 2000 l/hr, CIP system, and ancillary tubes and tanks, quoted at SR 1.17 million (Z$ 2.564 m), including installation and commissioning.

6.4.3.2 **Aseptic Packing.**

The Combibloc system offered by Metal Box Liquid Packaging Division was quoted at SR 3.598 million (Z$ 7.9 million). Incorporating the APV pasteurisation system brings the Budget estimate for this option to Z$ 10.5 million.

The Combibloc system's supply of packaging material was quoted at SR220,000 per 1000 (Z$ 482,192). Budget Quotations were valid until 30 Sept 94.

6.4.3.3 **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.

6.4.3.4 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%.

6.4.3.5 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:

Table 6.4.3.5 Cost of Steam-Jacketed Tilting Pots

Litres	Z$
45	4316
136	5219
227	6669

6.5 CIVIL WORKS

6.5.1 Farm [Cap 4 & 5]

6.5.2 Factory [5.3.2.]

6.5.2.1 It is envisaged that the Tetra Pak production facility will be housed in a shed of 210 m^2, constructed 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

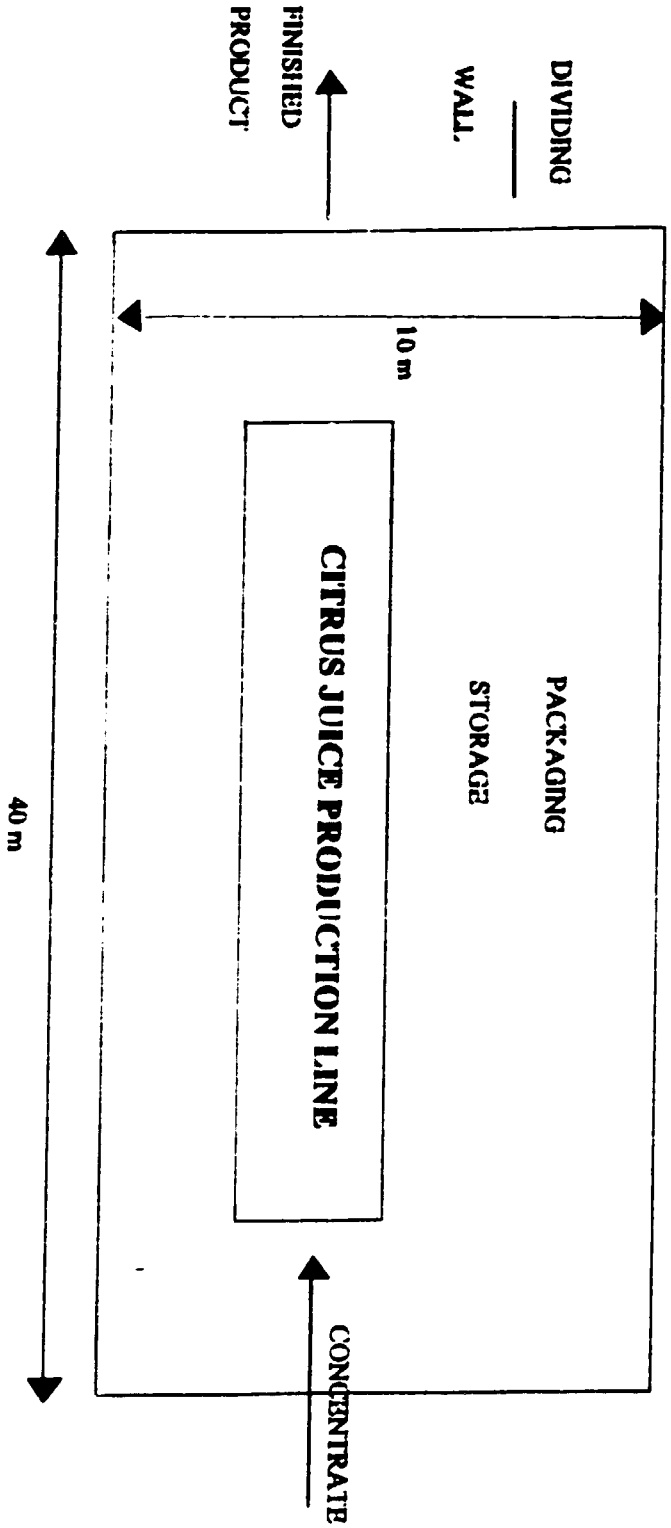
6.5.2.2 Other Construction

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 - Tetra Pak Factory

6.5.2.4 Site Plan - Factory



CHAPTER VII

PLANT ORGANISATION

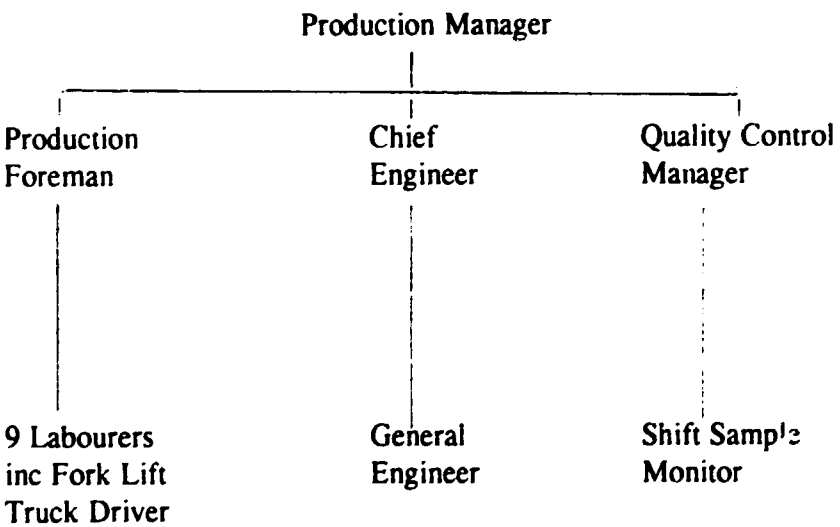
7.1 COST CENTRES

The ACI Factory
Production
Services
Administration
Technical Services
Quality Control

7.2 THE ORGANISATION CHART

Orange Juice Line

Production Organogram



CHAPTER VIII

MANPOWER

8.1 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 and factory work. The labour force may however be built up from commissioning with some savings to the ACI payroll costs in years one and two.

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 Orange Juice packing line in 8.2.2.

8.2.2 Manpower for ACI

		Numbers	Rate	Z$000pa
A	ADMINISTRATION			
	1. General Manager	1	99.84	99.84
	2. Asst GM			
	3. Accountant			
	4. Clerk	1	49.92	49.92
	Sub-Total (L104)	2		149.76
B	MARKETING			
	1. Manager	1	69.88	69.88
	2. Asst Manager			
	3. Clerk	1	49.92	49.92
	4. Salesman	1	49.92	49.92
	Sub-Total (L106)	3		143.20

		Number	Rate	Z$000pa
C	MANAGEMENT			
	1. Production			
	2. quality Control	1	69.89	68.89
	3. Chief Engineer			
D	SUPERVISORY/TECHNICAL			
	1. Foreman	1	68.89	68.89
	2. Production			
	3. Engineer Maint	1	49.92	49.92
	4. Engineer Elect			
	5. QC Technician			
	6.Warehouse Charge	1		
E	GENERAL WORKERS			
	1. RM Reception	1	23.40	23.40
	2. RM Sorters			
	3. Preparation	1	23.40	23.40
	4. Packing	3	23.40	70.20
	5. Tetrapak Ops.	1	31.20	31.20
	6. Warehouse			
	7. Stores			
	8. General			
F	SUB TOTAL C.D.F.	10		385.82
	Contingency			131.18
	Sub Total Labour Cost (100)			516.99
	Payroll Cost			809.96
	Levy @ 0.15%			1.22
	Total Manpower Cost			811.18
	Manpower Number	15		
	Average Cost PA		53.99	

8.2.3 Manpower for the Orange Juice Line

This Manning schedule has been adjusted to raise payroll rates by 20% over 1993 estimates. Rates are based on a 250 day working year x one 8 hour shift per day, plus pay for a 13th month to cover social costs. Some staff posts have been deleted from the original schedule at ACI's request, 7 June 94. It may be necessary to operate the plant for an extra 84 shifts pa to meet the recommended standard output. As this is equivalent to an additional 34% charge on the payroll, Z$131.18 is added as a contingency to the direct labour costs.

8.2.4 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

The training requirements will fall under 3 headings:

8.3.1.1 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 line. 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.

8.3.1.2 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.

8.3.1.3 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

Engineering training is offered to Tetra Pak operators at the Tetra Pak Training School in Pinewood, Durban, South Africa. Additional training in operating the machinery, and explanations of technologies involved would be provided on site by the Tetrapak engineer and technologist.

8.4 FOREIGN MANAGEMENT AND TECHNICAL ASSISTANCE

8.4.1 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.

CHAPTER 1X

IMPLEMENTATION SCHEDULE

9.1 IMPLEMENTATION PRE-CONDITIONS

For the orange juice packing proposed, raw materials including the concentrates and packaging, will be available year round. There are therefore no 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

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.

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).

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

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.

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.

6. Award of contract. ACI's existing Legal Adviser will be in charge.

7. Planning of Civil works. Civil works are determined by the nature of the fixed assets to be installed. ACI has in-house engineering competence, but may alternately hire Consultant engineers to oversee the planning and construction of the Civil works for the plant.

8. Tendering. ACI has in house construction capabilities, but may contract the Civil works required to a local contractor

9. Award of contract. Implemented by ACI Lawyers.

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

11. Finance Agreement. The Finance Plan will specify a detailed drawdown and repayment schedule, following the Cashflow values agreed by the Bank and ACI. Alternately, ACI may hire consultants to devise alternate Finance Plans to float the Project.

12. Construction period. The Construction period should not be later than November 1994 if ACI wishes to commission by Jan 1995.

13. Land purchase. The site is already owned by ACI.

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 Nov 1994.

15. Plant installation. Nov-Dec 1994 is planned for plant installation.

16. Testing. Validation of the Plant system delivered under contract will be undertaken by plant suppliers, Dec 1994. Alternately, ACI have the option of hiring consultants to oversee commissioning and plant performance.

17. Commissioning: Dec. 1994. The Plant supplier will normally oversee Plant Commissioning.

18. Build-up of Administration. ACI already has in place key administrators able to undertake implementation activities.

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

20. Training. Tetra Pak recommended 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 these 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 re-training should be more or less continuous through the first year of production, to ensure smooth plant operation and a quality product.

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.

22. Marketing Plan. ACI has many contacts in Zimbabwe's Wholesaling and Retailing system but should pre-arrange with them for distribution and margins to be charged.

23. Marketing activities. These activities will follow the schedule in the Marketing Plan.

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.

25. Licensing & Tax Registration. Company and Trading law in Zimbabwe requires the licensing and registration of any food product marketed in the Country.

26. Capital issue expenses. As ACI will be raising its equity internally, no floatation expenses will arise.

9.3 SELECTION OF IMPLEMENTATION ACTIVITIES:

Table 9.3 Time Schedule and Sequence for the Orange Juice Line

	ACTIVITY	YEAR 1994	1995
		MONTH	
	ZOJP	7 8 9 10 11 12	1 2 3 4 5 6
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	X X X X	
13	Land Purchase N/A		
14	Civil Works	X X X	
15	Plant Installation	X X	
16	Testing	X	
17	Commissioning	X	
18	Build-up of Admin	X X X X	
19	Manpower Recruitment	X X X X	
20	Training	X X X X	X X X X
21	Procurement of Inputs	X X X	X X X X X X
22	Marketing Plan	X	
23	Marketing Activities	X X X X	X X X X X X
24	Pack Design	X	
25	Licensing & Tax Regia	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 staffwork prior to Commissioning the rate Z$50 per manday is applied.

Table 9.4 Cost Estimates for Implementation

	ACTIVITY	MANDAYS	RATE PER DAY*	TOTAL COST
			Z$	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		
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 Admin.	20	50	1000
19	Manpower Recruitment	15	50	750
20	Training	30	50	1500

	ACTIVITY	MANDAYS	RATE PER DAY*	TOTAL COST
21	Procurement of Inputs	10	100	1000
22	Marketing Plan	10	100	1000
23	Marketing Activities	30	50	1500
24	Pack Design	5	100	500
25	Licensing & Tax Regia.	3	100	300
	Total Mandays estimated Cost Z$	186		23,300

CHAPTER X

FINANCIAL AND ECONOMIC EVALUATION

10.1 FINANCIAL AND COMMERCIAL PROFITABILITY

10.1.1 Total Investment Costs: The Orange Juice Plant

The total fixed investment cost for Orange Juice packing is Z$ 9.69 million, of which 57% is foreign, {Annex 14, Page 2.}

The investment cost of the Tetra Pak filling equipment and auxiliary services to mix and fill orange juice in 250 ml packs is estimated at Z$ 6.6 million, including engineering design, CIF, and provisions for import duty, installation, training and contingency,[6.4.2]. These plant machinery and equipment costs are budget quotations from Tetra Pak Harare, converted into Z$ at current rates of exchange.

Buildings and civil works are estimated at Z$ 2.236 million, and are principally local costs. Lorry transport is provided independently of other ACI operations at Z$ 307,200.

The optional extra equipment cost not included at this stage is the estimated US$ 365,000 for equipment to fill One Litre Juice packs if and when the market justifies this investment. There is also no provision for orange juice extraction equipment, as ACI is expected to buy in orange juice concentrate as its main raw material from either foreign or local sources.

Working Capital requirements in 1995 the first year of production are Z$ 4.86 million to be financed internally by ACI equity, {Annex 14, page 8}. Provisions for days of cover agreed with ACI are listed in the COMFAR Annex unchanged from the Financial Feasibility study of June 1993. Increases in working capital fall to a low of Z$ 544,094 in 1998 as cashflow strengthens. The incidence of financial costs and tax payments after 1998 together with the impact of a projected 20% inflation rate increase the estimates for net working capital progressively from 1999.

10.1.2 Projection of Annual Investment Expenditures

The Total Initial Investment takes place in less than one year, the construction year 1994, {14.2}. As the site is already serviced, installation can be completed within two months once finance has been arranged. The lead time on installation and commissioning will however depend on when ACI has placed, or is to place, firm orders for equipment. No estimates are made for current investment during the projected 15 years of production, 1995-2009, other than the estimates for working capital. Equipment replacement is accommodated in the provisions for spares, depreciation and accumulated reserves {14.pages 15-17}.

10.1.3 Total Production Costs

Factory and Financial costs are projected for 1995-2009, {Annex 14, pages 5-7}. An inflation rate of 20% per year has been adopted for all local costs, with the exception of labour costs. These are 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 5% a year, reflecting the long term price trends in source countries for raw materials, but these are sensitive to the highly volatile foreign exchange rates now affecting production in Zimbabwe. No differential inflation rate in product pricing has been introduced, and none is recommended. Any increase in the ex works and offer price for ACI Orange Juice would impair market prospects. The profitability of packed orange juice is already assured at cost and price increases in line with the general rate of inflation.

For 250 ml packs of Orange Juice unit production costs rise from Z$ 1.36 in 1995, to Z$ 1.96 in the year 2000. Of this, a high proportion is variable, 79% in 1995, and until ACI can use local sources of orange concentrate, a high proportion of total production costs must be met in foreign exchange, 74% in 1995.

