

Ministry of Agriculture and Irrigation
United Nations Development Programme
Food and Agriculture Organization

AGRO-PROCESSING POLICY REVIEW

(Technology and Human Resources Review)

FINAL REPORT

Alfred Osunsanya
P.O. Box 31260, Cell: (265) 832949
e-mail: eureka@sdip.org.mw
Lilongwe, Malawi.

July, 2002

TABLE OF CONTENT

Chapter	Page
1. INTRODUCTION	1
a) Value Added	
b) Macroeconomic Issues Relating to Agro-Industry	
2. REVIEW OF TECHNOLOGY	5
2.1. Policy Review	5
a) Agriculture Production	
b) Structural Adjustment Programme	
c) Agricultural and Livestock Development Strategy and Action Plan 1995	
d) Farm Power and Mechanization Policy and Strategies	
e) Malawi Agricultural Sector Investment Process (MASIP)	
f) Crop Diversification and Market Liberalization	
g) Livestock Production	
h) Land Problem and Population Increase	
i) Notable Technology Impacts	
j) Marketing Mix in Relation to Malawi Agro-Industry Products	
k) Existing Industrial Sector Initiatives	
l) Sector-Wide Policies and Strategies as it affects Agro-Processing	
2.2. Enterprises Technology Survey Analysis	18
2.3. Changes or Improvements in Government Policies on Technology Surveyed	22
Enterprises would like introduced.	
3. REVIEW OF HUMAN RESOURCES	23
3.1. Policy Review	24
a) Employment Policy	
b) Employment	
c) Labour Legislation	
d) Women's Role	
e) Technical Vocational Training	
f) Wages	
g) Employment of Expatriates	
h) Occupational Safety and Health	
i) Workers Compensation	
j) Key development Strategies	
3.2. Enterprises Human Resources Survey Analysis	27
3.3. Suggestions from Enterprises Surveyed	30
4. THE FIRST WORKSHOP REQUEST RECOMMENDATION	31
a) Appropriate Technologies	
b) Potential Investment Areas	
5. MAIN FINDINGS AND POLICY OPTIONS	33
6. POTENTIAL AREAS OF STUDY RECOMMENDATION	35
7. REFERENCES	36
8. ANNEXES	37

LIST OF TABLES

Table 1:	Current Agro-Processing Industrial by-products in Ma'awi	3
Table 2:	GDP by Sector of Origin at 1994 Factor Cost (MK' million)	3
Table 3:	Major Exports of Malawi 1999 (MK' million)	3
Table 4:	Principal Domestic Export Commodities 1996 - 2000 (MK' million)	3
Table 5:	Share of Agriculture in GDP at 1994 Factor Cost.	3
Table 6:	Smallholder Ownership of Productive Assets	5

37

ANNEXES

Annex 1:	Table 7 - Malawi Index of Industrial Production
Annex 2:	Enterprise Questionnaire Analysis on Technology
Annex 3:	Enterprise Questionnaire Analysis on Technology (Question 20) Enterprise Questionnaire Analysis on Technology (Question 21)
Annex 4:	Human Resources Questionnaire Analysis
Annex 5:	Human Resources Questionnaire Analysis

1. INTRODUCTION

a) *Value Added*: Agro-Processing is the value-added process to agricultural products or commodities. The value adding comes in many forms starting from as little as cleaning and storage and shape changing into other semi-finished goods and many other forms of consumable or raw material products. The major objectives of value adding is either for preservation or consumer product generation, all done to generate fund, food, feed and fibre.

The lack of or inadequate value adding through packaging, grading and agro-processing has reduced the impact of agriculture on the economy. Majority of the players in the produce sector are middle-men who are only interested in quick returns on their investment, especially when the cost of finance is as high as 50 percent per annum (early 2002).

At present there are two extreme levels at which processing of crops is done in Malawi. At one end, processing is done in large factories that produce goods beyond the financial means of the majority of the population. At the other end, processing is done largely by women using inefficient and time-consuming traditional methods at the household level. The finished products are mainly for home consumption or used at subsistence level.

Processing of fish is mainly at domestic level or at micro-enterprise level and mostly for local consumption. Most of the fish caught by the small and medium enterprises on Lake Malawi are sold into the local market with none for export. In-fact, Malawi is an importer of fish, in spite of the large lakes and rivers. Statistics indicate that fishing supports 30 % of the population through various activities yet there is no organisation in the industry, with many artisan fishers and middlemen still poor. One solution is to promote investment in rural fish farming particularly commercial aquaculture (*Department of Fisheries, In The Malawi Investor, 1st Quarter 2002*).

Processing of wood is mostly at micro and small enterprise level, either in to making charcoal or into furniture for use at home. The recently privatized wood industry produces timber and plywood for local furniture industry and produces wood products for export market. But imported finished products from South Africa that are sold through furniture stores with outlets in the major cities sustain the modern furniture industry.

Commodity processing exists in large numbers ranging from tobacco, sugar, tea and coffee as medium to large enterprise. The grain processing industry is large in number ranging from micro to small, medium and large players. They all contribute in no small measure to job employment and economic development.

Women's' involvement in subsistence agriculture and agro-processing in Malawi is considerable. The subsistence farming is largely in their hands and so is the processing of the food grown for family consumption. On the domestic front, mostly the traditional methods or techniques are used in accomplishing the processing tasks.

