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SUPPORT TO SMALL-SCALE INDUSTRIES AND ENHANCEMENT OF
INDIGENOUS OWNERSHIP

DP/ZIM/90/005

ZIMBABWE

Technical report: Potential for developing agro-processing
small scale industries *

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

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V.

EXECUTIVE SUMMARYSUPPORT TO SMALL SCALE INDUSTRIES AND ENHANCEMENT OF INDIGENOUS OWNERSHIP:MISSION ON AGRO-BASED AND FOOD PROCESSING INDUSTRIESDP/ZIM/90/005/11-53

The mission, which lasted from April 19 to 18 May 1992, focussed on assessing the state of agro-based and food processing industries undertaken by small-scale industries (SSI) against the scope and potential for development of the subsector.

The assessment is part of the activities of a Project DP/ZIM/90/005/11-53 - Support to Small Scale Industries and Enhancement of Indigenous Ownership. The area of agro-based and food processing industries is taken as a thrust subsector since Zimbabwe has a relatively large and growing agricultural economy and is one of the priority of the authorities.

Small-scale agro-based and food processing industries at the moment are few and at a low level of development, having suffered considerable neglect as a result of the priority attention paid to large scale food processing industries over the years. The bottlenecks hindering development are many and complex and these are deeply rooted in the lack of government promotional policies in support of small-scale agro-industry. At the moment small-scale agro-industries are not in a position to enter sub-contractual arrangements and direct exports.

There is considerable potential in the development of small-scale agro-based and food processing activities with the primary objective of supplying the normal markets initially. However, to achieve government's objectives for the subsector, strategic support mechanisms should be put in place to alleviate those constraints which hinder growth and development of the subsector. The process of deregulation should be speeded up and controls relaxed.

Given government's promotional support and a package of incentives, the alleviation of bottlenecks and constraints facing small-scale agro-based industries will fall in place. Consequently, small-scale agro-based and food processing industries will evolve and contribute positively to the economy.

1.

BACKGROUND

A mission was undertaken to Zimbabwe on 19th April to 18th May 1992 to assess the state of agro-based and food processing industries undertaken by small-scale industries (SSI) against the scope and potential for development of the subsector. The mission is part of Project DP/ZIM/90/005/11-53 - Support to Small Scale Industries and Enhancement of Indigenous Ownership.

The project aims at enhancing the Government capacity to further develop policy and regulatory framework for support to SSI sector and for promotion of indigenous ownership in industry with particular reference to rural development, as well as at determining the potential opportunities and prospects for indigenous entrepreneurs in agro-industry.

The terms of reference of the consultant are as follows:

1. Assess development potential for SSI in agro-processing activities;
2. Identify type and information sources on appropriate technologies for existing and new SSI in rural areas to process edible oil producing plants and vegetables, maize, millet/sorghum, vegetables, sugar and cotton;
3. Identify needs and potential for technological improvement, rehabilitation and diversification in competitive activities;
4. Prepare project profiles on small-scale agro-processing industrial ventures that are ready to be distributed for foreign investment promotion missions in the country.
5. Assess the feasibilities to breed and process ostrich, duck, and rabbit for promotion of export-oriented small-scale industries;
6. Prepare project formulation framework (PFF) for possible technical co-operation projects to promote agro-processing small-scale industries employing appropriate technologies;
7. Prepare a brief terminal report reflecting all the activities carried out, findings, problems encountered and recommendations which the government might follow up.

II.

ACTIVITIES CARRIED OUT

After initial briefings by UNIDO Country Director and Zimconsult, the mission met with the UNDP Resident Representative and his Deputy. The Permanent Secretary, Ministry of Industries and Commerce (MIC) also briefed the mission about government's development objectives about small-scale industries in general.

The Consultant met with Institutions/development agencies active in developing, prototype testing and disseminating appropriate technologies for small-scale agro-processing industries on dissemination support to user groups. The development agencies visited include Intermediate Technology Development Group (ITDG), Environment and Development Activities - Zimbabwe (ENDA) and Precision Grinders Engineers - manufacturers of grinding mills which are ready for dissemination.

Following discussions at ITDG, ENDA and Precision Grinders, small-scale agro-industries employing appropriate technologies located at growth points and a rural area were visited. The emphasis was on growth points because these are rural areas earmarked for development as centres where clusters of small-scale industries will be established with a view to generating additional employment and income thus reducing rural - urban migration. The growth points visited include:

<u>Growth Point</u>	<u>Activities</u>
i. Maphisa	grain milling, bakery
ii. Gokwe	grain milling, poultry and bakery
iii. Muronbedzi	edible oil extraction, grain milling
iv. Wedza (rural area)	grain milling owned by a women's group.

Other related agro-industrial activities at the growth point include butchery and sales of fresh agricultural produce.

Interviews were held with institutions concerned with human resources development, training, the development of indigenous business and other support services such as:

- African Univeristy, Mutare - the first private University established in Zimbabwe which commenced operations in 1992, with plans for a fisheries department.
- Mutare Technical College, Mutare
- Indigenous Business Development Centre (IBDC)
- Business Advisory and Extension Services (BESA)
- Women in Business Association (WIBA)
- Leather Institute of Zimbabwe, Bulawayo
- Agricultural and Development Authority (ADA), Harare
- Ostrich Breeders Association, Harare.

A visit was paid to CAIRNS FOODS, one of the largest food processing companies in Zimbabwe in order to have a clearer picture about the level of development of food processing industries in general.

III.

FINDINGS

A. Government's Development Objectives in relation to Small-scale Industries

Great importance is attached to the development of small-scale industries as they are likely to generate significant employment opportunities and contribute substantially to the dispersal of ownership and geographical locations of economic activities, given the unemployment problems which would attain acute proportions with the introduction of Structural Adjustment Programme (SAP). The agro-based industries is seen as a thrust subsector requiring special emphasis. Therefore, government is committed to providing incentives for establishing agro-based industries in rural areas and at growth points. Specifically, projects such as Cereal grinding, meat processing, saw milling and furniture manufacturing on small and medium scales are targeted for rural areas and growth points under the Second Five-Year National Development Plan (1991 - 1995). (1)

Following the relaxation of controls and liberalization of trade and investment opportunities under SAP, it is hoped that large scale agro-industries may withdraw from remote rural areas which they deem uneconomical

1) Republic of Zimbabwe: Second Five-Year National Development Plan (1991 - 1995) December 1991.

to serve as a result of the competitive arena created, leading to business opportunities for localised small-scale ventures to fill the vacuum. Subsequently, as medium and large-scale businesses become increasingly specialized and competitive, there is a likelihood of small-scale enterprises carrying out sub-contractual work, or acting as ancillary industries producing intermediate outputs.