10.1.4.1 Sources of Finance

ACI is able to finance 54.2 40% of the capital required from company resources, and has asked MCS to assume it will be able to tap an offshore line of credit through a Zimbabwe Credit Institution at an interest rate of 12%pa, with 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$ 4.439 million at current rates needs to be raised, {Loan A, Annex 14.21}. The investor will meet Z$ 5.252 million of the initial capital required as equity during the construction year, and will inject a further Z$ 5.3 million into the project as equity in the first production year to meet working capital requirements. This lowers the debt/equity ratio to 1: 2.3. Assuming that foreign exchange rates remain with the ranges examined in this study, the project cashflow is well able to sustain this level of gearing. No Bank overdrafts are foreseen during the life of the project.

Other local sources of finance are available to ACI should the need arise, and were examined exhaustively in the first version of the Project Financial Evaluation, [ZTCP, v1. June 1993].

10.1.4.2 Cash Flow Projections

Net cashflow is negative for the first two years of production and is projected to become positive at Z$ 942,970 in the third year, {14.11}. Accumulative cashflow remains negative until the seventh year of production, 2001. Thereafter, it accumulates strongly to over Z$ 182 million in 2009.

10.1.4.3 Financial Cover and Financial Costs

Equity of Z$ 5.2 million and loan funds of Z$ 4.4 million adequately meet the initial investment. Cashflow is in surplus throughout the project, except for deficits in the first two production years, so that debt service liabilities are fully covered. Following a two year grace period, debt repayment is constant from 1998 at Z$ 403,618 a year to 2007. The cost of servicing this debt on current assumptions falls from Z$ 532,776 in 1997, to a final interest payment of Z$ 48,434 in 2007, {14.13}.

In order to avoid the heavy interest payment penalties of bank overdrafts, it would be advisable for ACI 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 might arise.

The payment of dividends is projected from 1998 after year 4 at a rate comparable to the projected rate of interest currently 21%-26% obtainable from Harare bank deposits. This provides the investor with an annual dividend income of Z$ 2.112 million for his discretionary disposal. On current assumptions it is surplus to the financing needs of the project.

10.1.5.1 The Financial Evaluation

(a) Projected Balance Sheets

A strong Balance sheet reflects the positive cashflow from 1998. The generation of substantial profit from 1998 begins to accumulate in strong reserves from 2001, {14.16}. Equity falls from 66% of total liabilities in 1995 to less than 20% in 2004, and to 5.3% in 2009.

(b) Projected Income Statement

Net profits are negative in the first three years of operation but rise to Z$ 1.971 million in 1998,{14.18}. The strong cash flow for the Tetra Pak operation sustains liquidity throughout the life of the project. The Gross losses in years 1-3 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 may be further rebated to 15% if growth points are given equality of treatment with the proposed Export Processing Zones.(56). Tax for ZOJP is calculated and deducted at 25% of taxable profits, and debits Z$1.8 million from 1999.

(c) Investment Profitability Evaluation

The Rate of Return on equity invested against net income flow is 31.05%, at a 25% discount rate. The Rate of Return on Equity invested plus the value of reserves is 32.88%, at a 25% discount rate, {14.14}. These rates are sufficiently positive to warrant the investment, and are accepted by most Banks as the minimum for adequate profit and risk cover. Although they represent a reduction in profitability on projected rates of return calculated in June 1993,,they are reported to be comparable to rates of return prevailing 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.

10.1.5.2 Discounted Cashflow and IRR

The Net Present Value of the project investment taken as a whole is Z$ 4.663 million, at a discount rate of 25%. The project has an Internal Rate of Return of 29.01%, {14.14}. This compares very favourably with the values of other agro-industry investments shown to us in confidence by Zimbabwe financial institutions in 1993. It is unlikely than their relative profitability has changed since.

10.1.6 Sensitivity Analysis.

Break even capacity utilisation at which total costs including finance costs are met by annual sales is has increased since 1993 to 40%. The project has a high proportion of its costs as variable costs, and is therefore sensitive to variable cost changes. A 20% increase in variable costs occurring for example in the 5th year of production would raise the project's break even point to about 76% capacity utilisation, {14.27}. A 20% reduction in variable costs would lower breakeven to about 26% of capacity.

Sensitivity tests for possible changes in the ex-sales price of the packed orange juice product show that a 20% increase in price would lower break even to 25%, while a 20% reduction would render continued operation sub-commercial. {14.28}. Other tests indicate the project cashflow to be reasonably robust should fixed or financial costs increase within probable limits.

The most likely costs structure change that can be brought about by ACI during operations is the switch from imported orange juice concentrate to locally sourced concentrate in 1997/8. The price of internationally traded orange juice has been on a long term decline, but has risen since 1993 to reflect production difficulties in the world's largest supplier, Brazil.

While price projections are notoriously difficult to secure, it seems possible that local sources of concentrate in Zimbabwe may be discounted by as much as 15% on imported concentrate landed costs. If this assumption is valid and orange concentrate price inflation can be restricted to be held to 5% a year, the project's foreign variable costs can be substantially reduced. ACI's nominal raw material costs would be reduced from about 36% to 32% of total costs in the fifth production year, {Annex 14, charts 29 and 30}.

The impact of this on project financing would be to raise the Net Present Value to Z$ 10.667 million, and the IRR to 35.41%. The return on Equity invested (RR1) would increase to 35.41%, and on Equity plus reserves (RR2) to 42.53%.

10.2 ECONOMIC EVALUATION

10.2.1 General Economic Climate

The Zimbabwe Economy in 1993 was under considerable stress. GDP had fallen since 1992 by nearly 8%, [Annex 10:1.]. Manufacturing output in 1992 fell by 9.5%. Inflation abated in the first half of 1993 from the high rates of 50-70% prevailing in 1992, but in January 1994 was rising again for all income groups, and may be annualizing at about 20-25%.

Interest rates also remain high in Zimbabwe so that most industrialists fear private consumption will remain severely depressed, with local industry producing more than the market is able to absorb. Manufacturing performance improved marginally during the second half of 1993, and the first quarter 1994 output was 11.25% above the same period in 1993, but 22.1% lower than in the first quarter of 1992. Many new private sector investments unable to get access to low cost capital under these conditions have been deferred.

10.2.2 Economic Impact of the ACI Investment

Orange juice packing will offer better economic linkages when local raw material sources can be tapped and effect some import substitution from 1997/8. There are however many industrial investments with greater economic benefits for Zimbabwe than the proposed investment. In the present state of Zimbabwe's supply and of world market demand, it is hard to match the cost/benefit ratios of tobacco and beef, which ACI already produces. The projected site for an orange juice packing plant at ACI's Norton Estate is not a natural location for this product. Greater economies of proximity to locally-grown orange juice would arise for a packing plant located nearer to the new citrus plantations.

10.2.3 The Economic Cost/Benefit Analysis

As Zimbabwe is a relatively well-managed economy with a large internationally traded sector, and has since 1993 extensively liberalised its foreign exchange regime, 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 lowered to 25%, reflecting the current central rediscount rate and opportunity costs of capital,(49). This has been adopted as the discount rate for our analysis of the investment proposed, although we note with concern the Zimbabwe Reserve Bank's increase in the accommodation rate to 30%. At 30% discount rate, the investment proposed has a negative Net Present Value.

10.2.4 The Structure of Value Added

The high rate of foreign exchange costs in the project at current exchange rates and with the prospects of further Z$ devaluation are reflected in the foreign outflows of cash. The project has to bear a negative foreign cashflow throughout its life. Foreign exchange cashflow is Z$9.6 million in 1995 and rises to Z$ 15.3 million in 2009,{14.13}. Until local value can be added by sourcing orange juice locally, domestic value added is less than 35%.

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). A reasonable indicator of the gap between the official rate and what the market is prepared to pay for US $ was the forex acquisition window created by Government through the Export Retention Scheme.(50). The Shadow rate of Foreign Exchange adopted for ZTCP was the current official rate, plus the premium paid for ERS entitlements held by exporters. However, the premium paid by the Zimbabwe market for tradable foreign exchange accumulated through the Export Earnings Retention scheme running at a 24% premium on the official rate has been largely offset by the January 1994 devaluation. The exchange rate adopted for the ZOJP study is not believed to be significantly different from real market prices.

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.

10.2.6 Foreign Exchange Earnings/Savings

The Orange Juice line offers no immediate benefits in terms of foreign exchange earnings or savings. Neither is it an obvious import substitution investment, since the South African products that are its nearest competitor will continue to penetrate the market. Given the lack of purchasing power in the Region, and South Africa's commanding position, ACI cannot expect major export sales. 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 Z$ 4 million equivalent a year from 1997.

10.2.7 Infrastructural Implications

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

10.2.8 Technology transfer

The investment studied is not strikingly labour-intensive. 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, but the effort involved in changing the production culture sufficiently is unlikely to be made available from public or private sources.

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 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. Some benefits will stem for Zimbabwe in having a second advanced technology aseptic packing plant in the country. 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 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 36,000 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 low income 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

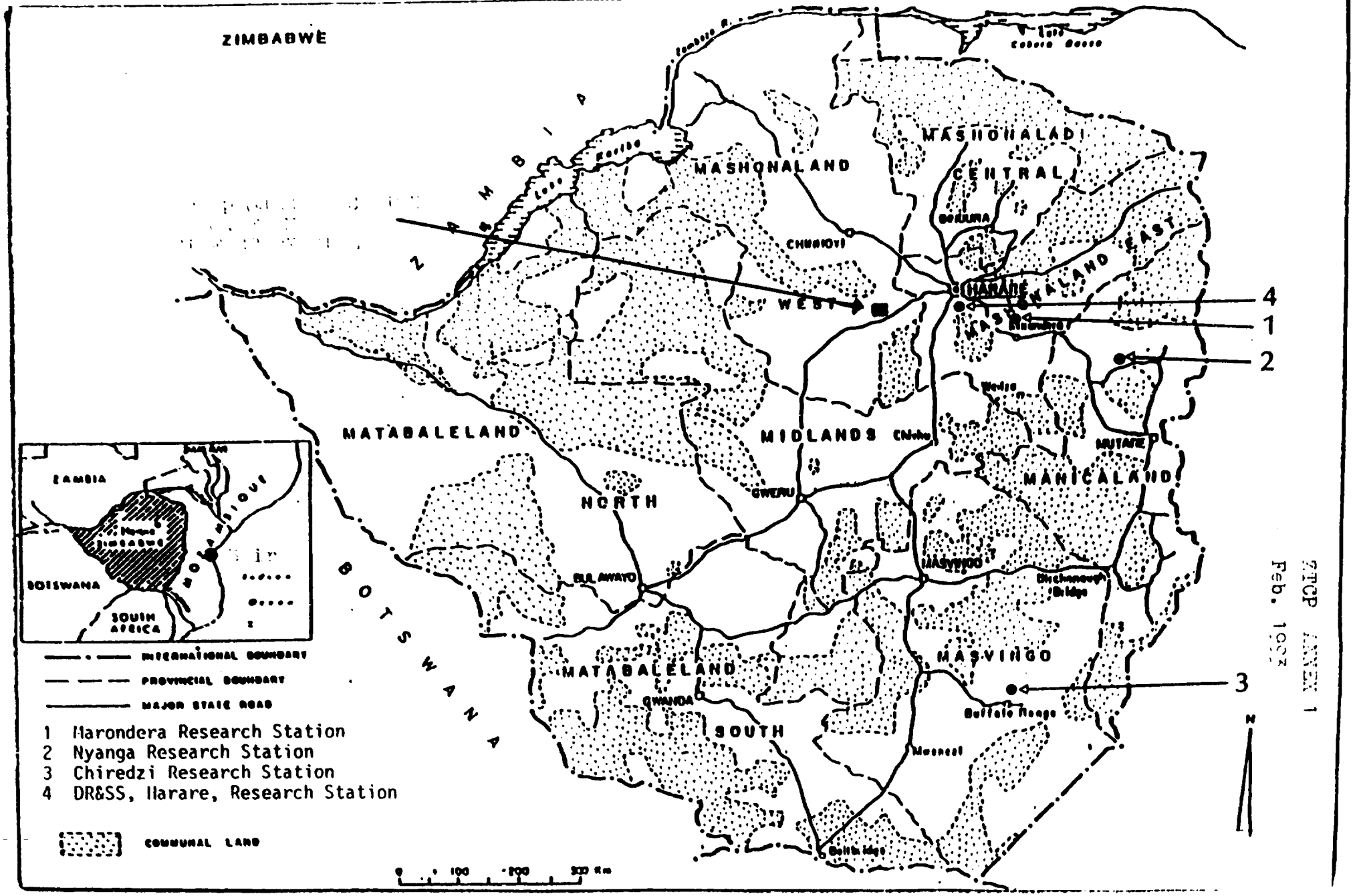
No special employment benefits arise as a result of the Tetra Pak project. There are no extensive linkages to the local economy, and future supplies of orange concentrate are likely to come from other parts of Zimbabwe,[4.1.2]. While there is some unemployment and under-employment in the Norton area, 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 3.3.3]. 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 ZOJP 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 of the ZTCP Final Report.

The impact of the proposed employment in the Factory on the labour catchment area of Norton will not significantly reduce rural male or female unemployment. In the Tetra Pak line, female staff can be trained to operate the equipment, as is common practice in other countries.

ANNEXES



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2. REFERENCES AND CITATIONS

1. The Zimbabwe Statistical Yearbook, 1989, published by the Central Statistical Office, (CSO), 20th floor, Kaguvi Building, 4th Street/Central Avenue, PO Box 8063, Harare. Tel: 706681-8. Director of Census and Statistics: GM Mandishona.

2. Ministry of Industry and Commerce (MIC), 13th floor, Mukwati Building, 4th Street/Livingstone Avenue, PO Box 7708, Harare. Tel: 702731, 791823-7.

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: 791881. 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).

6. ZIMTRADE, 4th floor Kurima House, 89 Baker Avenue, PO Box 2738, Harare. Tel: 731020, 706772. Fax: 706930. Director, Export Development, Mike Humphrey.

7. Agricultural Development Authority, (ADA). 3 McChiery Avenue, South Eastleigh, PO Box 8439 Causeway, Harare. Tel: 705841.

8. The Development Trust of Zimbabwe, (DTZ). PO Box 6880, Harare.

9. Agricultural Finance Corporation (AFC). Bi-Annual Statistical Digest, Sept 1992. AFC Economics Department, Hurudza House, 14-16 Baker Avenue, Harare. Tel: 795811. Fax: 795839. Dep.GM, Development, N Zumbika.

10. Production Account of Agriculture, Forestry and Fisheries, (excluding Communal Lands and Small-scale Market Gardening), 1982-1990, from the CSO (1).

11. Industrial Development Corporation of Zimbabwe Ltd (IDCZ), 93 Park Lane, PO Box 8531, Causeway, Harare. Tel: 706971. Fax: 796028.

12. Commercial Farmers' Union (CFU), Agriculture House, 113 Moffat Street, PO Box 1241, Harare. Tel: 791881. Chief Economist, Neil

Wright.

13. Zimbabwe Investment Centre, 2nd floor, Royal Mutual House, 45 Baker Street, PO Box 5950, Harare. Tel: 790991-4. Manager, K.G.Mangenje. Letter from the Director R.V.Wilde 19 Nov 1990, Ref D/3/138 approving ACI's Z$ 3.092 m ZTCP Project.

14. Quality Control for the Food Industry, an Introductory Handbook. The International Trade Centre UNCTAD/GATT (ITC) Palais des Nations. 1211 Geneva 10, Switzerland.

