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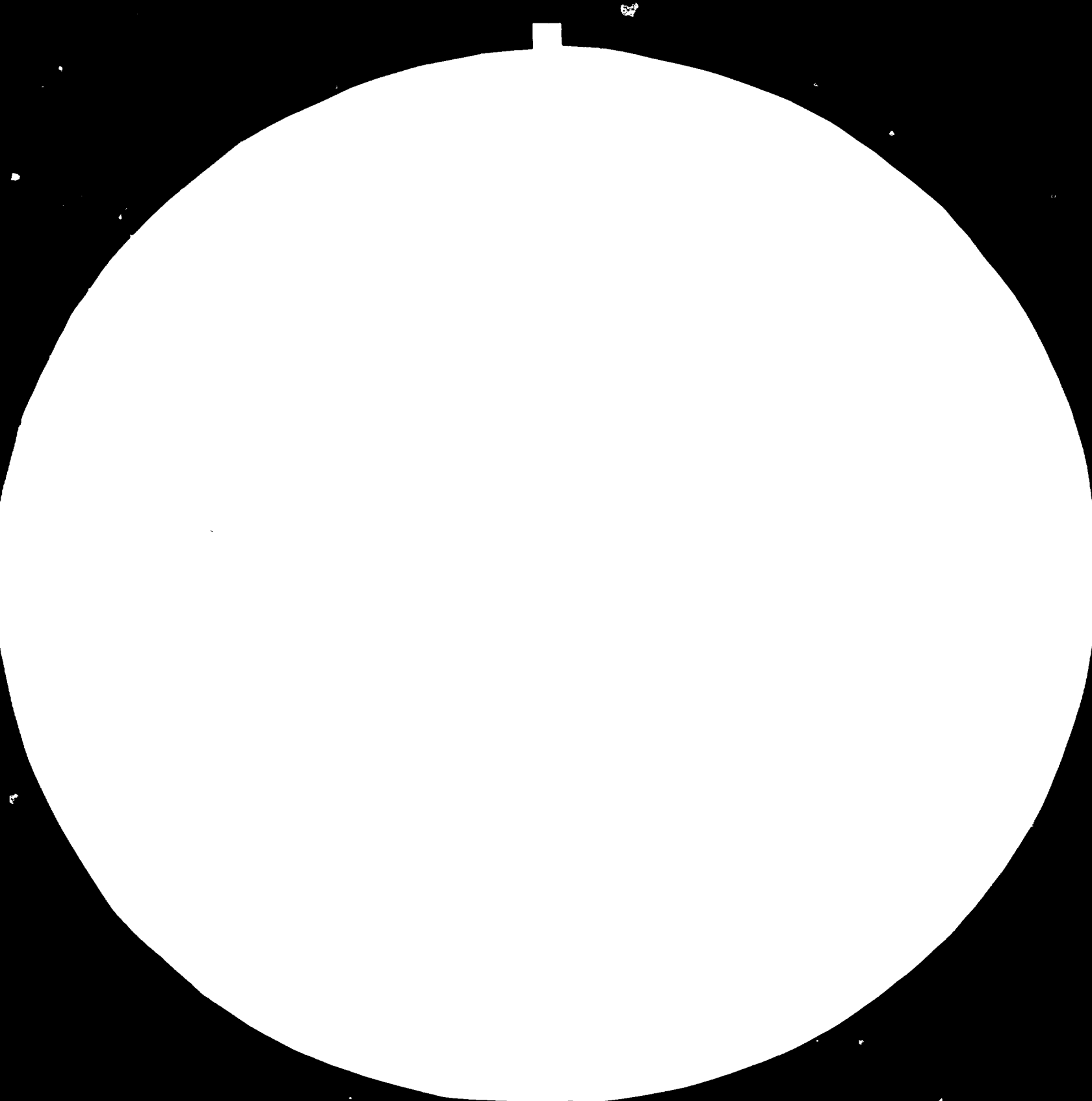
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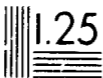
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DP/ID/SER.B/458  
1 June 1984  
ENGLISH

Zambia.