The traditional method of drying of cereals, fish, flour and vegetable is widespread. This means placing the produce on the ground in the open, in house compounds, and/or on roadsides for various lengths of time. This method invites opportunities for contamination and infestation by wind blowing fecal dust and parasite eggs, insects, and trappings from domestic animals. In addition, the slow drying rate promotes mould and fungi growth (e.g. *aphatoxin*) and excessive deterioration of colour, flavour and nutritive value in the products.

In the past, Malawi used to produce and export tonnes of Groundnuts but the presence of *aflatoxin* in the produce and lack of technology to improve the seeds killed the industry, and left some oil-exPELLING factories idle. Many including Lever Brothers now import cheap Crude Cotton Seed Oil for processing in Malawi. Many households in Malawi still cannot afford the high cost of these imported vegetable oils.

The traditional agro-processing methods and practices has persisted partly because improved facilities and low cost technologies have been unavailable, except in the case of Hammer Mills used for maize milling. The average woman lacks the requisite knowledge to handle and lack fund to acquire available modern facilities. There is therefore the need to promote small-scale agro-processing enterprises in the country, to reduce losses due to use of traditional methods and also to reduce the drudgery associated with the traditional agro-processing methods.

Malawi has a sizeable manufacturing base. The contribution of the manufacturing sector to GDP in recent years has been about 14 percent, which is higher than those of neighbouring countries (but considerably lower than in South Africa and Zimbabwe, where it is 26 percent). Although the industrial sector is reasonably developed, it is characterized by the legacy of the past import substitution policy and dependence on the exports of primary agriculture produce (*Agricultural Policy Review Document, MoA&I, 1999*).

However, most of the activities in the industrial sector are concentrated in the processing of natural resources such as agricultural products, livestock, forestry and mineral products and in simple manufacturing, including textiles. There is ample potential for further processing of these resources.

The current structure of industry in Malawi is typical of that in many developing countries, particularly of sub-Saharan Africa. It is characterized by:

- Its dependence on agriculture both as source of raw materials supply and as a provider of foreign exchange;
- Its reliance on imported inputs;
- The virtual absence of intermediate industry linkages;
- Its use of basic nature technologies;
- Technologies are too old and not modern, where available;
- Its high market concentration;
- Its focus mainly on the domestic markets, except for the main cash crops.

Most of the products of the agro-industry are consumed locally without adequate value added and presentation for the export market in Europe, Asia and America. Over 50 percent of total industrial output are accounted for by the food, beverage and textile sub-sector. The processing market is generally oriented towards the domestic market, which is rather small given a total population of 10 million and an average per capita income of less than US \$ 160 per annum.

The small-scale sector performance far outweighs that of the large-scale, which is dwindling over time. In the past 6 years, large-scale agriculture has performed badly and only improved slightly in 2000. The overall agriculture production improvement will therefore emanate mainly from the small-scale sub sector. The poor tobacco performance experienced in 2000 did not occur in 2001. Far much better prospects have been watered down by the persistent high rates of capital borrowing. Below are series of indices (*Tables 1 to 5 and Table 7 in Annex 1*) to confirm the potential and performance of Malawi agro-industrial sector in the recent years.

Table 1: Current agro-processing industrial by-products in Malawi are shown below:

No.	Material	Product
1.	Maize	Flour Meal, Brewing, Livestock Feed
2.	Sorghum	Opaque Beer
3.	Rice	Milled Rice
4.	Cassava	Starch, Chips, Flour
5.	Sweet Potatoes	Chips
6.	Soyabeans	Weaning Foods, Soya-milk, Livestock Feed Cake, Soya-oil, Confectionery Nuts.
7.	Cotton seed	Vegetable Oil
8.	Groundnut	Vegetable Oil, Confectionery Nuts, Livestock Feed Cake
9.	Sunflower	Vegetable Oil, Livestock Feed Cake
10.	Fruits (various)	Various Fruit Juices – (Mangoes, Pineapple, Guava); Canned Fruits; Fruit Jams
11.	Chilies	Grounded Chilies; Pastes
12.	Beans/Peas	Dry Beans Packaging, Canned Beans, Dhall
13.	Paprika	Food Colourants; Paprika Oils
14.	Livestock	Meat Processing, Leather Tanning, Poultry, Cow, Goats, Pork.
15.	Wood	Charcoal, Plywood, Furniture
16.	Cotton	Lint, Yarns, Textiles Production; Dress making
17.	Sugar	Sugar packaging, Alcohol
18.	Tobacco	Tobacco packaging; Cigarettes
19.	Fish	Fish Smoking/Drying, Fish Canning
20.	Coffee	Coffee production
21.	Tea	Tea Blending
22.	Honey	Honey and Honey comb
23.	Oil palm	Palm-oil; Soap

Source: Malawi Industrial Sector Opportunities Study, MoC&I, July 1994.

b) Macroeconomic Issues Relating to Agro-Industry

Table 2: GDP by Sector of Origin at 1994 Factor Cost (MK million)