15. The Manufacturing Sector in Zimbabwe. PPD/R2, 13 Nov 1986. Regional and Country Studies Branch, Studies and Research Division. UNIDO, Vienna International Centre, PO Box 400, A-1400 Vienna. Austria. Tel: 211 31 3847.

16. Second Five Year National Development Plan, (SFYNDP) 1991-95. Published by the Government of Zimbabwe Dec 1991.

17. A Framework for Economic Reform, 1991-95. Government of Zimbabwe, 18 Jan 1991. ESAP Reforms are "aimed at sustaining higher medium and long term growth and reducing poverty. This requires a recovery of investment and improved efficiency. To achieve such a recovery, a trade liberalisation programme aimed at moving away from the present controls will be implemented over a period of five years. Imports will be placed progressively under Open General Licence (OGIL) and Import taxes will be made more uniform. Labour regulations and price controls will be relaxed to improve the business environment and stimulate employment."

18. An Overview of the Zimbabwe Market, prepared by the ITC in cooperation with the Secretariat of the Organisation of African Unity, for the 6th All-Africa Trade Fair, Bulawayo, Zimbabwe, 2-10 Sept. 1992. Against exports to the RSA worth Z$ 321.7 m, Zimbabwe imported Z$ 902.1 m from the RSA in 1990, 75.6% of all imports from the Africa Region.

19. Rural Uplift through Village Industries, Sep 1977. Vivian Craddock Williams, Village Industry Service, PO Box RW 364, Lusaka, Zambia.

20. Terminal Report of the Mission on Agro-Based and Food Processing Industries, for GoZ, by Olu Omosaiye, Agro-Industries Expert of UNIDO/UNDP, May 1992, part of the Support to Small Scale Industries and Enhancement of Indigenous Ownership Project. In respect of the post-harvest wastage of fruits and vegetables in the target areas, he says, " the approach calls for local processing and marketing the final finished products using multi-faceted low-cost technologies to process different fruits. A Community Cannery is an example: so also is a fruit and

vegetable drying facility."

21. Household spending models in `Consumption, Culture and Economic Growth', 1992. Vivian Craddock Williams, Tricontinental Development Consultants (TDC), PO Box 7558, Kampala, Uganda.

22. Commercial Agriculture in Zimbabwe 1990/1. Modern Farming Publications, PO Box 1622, Harare.

23. Women Considered. How UNIDO is Making Women More Visible in Industry,1989. UNIDO, Vienna (15).

24. Farm Planning Schemes, issued by the Rhodesian Department of Conservation and Extension, for Clifford Farm Feb 1971, for John O'Groats June 1976. Both Farms were registered for Survey in the Intensive Conservation Area of Norton by the then owner and first developer, T.C.Lilford, a supporter of the Smith regime, who left the country at Independence in 1980. APRef = Aerial Photography Reference.

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.

29. 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.

32. National Economic Planning Commission, Office of the President, Old Mutual Centre, Justin Moyo and 3rd Street, PO Box 7700, Harare. Tel: 796191-4

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.

37. The Food Processing Industry in Zimbabwe -A Crisis. Paper by the Steering Committee of the Food Processing Industry, PO Box 103, Harare. May 1989. Chairman: A H Knight. 1991 Costs structure estimates are Manderstam's.

38. The Census 1992: Zimbabwe Preliminary Report, CSO Harare, (1) Dec 1992.

39. ZIMBANK Banking 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$ Labour 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. 3-23 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 Z.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. T el: 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

Table Annex 45

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

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, ZDB 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 Development 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 Zimbabwe 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% -24% 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 grain 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 2820,153 275922. Tech info: John McChlery.

54. Horticultural Export Marketing Study, Zimbabwe, Sept 1992,for the Ministry of Lands, Agriculture and Water Development, (5), 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 Export Processing Zones (EPZs) are expected to attract a 5 year tax holiday, tax rates of 15% from year 6, and many other tax exemption benefits. 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 Statutory 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 4-5 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.(5).- 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, J 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: 729438. 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), 9th 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:

Table Annex 72 : 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
CF 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, Broadwell, London SE1 9PL. Tel: 928 8966. Fax: 261 9081.

Princes Foods Ltd. 6th Floor, Royal Liver Building, Liverpool, L3 INX. 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. *Table Annex 75: The Identified Product Mix:*

	CITRUS	TOMATO
Type of Product	Orange Juice Sweetened	Paste
Type of Packaging	Carton	Can
Processing Method	Hot Filling	Hot Filling

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

77. 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.).

78. FAO Yearbook Vol 45, 1991.

79. eg W E Collett, Oceanic Fruits, Harare

80. 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.

Residence: 45638. UK Office: Commercial Director Steve Wyatt, 1,Longwalk Rd. Stockley Park, Uxbridge, Middlesex, UB11 1DL. Tel: 0895 868001.

81. Draft Report Evaluation Meeting, 7-8 June 1994, UNIDO Harare.

82. Metal Box Liquid Packaging Division, PO Box 6167, Johannesburg 2000, South Africa. Fax: 27 (11) 474 9466. Projects and Aseptic Manager,G Testa. Sales Manager: J Reyneke.

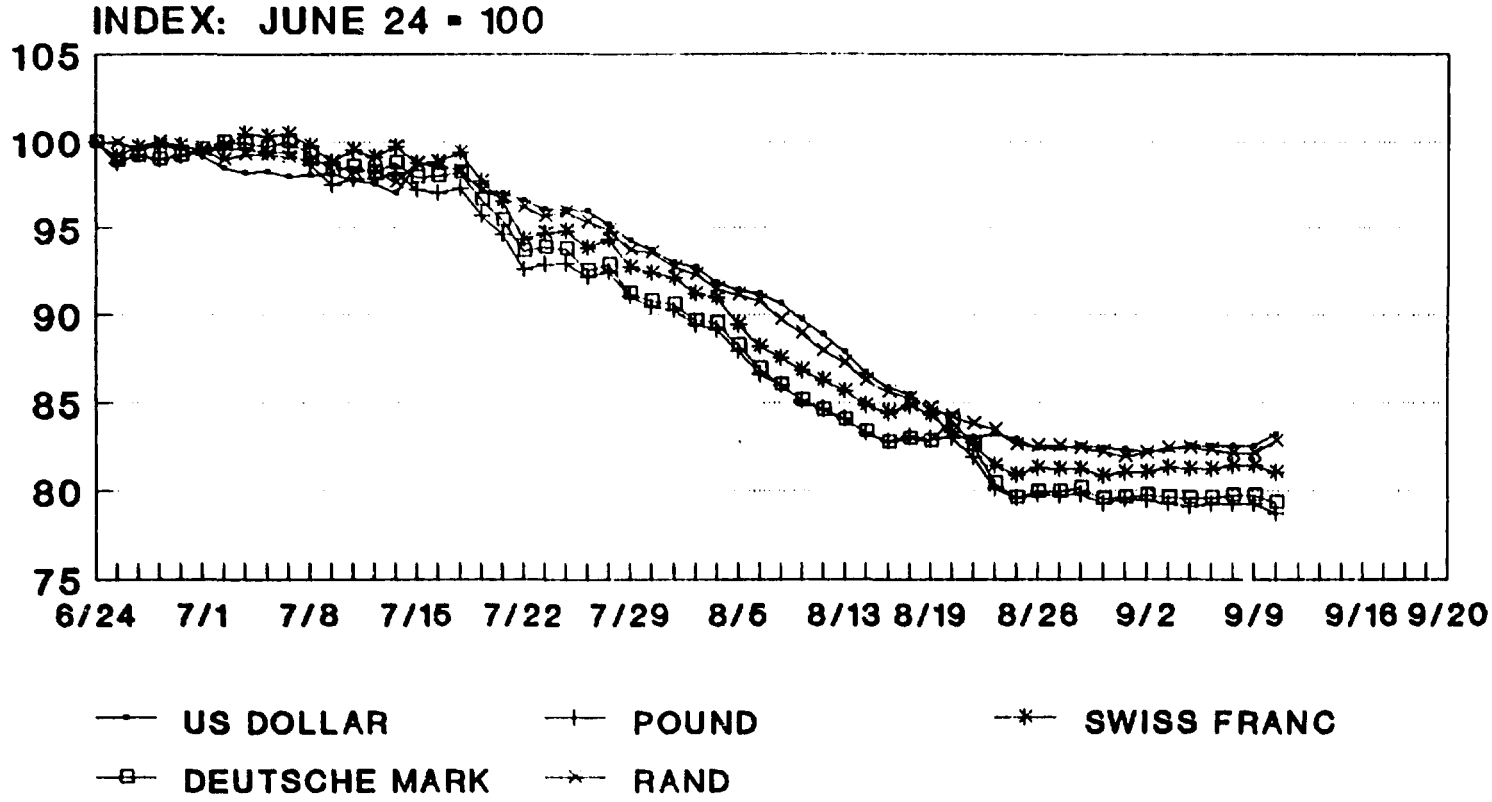
ANNEX 3

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	0,6710	- 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	- 7,6	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	- 2,8	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	-20,7	0,9588	-17,0	1,1611	-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	- 4,1	1,2238	+ 4,4	0,7793	+ 0,4	3,1379	- 3,3
1989	Mar.	0,4975		0,2948		0,9400		1,2702		0,8201		3,1750	
	Jun.	0,4670		0,3008		0,9174		1,2932		0,7891		3,1135	
	Sept.	0,4522		0,2706		0,8456		1,2263		0,7339		2,8650	
	Dec.	0,4405	-14,4	0,2744	+ 3,8	0,7440	-19,0	1,1272	- 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		1,1016		0,6232		2,3720	
	Apr.	0,4098		0,2511		0,6870		1,0896		0,5958		2,3066	
	May	0,4072		0,2404		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.	0,3804		0,1995		0,5915		0,9941		0,5008		1,9776	
	Nov.	0,3868		0,2000		0,5831		0,9739		0,4970		1,9691	
	Dec.	0,3794	-13,9	0,1928	-28,8	0,5665	-23,8	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		0,1899		0,5593		0,9138		0,4764		1,8972	
	June	0,3108		0,1913		0,5579		0,8955		0,4818		1,8925	
	July	0,2904		0,1774		0,5047		0,8305		0,4450		1,7333	
	August	0,2568		0,1525		0,4478		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	-46,1	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		0,3258		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	
RST MERCHANT BANK		0,1656		0,1093		0,2626		0,5079		0,2448		0,8896	