ASSISTANCE TO THE MWINILUNGA CANNERY

DP/ZAM/82/013

ZAMBIA

Terminal report\*

Prepared for the Government of Zambia  
by the United Nations Industrial Development Organization,  
acting as executing agency for the United Nations Development Programme

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## 1. Introduction

UNIDO has participated in this programme of Assistance to the Mwinilunga Cannery in pursuance of UNIDO's general objectives of providing technical assistance and the transfer of technology to developing countries in order to meet the goal set forth in the Lima Declaration to increase the share of developing countries to 25% of total world industrial production by the year 2000. A number of additional UNIDO objectives are involved including:

- strengthening the role of the public sector in promoting the economic development of developing countries:
- identification of viable industrial projects which are based on locally grown agricultural products; and
- the decentralization of industrial and economic development by the promotion of industries in rural areas.

The Mwinilunga Cannery is a model for the possibilities of industrial development:

- based on existing (and expanding) agricultural production involving as many as 800 small-scale farmers in an area of Zambia remote from developing urban centres. It is therefore a highly effective vehicle for the redistribution of wealth to one of Zambia's least industrially developed provinces;
- which is intended to meet the requirements for an existing and growing national market for the year-round availability of fruit products;
- providing employment opportunities in industry in a rural area; and
- providing an essential market for pineapple fruit during peak production periods when fresh fruit cannot be transported to distant markets because of the heavy rains and rain damaged roads.

In 1980-81, the Cannery paid over K62,000 in wages and salaries in Mwinilunga and over K75,000 for fruit to more than 600 farmers in Mwinilunga District. The Cannery is the largest single purchaser of agricultural produce in the District. Fifteen people are permanently employed, with seasonal employment for as many as seventy.

### 1.1. Objectives

The primary development objective of this project was to make the Mwinilunga Cannery a technically and economically viable operation providing a positive contribution to the economy of the region and the nation. Immediate objectives included:

- Analyses of the existing plant, production, raw material supply, management methods and operations.
- Preparation of recommendations for improvement of the Cannery and assistance in putting these recommendations into operation.
- Definition of the requirements for reorganization and expansion of the Cannery's operations.
- Determination of the effective market demand and evaluation of the export potential of the Cannery's products.
- Technical and engineering assistance in support of the continuing operations of the Cannery.
- Obtaining of capital funding for the proposed Cannery reorganization and expansion.
- Implementation of funded proposals for reorganization of plant and operations, purchase of new equipment, new construction, expansion and training of staff.
- Development of the necessary technical and supervisory skills to enable the Cannery to continue to function viably without financial subsidies and with a minimum of technical and managerial inputs from outside the company.

### 2. Activities and Outputs

At the outset of the project an inventory of plant, equipment and spare parts was made. The manufacturer of each item of equipment was contacted (where possible) and specifications, drawings and parts lists obtained. Plans for the building site and for the existing building and equipment installations were drawn up. The existing production operations were evaluated, production bottlenecks and faulty procedures identified, and, wherever possible, changes in operations introduced to improve workflow, sanitation and quality and to increase recovery.

A survey of pineapple and guava grown in Mwinilunga District was made. The major pineapple producing areas of Mwinilunga District were visited. Most of the large scale pineapple growers were visited as were large-scale farmers in the area who did not grow pineapples. Many small-scale growers were also visited. Discussions were held with agriculture extension personnel, officers of the Ministry of Lands and Agriculture in Lusaka and research personnel at the Mt. Makulu Research Station. The National Irrigation Research Station near Mazabuka, where pineapple horticulture trials had been conducted, was visited. Data on fruit off-take over a period of several years by the Cannery, Namboard and private traders was compiled and estimates of total annual fruit availability were made.

A study of the organizational set-up of the Cannery and its linkages with Rucom's Head Office in Lusaka resulted in recommendations regarding the location, distribution and coordination of functions and the filling of critical middle management positions.

Specifications for machinery to replace worn and inadequate machines, for required replacement parts and spares and for new machines were prepared and pro-forma invoices obtained from suppliers. Comprehensive lists were prepared for budget and capital grant requests. The design and preparation of the plans for new construction and modifications to existing plant and buildings was undertaken.

Throughout the project, existing machines at the Cannery were rebuilt and modified where necessary and technical and engineering assistance to on-going operation of the Cannery was provided. Machines rebuilt include two corer/peelers, eradicator, slicer, juice finisher, exhauster, can seamers and can reformer. The National Council for Scientific Research in Lusaka provided valuable assistance and facilities in the rebuilding and testing of a number of machines and instruments. Repairs were also carried out on the steam boiler, juice extractor, and steam-jacketed kettles. A programme of rehabilitation of Rucom's transport fleet was undertaken - seven trucks were reconditioned and a regular programme of maintenance established. It should be noted that several of these activities could not have been carried out were it not for the small but important input of foreign exchange provided by the project budget. For example, one truck, the current cost of which would be K30,000, and which had been off the road for 14 months was returned to service by the purchase, through the UNDP office in Zimbabwe, of a \$125 spare part. Two machines in the Cannery, the slicer and juice finisher are in operation today because it was possible to arrange to import bearings using project funds.