YEAR	1994	1995	1996	1997	1998	1999	2000
Agriculture	2,319.4	3,237.7	4,063.5	4,068.9	4,494.2	4,939.4	5,168.3
Small Scale Agriculture	1,624.2	2,331.6	3,070.2	2,964.0	3,524.9	3,984.1	4,139.1
Large Scale Agriculture	695.2	906.0	993.3	1,104.9	969.3	955.3	1,029.2
Manufacturing	1,597.0	1,685.2	1,675.1	1,691.3	1,710.4	1,690.1	1,704.6
GDP at Factor Cost	9,142.7	10,404.4	11,499.7	12,256.9	12,556.4	13,186.9	13,853.8
	<i>Annual Percentage Growth Rate</i>						
Agriculture		39.6	25.5	0.1	10.5	9.9	4.6
Small-Scale Agriculture		41.6	31.7	-3.5	18.9	13.0	3.9
Large-Scale Agriculture		30.3	9.6	11.2	-12.2	-1.4	7.7
Manufacturing		5.5	-0.6	1.0	0.5	-0.6	0.9
GDP at Factor Cost		13.8	10.5	6.6	3.5	4.2	5.1

(Source: Economic Report 2000)

Economic performance in 1999 was largely driven by the small-scale agriculture sector as a result of good weather and the starter pack initiative (target input programme). In addition to this, the static exchange rate helped to contain prices. Large scale agriculture remained depressed in 2000, due mainly to the lower level of burley tobacco production, a decline of 2.1 %, while sugar and tea decline by 4.7 % and 4.6 % respectively, due to vagaries of weather and poor world prices.

Table 3: Major Exports of Malawi 1999 (MK' Million)

Products	Value (MK)	% Distribution
Tobacco	12,488.6	64.8
Sugar	1,136.3	5.9
Textiles and Clothing	824.2	4.2
Tea	1,175.1	9.1
Groundnuts	11.2	0.1
Coffee	745.2	3.9
Cotton Raw/Lint	241.3	1.3
Macadamia and Cashew nuts	201.1	1.0
Rice	113.0	0.6
Pulses	88.3	0.5
Natural Rubber/Raw	62.1	0.3
Cut-flower	28.2	0.1
Sun-flower Seed	7.2	0.0
Sub-Total:	17,696.8	91.8
Others	1,587.5	8.2
TOTAL:	19,284.3	100.00

(Source: Economic Report, 2000)

Major domestic exports remain agricultural products with tobacco representing about 65 % of total export in 1999. Manufactured products, tea and textiles and clothing composed about 5 % and 9 % of total exports respectively in 1999.

Table 4: Principal Domestic Export Commodities 1996 - 2000 (MK' Billion)

Crops	1997		1998		1999			2000		
	Value (MK)	% share	Value (MK)	% share	Value (MK)	% share	Growth	Value (MK)	% share	Growth
Tobacco	5,780.3	62.1	10,306.0	61.6	12,109.1	61.2	17.5	14,305.3	61.2	18.1
Tea	701.1	7.5	1,247.8	7.5	1,734.6	8.8	39.0	2,270.6	9.7	30.9
Sugar	393.1	4.2	1,563.1	9.3	1,019.5	5.2	-34.8	1,470.4	6.3	44.2
Cotton	190.6	2.0	154.8	0.9	235.0	1.2	51.8	138.3	0.6	-41.1
Rice	29.2	0.3	74.0	0.4	130.1	0.6	48.8	52.4	0.2	-52.4
Coffee	209.1	2.2	327.1	2.0	393.2	2.0	19.9	329.5	1.4	-16.0
Pulses	105.8	1.1	134.1	0.8	284.9	1.4	112.5	364.3	1.6	27.9
Maize	---	---	---	---	---	---	---	---	---	---
Other	1,643.6	17.7	1,963.2	11.7	2,558.7	12.9	30.3	2,901.8	12.4	13.4
TOTAL Domestic Exports	9,052.8	100.0	15,770.1	100.0	18,444.1	100.0	17.0	21,832.6	100.0	18.4

(Source: Economic Report, 2000)

Table 5: Share of Agriculture in GDP at 1994 Factor Cost

YEAR	% GDP
1999	37.5
1998	35.5
1997	33.2
1996	35.3
1995	31.1
1994	25.4

(Source: Malawi Economic Report, 1999)

In 1995, there were about 56,300 work-oxen in the country and most were used for land preparation. Only 13 % of smallholder farmer's use DAP in their farm operations. Engine power technologies comprise of tractors, power tillers and stationery engines such as maize and rice mills. It should be noted that both DAP and engine powered technologies are very expensive for an average smallholder farmer in Malawi. This is evidence by the large percentage of farmers that depend on manual labour (*Mbeza and Stevens, Baseline Survey, March 2000*).

e) Malawi Agriculture Sector Investment Programme (now Process): MASIP was formulated to assist in providing the necessary impetus to transform the agriculture sector to a state of implementing laudable objectives to achieve poverty alleviation in the 21st Century. The revitalized partnership agreement for implementation between Government and Development Partners (donors) was signed in May 2002.

The agreement is a dynamic document and it is claimed to be a document that will change with time to changes in the external environment, as well as to changes within the framework of the process. The external environment to the MASIP includes the following:

- The iterative development of integration with wider policy and institutional reforms under the Malawi Poverty Reduction Strategy Paper (PRSP);
- The accelerating national process of decentralization, with limited progress within the agricultural sector;
- The evolving donor relationships and modes of aid management, with a continued diversity of policies and approaches in some areas and convergence of policies and approaches in others.

f) Crop Diversification and Market Liberalization

The policy on crop diversification and market liberalization has increased productivity in crop production and agro-processing or value added area of agriculture in the previous two years.

The improvement it brought into the productivity of the estate and smallholder sub-sectors has injected more income into the smallholder economy comparatively. The area under other cash crops (apart from smallholder burley tobacco) e.g. groundnuts (crop of the 1980s and early 1990s) has increased due to availability of improved seeds in the last couple of years.