EXCHANGE RATE TRENDS

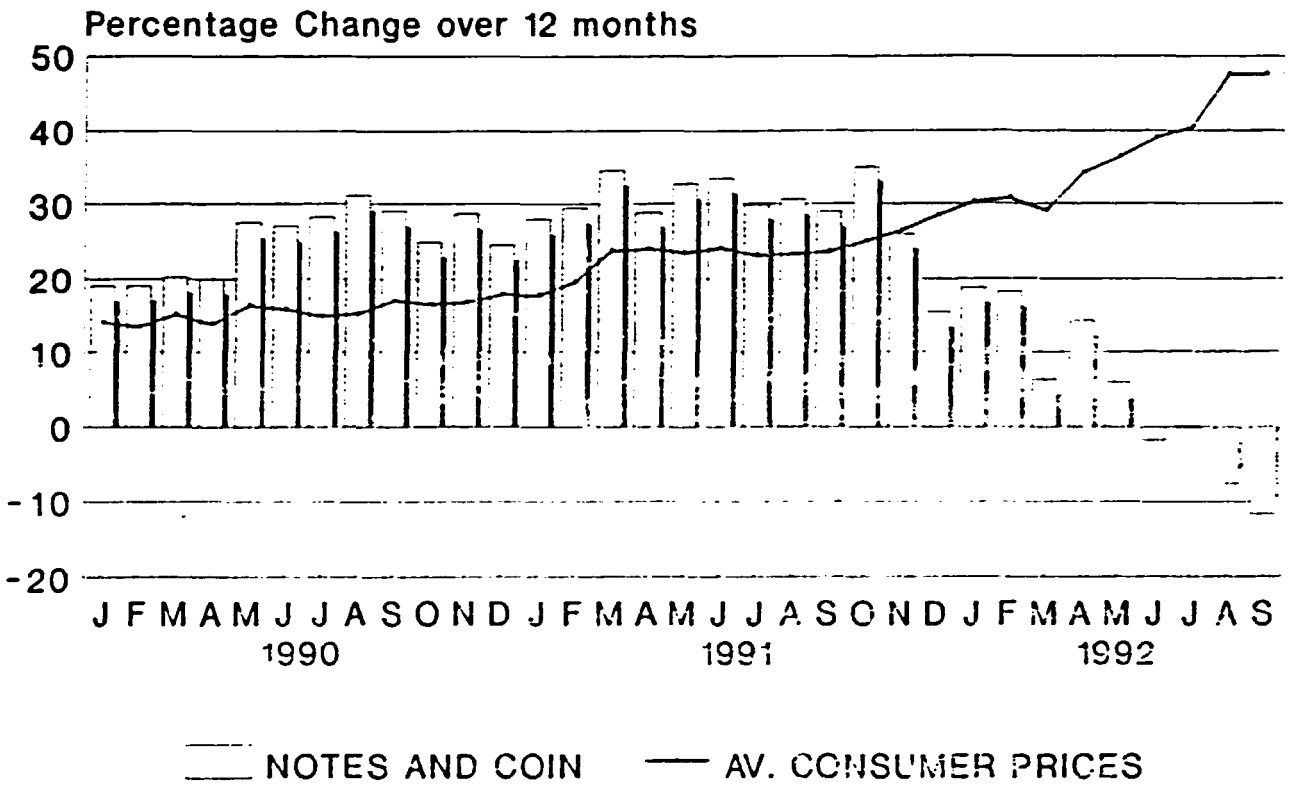
JUNE 24 - SEPT 20



FIRST MERCHANT BANK

MONEY SUPPLY & PRICES

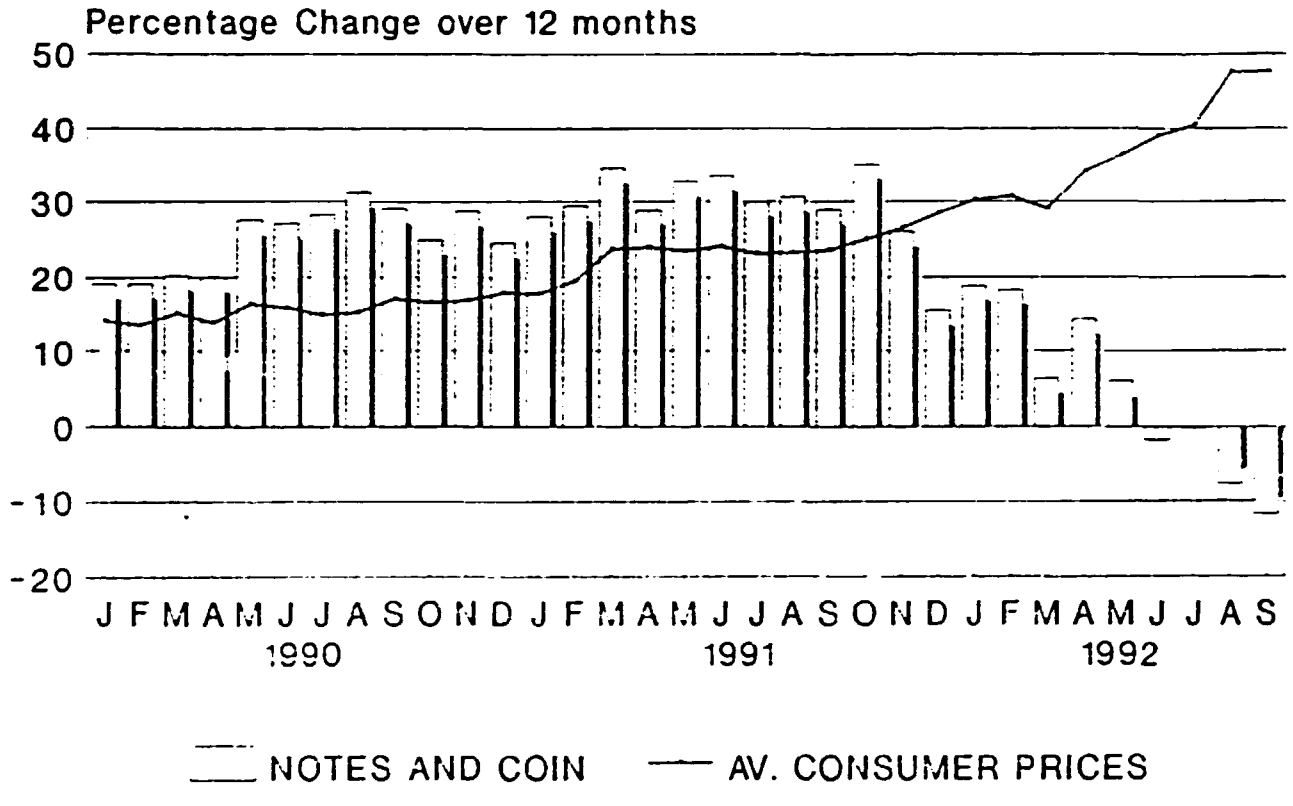
Notes and Coin/Consumer Prices



FIRST MERCHANT BANK

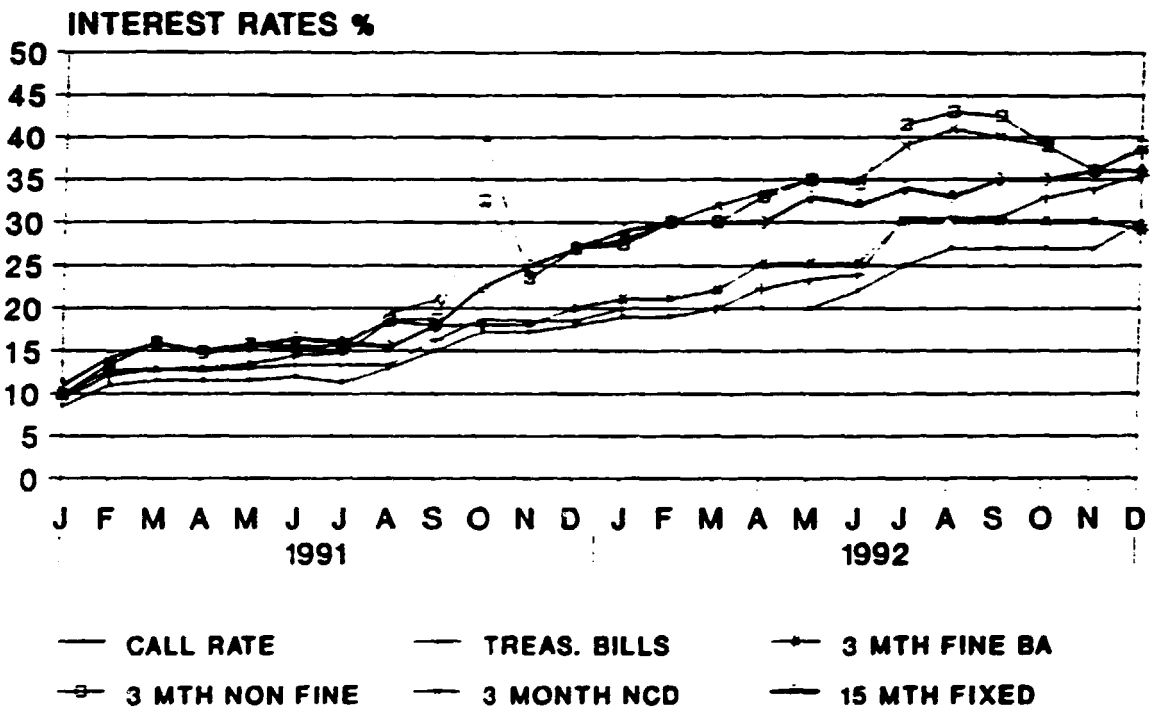
MONEY SUPPLY & PRICES

Notes and Coin/Consumer Prices



FIRST MERCHANT BANK

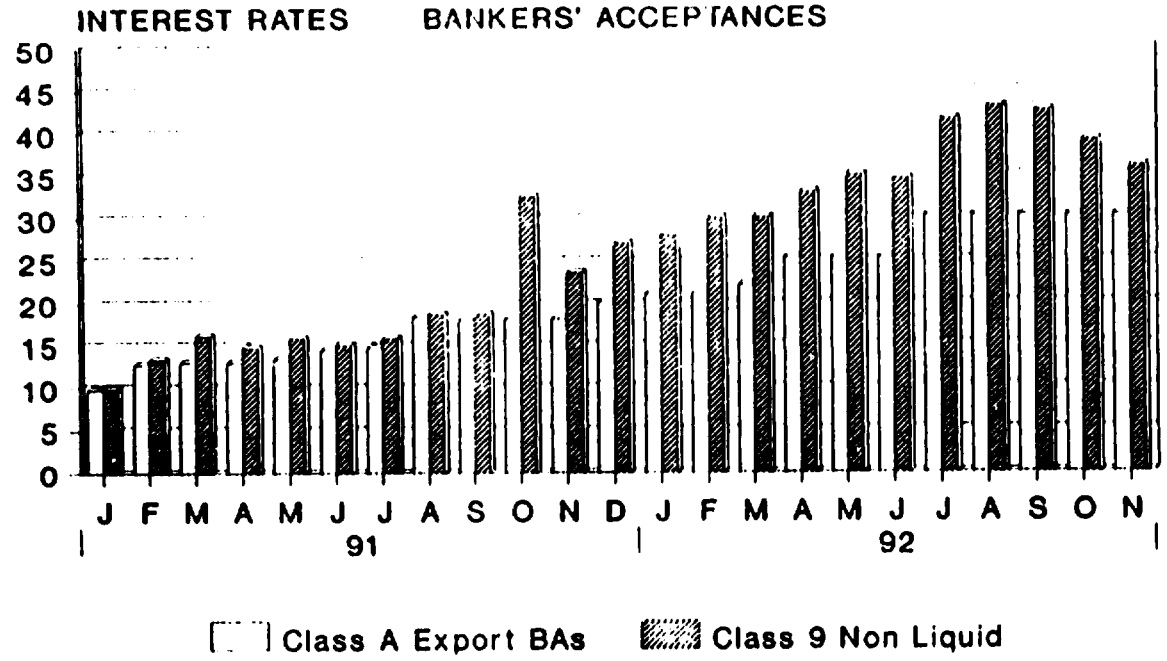
INTEREST RATE TRENDS
JANUARY 1991 to DECEMBER 1992



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 Colyer

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 Tonder

Wholesale Fruiterers
P O Box 1740
Harare
Zimbabwe
Telephone 704671 Telex 24228 ZW
Person to contact Mr Baziolakis

2/...

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 706607

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

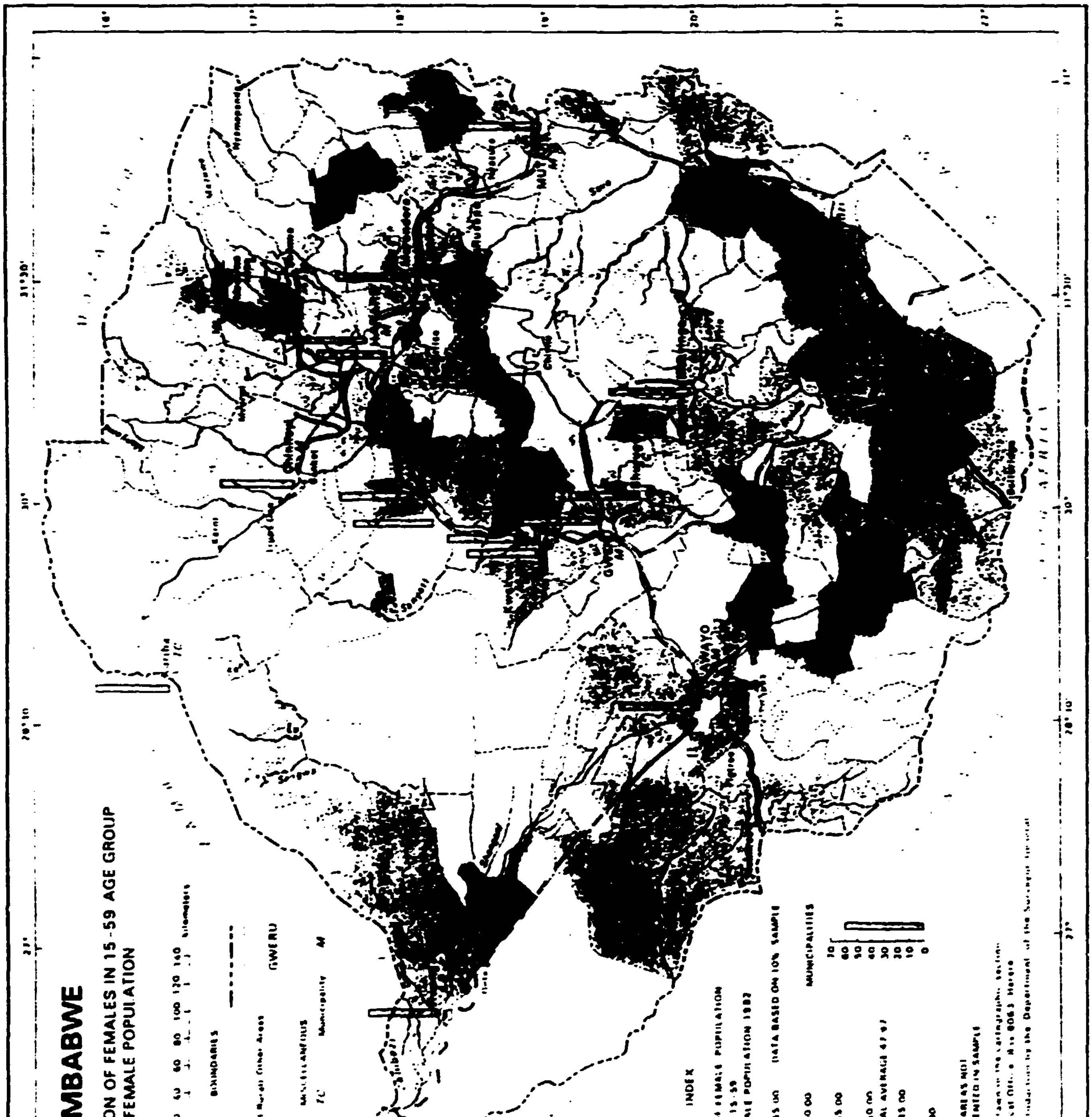
Manica Produce Market
P O Box 3238
Paulington
MUTARE
Tel (120) 64330
Person to contact Mr Neil Sharples

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

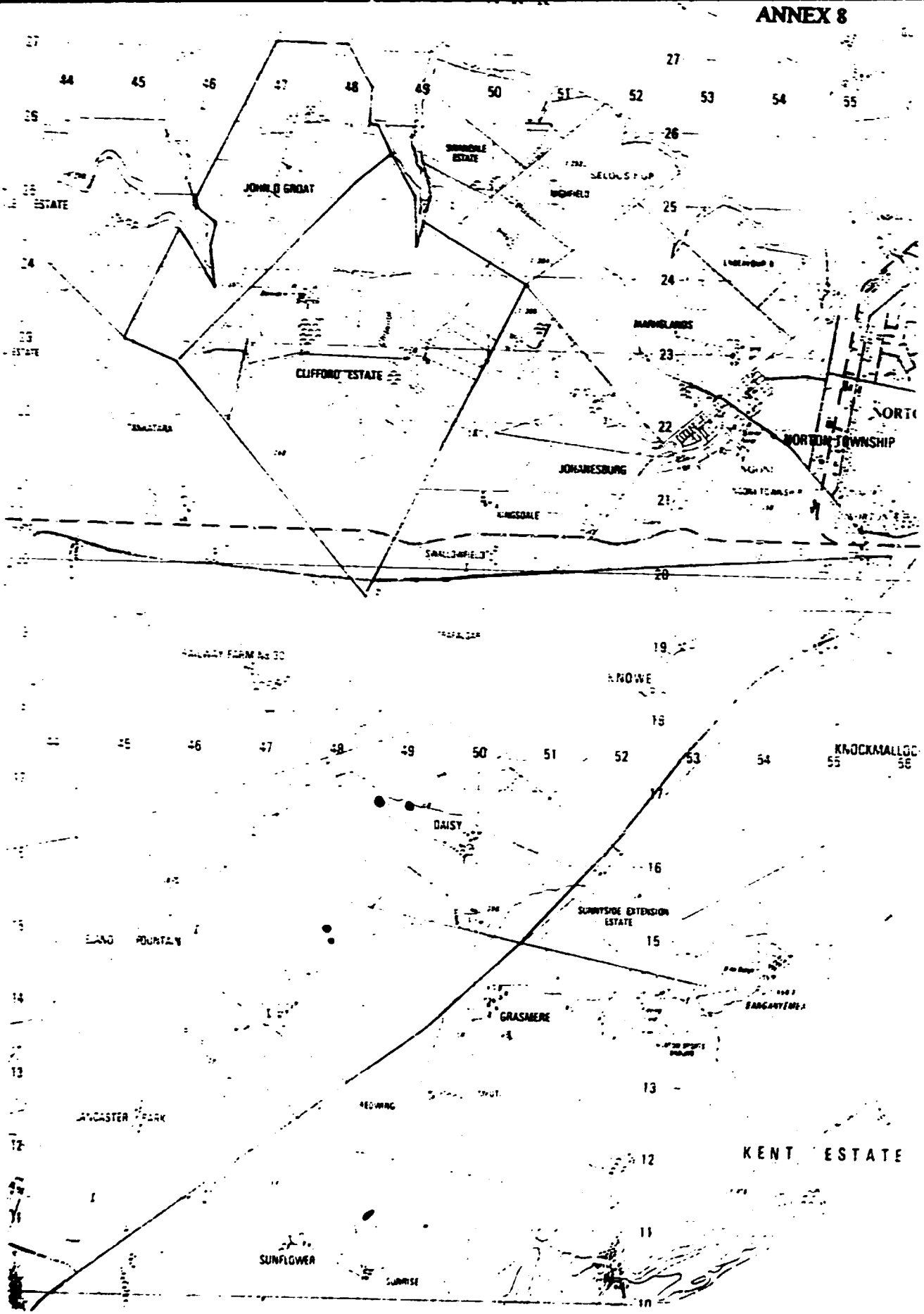
Selby Enterprises
P O Box A460
Avondale
HARARE
Phone Adam/Giles Selby 732833

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
BOUNDARIES
GWERU
MISCELLANEOUS
INDEX
DATA BASED ON 10% SAMPLE
MUNICIPALITIES
NATIONAL AVERAGE 47.67
BLANK AREAS NOT REPRESENTED IN SAMPLE
Victoria Falls TC

ANNEX 8


JOHN O GROAT
CLIFFORD ESTATE
JOHANNESBURG
MARKLANDS
NORTON TOWNSHIP
KINGSDALE
DAISY
SUNNYSIDE EXTENSION ESTATE
GRASMERE
KENT ESTATE
SUNFLOWER
KNOWE
KNOCKMALLOC

- BANNED [illegible] DRINK FROM KENYA

- [illegible] JUICE WITH PRESERV [illegible]
FROM [illegible]


HALL

BLENDED FRUIT JUICE DRINK
NEW
READY TO DRINK
Rowntree's
FRUIT
JUICE DRINK
A FUN FRUITY TASTE
Rowntree's
FRUIT
JUICE DRINK
A FUN FRUITY TASTE
CASHEL
Valley
SEALED IN FRESHNESS
TOMATO PUREE
CASHEL
Valley
SEALED IN FRESHNESS
TOMATO PUREE
LEMCO FOODS

4bp Jan 93 VK.