B. Bottlenecks and Constraints hindering the development of small-scale agro-industries.

Despite government's objectives, there are currently no specific policies for the promotion of small-scale industries. There is a lack of the necessary back-up support in the form of improved access to development and other incentive schemes such as allocation of resources. The existing labour laws, conditions for registration of projects, product standards, hygiene and health regulations are pitted against the small-scale agro-industrialist.

There is no clarity of definition on small-scale industries and base line data is rather patchy and not disaggregated in favour of small-scale agro-industries.

A key observation is that there is a large scale highly developed and sophisticated commercial sector of agro-industry while the small-scale industries in the sector are developing, albeit very slowly and insignificantly. Only a very modest beginning has been made. The difference in the level of development between the two is quite clear.

The visits to the growth points and the rural area confirm some of the constraints which hinder the growth and development of small-scale agro-industries. These include:

- lack of raw materials (rationing of flour left bakeries idle and unable to satisfy the basic needs of consumers: rationing of maize at GMB resulted in under-utilization of installed capacities at the grinding mills although the drought was blamed).
- the agro-food industries are few when viewed against the population that they are supposed to serve at the growth points visited. For example, customers travel from as far as 40km away from a growth point to grind maize or buy bread and some essential basic foods - only to go back disappointed for lack of these.

Interviews confirmed the lack of support for intending indigenous entrepreneurs because there are hurdles in the form of availability and cost of loan finance and equity contribution. Entrepreneurs also lack collaterals. The situation is exacerbated because the cost of equipment targeted to the rural poor (promoters) is no longer within their reach. The lack of technical, managerial and business capabilities of intending small-scale entrepreneurs appears to be a major obstacle for entry into, expansion within and graduation from the small-scale sector.

There is inadequate development of technology, and the application of technologies so far developed is however, very limited. Rural communities/entrepreneurs do not have access to such technological information. Manufacturers of equipment now face difficulties in producing high quality efficient equipment because they lack exposure to technology and artisan skills. They also lack foreign exchange to import capital equipment to improve existing technologies. Efforts at copying and disseminating new technologies have proved unsuccessful.

There is a shortage of trained and skilled manpower for formulating, appraising and management of small-scale industrial projects. In addition, professionals involved in financial, technical, marketing and feasibility studies are few. Delivery systems of some of existing institutions are also weak. A more serious dimension is the lack of trained and skilled manpower in the area of food processing technology and allied fields, which has far reaching negative implications for the growth of the sector.

Markets are inadequately developed and unorganised, and there is a lack of marketing information and support for small-scale agro-industries. Infrastructural facilities such as good access roads are poorly developed and lack of transport facilities is a major bottleneck in access to markets. Packaging, which enhances product presentation is a constraint to the small-scale agro-industrialist who cannot afford to tie down capital to buy bulk packaging materials as laid down by packaging houses.

C. Agro-based and Food Processing Industries in Zimbabwe

Zimbabwe is predominantly agriculture-oriented with over 70% of the active population engaged in agricultural operations. Therefore, the country has

an inherent advantage in agro-based industries. Although in terms of GDP, agriculture accounts for only 15 per cent, the resultant agro-industrial activities play a dominating role. In 1987, agro-industries contributed 61 per cent of gross output, 62 per cent of value added and 59 per cent of employment to total manufacturing industries. (2)

Government is committed to the expansion of production capacities to meet rising domestic and export market demand and also introduce competition. The agro-processing industry is dominated by large-scale sophisticated commercial, national and multi-national firms in terms of employment and gross output, controlling over 90 per cent of market produce. For reasons of a tightly controlled, centralised and rigid economy, the group has shown rapid growth largely due to the heavily protected environment for strategic reasons since 1980. These firms control products like edible oils, canned fruit and vegetables, canned fish and meat, roller milled flour, peanut butter and a wide range of other commodities.

Although the commercial food processing industry in Zimbabwe is well developed, the bulk of the processed products are marketed in urban and peri-urban areas with almost insignificant quantities going to rural areas. Thus, in terms of basic food needs (edible oils, bread, maize meal, margarine and others), the requirements of the rural underprivileged people, with little or no surplus income remain unfulfilled.

D. Development Potential for SSI in Agro-processing Activities

The reasons given for the unfulfilled aspirations of the rural poor for lack of access to basic food commodities include:

- i. a shortfall of certain food products eg. edible oils - urban markets are favoured, while rural markets are unattractive. There is also shortage of other food commodities,
- ii. cost - most members of the rural population cannot afford to buy most of the processed products manufactured by the commercial firms, including basic commodities like edible oils, bread, maize meal, margarine etc.

2) Central Statistical Office, The Census of Production 1980 - 1987
Harare 1989 (Annex ..2.)

The reasons notwithstanding, the lack of basic food commodities in the rural areas could lead to malnutrition and food insecurity. Therefore, there is an urgent need for the setting up of small scale industries in food processing in rural areas to produce some of the basic consumer goods. In addition, these industries represent a more sustainable way of generating employment, income and increasing purchasing power since local labour and raw materials will be utilised, thus alleviating problems of pre and post-harvest losses. The technologies could be labour intensive and machinery could be sourced locally. With trade liberalization, the setting up of the industries could also lead to diversified income sources through activities in transportation, the production of food and cash crops, storage, processing and distribution, thus, reducing household food insecurity. Such a setting would create linkages between the grower, the processor and the rural consumer. In addition to adding value locally, SSI represent lower investment cost per job created, when compared to investment in large scale plants.