The shift in policy has also seen changes in cropping pattern leading to increase in production of new crops such as cassava and sweet potato, sorghum and millet. All these require new techniques, skills and technologies for production and processing.

The high production in maize in the last few years was as a result of using yield-enhancing technologies, especially imported improved seed hybrids and fertilizer. Cultural practices such as spacing and dept of planting techniques are areas SASAGAWA Global 2900 project is working on while Agricultural Productivity Investment Programme (APIP, started 1997) has been supporting the provision of input. There is the Starter Pack Programme (SPP) and Target Input Programme (TIP) on food security for the poor which provides free inputs to poor households.

g) Livestock Production

The Government has always been putting much emphasis on cattle production in their animal husbandry extension. Cattle in Malawi are kept only by a small number of rural households (15 % -EU Survey 2001). Commercial operations are few. Major problem with cattle keeping

include the large size of animals, which require more feed and attention, making them very expensive to acquire in terms of money and their requirements for large landholdings. It is also rare that farmers sell them except in times of dire needs.

In the livestock population survey, the number of cattle get smaller in area of the south and central Malawi where about 80 percent of the households own and cultivate less than 1.0 hectare. In such areas other small stocks such as small ruminants (especially goats), pigs and poultry are more widely distributed.

The *EC-APRU Food Security Survey (2001)* indicate that 15 % keep cattle, 44 % keep goats, 13 % keep pigs, 96 % keep chickens, 3 % keep sheep, 1 % keep turkeys, 4 % keep rabbits and 8 % keep guinea fowls.

Between 1980 and 1985, the population of cattle was above that of goats. The population of cattle started decreasing after 1986/87 and overtaken by the population of goats. The populations of pigs and sheep have consistently been low. While sheep population has been static and that of pigs has surprisingly increased since 1997. These national changes especially of cattle and sheep are of concern regarding the place of livestock in agro-processing and food security.

In actual fact, the shortage of cattle in the market has drastically affected the butchery industry and dairy industry productions drastically. The dairy industries are presently producing below normal production. For example, farms that used to supply base milk of 4,000 liters per day are only supplying about 350 liters per day to the dairy processors. There is similar trend with the smallholders. The main butchery industry, Cold Storage Company, owned by the government is soon to be privatized, as it has not been able to source enough animals to keep it in production. This has a direct impact on the tannery industry that is near total collapse.

One of the reasons for the virtual decrease in large animal production is the small average farm size. For a family of 5 people to meet their maize subsistence they require 1.0 to 1.3 ha of land (FAO). However 56 % of households cultivate less than 1.0 ha. It is therefore, not surprising to see farmers moving from cattle to smaller stock, especially goats. Another reason farmers are discouraged from keeping cattle is the rampant thefts and lack of security for their livestock, especially in the districts near the urban settings.

The Malawi dairy industry is small and consumption of dairy products is quite low, with a national average of 4.5 liters per capita compared to 6 liters per capita given by FAO and the 15 kg/capita as average for Africa. The international average recommended is 200 liters per capita. About 91 % of the milk processed in the formal milk sector are by the three major private processing plants. Only 4 % comes from several small processors (DANIDA, 1997).

Malawi has been and may remain a net importer of livestock products, mainly beef, chicken, milk and eggs. The policy of importation is always implemented by Government to increase the supply of livestock products, mainly in the urban areas. How best to combine this with that of encouraging domestic production of livestock and livestock products is a major challenge to the Government.

The solution to this would be to encourage farmers to do intensive farming of animals. There is need for improvements in organization, production, processing and marketing and provision of support services, especially in the Livestock Feed Industry. But these require the use of special technology in feeding and health care, both of which are not within the reach of the smallholder

farmers. This system will also require extra costs that the farmers cannot afford, especially in a situation of high interest rates.

The new Dutch livestock policy stresses that livestock and dairy development will no longer be treated in isolation. They must be integrated as part and parcel of rural development, embedded in the right macro-economic and policy environment and aim at increased market orientation with producer-entrepreneurs as partner in development (FAO, *Dairy Development Policy and Implementation, 1994*).

h) Land Problem and Population Increase

As population continues to increase at the rate of 1.9 % (WB 2001) annually, with decline in soil fertility and sub-sequent decline in productivity, the essentiality of increasing staple maize productivity continue to affect policy.

There is virtually no scope of increasing the maize cropping area, as Malawi has the highest land pressure of any country in the sub-Saharan Africa with a single mode of rainfall. About 72 percent of smallholder cultivate less than 1.0 hectare. The failure of food production to keep pace with population growth has contributed to the unacceptable levels of malnutrition and child mortality.

The technology and policy interventions thus have to change. Without discounting the organic strategies, it has been noted that as the content of organic matter in the soil decline, soil texture and fertilizer use efficiency decline leading to a further stagnation in agricultural productivity. A combined strategy of increasing smallholders' access to fertilizers with promoting organic technologies will be required over medium to long-term. In the short-term, an immediate and short-term soil fertility crises had to be averted. The technology policy options adopted were:

- Widespread deployment of inorganic nitrogen fertilizer and improved seeds; and
- Increasing the grain legume component in smallholder cropping systems through rotations and relay crops.