BELLA Tomato

PURÉE

DOUBLE CONCENTRATED
28%-30%

200 g e

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 Purée
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 purée 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

BEST BEFORE END OF SEE END FLAP

BELLA Tomato

PURÉE

DOUBLE CONCENTRATED
28%-30%

200 g e

JUNE 1994

STORE IN A COOL 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.

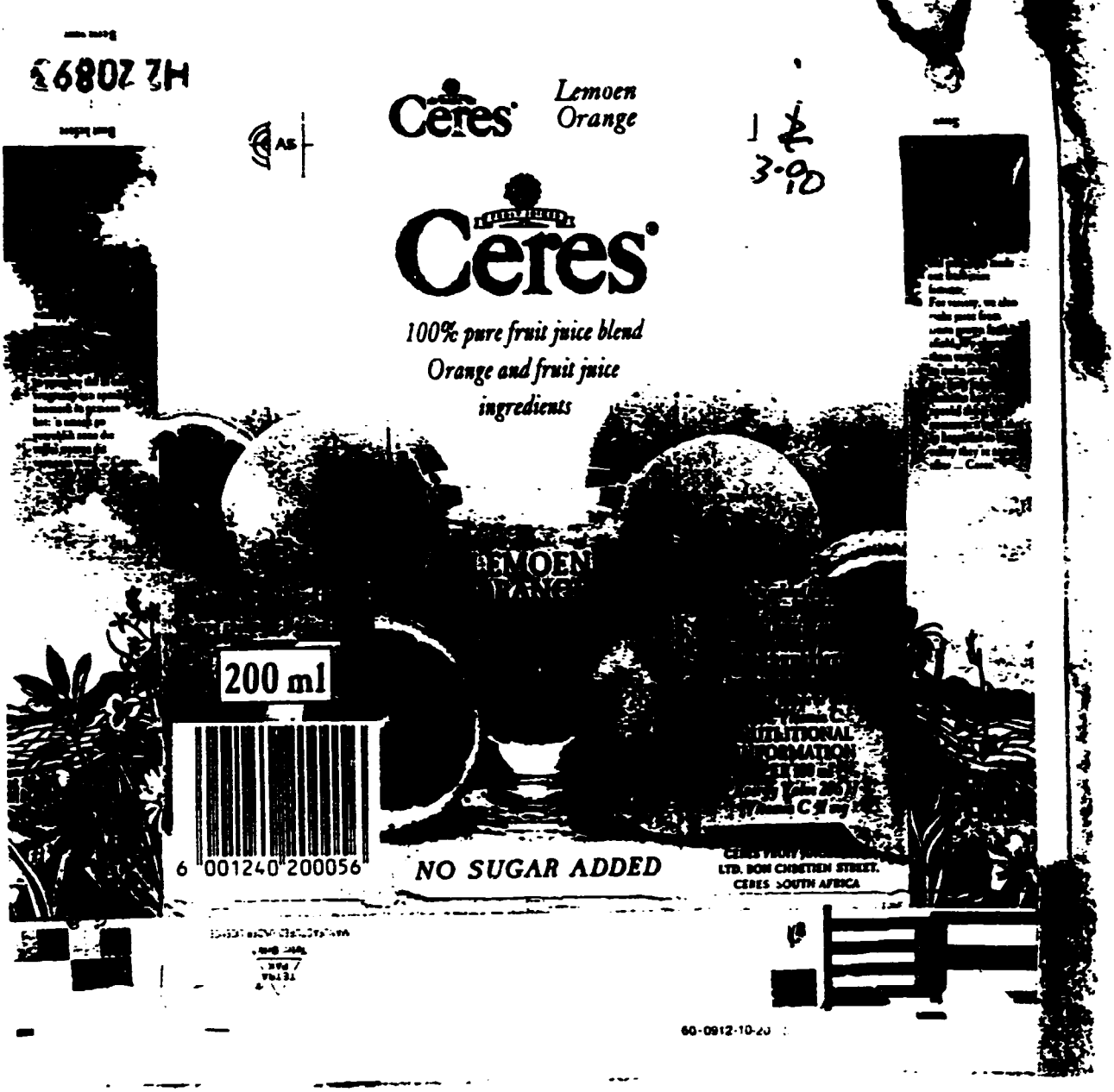
Nutrition per 100 g	
Energy	421 kJ/99 kcal
Protein	5.8 g
Carbohydrate	18.9 g
Fat	0.4 g

INGREDIENTS:
FRESH TOMATOES

Gateway Foodmarkets Ltd.,
P.O. Box 197, Bristol
gateway
Produce of Italy by PVT

Doppio concentrato di pomodoro
Prodotto in Italia da PVT

5 000192 020170



CITRUS FRUIT JUICE FROM SOUTH AFRICA


ZIMBA WE IS BORN
Argentina Seizes Falklands
U.K. Breaks Diplomatic Ties
PURE GOLD
Hockey girls triumphant at Olympics
MANDELA FR
Charles Will Marry Lady Diana Spencer
Sip into The Maz
A lot of things hav
Mazoe Orange
that distinctive,
exceptionally high
It's no wonder it's been
favourite choice for
Mazoe
ORANGE
LD-CONTAINS 50% REAL JUICE

(percent)

From The IBRD PROGRESS REPORT on ADJUSTMENT WITH DROUGHT. Nov 1992 (EA).

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	-2	2	1	9	12	13
Capital Account: 1/	164	304	419	751	759	428	256
Grants	78	108	141	297	251	201	168
Foreign Investment	-10	-12	3	16	28	38	44
Net LT Capital Inflow	55	118	292	481	481	189	124
Short-term Capital 2/	41	90	-17	-42	0	-73	-70
Overall Balance	89	12	-129	-219	-1	48	95
Financing	-89	-12	129	219	92	25	-126
o.w. Change in Reserves	-225	-140	-81	-4	-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. Erimdisrf Mill Imco - one
25. Cattle Feed Mixer - one

TABLE 1.
BASIC INDICATORS

COUNTRY	TOTAL AREA (Km2)	ARABLE LAND 1989 ('000 Ha)	POPULATION ('000)		POP'N AVERAGE ANNUAL GROWTH RATE (%) 1982-90	DENSITY 1990 (Inhab. per km2)	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	3,047	10,011	10,538	2.5	8	8,410	10,456	9,473	11,131	946
BURUNDI	27,834	1,119	5,478	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	4,858	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	8,688	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	GNP (Mns USD)		PER CAPITA GNP 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 1991 (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	1,971	0.00	6.40	6,304	...	7,152	
BURUNDI	1,151	1,161	210	101	247	6.70	24.09	131	105	850	
COMOROS	227	228	478	28	120	0.04	2.43	40	30	170	
DJIBOUTI	434	464	1,016	54	376	25.80	21.73	147	94	165	...
ETHIOPIA	6,041	6,064	118	307	1,114	29.27	9.73	2,411	24	3,185	103.8
KENYA	8,958	9,033	368	1,324	2,229	251.40	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	729	142.8
MOZAMBIQUE	1,208	1,204	77	390	899	5.79	85.01	...	...	4,853	...
RWANDA	2,214	2,218	311	203	213	13.77	33.15	292	44	692	111.6
SOMALIA	946	948	151	106	197	0.67	36.03	135	...	1,922	...
SUDAN	11,021	12,361	437	358	1,419	0.70	38.26	4,682	11	9,356	933.9
SWAZILAND	645	651	817	327	77	27.13	6.98	74	216	251	200.6
TANZANIA	2,335	1,836	86	385	1,090	17.55	37.58	569	193	5,296	359.4
UGANDA	3,814	3,845	220	171	464	2.55	109.08	228	64	2,301	6,629.7
ZAMBIA	3,391	3,396	418	1,061	1,066	40.82	76.63	433	193	4,784	1,194.2
ZIMBABWE	6,313	6,346	644	1,541	1,488	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	1,715
BURUNDI	5	50	116	6.8	33	70	4	50	2,253
COMOROS	27	55	...	6.8	56	80	..	..	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	6.4	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	13.4	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

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

COST ESTIMATES	FOREIGN US $
Plant machinery & equipment (L8)	
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 iine 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

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 @ Z$ 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.

COMFAR 2.1 UNIDO

COMFAR 2.1 - MAUDERSTAN CONSULTING SERVICES, LONDON, ENGLAND

ORANGE JUICE
29 09 94 (v2).
250 ml ASEPTIC PACKS

1 year(s) of construction, 15 years of production
currency conversion rates:
foreign currency 1 unit = 8.0000 units accounting currency
local currency 1 unit = 1.0000 units accounting currency
accounting currency: I$

Total initial investment during construction phase

fixed assets:	9691.86	72.848 % foreign
current assets:	0.00	0.000 % foreign
total assets:	9691.86	72.848 % foreign

Source of funds during construction phase

equity & grants:	5252.06	0.000 % foreign
foreign loans :	4439.80	
local loans :	0.00	
total funds :	9691.86	45.810 % foreign

Cashflow from operations

Year:	1	2	3
operating costs:	12601.71	15622.92	19208.40
depreciation :	1663.63	1663.63	1663.63
interest :	0.00	0.00	532.78
production costs	14265.34	17286.55	21404.80
thereof foreign	74.44 %	72.41 %	70.56 %
total sales :	15365.28	19785.26	25409.01
gross income :	-1614.85	-803.98	-32.67
net income :	-1614.85	-803.98	-32.67
cash balance :	496.60	-210.83	6.58
net cashflow :	-4813.29	-210.83	942.97

Net Present Value at: 25.00 % = 4663.98
Internal Rate of Return: 29.01 %
Return on equity1: 31.05 %
Return on equity2: 32.88 %

Index of Schedules produced by COMFAR

otal Initial Investment in 2$

ar	1994
ed investment costs	
and, site preparation, development	4.500
uildings and civil works	2236.500
uxiliary and service facilities .	517.600
ncorporated fixed assets	307.200
lant machinery and equipment . . .	5602.760
tal fixed investment costs	9668.560
e-production capital expenditures.	23.300
t working capital	0.000
tal initial investment costs . . .	9691.859
it foreign, in %	72.848

COMFAR 2.1 - MANDERSTAM CONSULTING SERVICES, LONDON, ENGLAND

otal Current Investment in Z$

ar	1995	1996	1997	1998	1999
xed investment costs					
and, site preparation, development	0.000	0.000	0.000	0.000	0.000
uildings and civil works	0.000	0.000	0.000	0.000	0.000
uxiliary and service facilities	0.000	0.000	0.000	0.000	0.000
ncorporated fixed assets	0.000	0.000	0.000	0.000	0.000
lant, machinery and equipment	0.000	0.000	0.000	0.000	0.000
tal fixed investment costs	0.000	0.000	0.000	0.000	0.000
eproduction capitals expenditures.	0.000	0.000	0.000	0.000	0.000
rking capital	4862.068	1070.480	1220.761	544.093	612.671
tal current investment costs	4862.068	1070.480	1220.761	544.093	612.671
it foreign, %	86.926	79.802	75.803	54.632	50.943

COMFAR 2.1 - MANDERSTAM CONSULTING SERVICES, LONDON, ENGLAND

otal Current Investment in Z$

ar	2000	2001	2002	2003	2004
xed investment costs					
and, site preparation, development	0.000	0.000	0.000	0.000	0.000
uildings and civil works	0.000	0.000	0.000	0.000	0.000
uxiliary and service facilities	0.000	0.000	0.000	0.000	0.000
ncorporated fixed assets	0.000	0.000	0.000	0.000	0.000
lant, machinery and equipment	0.000	0.000	0.000	0.000	0.000
tal fixed investment costs	0.000	0.000	0.000	0.000	0.000
eproduction capitals expenditures.	0.000	0.000	0.000	0.000	0.000
rking capital	693.819	790.218	905.133	1042.576	1207.448
tal current investment costs	693.819	790.218	905.133	1042.576	1207.448
it foreign, %	47.234	43.546	39.918	36.388	32.991

ORANGE JUICE --- 29 09 94 (v2).

otal Current Investment in Z$

r	2005	2006	2007	2008	2009
ed investment costs					
nd, site preparation, development	0.000	0.000	0.000	0.000	0.000
ildings and civil works	0.000	0.000	0.000	0.000	0.000
xiliary and service facilities .	0.000	0.000	0.000	0.000	0.000
corporated fixed assets	0.000	0.000	0.000	0.000	0.000
ant, machinery and equipment . .	0.000	0.000	0.000	0.000	0.000
al fixed investment costs	0.000	0.000	0.000	0.000	0.000
production capitals expenditures.	0.000	0.000	0.000	0.000	0.000
king capital	1405.767	1644.904	1933.918	2283.911	2708.549
al current investment costs . . .	1405.767	1644.904	1933.918	2283.911	2708.549
it foreign, i	29.753	26.699	23.845	21.200	18.770

otal Production Costs in Z$

ar	1995	1996	1997	1998	1999
of nom. capacity (single product).	54.907	63.206	71.448	71.448	71.448
w material 1	5390.398	6519.580	7743.917	8137.931	8553.011
her raw materials	4786.315	6008.037	7433.299	8167.638	9011.227
ilities	24.526	33.880	45.958	55.150	66.180
ergy	868.619	1135.925	1470.550	1701.905	1979.532
bour, direct	757.043	973.120	1249.690	1562.112	1952.641
pair, maintenance	79.491	96.385	209.009	250.810	300.972
ares	153.330	170.825	189.913	201.427	213.920
ctory overheads	19.294	23.751	29.213	35.056	42.067
ctory costs	12079.020	14961.500	18371.550	20112.030	22119.550
ministrative overheads	269.597	338.528	425.120	528.976	658.312
dir. costs, sales and distribution	253.099	322.891	411.728	512.961	639.162
rect costs, sales and distribution	0.000	0.000	0.000	0.000	0.000
preciation	1663.627	1663.627	1663.627	1315.131	269.635
nancial costs	0.000	0.000	532.776	484.341	435.907
tal production costs	14265.340	17286.550	21404.800	22953.440	24122.560
sts per unit (single product)	1.360	1.431	1.568	1.681	1.767
it foreign, %	74.439	72.414	70.560	66.958	62.212
it variable,%	79.127	81.064	80.072	81.080	84.093
tal labour	1223.051	1566.164	2004.073	2505.091	3131.364