There is considerable scope for creating viable and remunerative agro-based industries given available raw materials, and market demand while technology and skills can be provided through training.

Zimconsult focused on some of the potentials in rural-based SSI, covering grain milling, oil pressing and bread making. Urban based subsector studies focused on furniture and clothing industries, now increasing in number especially at the growth points. Details of the studies are elaborated in Zimconsult's report and are not repeated here. Other opportunities for small-scale agro-industries include:

i. Animal feeds.

The surplus cereals and their milled byproducts such as bran and germ could be blended into simple stock feed formulations. The idea is to use own production for small feed mills to feed own animals. Using very simple blenders and mixers, this would lead to easy availability of feeds which eventually would spur the growth of local livestock and poultry products. The current production of stockfeeds by large commercial processors (Agro-food PVT Ltd, National Foods, Rumavite and Triangle Feeds) is estimated at 500,000 tons. The estimated total market demand is 750,000 tons

leaving a shortfall of 250,000 tons for possible small scale industries production at growth points.

- ii. Oilseed Crushing Units: A further justification is that there is always a shortage of cooking oil, and urban market is favoured. With the drought situation, the price of cooking oils has escalated. With 70% of the oilseed trade under the Agricultural Marketing Authority, the balance of 30% could be used by small-scale oilseed crushing units located at growth points. The manual based oil presses are not particularly efficient and a greater opportunity arises if more tinytechs can be disseminated, or a higher capacity oil expeller (Oil Expeller Mark IV) imported from India to boost local oil production, based on ~~techno-economic~~ *feasibility*.

Such a venture offers two distinct advantages:

- a. in addition to the production and supply of cooking oil to the local market, there are opportunities for subcontracting. These oils could be supplied to larger processing facilities for refining or hydrogenation.
- b. unbranded soaps which are currently enjoying a high demand are being produced using some of the oils or the by-products (crude glycerine) from refineries.

The by-products from oilseed processing (oilcakes) may be ground and added to stock formulations as a source of energy and protein. It is most important to ensure that oil recovery is maximum and the resulting cake is sold as soon as produced to avoid any loss due to quality problems.

- iii. Fruits and Vegetables:

There is evidence of considerable wastage of fruits at Chimanimani in Manicaland due to low levels of local demand and the inability to transport some of surplus fruits to urban demand areas. Also reported is wastage of tomatoes and mangoes in Mashonaland East (Mutoko and Murewa area). The approach calls for local processing and marketing the final finished products using multifaceted low cost technologies to process different fruits. A 'community cannery'

is an example; so also is fruit and vegetable drying facility, both based on techno-economic feasibility. The idea is not to produce exotic products, but quality products which should survive the competition, is cost effective, profitable and acceptable socio-culturally.

iv Mini-sugar Plants:

These can be established in sugar cane growing areas to process sugar cane into brown or mill-white sugar for local consumption. However, water availability is a critical component. The techno-economic feasibility of such venture should be ascertained as it is aimed at relieving the pressure on large scale processors so that they can produce refined sugar for export, to earn foreign exchange. The bagasse obtained as by-product can be used as fuel or for making paper if in substantial quantity.

v. Meat processing and Cold storage:

There is potential in this area as butchers can be found in most markets including growth points. Of particular relevance is integrated poultry processing which offers the easiest accessible meat within weeks. Poultry also offers direct links with stockfeeds - for chicken feed requirements. Butchery encourages local slaughter of animals and the tallow obtained can be used for laundry soaps.

vi. Dairy products processing:

Small groups of producers can evolve to diversify the dairy products market, producing products like cheeses, yogurt and butter from plants handling about 10,000 lit/day of milk.

vii. Sugar Confectionery:

A variety of diversified, good quality local products is possible (hardboilings, toffee, caramels) at lower cost and good accessibility at rural areas. This is bound to stimulate demand.

viii. Leatherworks:

Many entrepreneurs (especially in the Bulawayo area) are involved in leatherworks - production of shoes, wallets and ladies bags. Products of acceptable quality enjoy consumer confidence and these are being exported into neighbouring countries.

E. Type and Information Sources on Appropriate Technologies for Existing and New SSI in Rural Areas to Process:

1. Edible Oil Producing Plants and Vegetables.

The main oilseed crops produced by smallholder farmers in Zimbabwe are groundnuts, soyabean and sunflowers. Although cottonseed is not classified under oilseed crops, it is playing an increasingly important role in the production of edible oils. Traditionally, there are no direct methods of extracting oil from oilseeds in the country. However, the production of peanut butter from groundnuts is a popular local technology among rural women.

There is currently not yet a very successful small-scale oil expressing project operational in Zimbabwe. ~~Edible oil production is still dominated~~ by a few commercial firms who provide almost all of the marketed edible oil in the country.

Some of the technology options being tried in Zimbabwe for oil pressing include:

<u>Type of Equipment</u>	<u>Origin/Source</u>
. Ram oil press	Appropriate Technology International
. Hydraulic press (spindle)	Institute of Agric. Eng. (IAE) Zimbabwe
. Screw press	Being tested in Malawi and Zimbabwe
. Tinytech Oil Mill	Indian manufactured, being managed by ENDA after ITDG commissioned and carried out production trials.
. Decorticator (Sunflower)	Institute of Production Innovation (IPI) UNIV. Daresalam, Tanzania.
. Decorticator (Groundnuts)	TINYTECH, INDIA.

Details on oilseed pressing are available in Zimconsult's report (Annex 10, page 16 - 20).

This report highlights points on the manual spindle oil and the Tinytech Oil Mill.

a. Manual Spindle Oil Press (3)

The manual spindle press is a low pressure oil press which when used in conjunction with a sheller, grinder and a heater can be used to produce 30 - 45 litres of edible oil per day.

This manual technology is well known in West Africa, and has been introduced by ITDG/GTZ to Malawi, where some 8 village oil units are operated, mainly by women's groups.

The spindle press can be used to process groundnuts, sunflower, coconut and sesame. In Zimbabwe, as in Malawi it is felt to be chiefly applicable to groundnut processing.

Efficient use of the spindle press is dependent upon conditioning or treating the groundnut seed, before oil pressing.