The new Land Policy as it affects investors in agro-industry is that no foreigner can own land as freehold, unless he is in partnership with a Malawian or he becomes a Malawian citizen. On the other hand an investor is allowed to own land for residential purposes on leasehold for a period of 99 years and for industrial use for a period of 50 years or less.

i) Notable Technology Impacts

- Successful area specific fertilizer demonstrations were accomplished providing better information on proper fertilization techniques.
- More farmers have access to clean planting materials in the cereals and legumes, through the liberalization of the seed industry accommodating many players and incorporation of improved practices and other crops such as chilies, spices, soyabean, etc. The Chitedze Research Station also developed some viable high yielding maize varieties of the MH 18 series. This effort increased yield considerably. The use of Certified Seed smallholder growers is in practice through NASSPA.

- Crop diversification into Cassava and Sweet potato planting materials, thus providing higher income and diverse food base but no processing strategies to improve the diversity of food base for the populace. Planting materials programme (cassava and sweet potato) of IITA/SARRNET based in Chitedze.
- Trials on Irrigation Technology for smallholders. IFAD programme on smallholder irrigation is in progress across the country. Threadle Pumps has been adopted, but inadequacy of other production technologies, such as use of Power Tillers and Motor-propelled low cost technologies is still apparent, especially in the value adding areas. Without all these other complementary low cost technologies, the benefits of irrigation water use will be limited and response in yield will not be substantial, while post-harvest loss will still remain high without appropriate post-harvest principles being put in place.
- There are other programmes introducing new technologies, addressing the yield per unit area of farmland. Such include the SASAKAWA project on inter-cropping and inter-planting of arable crops.
- There are also programmes addressed at improving entrepreneurship levels of SME's in the country. Many have been tried by government agencies with failures and new ones are coming up through donors, such USAID/NASFARM, EU, DfID, Micro-Finance NGO's, amongst others.

In conclusion, the above policy frameworks and strategy objectives and action plans offer long lists of such intended activities to enhance agricultural productivity but made no clear cut strategy for adding value or encouraging agro-processing of produce of agriculture. Thus, there has been no outlined strategy or articulated policy to transform the subsistence-based farming systems, to those that will ensure sustainable technology based agriculture, incorporating agro-processing.

j) Marketing Mix in relation to Malawi Agro-Industry Products

This describes the "offering" of the company produce to the market and consists of three elements:

- The Product range;
- The Price, discounts and terms;
- The Presentation, or means of communicating with the market (selling, sales promotion, advertising, etc).

By juggling with these three elements, a company is able to balance its objectives with the consumer objectives. The effect of the technological development and --vigorous competition-- has resulted in products and prices of competing companies in most industries becoming increasingly similar.

Consequently, the first two elements of the mix are becoming less important to consumer choice. This emphasize the role of technology in achieving a competitive advantage for Malawi products. This is presently not in any of the policy agendas.

Moreso, even if the industry identifies appropriate technology they may not be able to access them. The reason is that technology does not come cheap, especially the latest modern high-tech technologies infused with computers, colour separation and coding of packages.

Apart from the high cost of the hardware and machinery, some of them require well-trained hands or technicians to operate them. These expertise are not found easily nor can they be made overnight. It requires years of planning and training in the sciences or computer education and various engineering fields to have them.

Mbeza H. and Stevens P. (2000) in their survey analysis confirmed the above problem in their report that, supply and repair services are few and rudimentary in Malawi. Of course, lack of demand reduces the supply. Mechanization is not diverse and farmers are not aware of the many options available. Much equipment is no longer available or never properly introduced. By far, most work is done by hand labour, also in areas where there are oxen, and where conditions are suitable to use draught animals for farm-work.

When or where draught animal powers are put to use something always come wrong. This problem is attributable to improper training. For instance, when donkeys are used in drawn carts, they are yoked like the oxen, rather than harnessed using the more fitting breast belt. Donkeys are said to be lazy for tillage but this is because they are used to pull the heavy ploughs and ridgers meant for the oxen. Some farms where the training's are done have recently been privatized.

Processing equipment is generally scarce, limited to grinding mills in only a few places and far less dehullers. Most of the work is done manually by pounding in mortars with pestle and groundnuts and maize are still shelled by hand, no hand or motorized shellers. Many jobs, especially the ones with the largest labour constraint, such as weeding, banking, applying fertilizer, harvesting and processing tobacco leaves, and grading tobacco, are done by both men and women. However, food-processing duties are traditionally women's jobs and are judged as drudgery jobs by men and women.

When the hammer mill is far away from the village, the maize has to be carried on head or by bicycle if available and in instances people contribute money to hire ox-cart for the transportation. Effective rural transportation is highly essential.

During the rainy season or in very wet areas, such as Nkhata-bay in the north, the drying of the staple cassava flour under the sun becomes a problem. The absence of portable dryers or drying technology poses a food security problem as most of the flour rot away due to moist environment.

Smallholder farmers are still using the *rhumbus* type of storage system and records show that many of them lose between 40 and 80 % of their stored maize crop to insect pests and rodents. Efforts have not been intensified to introduce the modern cribs and use of insect repellent or control storage insecticides.

Elements of spraying equipment for combating insect pests in vegetables, cotton, tobacco fields and grain storage are common. Unfortunately many of these sprayers are never utilized, either as a result of lack of spare parts or no assistance in putting them to good use. In many EPAs and ADDs are traces of past efforts to mechanize agricultural production and the introduction of processing technology activities but somewhere along the line things fell apart or the culture of poor maintenance took control (*Mbeza and Stevens, Baseline Survey, March 2000*).