Total Production Costs in Z$

Year	2000	2001	2002	2003	2004
% of nom. capacity (single product).	71.448	71.448	71.448	71.448	71.448
Raw material 1	8990.480	9451.789	9938.518	10452.410	10995.390
Other raw materials	9984.037	11109.940	12417.470	13940.790	15720.770
Utilities	79.415	95.299	114.358	137.230	164.676
Energy	2312.683	2712.465	3192.203	3767.889	4458.712
Labour, direct	2440.801	3051.001	3813.751	4767.188	5958.986
Repair, maintenance	361.167	433.400	520.080	624.096	748.916
Spares	227.522	242.386	258.690	276.646	296.505
Factory overheads	50.480	60.576	72.692	87.230	104.676
Factory costs	24446.590	27156.850	30327.770	34053.480	38448.630
Administrative overheads	819.399	1020.060	1270.048	1581.528	1969.671
Indir. costs, sales and distribution	796.506	992.697	1237.348	1542.457	1922.997
Direct costs, sales and distribution	0.000	0.000	0.000	0.000	0.000
Depreciation	269.635	269.635	134.930	0.225	0.225
Financial costs	387.473	339.039	290.605	242.171	193.737
Total production costs	26719.600	29778.280	33260.700	37419.870	42535.270
Costs per unit (single product)	1.957	2.181	2.436	2.741	3.116
Of it foreign, %	58.643	54.963	51.349	47.649	43.836
Of it variable,%	83.087	81.942	80.996	79.858	78.304
Total labour	3914.206	4892.757	6115.946	7644.932	9556.166

Total Production Costs in Z$

Year	2005	2006	2007	2008	2009
of nom. capacity (single product).	71.448	71.448	71.448	71.448	71.448
aw material 1	11569.600	12177.400	12821.450	13504.750	14230.650
ther raw materials	17806.330	20256.080	23140.200	26542.780	30564.610
tilities	197.611	237.133	284.560	341.472	409.766
nergy	5287.699	6282.484	7476.227	8908.717	10627.710
abour, direct	7448.732	9310.916	11638.640	14548.300	18185.380
epair, maintenance	898.699	1078.439	1294.127	1552.952	1863.542
pares	318.561	343.167	370.739	401.772	436.856
actory overheads	125.611	150.733	180.880	217.056	260.467
actory costs	43652.850	49836.350	57206.830	66017.800	76578.990
dministrative overheads	2453.403	3056.331	3807.905	4744.872	5913.078
dir. costs, sales and distribution	2397.658	2989.767	3728.441	4650.031	5799.914
irect costs, sales and distribution	0.000	0.000	0.000	0.000	0.000
epreciation	0.225	0.225	0.225	0.225	0.225
inancial costs	145.303	96.868	48.434	0.000	0.000
otal production costs	48649.440	55979.540	64791.840	75412.940	88292.210
osts per unit (single product)	3.564	4.101	4.746	5.524	6.468
f it foreign, %	40.091	36.456	32.966	29.651	26.574
f it variable,%	76.684	75.019	73.326	71.626	69.897
otal labour	11945.210	14931.510	18664.380	23330.480	29163.100

---------- COMFAR 2.1 - MANDERSTAM CONSULTING SERVICES, LONDON, ENGLAND -----

Net Working Capital in Z$

Year			1995	1996	1997	1998	1999
Coverage	mdc	coto					
Current assets &							
Accounts receivable	30	12.0	1276.375	1577.134	1937.107	2140.743	2377.849
Inventory and materials	83	4.3	2991.240	3621.945	4307.679	4533.518	4772.740
Energy	30	12.0	72.385	94.660	122.546	141.825	164.961
Spares	152	2.4	72.487	80.258	88.603	93.089	97.811
Work in progress	30	12.0	1006.585	1246.792	1530.962	1676.002	1843.296
Finished products	10	36.0	343.017	425.001	522.130	573.361	632.718
Cash in hand	30	12.0	106.563	133.551	175.245	214.865	263.993
Total current assets			5868.653	7179.341	8684.271	9373.405	10153.370
Current liabilities and							
Accounts payable	30	12.0	1006.585	1246.792	1530.962	1676.002	1843.296
Net working capital			4862.068	5932.549	7153.309	7697.403	8310.071
Increase in working capital			4862.068	1070.481	1220.760	544.094	612.668
Net working capital, local			635.681	851.900	1147.282	1394.124	1694.681
Net working capital, foreign			4226.387	5080.648	6006.027	6303.277	6615.391

Note: mdc = minimum days of coverage ; coto = coefficient of turnover .

---------- COMFAR 2.1 - MANDERSTAM CONSULTING SERVICES, LONDON, ENGLAND -----

Net Working Capital in Z$

Year			2000	2001	2002	2003	2004
Coverage	mdc	coto					
Current assets &							
Accounts receivable	30	12.0	2655.174	2980.921	3365.078	3819.803	4359.917
Inventory and materials	83	4.3	5026.432	5295.820	5582.291	5887.422	6213.010
Energy	30	12.0	192.724	226.039	266.017	313.991	371.559
Spares	152	2.4	102.782	108.018	113.535	119.351	125.486
Work in progress	30	12.0	2037.216	2263.071	2527.314	2837.791	3204.053
Finished products	10	36.0	70[illegible].833	782.692	877.717	989.862	1122.731
Cash in hand	30	12.0	324.947	400.618	494.605	611.391	756.563
Total current assets			11041.110	12057.180	13226.560	14579.610	16153.320
Current liabilities and							
Accounts payable	30	12.0	2037.216	2263.071	2527.314	2837.791	3204.053
Net working capital			9003.892	9794.110	10699.240	11741.820	12949.270
Increase in working capital			693.820	790.219	905.132	1042.576	1207.447
Net working capital, local			2060.782	2506.895	3050.719	3713.918	4523.022
Net working capital, foreign			6943.109	7287.215	7648.524	8027.900	8426.244

Net Working Capital in Z$

Year	mdc	coto	2005	2006	2007	2008	2009
Coverage							
Current assets &							
Accounts receivable	30	12.0	5003.494	5772.588	6694.140	7801.057	9133.577
Inventory and materials	83	4.3	6561.124	6934.135	7334.788	7766.263	8232.258
Energy	30	12.0	440.642	523.540	623.019	742.393	885.642
Spares	152	2.4	131.962	138.801	146.030	153.679	161.779
Work in progress	30	12.0	3637.738	4153.029	4767.236	5501.483	6381.583
Finished products	10	36.0	1280.729	1469.241	1694.854	1965.630	2291.446
Cash in hand	30	12.0	937.084	1161.632	1441.025	1788.746	2221.611
Total current assets			17992.770	20152.970	22701.090	25719.250	29307.900
Current liabilities and							
Accounts payable	30	12.0	3637.738	4153.029	4767.236	5501.483	6381.583
Net working capital			14355.030	15999.940	17933.860	20217.770	22926.310
Increase in working capital			1405.769	1644.903	1933.918	2283.910	2708.549
Net working capital, local			5510.529	6716.259	8189.043	9988.766	12188.910
Net working capital, foreign			8844.505	9283.679	9744.813	10229.000	10737.400

Note: mdc = minimum days of coverage ; coto = coefficient of turnover .

Cashflow Tables, construction in Z$

ear	1994
otal cash inflow . .	9691.859
Financial resources .	9691.859
Sales, net of tax . .	0.000
otal cash outflow . .	9691.859
Total assets	9691.859
Operating costs . . .	0.000
Cost of finance . . .	0.000
Repayment	0.000
Corporate tax . . .	0.000
Dividends paid . . .	0.000
rplus (deficit) .	0.000
mulated cash balance	0.000
flow, local	5252.060
tflow, local	2631.500
rplus (deficit) .	2620.560
flow, foreign . . .	4439.800
tflow, foreign . . .	7060.360
rplus (deficit) .	-2620.560
t cashflow	-9691.859
mulated net cashflow	-9691.859

Cashflow tables, production in Z$

Year	1995	1996	1997	1998	1999	2000
Total cash inflow . .	18966.960	16722.780	21656.300	25069.880	29319.290	34380.630
Financial resources .	6316.475	240.207	284.170	145.040	167.293	193.920
Sales, net of tax . .	12650.490	16482.570	21372.130	24924.840	29152.000	34186.700
Total cash outflow . .	18470.370	16933.610	21649.720	24843.430	28904.500	32462.480
Total assets	5868.653	1310.688	1504.931	689.133	779.963	887.740
Operating costs . . .	12601.710	15622.920	19208.400	21153.960	23417.020	26062.490
Cost of finance . . .	0.000	0.000	532.776	484.341	435.907	387.473
Repayment	0.000	0.000	403.618	403.618	403.618	403.618
Corporate tax . . .	0.000	0.000	0.000	0.000	1755.605	2608.789
Dividends paid . . .	0.000	0.000	0.000	2112.378	2112.378	2112.378
Surplus (deficit) .	496.594	-210.832	6.578	226.443	414.797	1918.141
Cumulated cash balance	496.594	285.762	292.340	518.783	933.580	2851.721
Inflow, local	14298.680	12241.440	16673.800	19964.130	23958.260	28751.540
Outflow, local	4220.191	4769.449	6412.741	9755.828	13171.030	16048.450
Surplus (deficit) .	10078.490	7471.992	10261.060	10208.300	10787.240	12703.100
Inflow, foreign . . .	4668.276	4481.337	4982.501	5105.742	5361.029	5629.081
Outflow, foreign . . .	14250.180	12164.160	15236.980	15087.610	15733.460	16414.040
Surplus (deficit) .	-9581.899	-7682.823	-10254.480	-9981.864	-10372.430	-10784.960
Net cashflow	-4813.296	-210.831	942.971	3226.778	3366.702	4821.604
Cumulated net cashflow	-14505.160	-14715.990	-13773.020	-10546.240	-7179.535	-2357.932

ashflow tables, production in Z$

ar	2001	2002	2003	2004	2005	2006
tal cash inflow . .	40414.430	47613.270	56208.200	66476.360	78750.270	93428.880
inancial resources .	225.856	264.243	310.477	366.262	433.685	515.292
ales, net of tax . .	40188.570	47349.030	55897.720	66110.090	78316.580	92913.590
tal cash outflow . .	36679.620	41737.350	47751.240	54871.250	63383.460	73577.720
otal assets	1016.073	1169.376	1353.052	1573.710	1839.452	2160.196
perating costs . . .	29169.610	32835.160	37177.470	42341.300	48503.910	55882.450
ost of finance . . .	339.039	290.605	242.171	193.737	145.303	96.868
epayment	403.618	403.618	403.618	403.618	403.618	403.618
orporate tax . . .	3638.903	4926.218	6462.551	8246.494	10378.800	12922.220
ividends paid . . .	2112.378	2112.378	2112.378	2112.378	2112.378	2112.378
rplus (deficit) .	3734.805	5875.918	8456.957	11605.110	15366.800	19851.160
mulated cash balance	6586.525	12462.440	20919.400	32524.510	47891.310	67742.480
flow, local	34503.890	41407.210	49691.830	59634.176	71565.980	85885.380
tflow, local	19548.560	23851.000	29069.390	35351.720	42981.960	52247.710
rplus (deficit) .	14955.330	17556.210	20622.436	24282.450	28584.020	33637.670
flow, foreign . . .	5910.534	6206.061	6516.364	6842.182	7184.290	7543.503
tflow, foreign . . .	17131.060	17886.360	18681.840	19519.520	20401.510	21330.020
rplus (deficit) .	-11220.530	-11680.300	-12165.480	-12677.340	-13217.220	-13786.510
t cashflow	6589.839	8682.520	11215.130	14314.850	18028.100	22464.020
mulated net cashflow	4231.907	12914.430	24129.550	38444.400	56472.490	78936.520

Cashflow tables, production in Z$

Year	2007	2008	2009
Total cash inflow . .	110990.900	132010.700	157177.400
Financial resources .	614.207	734.248	880.099
Sales, net of tax . .	110376.700	131276.400	156297.300
Total cash outflow . .	85805.740	100090.800	117790.100
Total assets	2548.123	3018.161	3588.645
Operating costs . . .	64743.180	75412.690	88291.980
Cost of finance . . .	48.434	0.000	0.000
Repayment	483.618	0.000	0.000
Corporate tax . . .	15950.000	19547.530	23797.100
Dividends paid . . .	2112.378	2112.378	2112.378
Surplus (deficit) .	25185.160	31919.940	39387.340
Accumulated cash balance	92927.630	124847.600	164234.900
Inflow, local	103070.200	123694.000	148444.900
Outflow, local	63498.370	77158.360	93726.786
Surplus (deficit) .	39571.850	46535.610	54718.110
Inflow, foreign . . .	7920.679	8316.712	8732.548
Outflow, foreign . . .	22307.370	22932.390	24063.320
Surplus (deficit) .	-14386.690	-14615.680	-15330.770
Net cashflow	27749.590	34032.310	41499.730
Accumulated net cashflow	106686.100	140718.400	182218.200

ashflow Discounting:

Equity paid versus Net income flow:

Net present value	6135.20	at	25.00 %
Internal Rate of Return (IRRE1) ..	31.05 %		

Net Worth versus Net cash return:

Net present value	7248.73	at	25.00 %
Internal Rate of Return (IRRE2) ..	32.88 %		

Internal Rate of Return on total investment:

Net present value	4663.98	at	25.00 %
Internal Rate of Return (IRR) ..	29.01 %		

t Worth = Equity paid plus reserves

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rojected Balance Sheets, construction in 1$

ar	1994
tal assets	9691.859
xed assets, net of depreciation	0.000
nstruction in progress	9691.859
rrent assets	0.000
sh, bank	0.000
sh surplus, finance available .	0.000
ss carried forward	0.000
ss	0.000
tal liabilities	9691.859
uity capital	5252.064
serves, retained profit	0.000
ofit	0.000
ng and medium term debt	4439.796
rrent liabilities	0.000
nk overdraft, finance required.	0.000
tal debt	4439.796
uity, % of liabilities	54.190

Projected Balance Sheets, Production in Z$

Year	1995	1996	1997	1998	1999
Total assets	16008.330	16248.540	16129.090	17841.910	18908.020
Fixed assets, net of depreciation	8028.232	6364.605	4700.979	3385.847	3116.212
Construction in progress	0.000	0.000	0.000	0.000	0.000
Current assets	5762.090	7045.790	8509.026	9158.539	9889.375
Cash, bank	106.563	133.551	175.245	214.865	263.992
Cash surplus, finance available	496.597	285.767	292.347	2631.164	3045.964
Loss carried forward	0.000	1614.854	2418.830	2451.498	2592.479
Loss	1614.854	803.977	32.668	0.000	0.000
Total liabilities	16008.330	16248.540	16129.090	17841.910	18908.020
Equity capital	10561.950	10561.950	10561.950	10561.950	10561.950
Reserves, retained profit	0.000	0.000	0.000	0.000	0.000
Profit	0.000	0.000	0.000	1971.396	3273.831
Long and medium term debt	4439.796	4439.796	4036.178	3632.561	3228.943
Current liabilities	1006.585	1246.792	1530.962	1676.002	1843.296
Bank overdraft, finance required.	0.000	0.000	0.000	0.000	0.000
Total debt	5446.380	5686.588	5567.141	5308.563	5072.238
Equity, % of liabilities	65.978	65.002	65.484	59.197	55.860