- shelling
- grading (i.e. removal of bad kernels)
- grinding (by use of roller mill or hand pounding if preferred)
- addition of water to groundnut flour
- heating flour
- oil pressing.

The oil is fairly clean when collected from the press and can be simply clarified by leaving it to stand overnight in a closed bucket.

The by-product, groundnut oilcake, can be used for a wide variety of uses eg. as it is, as confectionery, weaning foods, or animal feeds.

i. Capacity.

Each 'batch' or charge of the oil press uses 10kg of groundnuts, which on average should produce 3.5 litres of oil.

ii. Cost.

The current indicative cost of a set of manual oil equipment including the spindle press is Z\$11,200.

iii. Employment Potential.

Although a manual process, the labour required is made easier by the use of the conditioning steps involved, and these create additional employment opportunities.

Manual oil units using the spindle press employ between 6 - 12 people, these are usually arranged in two work-teams to enable nearly continuous production.

- b. The Tinytech Oil Mill offers real prospects of providing an economically viable rural oil expelling technology for Zimbabwe. However, the management of the mill is critical. At the time of visit by the consultant, the mill was undergoing rehabilitation by ENDA personnel because the system's operations had almost broken down and the mill was operating at a loss; despite proven technical feasibility and commercial viability by ITDG.

A theoretical profit of \$(ZM) 5,700 was possible monthly if the mill were run properly based on calculations by an ENDA economist at site. Therefore attention must be paid to details in the operation and management of the mill, while ensuring extraction efficiency. It follows that technical, organisational and managerial support is needed for a longer time for the mill to stabilise and operate profitably.

2. Maize, Millet/Sorghum

Traditional methods of processing cereals for household food consumption pose a considerable burden to women in rural areas. Such methods include shelling of maize, threshing and winnowing of sorghum and millets, milling and grinding. These methods may result in considerable loss of grain, but the serious problem is that the traditional methods are tedious, labour intensive and quite time consuming.

The primary processing technologies for cereals include:

- handwinnow - to rapidly winnow seeds and grains by hand, currently not widely used.
- thresher - for threshing cereals
- hand operated maize sheller and mechanical maize sheller,
- dehuller - used to dehull cereals, especially small grains like sorghum, rapoko and millet,

- hammer mill - used in most rural areas to grind grains into flour (maize, millet/sorghum).

The hammer mill has been popularised for custom milling of grain in Zimbabwe by Precision Grinders Engineers, the market leader and makers of the Hippo Mill. Having led the market for forty-six years, this company has decided to diversify into new ventures because government support in providing foreign exchange, needed to import diesel engines (power source in most rural areas) is difficult to obtain. Yet, the company has 250 customers on the waiting list for the Hippo Mill.

efforts to disseminate the dehuller technology are currently ongoing by ENDA, an NGO. The concept is that both the dehuller and the hammer mill are powered from the same source operating jointly. The system which is designed to process small grain (sorghum and millet), dehulls, winnows and mills at the same time. This is a new concept in Zimbabwe and ENDA introduced a comprehensive package through manufacturing, feasibility and demonstration runs, identification of potential buyers, credit schemes, installation and commissioning. ENDA has set up 40 operational units around the country especially in the drought-prone areas of Manicaland.

3. Vegetables

Traditional methods of processing vegetables involve:

- i. Sun-drying: leafy vegetables are plucked, shredded and sun-dried on rock outcrops or other suitable flat surfaces, for several days and can be preserved as such for months, under simple storage facilities.
- ii. Blanching: vegetable leaves are shredded and blanched in water for a few minutes, drained and sun-dried.
- iii. Cooking: fresh or dried vegetable leaves are boiled, mixed with peanut butter and further boiled with other ingredients to make a pleasant flavour.

The key problem with drying of leafy vegetables in direct sunlight is that solar radiation destroys a substantial amount of vitamins contained in the processed products. Several locally based agencies are reported

to be working on solar driers in the country. These include Silveira house, Rondon Engineers, Agencies of Bulawayo and Ecological Designs. Several designs of driers and different sizes and needs have been produced.

A non-portable solar drier which can be used for drying vegetables, fruits, spices, meat and fish is also in operation. The drying chamber of the drier is built of burnt bricks, about one metre from the ground on which there is a concrete foundation. The size of the drier can vary depending on specific needs.

A portable solar drier made of bamboo bent into a semi-circle and then attached to a wooden frame is also in operation. It can be used for drying a wide variety of products including vegetables. The key attraction is the simplicity of construction and the low cost of construction materials.

Electric powered driers with a capacity to dry 50kg of dried matter per day are made locally. These are used to produce a wide range of dried and candied fruits. These machines can be adapted to process dried vegetables.

4. Sugar

Currently, there are no small-scale appropriate technologies for processing sugar in rural areas. In order to meet growing domestic demand and maintain current and highly valued preferential export markets as well as expansion of ethanol production, emphasis has been on large scale sugar mills. However, the production of brown and plantation white sugar on small-scale basis for local consumption presents an opportunity for large scale mills to face the challenges of export markets.

Sugar production technology

In simple terms, sugar is produced from sugar cane by:

- crushing the cane to extract the juice
- boiling the juice until the syrup thickens and crystallises
- spinning the crystals in a centrifuge to produce raw sugar.

The raw sugar is then refined to produce white sugar by:

- washing, boiling and filtering to remove impurities and colour
- crystallised, dried and packaged.

Plantation white sugar technology (vacuum pan) mini plants are available from India - a technology which is recommended for developing countries. Factories with capacities ranging from as little as 100 tons cane per day to as much as 10,000 tons cane per day are available.

5. Cotton

The visit to Gokwe was undertaken with a view to evaluating small-scale agro-industrial projects at the growth point and visit the cotton ginnery. Unfortunately, the cotton ginnery located at Sanyati, 120km away from Gokwe, could not be visited. There is a local office of the Cotton Marketing Board at Gokwe, for onward transportation to the ginnery. Small-scale appropriate technologies for ginning cotton do not seem to exist in Zimbabwe. Cotton ginning is dominated by the Cotton Marketing Board (CMB), the producer of lint. All operations from ginning through baling, classifying, spinning to weaving are interrelated and each depends on receiving quality products from one unit operation to the other. The short visit to Gokwe did not offer an opportunity to discuss issues on cotton processing since the ginnery was not visited. Appropriate technologies for small-scale processing of cotton are however available from International Institute for Cotton, London.