Various programmes for monitoring operations and quality control were introduced. Report forms were prepared and staff members familiarized with their use. A major equipment inspection and maintenance programme carried out at six-month intervals was initiated and Cannery management and maintenance staff worked together with the expert in implementing the programme.

Two counterparts to the expert, both technical school graduates, were given two months training at the Central Food Technological Research Institute in Mysore, India. Training included classroom and laboratory work as well as practical experience in food canning factories in India. The experience was most valuable for these two UN fellows. However, the training programme was not for a long enough period nor was sufficient planning done to maximize the benefits to the fellows. The two counterparts also received on-the-job training by the Cannery Manager under the supervision of the expert.

Approaches to finding local suppliers for the Cannery's tin can requirements have been partially successful. The Cannery presently imports all its tin can requirements. Four potential local suppliers have been identified, two of which have supplied sample consignments of tin cans, and a third has indicated his intention to supply cans in the future. Although initial tests of the cans already supplied were not successful, it is anticipated that at least one supplier will be able to supply an acceptable food grade can to the Cannery's specifications sometime in 1983.

A market study based principally of several years data from Rucom sales and on interviews with major purchasers of the Cannery's products and with other food canners in Zambia indicates present effective total market demand for Rucom's pineapple products is in excess of 30,000 cases per year. Based on the quality of its products and its location near-by the growing area, the Cannery should be able to dominate the canned pineapple market in Zambia for the foreseeable future. The present size of the retail market for guava halves, another Cannery product, is estimated to be 5,000 cases per year with significant potential for expansion and diversification.

Direct exports of the Cannery's pineapple products would not find markets due to the Cannery's cost structure. However, substantially discounted sales of some portion of the Cannery's output, shipped by container to markets in countries where special circumstances exist would generate badly needed access to foreign exchange for purchase of inputs (tin cans or tin plate) and machinery and spare parts. Domestic sales would thus be used to subsidize exports in order to ensure availability of foreign exchange.

It was not possible to introduce additional processed products for several reasons. The present production of the Cannery does not meet the existing market demand so all of the current input to the Cannery is committed to the present products. The season that the Cannery is idle - early April to mid June - is devoted to maintenance and overhaul of plant machinery. During this period machines are removed and taken to engineering firms on the Copperbelt of in Lusaka. However, some production - the canning of guavas - is continued through April and May.

Implementation of an incoming fruit grading system (based on degree of ripeness and size) to encourage supply of good quality fruit and to perhaps establish different grades and prices for the purchase of fruit, has not been feasible at the present time. During the dry season the Cannery has difficulty in obtaining sufficient quantities of fruit for production and must buy any fruit offered in order to stay in production. During the rainy season, the Cannery is frequently the only buyer available for the farmers and the Cannery is forced to buy all the fruit suitable for processing.

A number of factors may be identified as impeding the implementation of the project. Throughout the project Rucom Industries was operating under austerity budget conditions and adequate working capital was not available for Cannery operations. Because the Cannery is not financially independent from other Rucom operations, capital generated could be lost to another operation. Thus capital required to purchase fruit, which is regenerated after the processing and sale of finished products, was generally not available. Fruit purchases from farmers were therefore made on credit with payment only after the products were processed, distributed and sold. If farmers have their choice of selling to the Cannery with payment perhaps six months later or to a trader who offers immediate payment, it is clear that the Cannery would have difficulty in obtaining supplies, even when it offers slightly higher prices for fruit than the traders.

Another impeding factor was the resignation of the Cannery Manager at Mwinilunga and the departure of the Projects Coordinating Officer in Lusaka. (The post of the Deputy General Manager, who acted as Project Coordinator, was abolished.) The resignation of the Cannery Manager left the Cannery without adequate technical and engineering expertise and without sufficient experience in operational planning. Efforts have been made by Rucom's Personnel Department to find someone with the technical, engineering and managerial qualifications who would be willing and able to work at Mwinilunga. The expert also actively sought suitable candidates at the National Council for Scientific Research - Food Technology Research Unit, the University of Zambia, the Natural Resources Development College and elsewhere. The right person for the position has yet to be found.