COMFAR 2.1 - MANDERSTAM CONSULTING SERVICES, LONDON, ENGLAND

Projected Balance Sheets, Production in Z$

Year	2000	2001	2002	2003	2004
Total assets	20282.810	23333.030	30243.390	40053.170	53231.780
Fixed assets, net of depreciation	2846.577	2576.942	2442.012	2441.787	2441.562
Construction in progress	0.000	0.000	0.000	0.000	0.000
Current assets	10716.160	11656.560	12731.950	13968.220	15396.760
Cash, bank	324.947	400.618	494.605	611.391	756.563
Cash surplus, finance available	4964.100	8698.909	14574.820	23031.780	34636.900
Loss carried forward	1431.027	0.000	0.000	0.000	0.000
Loss	0.000	0.000	0.000	0.000	0.000
Total liabilities	20282.810	23333.030	30243.390	40053.170	53231.780
Equity capital	10561.950	10561.950	10561.950	10561.950	10561.950
Reserves, retained profit	0.000	1314.912	5973.920	13023.660	22926.580
Profit	4858.316	6771.386	9162.113	12015.300	15328.340
Long and medium term debt	2825.325	2421.708	2018.090	1614.472	1210.854
Current liabilities	2037.216	2263.071	2527.314	2837.791	3204.053
Bank overdraft, finance required.	0.000	0.000	0.000	0.000	0.000
Total debt	4862.541	4684.779	4545.404	4452.263	4414.907

rojected Balance Sheets, Production in Z$

ar	2005	2006	2007	2008	2009
tal assets	70437.800	92448.930	120182.000	155119.800	198095.600
xed assets, net of depreciation	2441.337	2441.112	2440.887	2440.662	2440.437
nstruction in progress	0.000	0.000	0.000	0.000	0.000
rrent assets	17055.690	18991.340	21260.070	23930.510	27086.290
sh, bank	937.084	1161.632	1441.025	1788.746	2221.611
sh surplus, finance available	50003.690	69854.850	95040.020	126959.900	166347.300
ss carried forward	0.000	0.000	0.000	0.000	0.000
ss	0.000	0.000	0.000	0.000	0.000
tal liabilities	70437.800	92448.930	120182.000	155119.800	198095.600
uity capital	10561.950	10561.950	10561.950	10561.950	10561.950
serves, retained profit	36142.540	53318.500	75217.950	102740.400	136944.000
ofit	19288.340	24011.830	29634.860	36315.970	44208.030
ng and medium term debt	807.236	403.619	0.000	0.000	0.000
rrent liabilities	3637.738	4153.029	4767.236	5501.484	6381.583
nk overdraft, finance required	0.000	0.000	0.000	0.000	0.000
tal debt	4444.974	4556.648	4767.236	5501.484	6381.583
uity, % of liabilities	14.995	11.425	8.788	6.809	5.332

Net Income Statement in 2$

Year	1995	1996	1997	1998	1999
Total sales, incl. sales tax	15365.280	19785.260	25409.010	29459.790	34269.170
less: variable costs, incl. sales tax.	14002.540	17315.810	21176.200	23145.570	25402.460
Variable margin	1362.736	2469.447	4232.811	6314.219	8866.711
as % of total sales	8.869	12.481	16.659	21.433	25.874
Non-variable costs, incl. depreciation	2977.590	3273.424	3732.703	3858.481	3401.368
Operational margin	-1614.854	-803.977	500.107	2455.738	5465.343
as % of total sales	-10.510	-4.064	1.968	8.336	15.948
Cost of finance	0.000	0.000	532.776	484.341	435.907
Gross profit	-1614.854	-803.977	-32.668	1971.396	5029.436
Allowances	12.173	13.287	13.422	13.422	13.422
Taxable profit	-1627.026	-817.264	-46.090	1957.974	5016.014
Tax	0.000	0.000	0.000	0.000	1755.605
Net profit	-1614.854	-803.977	-32.668	1971.396	3273.831
Dividends paid	0.000	0.000	0.000	2112.378	2112.378
Undistributed profit	-1614.854	-803.977	-32.668	-140.981	1161.453
Accumulated undistributed profit	-1614.854	-2418.830	-2451.498	-2592.479	-1431.027
Gross profit, % of total sales	-10.510	-4.064	-0.129	6.692	14.676
Net profit, % of total sales	-10.510	-4.064	-0.129	6.692	9.553
ROE, Net profit, % of equity	-15.289	-7.612	-0.309	18.665	30.996
ROI, Net profit+interest, % of invest.	-11.096	-5.146	2.969	14.122	20.607

Net Income Statement in A$

Year	2000	2001	2002	2003	2004
Total sales, incl. sales tax	39986.300	46790.020	54894.800	64557.980	76087.780
Less: variable costs, incl. sales tax.	28000.070	31002.250	34485.750	38542.840	43284.530
Variable margin	11986.230	15787.770	20409.050	26015.040	32803.250
As % of total sales	29.976	33.742	37.178	40.297	43.112
Non-variable costs, incl. depreciation	4131.652	5038.441	6030.114	7295.017	9034.682
Operational margin	7854.579	10749.330	14378.940	18720.020	23768.570
As % of total sales	19.643	22.974	26.194	28.997	31.238
Cost of finance	387.473	339.039	290.605	242.171	193.737
Gross profit	7467.105	10410.290	14088.330	18477.850	23574.830
Allowances	13.422	13.422	13.422	13.422	13.422
Taxable profit	7453.684	10396.870	14074.910	18464.430	23561.410
Tax	2608.789	3638.903	4926.218	6462.551	8246.494
Net profit	4858.316	6771.386	9162.113	12015.300	15328.340
Dividends paid	2112.378	2112.378	2112.378	2112.378	2112.378
Undistributed profit	2745.938	4659.008	7049.735	9902.923	13215.960
Accumulated undistributed profit	1314.912	5973.920	13023.660	22926.580	36142.540
Gross profit, % of total sales	18.674	22.249	25.664	28.622	30.984
Net profit, % of total sales	12.150	14.472	16.690	18.612	20.146
ROE, Net profit, % of equity	45.998	64.111	86.746	113.760	145.128
ROI, Net profit+interest, % of invest.	28.059	36.490	46.357	57.188	68.557

et Income Statement in Z$

ar	2005	2006	2007	2008	2009
tal sales, incl. sales tax	89854.590	106302.200	125963.200	149476.400	177608.300
ss: variable costs, incl. sales tax.	48844.480	55383.660	63096.070	72215.610	83024.440
riable margin	41010.100	50918.550	62867.130	77260.800	94583.860
% of total sales	45.641	47.900	49.909	51.688	53.254
n-variable costs, incl. depreciation	11197.660	13887.630	17233.830	21397.300	26578.730
erational margin	29812.440	37030.920	45633.300	55863.500	68005.130
% of total sales	33.179	34.836	36.227	37.373	38.289
st of finance	145.303	96.868	48.434	0.000	0.000
oss profit	29667.140	36934.050	45584.860	55863.500	68005.130
lowances	13.422	13.422	13.422	13.422	13.422
xable profit	29653.720	36920.630	45571.440	55850.080	67991.710
x	10378.800	12922.220	15950.000	19547.530	23797.100
t profit	19288.340	24011.830	29634.860	36315.970	44208.030
vidends paid	2112.378	2112.378	2112.378	2112.378	2112.378
distributed profit	17175.960	21899.450	27522.480	34203.590	42095.650
cumulated undistributed profit	53318.500	75217.950	102740.400	136944.000	179039.700
oss profit, % of total sales	33.017	34.744	36.189	37.373	38.289
t profit, % of total sales	21.466	22.588	23.527	24.295	24.891
, Net profit, % of equity	182.621	227.343	280.581	343.838	418.559
, Net profit+interest, % of invest.	80.816	93.838	107.448	121.419	135.532

ource of Finance, construction in Z$

ar	1994
uity, ordinary ..	5252.064
uity, preference.	0.000
bsidies, grants .	0.000
Loan A, foreign .	4439.796
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
tal loan	4439.796
rrent liabilities	0.000
nk overdraft	0.000
tal funds	9691.859

ource of Finance, production in Z$

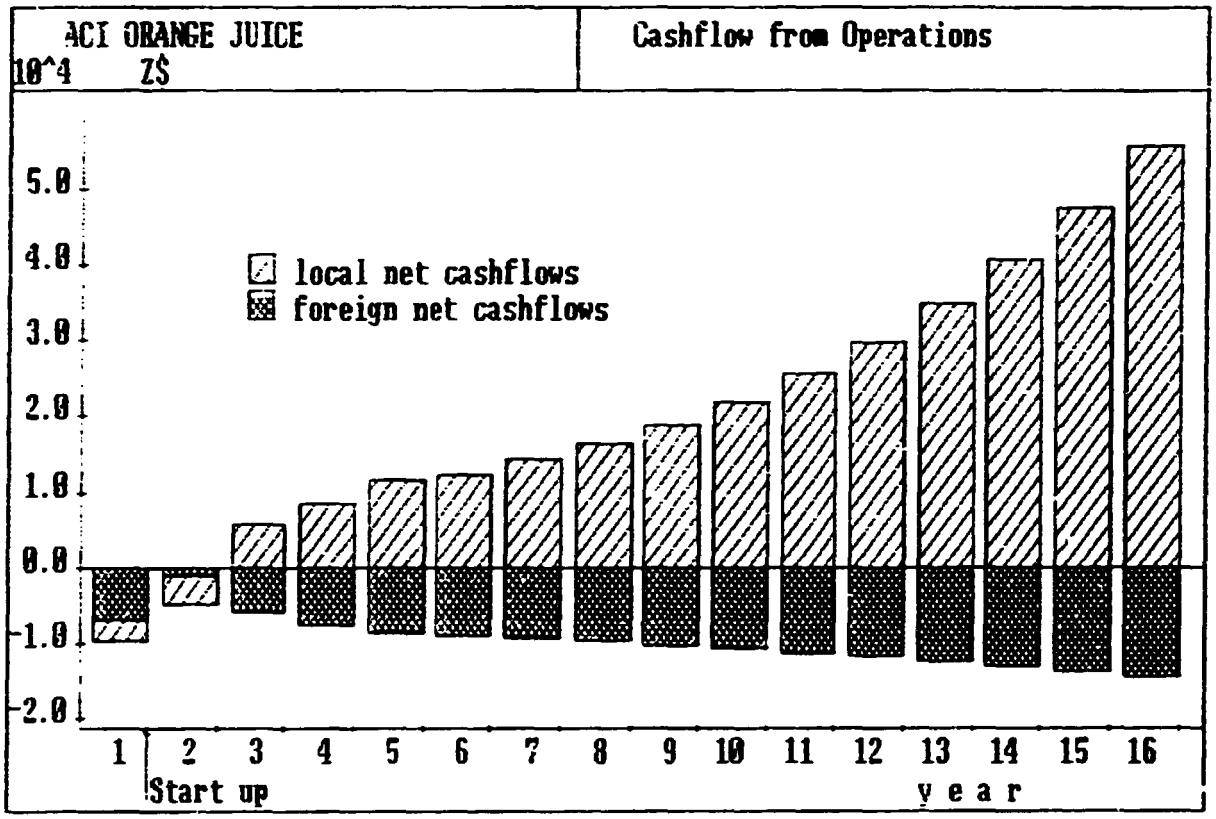
ar	1995	1996	1997	1998	1999	2000
uity, ordinary ..	5309.890	0.000	0.000	0.000	0.000	0.000
uity, preference.	0.000	0.000	0.000	0.000	0.000	0.000
bsidies, grants .	0.000	0.000	0.000	0.000	0.000	0.000
Loan A, foreign .	0.000	0.000	-403.618	-403.618	-403.618	-403.618
Loan B, foreign..	0.000	0.000	0.000	0.000	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
tal loan	0.000	0.000	-403.618	-403.618	-403.618	-403.618
rrent liabilities	1006.585	240.207	284.170	145.040	167.293	193.920
nk overdraft	0.000	0.000	0.000	0.000	0.000	0.000
tal funds	6316.475	240.207	-119.447	-258.578	-236.325	-209.698