In the interests of higher efficiency and production, the traditional combination of discrete processing stages between the bale and the final yarn has been replaced by continuous, automatically controlled systems in which little or no human intervention is possible. This may likely be the situation in Zimbabwe where the cotton and textile industries are well developed.

F. Needs and Potential for Technological Improvement,
Rehabilitation and Diversification in Competitive Activities

It may be difficult to pursue vigorously to the letter, any policies formulated for the promotion of small-scale agro-industries, given the sluggish overall economic environment. However, viewed against the background of ESAP and government's development objectives, greater emphasis should be on small-scale agro-industries to accomplish the tasks in agro-food processing and preservation and policies designed to control, stimulate and promote them.

The needs and potential for technological improvements are specific and technological requirements in food processing are quite clear. There is the need to ensure:

- (a) Steady supply of local raw materials at the right price and the right quality.

It is expected that with deregulation and relaxation of controls, raw materials would become more available as the grain marketing board and other related parastatals loose their current grip on the purchase of agricultural primary produce to market forces. Therefore, adequate storage facilities for raw materials should be part of an integrated system which ensures raw material availability

The possibility of success will be much higher if the integrated concept applied involves a captive production base and an assured market outlet to go along with processing. Therefore small-scale farmers' association and primary raw material producer groups can organise themselves into co-operatives to own processing units.

- (b) There is the need to ensure appropriate process and adequate plant and machinery for production. Therefore, detailed operational information about appropriate alternative technologies should be available. When the equipment is finally selected and installed, there is the need to ensure:

- i. efficiency of production processes and
- ii. the reliability of the plant to function at a level guaranteed by the manufacturer, thus maintaining an optimum installed capacity.

For example a low extraction efficiency of the Tinytech oil expeller results in oilseed cakes with undesirable fat content and a loss to the owner of the plant. Thus, a delicate balance exists between the cake obtained, and the fat recovered/expelled.

- (c) Infrastructural requirements of energy, water, transport and communication are vital for a viable small-scale agro-industry. The potential for rural industrialization is assured in Zimbabwe if these facilities are improved.
- (d) Specialized personnel in food technology, engineering, maintenance, quality assurance, marketing and management analysis are required to give support to development of small-scale agro-industry. It should be stressed that vocational and technical training schemes would have to keep pace with rural small-scale industrialization given proper infrastructural facilities made available to the sector.
- (e) The potential for development is assured if there are also improvements in distribution and marketing of products and services. This entails improvement in packaging standards, quality control and assurance, safety and hygiene so that a minimum level of product quality is guaranteed.

2. Needs and Potential for Rehabilitation

Rehabilitation refers to the process of restoration, revitalization, regeneration, or modernization of a low efficiency and ailing enterprise or enterprises, and the potential for transformation into a healthy, viable, dynamic and efficient undertaking. Such transformation may involve physical as well as technical, financial and organisational rehabilitation aspects at a micro-economic level.

The subsector of small-scale agro-industry which is in dire need of rehabilitation is shoe and leatherworks. Equipment in use in the subsector is old and obsolete and spare parts are not easy to come by. Twenty-year old tanneries are still struggling to survive for want of equipment, foreign exchange and quality and are incapable of supplying good quality leather to growth points. Entrepreneurs (shoemakers, bags, wallets etc.) need small appropriate equipment and are willing to expand because potential sales are assured at meeting local demand and exporting to neighbouring countries if given technical support.

The subsector (small-medium enterprises) needs rehabilitation in the form of equipment and technical assistance to increase efficiency and capacity utilization, upgrade technical standards, operational methods and skills, product quality and marketing performance.

Rusitu Jam Making facility at Chimanimani needs some form of rehabilitation. If after five years of operations, the company has not been able to break even, then some assistance is required. The emphasis for rehabilitation should be on auditing the people's approach to the business, the operations, products etc. At the end of the exercise, recommendations are likely to include product differentiation (or diversification) so as not to be in competition with products produced by the market leaders.

3. Needs and Potential for Diversification in Competitive Activities

Small -scale agro-industries will survive if products which are produced are not in competition with those of the market leaders.

- . The market for fresh juice is vibrant. large scale fruit processing companies are not producing a range of diverse products in this area to satisfy domestic demand.
- . There is a need for intermediate products production. For example, tomato paste production can take place at the primary source of raw material (Mutoko or Mutare) and the paste transported to a larger processing facility for finishing into exotic products.
- . Entrepreneurs must avoid high capital investments and still produce acceptable quality products - for example:
 - the production of dried fruits and vegetables
 - the organisation of farmers to use their own production for making small feeds for their animals.
 - small dairy factory at a central location in a rural dairy zone.

The idea is to break the dependence on large markets, and evolve as small groups of producer associations to diversify the market with basic consumer goods.

In leatherworks, shoemakers and bagmakers could specialise in supplying the surrounding people at the growth points and rural areas. Given a situation where the rural area is a tourist route, the entrepreneur can specialise in making utility items or souvenirs of acceptable quality for tourist attraction.

Ideally, the existence of both small and large scale agro-industries should present opportunities for linkage development and subcontracting activities. Unfortunately, this is not the case in Zimbabwe at the moment. Rather the small-scale agro-industry is not trusted and large scale companies are monopolistic. It remains to be seen whether the current economic climate will force large-scale processors to critically re-evaluate the situation and create such linkages, and enter contractual arrangements with small-scale industries. The alternative is that a selfish approach may be taken whereby the large scale companies establish smaller units to process intermediates for the parent companies.

Currently, the leatherworks subsector is an area where subcontracting may work. Large scale companies are bursting at the seams for space, and subcontracting can take place in design and the making of patterns, stitching or spraying and finishing of shoes.