A well-structured focus on investment in technology and training or retraining of artisans in the various agro-processing and technological fields has not been a major focus in the previous national agricultural policies. One of the newly introduced strategies to address this type of issue

is the TEVETA programme. But this is still inadequate, as there are still inadequacies in higher technological education.

k) Existing Industrial Sector Initiatives

- Government has mobilized effort to improve productivity in the industrial sector by way of establishing the Productivity Centre, as a Centre of Excellence. This will provide information on technology choices, their performance and problems in other parts of the world. Technology adaptation and development should be a major focus with Private Sector playing a leading role.
- A Private Sector Strategy and Action Plan is being funded by the World Bank. This is to identify sub-sectors where Malawi has competitive advantage for intensive focus.
- With assistance from UNIDO the government through the Ministry of Commerce and Industry is embarking on the preparation of an Integrated Industrial Development Programme to support the manufacturing sector.
- Malawi Bureau of Standards has intensified its Technical and Quality Assurance and Certification Programme for upgrading local manufacturing the industry, which started with UNIDO assistance in 1997.
- The Malawi Industrial Research and Technology Development Centre (MIRTDC) is also intensifying effort on industrial productivity improvement, with support on shop-floor assistance to enterprise. They already have breakthrough with production of some low cost technologies, such as the Salt production technology improvement, micro-scale vegetable oil-extraction presses, fruit juice extraction press, amongst others.
- Chitedze Agricultural Station needs to develop its engineering ability in order to turn its good concepts into production models. They have been testing agricultural implements and processing equipment.
- The new market initiatives has drawn attention to the grounded work at existing Research Stations which focused on high value crops, such as, cotton, grain and legumes, etc. The stations need serious attention in human and financial resources support in order to generate ideal raw materials for the agro-industries.
- The government is about to review the Micro and Small Enterprise Policy in relation to agriculture. It is to de-politicise Micro-Credit Management and Administration. Agro-processing and Value Adding are to be accorded special status when disbursing credit. Government is soon to enforce lease covenants to assist entrepreneurs, in view of the high cost of finance (interest rates of 50 %) in the country and the general lack of fund to procure machinery and equipment. Some of these are on-going programmes.

In consultation with stakeholders the following deductions were recently compiled for the government by consultants, but with some new additions for this report:

- **Lack of Capital:** Capital is required to purchase high yielding and pest resistant hybrid varieties and other inputs, as well as oxen, ploughs, ridgers and tractors. Capital is indeed a sector wide issue. The agro-processors who add value to the produce for consumption or

- Increased facilitation of private sector involvement in the trading of inputs and produce following liberalizing the market in 1990's;
- Technology breakthrough such as the development and release of semi-flint hybrids MH 17 and MH 18 in 1990;
- Development of area specific fertilizer recommendations in 1990's;
- Wide adoption of Mikolongwe Black Australorp dual purpose chicken in 1980s;
- Development of Stall-feeding program and smallholder dairy schemes in the 1970s;
- Development of milk-bulking groups in the 1980s;
- Formation of farmers association in the 1980s and 1990s;
- Chambo commercial fish farming development and allied industry;
- Adequate focus on Groundnut breeding programme of the 1980's.

The Policy Review Document of 1999, noted that there were too many strategy interventions (130) suggested in the Action Plan. The report considered these to be too many and advised on the need to consolidate the strategies and prioritize them. Some of the interventions were not supported by a proper policy framework and yet they play a crucial role in the development of the agro-industry sector in the country.

These include interventions on soil fertility, seed multiplication and distribution, diversification and agricultural finance, low cost technology adoption and fabrication amongst others. That indeed was the problem. There is need for a direct agro-industry policy integrated into the general Agriculture and general Industry policy.

Apart from the essential agro-industry specific policy, other issue specific policies and strategies should be developed to address such as the following:

- Soil fertility and fertilizer: e.g. subsidy on fertilizer and use of organic manure;
- Seed development and distribution: e.g. use of high yielding hybrid varieties based on agro-ecological zones;
- Diversification incorporating the High value crops into the farming systems;
- Agricultural finance outside the framework of Commercial Banking: e.g. soft loans for machinery acquisition and availability of working capital for industries;
- Phytosanitary and Health;
- Mechanization and Appropriate Technology;
- Contract Farming Agreements for raw material sourcing to industries to be legalized with an Act of Parliament.

The policy objectives should be matched with appropriate interventions in the Plan of Action. One major need of the Ministry of Agriculture and Irrigation is to set up a Department of Agriculture and Engineering Services, which should have two units of Mechanization with Engineering Services and the Post-Harvest Technology Services. This unit will meet the requirements of the nation in issues relating to agro-processing and related operations. Total reliance on Chitedze Research Station is obviously inadequate for the Ministry.

iii. Micro and Small Enterprise Policy (MSEs): The policy was made to create a conducive climate for the development and growth of micro and small enterprises, the former being predominantly informal and the later being fairly formal and more or less permanent. The strategies were to provide training and access to credit, as well as development of infrastructure and an institutional framework for SMEs. It was to cover income-generating activities including some on processing.

The government provided low cost loans (15 %) to SMEs through several institutions which include: DEMAT, SEDOM, NABW and ADMARC. These loans encountered high default rates. This has been attributed to lack of business acumen amongst borrowers and political rhetorics.