Finally, the inability to obtain access to foreign exchange greatly hindered to evolution of the project. The Government of Zambia has shown its committment to the rehabilitation of the Cannery by budgeting funds for the project for several years. Since the expenditures requested involve purchases of machinery, spare parts and vehicles, all of which require foreign exchange, and Rucom has been unable to obtain the necessary foreign exchange allocation from the Bank of Zambia, the rehabilitation programme has been delayed. In fact, protracted efforts were required merely to obtain the relatively small foreign exchange allocations for importing the cans required to keep the Cannery in production. No foreign exchange allocation has been granted for purchase of spare parts or machinery.

### 3. Achievement of Objectives and Utilization of Project Results

Progress towards the overall goal of this project - making the Mwinilunga Cannery an economically viable enterprise - is best demonstrated by the history of the Cannery's operational results as shown in the Table in page 7.

While it cannot be claimed that economic viability has been attained, the figures provide quantitative evidence that it can be possible to operate the Cannery as a viable enterprise. Perhaps the most valuable achievement of the project to date has been to demonstrate that economic viability is a very real possibility for an operation that had not produced a profit since opening in 1970. Only with the production levels achieved during 1979-81 has it been possible to identify the real constraints to profitable operation.

When production rates approach economic levels, for example the 19,382 cases produced in 1979-80, the Cannery itself operated at a small profit even given the relatively low recovery rates achievable with existing machinery. Part of the loss sustained in later years can be explained by unusual expenditures for rehabilitation of trucks, which under more normal economic conditions would be disposed of and replaced and the cost would therefore be capitalized. In fact, if credit is included for an uninvoiced credit sale which occurred in 1980-81 the loss incurred was less than the amount of sales tax the Cannery paid to the Government. The heavy losses sustained in 1981-82 are the result of low production rates. From June to August 1981, Most farmers refused to supply pineapples to the Cannery because they had not been paid for fruit they had supplied during the previous processing season +

**RUCOM INDUSTRIES LIMITED - MWINILUNGA CANNERY**  
**OPERATIONAL RESULTS 1971 to 1982<sup>1</sup>**

Financial Year	Production (in cases)	Turnover	Cost of Sales	Profit or (Loss)
1971-72 <sup>2</sup>		K 18,000	K 48,000	(K 30,000)
1972-73 <sup>3</sup>		28,000	53,000	( 25,000)
1973-74	12,292	107,719	128,949	( 21,230)
1974-75	12,595	41,352	67,822	( 26,471)
1975-76	7,822	102,540	163,614	( 61,074)
1976-77	3,935	67,601	111,724	( 44,123)
1977-78	9,614	79,934	118,856	( 38,922)
1978-79	8,804	106,375	224,164	( 117,789)
1979-80	19,382	227,724	219,608	8,116
1980-81	18,420	392,233	498,200	( 105,967)
1981-82	11,191	271,491	447,000	( 175,509)
1982-83 <sup>4</sup>	14,000	406,000	430,000	( 24,000)

<sup>1</sup> Figures for 1974-75 onwards from Annual Reports to the Board of Directors. Figures from earlier years from Rucom files.

<sup>2</sup> First pineapple processing trials were in February, 1970. Figures for 1970-71 not available.

<sup>3</sup> April to November 1972 only. Figures for entire year not available.

<sup>4</sup> Projected from mid-year operational results.

December 1980 to March 1981. The Cannery's failure to pay farmers was the result of the cash flow difficulties experienced by Rucom when payments for products which had been delivered to the National Defense Forces were delayed for up to eight months. Outstanding payments for this account alone approached K200,000. The account has since been completely paid up. Rising costs of inputs and transport costs contributed significantly to the 1981-82 losses.

Significantly reduced losses are projected for 1982-83. The projected loss is a result of low production during the June to September processing season, due to the small quantity of fruit supplied to the Cannery. Farmers have begun to insist on cash payments for fruit collected from the farms. A price increase granted as of 1st April 1982 and improvements in recovery rates during the first half of 1982-83 should greatly reduce losses.

Other indicators of the degree of attainment of the project's objective include:

- The Cannery operated throughout the project without major breakdowns of equipment or stoppages due to lack of supplies such as tin cans. Prior to 1979, stoppages of the Cannery were periodically reported in Parliament and in the press.
- Levels of production 50% higher than in any previous year and 110% above the 1973-79 average were obtained.
- Major improvements in quality and in the sales and marketing of products were made. Since 1980-81 orders for Mwinilunga Cannery "Sunripe" products have exceeded production. At May 1981, the Cannery's annual production of 18,420 cases had been sold and orders for 6,000 additional cases remained unfilled. Demand by Lusaka's major international hotels for the Cannery's products has increased significantly - an indication of the improvement and consistency of the quality of the products.
- Brief training in food processing theory and practice was provided for two counterparts at the Central Food Processing Technological Institute in Mysore, India.
- A programme of maintenance and repair of plant and machinery has reduced the number of breakdowns and stoppages to a minimum despite the age and condition of some of the equipment. No major breakdowns of equipment occurred during the project period.