G. Assessment of Feasibilities to Breed and Process Ostrich, Duck and Rabbit for Promotion of Export-oriented Small-scale Industries

There exists in Zimbabwe an Ostrich Breeders Association. Total membership of the association is 230 with 170 as producers only (ie. have their own birds). There is also company membership of a firm making "feather dusters"

Currently, production and selling of ostrich is by breeders for breeders. The association is primarily concerned with building up stock. There are no slaughtering of birds yet. The association is building an abattoir to European standards so as to export ostrich meat and wishes to have enough ostrich to process when the abattoir is ready.

There is potential for export oriented small-scale industries in ostrich processing if there is sufficient quantity of the birds to process. South Africa, which controls most of the world's market cannot supply the demand throughout the world. Demand for ostrich products is due to the intrinsic qualities of its meat, skin and feathers.

- i. Ostrich skin (leather) is the most costly of all leathers - beautiful, aesthetically strong and tough, yet soft and pliable.
- ii. There is world wide demand for ostrich meat. The texture is coarse grain, tastes more like beef yet, it is like non-fatty chicken; low in cholesterol. A swing away from health - damaging foods puts demand pressure on the meat.
- iii. The feathers are used in making feather dusters for cleaning computers. It removes dusts easily and readily without leaving residue. The feather duster industry in the USA can take the world's entire output of ostrich feather.

The breeders association maintain that there is a good level of profitability in small-scale agro-industry in ostrich breeding and processing. However, a critical high level of management is required for success. The management problem is the key issue as far as communal area ostrich breeding in Zimbabwe is concerned. Many breeders stand to lose money drastically if the venture is not well managed.

Duck breeding and processing is not popular in Zimbabwe as duck is not eaten. The consultant could not visit the rabbit programme at the University for assessment because of closure due to disturbances at the campus during the mission.

IV.

PROBLEMS ENCOUNTERED

Given the diversity of agro-industrial products and the need to have a clear picture in rural areas, the period of the mission was rather short. For example, it was difficult to meet entrepreneurs who have small-scale agro-processing industrial ventures that are ready to be distributed for foreign investment promotion missions in the country. The general feeling was that the small ventures are too small to warrant foreign partnership. The small entrepreneur wants to remain alone and retain his independence. He does not want to lose control. The potential contribution of small-scale agro-based and food processing industries to economic development could not be assessed due to paucity of data, a critical constraint which hindered a valued appreciation of the subsector.

V.

RECOMMENDATIONS

A strong case exists for active intervention by government to devise solutions to the problem of underdevelopment of small-scale agro-industries.

Against the background of government's development objectives of

- indigenous ownership
- rural industrialisation
- employment and improved standards of living of the rural poor,

- a. Strategic support mechanisms should be put in place to assist the small-scale agro-industrialist. Deliberate action should be taken to speed up the process of deregulation so that the entrepreneur has better access to loan finance and credit and special incentives given for entry into the sub-sector. Current regulatory mechanisms should be relaxed. Specifically, two sets of standards of quality should be evolved for the food sector; one for basic staple foods or first stage processing products, processed largely with local technologies and geared to the national market, and the other for products with higher value added or secondary processing using largely imported technology. Export products will of course conform to the standards of the export markets.
- b. With deregulation and relaxation of controls, satellite storage systems at communal primary production centres should be set up as a safety measure against post harvest losses of raw materials. This should be accompanied with "value added" processing to produce basic consumer foods for domestic markets. This step assures food security and prevents malnutrition related problems in rural areas.
- c. Process technologies should ensure maximum utilization of local inputs (raw materials, packaging etc), human resources and strengthening of technological capacities. For this purpose, it is essential that an effective information system be developed on range and sources of technology available from both developed and developing countries, through updating technology data banks at relevant centres. It is also suggested that the small-scale agro-industries section of the Ministry of Industries be strengthened, so as to improve government's capacity to deal effectively with matters relating to small-scale agro-industries.

- d. Given the current difficulties which entrepreneurs face in accessing and procuring plant and equipment, and the apparent difficulties faced by manufacturers in the production of quality equipment, government should review institutional arrangements and procurement systems to assist small-scale entrepreneurs to acquire equipment and technology. Manufacturers should be assisted in acquiring relevant components and parts necessary for fabrication, including the provision of foreign exchange to import proven critical components.
- e. The Development Technology Centre of the University of Zimbabwe should be strengthened and well equipped to pursue R & D work in rural technologies. The linkage between the centre, other departments of the University, equipment manufacturers, technology developers and small-scale enterprises should be strengthened in the overall development, adaptation and application of technologies.
- f. It is recognised that personnel with appropriate technical qualifications and experience in Food Science and Technology are few in Zimbabwe. For example, specialised personnel in agricultural/food engineering, maintenance, quality assurance, marketing and management analysis will quicken the pace of agro-industries development at all levels. To this end it is recommended that a department of Food Science and Technology and Allied fields be set up at the University of Zimbabwe or the National University of Science and Technology so as to produce the manpower needs of the nation in agro-industry. Orientation should be towards food-related activities in the last year of training. Such a move is a positive step towards matching manpower needs in primary agricultural production with those of "value added" processing, including post harvest technology, research and development, new product development and human nutrition. The establishment of a National Research Institute in Food Science and Technology is highly recommended. It is gratifying to note that a Food Science Programme is planned as part of the first phase of the Scientific Industrial Research and Development Centre. It is recommended that the programme lays emphasis on indigenous foods and the upgrading of traditional food processing technology, an area of considerable potential to small-scale entrepreneurs.

The food processing sector in return, should establish direct links with the training institutions, mutually co-operating for the advancement of the sector.

- g. To ensure the delivery of the required range of services in the performance of the small-scale agro-industries sector, consultancy organisations, NGOs and other related institutions should be strengthened through training in project formulation, appraisal and management of industrial activities.
- h. In order to decentralise the food processing operations and promote small-scale units in the rural areas, infrastructural requirements of water, energy, transport and communication are vital and critical.
- i. It is important to sensitize women on the immense opportunities around them in the area of agro-industry. They should be enlightened not only on the need to produce, but to process and preserve. This has implications for safety against hunger and starvation. In addition, organised marketing will be required to assist the rural women entrepreneurs in identifying and penetrating markets.
- j. There is considerable scope for collaboration between large enterprises and small-scale agro-industry especially in the production of intermediates. This collaboration does not exist now. Large scale food processing companies should be encouraged (through incentives) to establish such links so as to boost the nation's industrial structure and productivity.