The Policy Review of 1999 recommended amongst others that:

- Policies and Micro-credit Act be developed to improve the SME sector;
- Politics to be removed from micro-credit management;
- Micro-credit schemes should be directed at production of indigenous commodities to expand the productive base of the economy and not at the petty trading based on imported goods;
- Agro-Processing and value adding activities that strengthen backward and forward linkages should be accorded special attention when disbursing credit;
- Credit should be provided to proven credit-worthy borrowers and a system of cross-referencing should be developed amongst financial institutions.

This was the first time that a direct call was made for incorporating agro-processing effectively on the policy issues. The best alternative will be to set up an Agricultural Bank. The existing MRFC could be upgraded to this level to serve the need for working capital and equipment financing in the agricultural sector.

In 1987, GoM-READI Project Survey found out that 49 % of the MSME entrepreneurs interviewed said that if the government were to build a small market place or a workshop center, and charge rent, they would move their business to that place. Obviously the need for Business Shells with utilities is long overdue for the SME development in Malawi.

iv. Co-operative Policy: The co-operative policy and the accompanying Act seek to encourage, promote and facilitate all aspects of cooperative activity, including multi-purpose cooperatives, credit unions, consumer co-operatives and co-operative banking.

There may be need to exploit how the cooperative could ensure better use of the land and improve smallholder agriculture to provide adequate raw materials for the agro-industry.

v. Privatization Policy: The privatization policy is about diminishing the role of the public enterprise sector and strengthening the private sector in enterprise management with a view to enhance competition and economic efficiency, as well as raising Government revenue.

The process involves selling off of about 140 public enterprises and some other assets managed by various Ministries. These include ranches, farms, fish farms, agro-processing facilities, amongst others. The underlying assumption is that the private sector has requisite business acumen and that the economic environment is conducive to investment. Recent indicators show that this assumption does not seem to apply to Malawi.

It has been noted that the initial development concerns upon which some of the public companies were established such as, animal improvement and fostering backward and forward linkages through agro-processing are being compromised by reorienting production plans in favour of goods and services that have low priority in the country.

Also a good number of these companies are heavily indebted and are not viable due to poor management and lack of competitiveness at regional level. Poverty is too severe for ordinary

people to invest in shares. And cost of borrowing is too high and when associated with the inefficient financial market the exercise is too prohibitive to fairly reward investor.

vi. Trade and Regional Cooperation Agreements: The process of comparative advantage is the basis for developing efficient allocation of resources between countries. But in many cases this has been compromised for other factors such as national pride, security and lack of foreign exchange with which to import some other needs the country does not produce.

For instance, Southern Africa Development Community is there to counter threats the region is facing from globalization and development of major trading blocks, such as European Union, North American Trade Area (NAFTA) and the Association of South East Asian Nations (ASEAN) and the Economic and Social Commission for Asia and the Pacific (ESCAP).

Strategies proposed to achieve objectives in the "Protocol on trade in the SADC region" involve elimination of barriers to intra-SADC trade, import and export duties and quantitative restrictions, facilitation of trade and harmonization of rules and procedures.

It has been observed that many impediments need to be removed from Malawi's production system if it is to benefit from provisions of this trade. Such include low productivity in many agricultural commodities including tobacco in comparison with major trading partners such as South Africa and Zimbabwe. High transport cost to the ports, uncompetitive financial sector and high taxation are some of the factors driving away investors from Malawi.

Malawi has also ratified the Preferential Trade Area and the Common Market for Eastern and Southern Africa (COMESA) without a thorough analysis of the costs and benefits. For instance, Malawi has reduced tariffs for commodities imported from neighbouring Zimbabwe while they have not reciprocated in like manner.

An example is the negative effect of imported low cost powdered milk from Zimbabwe on the price of fresh milk received by local dairy farmers. The dairy industry will therefore rather import powdered milk from Zimbabwe at low price and blend them with fresh milk rather than pay premium price for larger use of locally produced dairy milk. BAT also closed its factory because of the proliferation of cheap cigarette imports. Lever Brothers also faced competition on her import substitutes such as cooking oil, detergents and toiletries from the products of the country's trading partners in the region and beyond. Universal Industries could not sell its products due to imported brands at the retail supermarket chains, e.g. Shoprite and PTC. The effect of this unfair competition or dumping has been scaling down production in the agro-processing sector.

Introduction of surtax on products either consumed locally or exported has also reduced competitiveness of Malawi based processors. Some imported raw materials and accessories in the agro-processing industry and agricultural production also attract import duties and weakens the competitiveness of many small scale industries.

- Future strategy will be to thoroughly analyze agreements before signing them.
- Use the anti-dumping provisions of the World Trade Organisation and the SADC Trade Protocol to protect such comparative advantage commodity industries as horticultural produce, cigarette manufacture, tea and coffee blending, rice and confectionary nuts.
- Tariffs on all ingredients and raw materials for agro-processing industries should be phased out to allow for locally produced product competitiveness with imports.

2.2. Enterprises Technology Survey Analysis

In this aspect, 16 companies were chosen at random, with focus on the need to contact at least one company in all the ISIC economic activity areas. All the ISIC areas were not covered as there were limitations on this aspect. The finding of the discussions held with the enterprises using the questionnaires are analyzed below. Other issues as raised by the entrepreneurs are also compiled.

Technology Choice

Only 18.75 of companies surveyed have management staff (production or technical manager) that were personally involved in the choice of technology they are presently utilizing in production. But 93.75 % of those surveyed claimed to have been involved in subsequent modernization, diversification or expansion projects.