- Requirements for equipment, buildings and transport for reorganization and expansion were specified, detailed plans drawn up and suppliers quotations obtained. On the basis of the requirements and costs presented, funds for the reorganization of the Cannery have been budgeted by Government. (Only lack of foreign exchange requirements has prevented implementation.)
- Two can suppliers - Crown Cork Zambia Ltd. and Monarch Zambia Ltd. - have supplied sample consignments of tin cans produced in their factories in Zambia for packing the Cannery's pineapple and guava products. Neither consignment proved satisfactory. One supplier, Crown Cork, has agreed to correct the problems previously encountered with their cans and to provide suitable cans once foreign exchange is available for importation of tinsplate. A third can supplier has informed Rucom that they will be able to supply cans for the Cannery once they have received and installed some new machinery in their can making plant near Lusaka.

#### 4. Findings

Economic analyses of the Cannery's operation indicates that the Mwinilunga Cannery can be an economically viable operation. Although this is not conclusively demonstrated by operational results, the results, together with the experience gained from 1979 to the present clearly indicate that given the rehabilitation of plant and machinery, sound technical and engineering support and adequate working capital, profitability is certain.

The availability of sufficient raw materials has been demonstrated - the Cannery purchased 650 tons of pineapples during 1980-81 and more than 730 tons in 1979-80. From this quantity of fruit 30,000 cases of products can be produced at attainable recovery rates.

A current annual market in Zambia for the Cannery's pineapple products in excess of 24,000 cases has been effectively demonstrated and an existing market of 30,000 cases has been projected.

In support of the above findings it may be noted that Zambia's two major food canners, both of which are privately owned (one packs more than 10 million cans per year), have expressed their interest in purchasing the Mwinilunga Cannery if a decision is made to sell it.

Major difficulties faced by the Cannery prior to the involvement of UNIDO can be summarized as follows:

- Frequent breakdowns of old, worn machinery.
- Very heavy losses of finished canned products due to spoilage and bursting of cans. Poor and uncertain quality of products offered for sale.
- Low recovery rates.
- Frequent breakdown of transport and distribution.
- Low levels of sales and high levels of product inventory.
- Frequent cries from farmers in the pineapple producing areas of fruit rotting in the fields.
- Lack of adequate coordination and planning regarding the provision of essential inputs.

While these problems have been identified and in many instances overcome or at least checked, this has brought the Cannery to the next step of its development.

##### 5. Recommendations

The critical problems which must now be solved if the Cannery is to reach its potential as a viable operation include:

- Capital funds for reorganization. Funds are required for parts and components for rebuilding and maintenance of existing machines, purchases of new machines to update present operations and eliminate bottlenecks and for expansion of capacity. Capital is also required for vehicles and construction of a warehouse and for modifications to the present Cannery buildings.
- Cannery management. Suitable technical and engineering management is required to see the Cannery through the rebuilding/expansion programme, to train plant personnel and keep the Cannery in operation. A training programme to prepare a Cannery manager in the fields of management, engineering and food processing is essential.
- Working capital. Adequate procedures and safeguards to ensure the availability of sufficient working capital for the Cannery's operation are required.

Government has shown its willingness to finance local costs of a rehabilitation programme, but the non-availability of foreign exchange has prevented the rebuilding , updating and expansion of the Cannery.

The World Bank appraisal team which visited Zambia on behalf of the International Fund for Agricultural Development(IFAD) in January 1982, recommended that rehabilitation of the Cannery could be financed from US\$625,000 available as part of the Northwestern Province Area Development Project if a feasibility study finds the Cannery to be a viable investment.

- 5.1. Preparation of the feasibility study required by IFAD is recommended. The study should be prepared as soon as possible.
- 5.2. A qualified engineer or food technologist must be hired for the Cannery.
- 5.3. A programme to develop Rucom's Chati Woodworking Plant into a viable enterprise is required if operation of this plant is to be continued. (Losses incurred by the Chati facility deplete Rucom's available working capital.)