ANNEX 1LIST OF PEOPLE MET

- | | |
|--------------------|--|
| - Line Gery-Pochon | - UCD Harare |
| - A Hauge | - Programme Officer UNIDO, Harare |
| - D Dragic | - UNDP Resident Representative, Harare |
| - E Bengtsson | - Deputy Resident Representative UNDP, Harare |
| - D Ndlela | - Associate, Zimconsult |
| - M Nziramasanga | - Permanent Secretary, Ministry of Industry and Commerce |
| - K Matichell | - Senior Technical Manager, Food Processing, ITD |
| - S Chipika | - Economist, ITDG |
| - J C Gwitira | - Deputy Director, ENDA, Zimbabwe |
| - M W Chihuri | - Executive Director, IBDC |
| - E Essof | - Director, Leather Institute of Zimbabwe |
| - O'sshaughnessy | - National Expert, Leather Institute of Zimbabwe |
| - C M Mafarachisi | - Registrar, Africa University, Mutare, Zimbabwe |
| - G E Jaravasa | - Vice President, Women in Business Association, Harare. |
| - D Mead | - Visiting Professor, Dept. of Business Studies, University of Zimbabwe. |
| - D T Mug | - Director, BESI. |
| - P Chumira | - Technical Director, Cairns Holdings Limited. (Cairns Foods): Chairman, Food Manufacturers Association. |
| - T Kuwengwa | - Principal, Mutare Technical College |
| - Mrs Mugaba | - Nhamoienharo Women's Group Hippo Grinding Mill at |
| - Mrs Mudjandarira | - Wedza District |
| - M Sena | - Fiannee, Agricultural Rural Development Authority, (ARDA), Harare. |
| - M Guga | - Marketing, ARDA, Harare. |

- | | | | |
|---|-------------|---|--|
| - | P Mzamo | - | Township Superintendent, Maphisa Township. Maphisa Growth Point. |
| - | Thomas Mast | - | Field Co-ordinator, SVS, Harare (Met at Maphisa Growth Point. (Swedish project) |
| - | Edson Moyo | - | Miller, Sizabantu Grinding Mill, Maphisa Growth Point. |
| - | D Sibanda | - | Manager, Maphisa Bakery. |
| - | W Zeroma | - | Asst. Manager, Shirichena Milling, Bulawayo. |
| - | Mabuku S | - | Poultry (mechanized) Gokwe Growth Point |
| - | A Zemora | - | Shirichena Milling, Gokwe Growth Point. |
| - | E Muronga | - | Manager, Gokwe Bakery. |
| - | F Chikwanda | - | Murombedzi Growth Point. (ENDA personnel rehabilitating the Tinytech Oil Mill for Farmers - the owners). |
| - | D Chemambo | - | " " " " |
| - | Dr Clark | - | Ostrich Breeders Association, Harare |
| - | L Reed | - | Zimbuko Trust, Harare |
| - | D Hudgston | - | Managing Director - Precision Grinders Engineering Company. |
| - | G Kudzwa | - | Manager Milling " " |
| - | M S Dikito | - | Consultant, Women in Development, Harare. |

ANNEX 2CONTRIBUTION OF THE AGRO-INDUSTRY TO TOTAL MANUFACTURING OUTPUT (1980 - 1987)

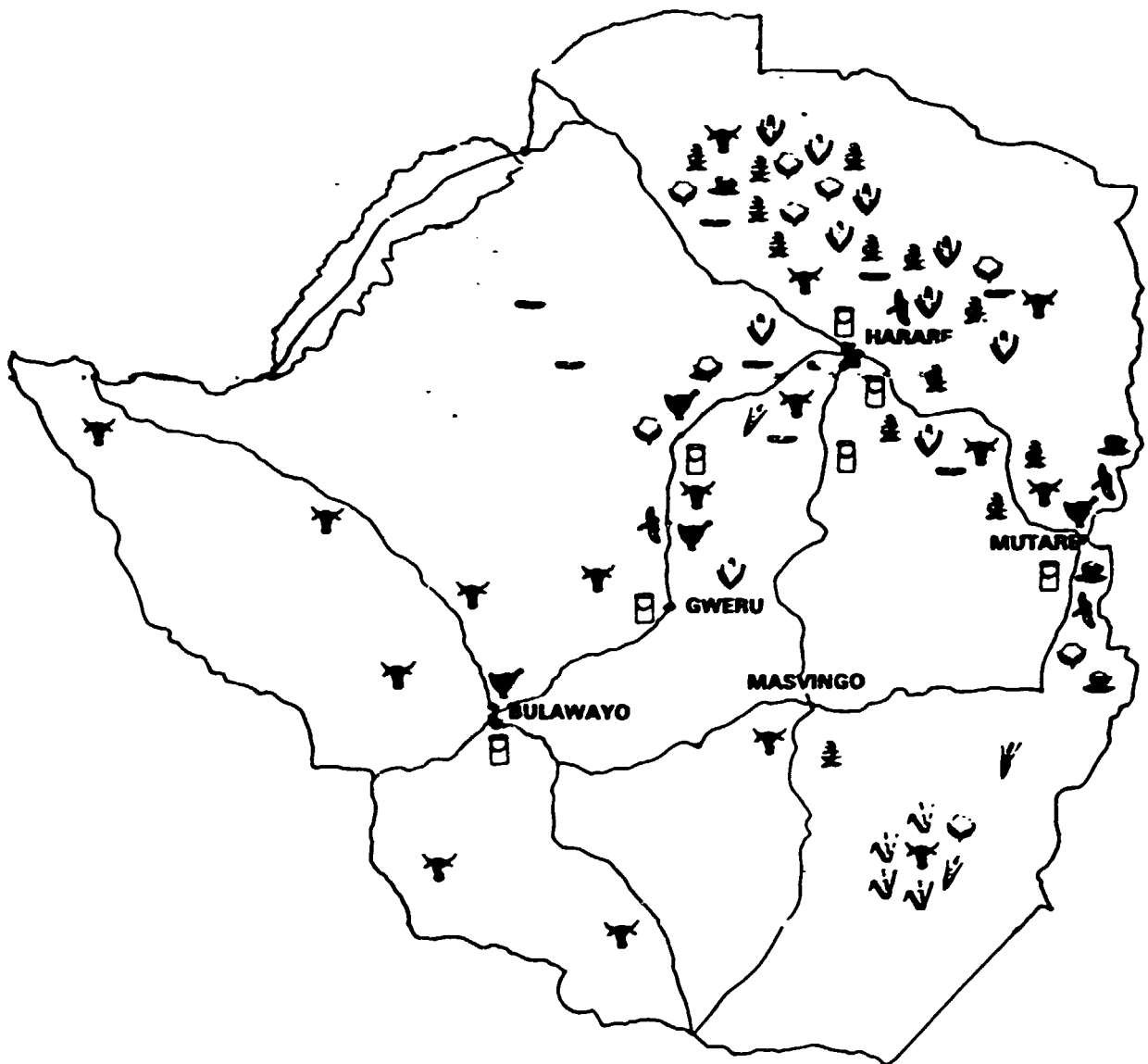
YEAR	GROSS OUTPUT (Z)	ADDED VALUE (Z)	EMPLOYMENT (Z)
1980	55	50	57
1981	55	52	58
1982	57	54	58
1983	60	58	59
1984	62	61	60
1985	60	58	60
1986	59	58	59
1987	61	62	59