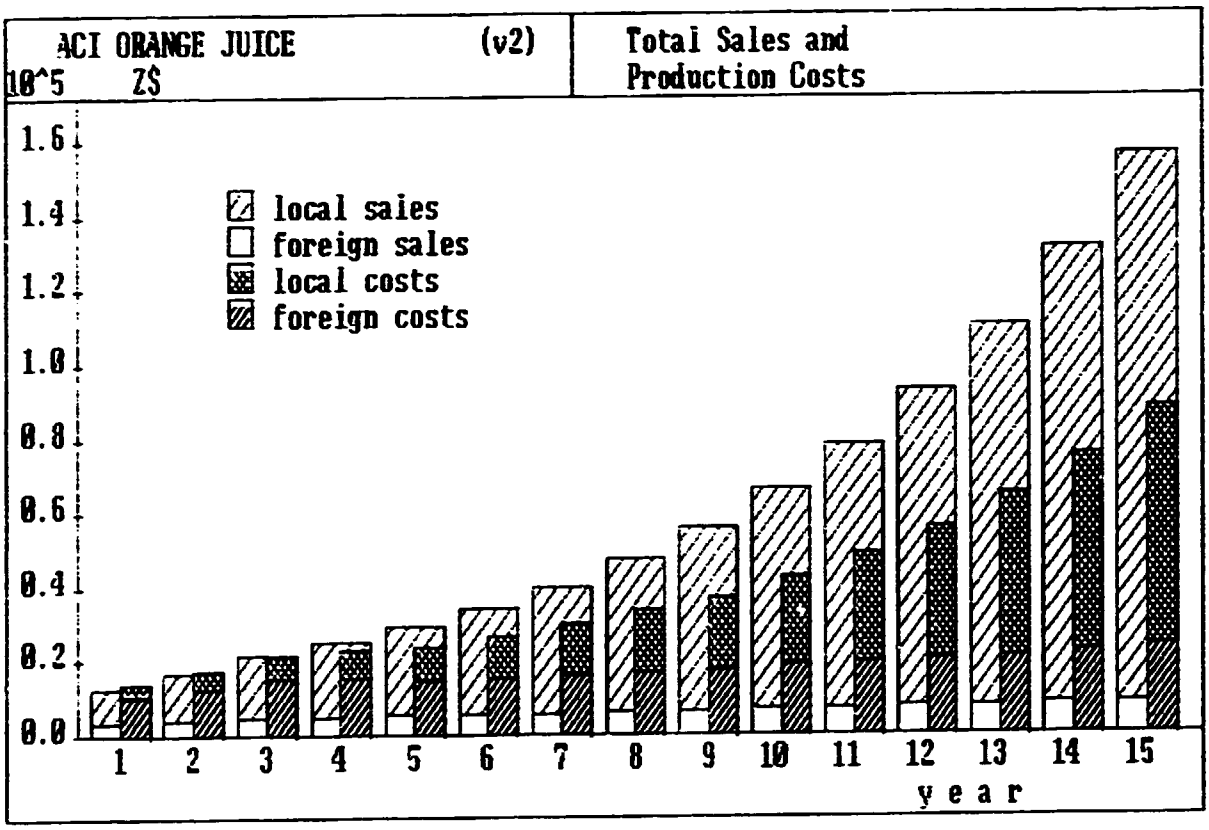
ource of Finance, production in Z$

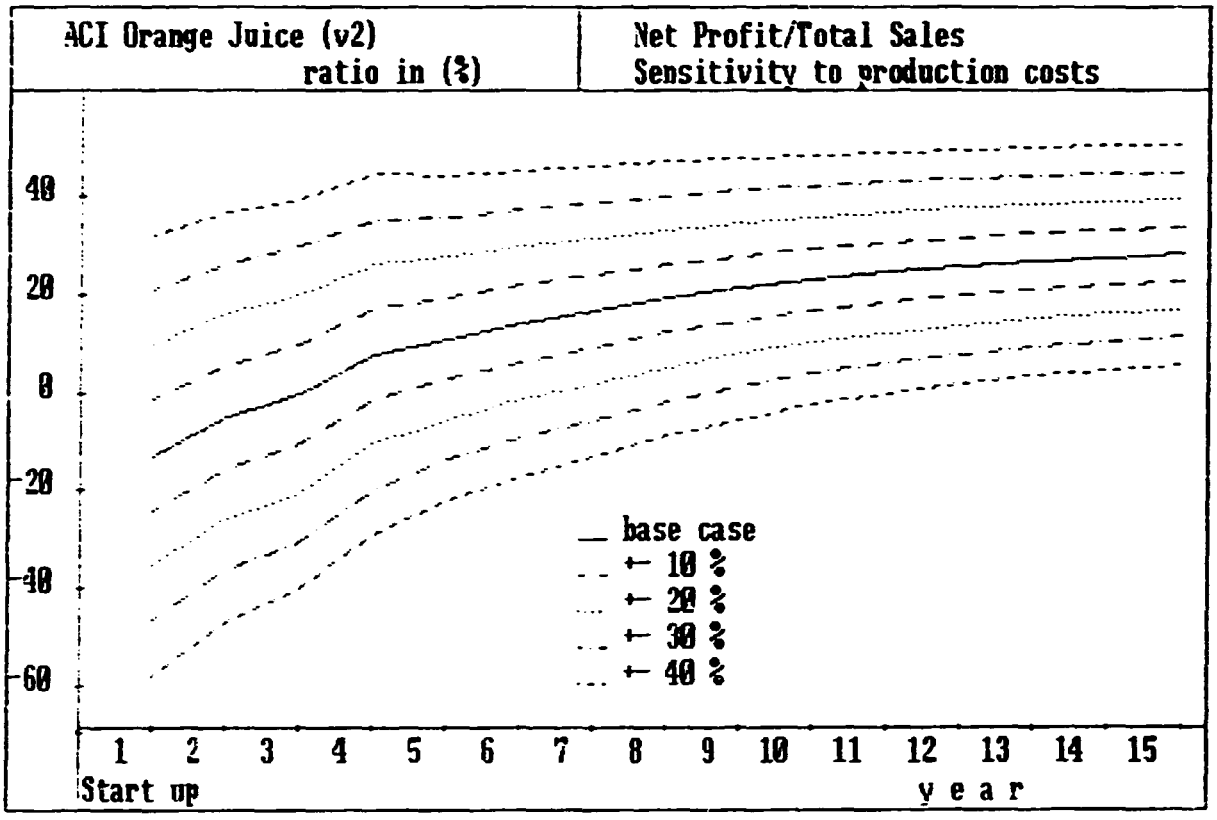
ar	2001	2002	2003	2004	2005	2006
uity, ordinary ..	0.000	0.000	0.000	0.000	0.000	0.000
uity, preference.	0.000	0.000	0.000	0.000	0.000	0.000
bsidies, grants .	0.000	0.000	0.000	0.000	0.000	0.000
Loan A, foreign .	-403.618	-403.618	-403.618	-403.618	-403.618	-403.618
Loan B, foreign..	0.000	0.000	0.000	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
tal loan	-403.618	-403.618	-403.618	-403.618	-403.618	-403.618
rrent liabilities	225.856	264.242	310.477	366.262	433.685	515.292
nk overdraft	0.000	0.000	0.000	0.000	0.000	0.000
tal funds	-177.762	-139.375	-93.141	-37.355	30.067	111.674

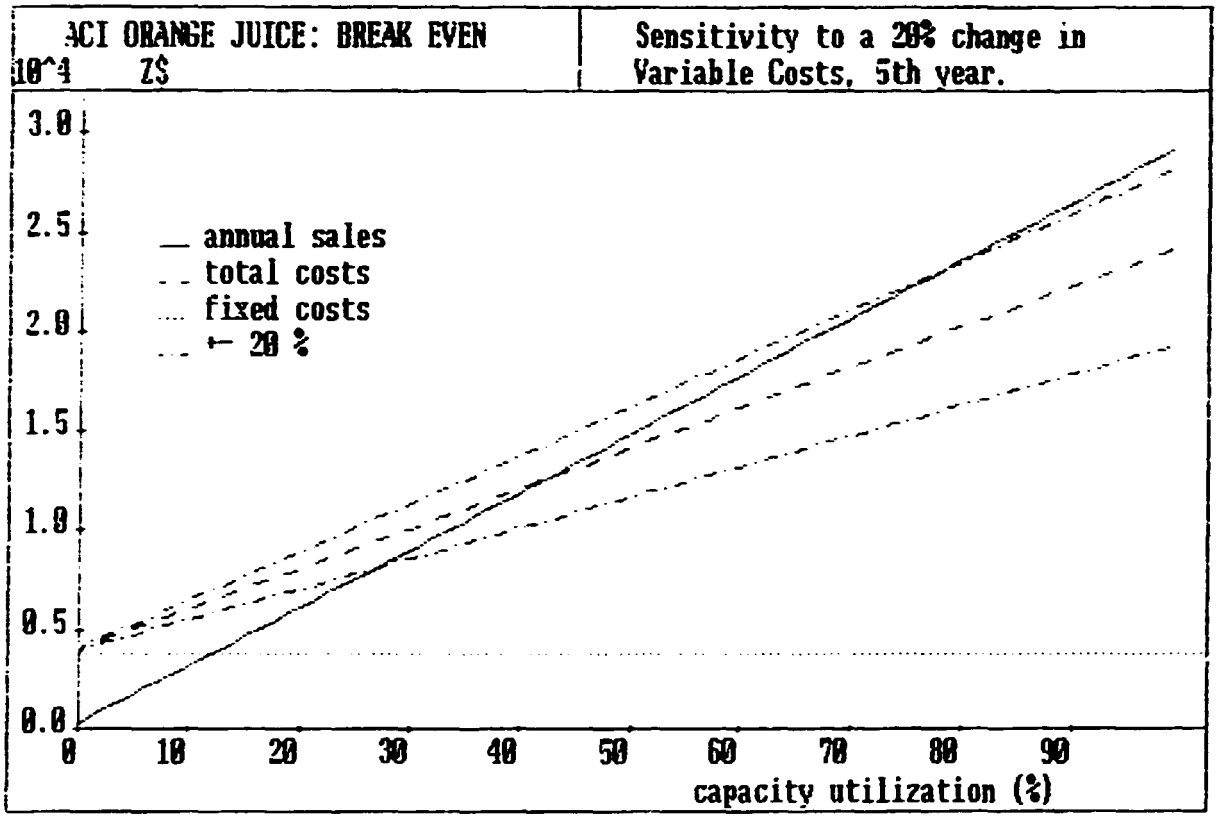
ource of Finance, production in Z$

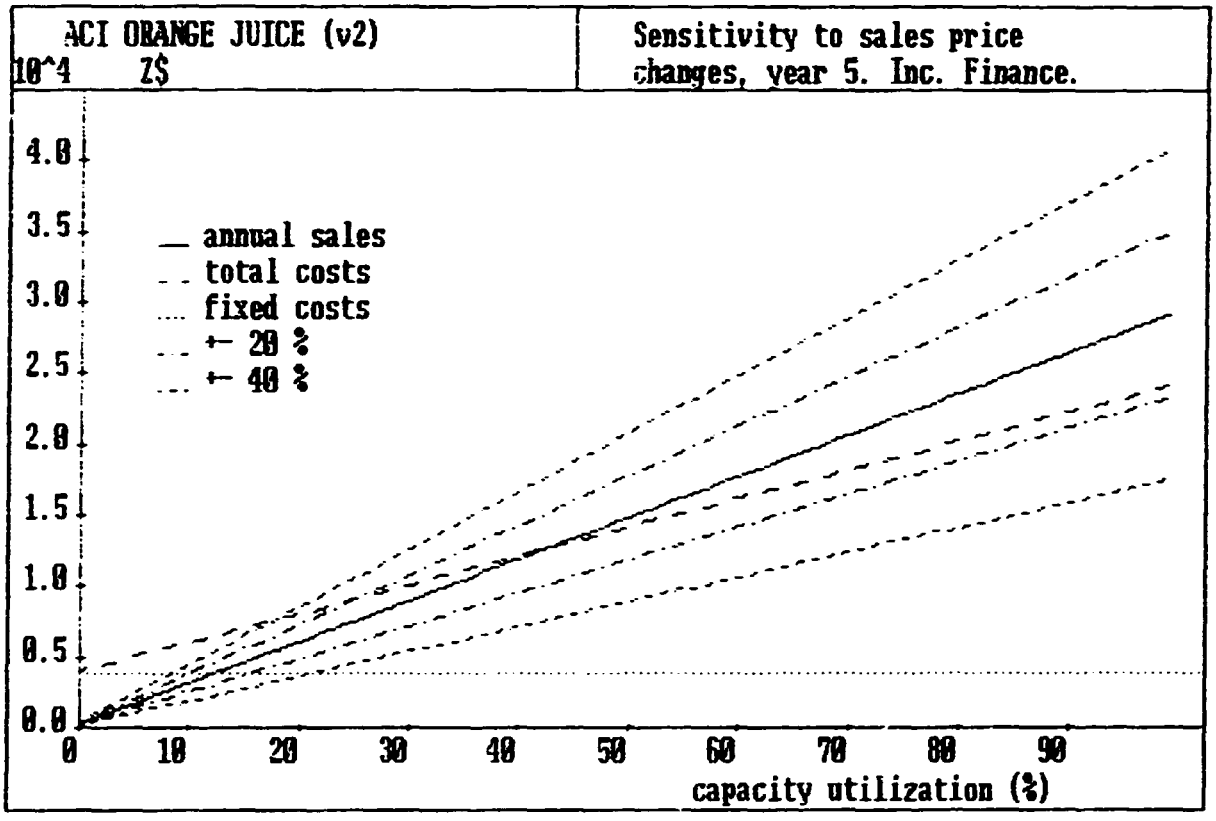
r	2007	2008	2009
ity, ordinary ..	0.000	0.000	0.000
ity, preference.	0.000	0.000	0.000
sidies, grants .	0.000	0.000	0.000
Loan A, foreign .	-403.618	0.000	0.000
Loan B, foreign..	0.000	0.000	0.000
Loan C, foreign .	0.000	0.000	0.000
Loan A, local....	0.000	0.000	0.000
Loan B, local....	0.000	0.000	0.000
Loan C, local....	0.000	0.000	0.000
tal loan	-403.618	0.000	0.000
rrent liabilities	614.207	734.248	880.099
k overdraft	0.000	0.000	0.000
tal funds	210.588	734.248	880.699


ACI ORANGE JUICE
Cashflow from Operations
10^4 Z$
5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
local net cashflows
foreign net cashflows
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
Start up
year


ACI ORANGE JUICE (v2)
10^5 Z$
Total Sales and Production Costs
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
local saies
foreign sales
local costs
foreign costs
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
year

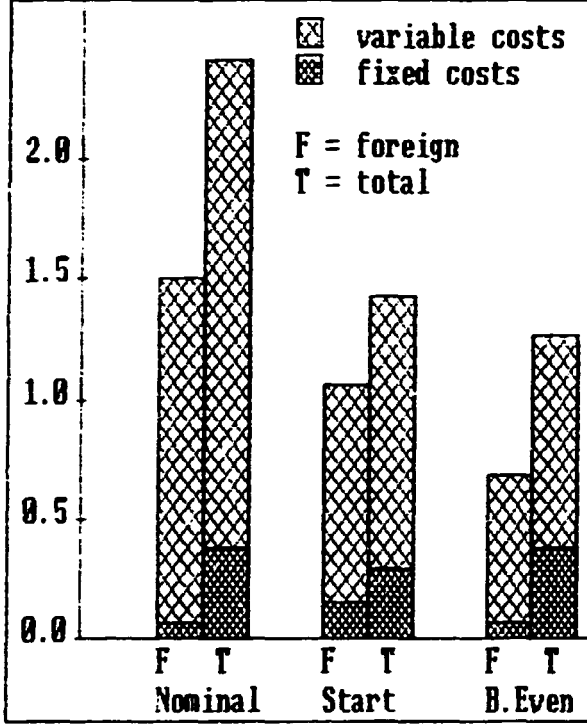

ACI Orange Juice (v2)
ratio in (%)
Net Profit/Total Sales
Sensitivity to production costs
40
20
0
-20
-40
-60
base case
+ 10 %
+ 20 %
+ 30 %
+ 40 %
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Start up
year


ACI ORANGE JUICE: BREAK EVEN
10^4 Z$
Sensitivity to a 20% change in
Variable Costs, 5th year.
3.0
2.5
2.0
1.5
1.0
0.5
0.0
annual sales
total costs
fixed costs
+ 20 %
0
10
20
30
40
50
60
70
80
90
capacity utilization (%)


ACI ORANGE JUICE (v2)
10^4 Z$
Sensitivity to sales price changes, year 5. Inc. Finance.
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
annual sales
total costs
fixed costs
+- 20 %
+- 40 %
0
10
20
30
40
50
60
70
80
90
capacity utilization (%)

ACI ORANGE JUICE (v2)

Structure of Production Costs
for 5th production year



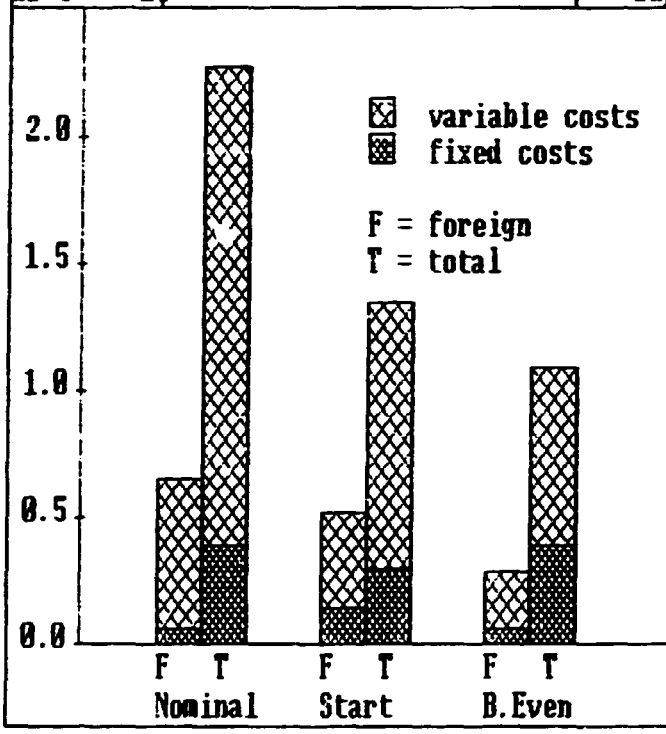
production level

Nominal	Start up	
35.46	37.79	raw material
37.36	33.55	other RM
0.27	0.17	utilities
8.21	6.09	energy
8.09	5.31	labour
1.25	0.56	maintenance
0.89	1.07	spares
5.55	3.80	overheads
1.12	11.66	depreciation
1.81	0.00	interest
100.00	100.00	Total Prod C.

ACI ORANGE JUICE (v2)

Orange concentrate locally supplied, 5th production year

10^4 Z$



Nominal	Start up	
31.67	33.96	raw material
39.55	35.62	other RM
0.29	0.18	utilities
8.69	6.46	energy
8.57	5.63	labour
1.32	0.59	maintenance
0.94	1.14	spares
5.88	4.03	overheads
1.18	12.38	depreciation
1.91	0.00	interest
100.00	100.00	Total Prod C.