SOURCE: Central Statistical Office
 The Census of Production 1980/1987
 Harare 1989.

ANNEX 3

Commercial Agriculture in Zimbabwe, 1990/1991

ISSN 0259 3238.



	Beef		Maize		Tea/Coffee
	Cotton		Oilseeds		Tobacco
	Dairy		Poultry		Wheat/Barley
	Horticulture		Sugar		

ANNEX 4AGRICULTURAL AND AGRO-PROCESSED PRODUCTS PRODUCED IN ZIMBABWE

Primary Products	Main Processed Products	Growing Season of Primary Product	Geographical Areas of Concentration
A. Cereal			
i) Maize: The main staple food and grain	Maize flour/maize meal Maheu	Summer	Widespread in all regions
ii) Millet (Rapoko): second important cereal crop produced in communal areas	Millet flour/millet meal, beer	Summer	Widespread in most provinces
iii) Sorghum - third most important grain. Suitable for Cultivation in most regions.	Beer; sorghum flour	Summer	Fairly widespread in many areas
iv) Wheat - An important cereal grown in limited areas.	Wheat flour, bread, etc. cakes.	Autumn	Mainly grown by commercial farmers.
v) Mhunga (millet); An important food crop in low rainfall areas	Mhunga flour, Mhunga meal, beer	Summer	Mainly in NR5 eg. Buhera, parts of Chivoi districts.
B. Vegetables			
i) Leaves; e.g. rape cabbage, covo, tsunga	Dried vegetable, boiled vegetable	All year round	Widespread

ii) Roots e.g. turnip, carrots.	Boiled	All year round	Widespread
iii) Tubers e.g. potato, cassava, sweet potato, yam	Boiled, roasted, sun-dried flour	Mainly summer and autumn	Widespread in many areas except cassava and yam.
iv) Bulbs; onion, shallot, garlic	dried, canned, boiled	All year round	Widespread
v) Fruits; e.g. pumpkin, cucumber, melons, squash, pepper	dried, canned, boiled.	All year round	Widespread
vi) Flowers; e.g. cauliflower, brocoli, pumpkin	Dried, boiled	All year round	Fairly widespread e.g. in NR I, II, III
vii) Seeds: e.g. peas, beans	canned, dried, boiled	Mainly summer and autumn	Widespread in III, scattered in other areas.
C. Fungi; edible fungi mushroom - Grow wild in most communal areas after first rains but cultivated in some commercial areas.	sun-dried, boiled	Summer	Widespread
D. Oilseed Groundnuts	Edible oils, Peanut Butter, stock feeds/ molasses, soya milk.	Summer	Widespread
Sunflower soya beans Pumpkin seeds	cake soya milk		
E. Fruits <u>Citrus</u> Oranges Grapefruit lemons	Fruit juices, jams canned fruits soft drinks.	Autumn/winter	Mainly in NR I & II

Tropical

Bananas	Banana chips;	Winter	Mainly in NR I & II
Avocado	dried matter		III.
Mango	avocado oil; soap	Winter	IV depending on
Guava			fruit types
Pineapples	fruit juices	January to	
	mixed fruit jams.	March.	
		January to	
		February.	

Deciduous

Apples	dried fruit	Autumn/	Mainly in NR I & II
Apricots	juices	winter	
Peaches	jams		
Grapes	soft drinks		
Plums	canned		
Pears	fruit		

F. Wild Fruits

Mazhanje	juices	Mainly	Scattered in many
baobab	wines	summer	regions.
figs	dried fruits		
matamba			
hacha			
marula			
tsubvu			
gooseberry			
matufu			
matchwe			
prickly pear			
maroro			

G. Foods from Animals

i) Meat; include	dried, frozen, canned	All year	Widespread but
cattle, sheep, goats,	smoked	round	commercial process
pigs, rabbits, chicken,			limited to urban
ducks, wild animals			centres.
and mice.			

ii) Fish;	Canned, smoked, dried, fishmeal and frozen fish	All year round	Kariba, other dams etc; little commercial activity in rural areas
iii) Milk	Milk powder, cheese, lacto, butter, cream pasteurised milk	All year round	Widespread but commercial process activity mainly in urban areas.
iv) Insects: Caterpillars and a number of insects from important dishes in communal areas e.g. caterpillars (madora); locusts, flying termites, mandere, makurwe etc.	Dried, boiled and fried	Mainly summer	Scattered and limited commercial activity except for caterpillars in specific areas.

SOURCE: ITDG, Harare.