Only one (6.25 %) of the companies surveyed was established in the last five years (a regional investor in the livestock feed sector), all the others have changed ownership many times and at least 93.75 % of them are more than 20 years old.

Actions taken before acquisition of most recent machinery and equipment

Many of the companies have acquired additional equipment to their production lines even if no new lines are procured in recent years. All the companies surveyed have used at least one method of information seeking on the equipment and machinery they are buying before procurement.

The privately owned companies seem to have done more information seeking than the multinationals or those with parent companies that rely on expertise of their mother companies (about 43.75 %). At least 31.25 % of the companies surveyed have utilized the expertise of private technical consultants. Also 43.75 % of the companies surveyed have either sent staff abroad to see new machinery in local working condition or visit trade fairs or exhibitions to see new machinery used in their production sector.

None of the companies have ever negotiated technology licenses or agreements with foreign investors or patent holders. And 25 % of those surveyed have visited other domestic manufacturers to see new machinery in local working condition. 62.5 % of the companies have obtained brochures and specifications on available machinery from potential suppliers. 18.75 % of companies surveyed have used other steps such as in-house expertise, especially staff from parent companies to identify their needs.

Only 12.5 % of companies surveyed have utilized the resources of the Ministry or Government agencies or departments for information seeking. The government therefore needs to do more in sourcing and providing information to the agro-industries.

Only 12.5 % of the companies have accepted a direct foreign investment as part of a package of capital, technology, management, etc. All the companies surveyed have made direct purchase from independent suppliers of machinery (national or foreign).

After-Sales Service from Machinery suppliers

81.25 % of companies surveyed have received assistance in installing the machinery in their factory, while 75 % have received assistance in training their workers in operating the machinery within their own factory. Another 43.75 % claimed to have received training assistance for their operatives in other factories prior to installation, while 50 % of the companies claimed to have received assistance in training their service engineers in maintenance and repair. 43.75 % of the companies have been visited by supplier's staff to deal with technical problems that have arisen

- 56.25 % of companies surveyed rate the services of foreign manufacturers of their machinery or their agents as good, while 12.5 % rate them as excellent; an indication that the foreign machinery suppliers to Malawi agro-industries are providing an excellent service.
- 25 % of companies surveyed rate the services of foreign investors or partners in their enterprise as excellent, while 6.25 % rate them as good and 12.5 % have not enjoyed such assistance; an indication that foreign investors or partners are doing an above average job in Malawi's agro-industry.
- 18.75 % of companies surveyed rate services provided by overseas manufacturers in the same sector as their own as good, while 6.25 % rate them as excellent, and 12.5 % have enjoyed no such privilege; an indication that local companies do not interact well with overseas manufacturers.
- Only 6.25 % of domestic manufacturers in the same sector as their own have enjoyed technical information assistance, while 18.75 % have not experienced such; an indication that agro-industrial companies in Malawi do not provide technical information support to each other.
- 37.5 % of the companies surveyed rate the technical information provided by the Ministry of Industry as above average, while 12.5 % have never enjoyed their support; an indication that the Ministry still have to improve their relationship with the agro-industries.
- 18.75 % of the companies surveyed rate the technical information and advice received from other Ministries or government agencies (e.g. MIRTDC, MEPC, MIPA, Research Stations, etc.) as above average and another 18.75 % rate their support as weak or poor or none existence; an indication that government institutions and policies are not adequately supporting the industries.
- 43.75 % of the companies rate the technical support from the University and Polytechnic as average and above, while another 18.75 % have not felt their existence; an indication that the colleges can still do more and improve on their support services to the agro-industries.
- 50 % of the companies surveyed rate the private technical consultants as providing a good technical advice to the agro-industries, while 18.75 % have not enjoyed their assistance; an indication that the private consultants are contributing much to the agro-industrial development and can still do more.

Response and Rating to Assistance received from the following source:

Source of Assistance	%age Surveyed Companies Benefiting	Average Score	Rating	Examples of Nature of Assistance
a) Suppliers of Raw Materials	31	4	Good	Chemical Analysis
b) Suppliers of Office Equipment	75	3.7	Good	After sales service
c) Other manufacturers to whom you sell your products	38	3.7	Good	Quality feedback
d) Other firms for whom you serve as a sub-contractor	25	3.5	Good	Packaging advice
e) Distributors of your products	19	3.8	Good	Products quality feedback.
f) Government institutions set up to assist small firms	46	3.5	Good	Technical information, Training.

From the result of companies surveyed shown above:

- 75 % of the companies were happy with the assistance received on technical services from the Supplier of office equipment and rated them as good.
- 31 % of the companies surveyed benefited in technical fields from the Suppliers of raw materials and rated them as providing good services.
- 38 % of the companies surveyed benefited in technical fields from other manufacturers to whom they sell their products and rated them as good.
- 25 % of the companies surveyed benefited in the technical fields from other firms to whom they serve as sub-contractor and rated their support as good.
- 19 % of surveyed companies benefited in the technical fields from the distributors of their products and rated such support as good.
- 44 % of the companies surveyed benefited technically from the Government institutions set up to assist small firms and rated their support assistance as good.

Government Policies on Technology

37.9 % of the companies surveyed found the government policy on technology as satisfactory, while another 37.9 % found same to be unsatisfactory. Another 12.5 % either do not know if there is a policy on technology or cannot say anything on the technology policy.

The observation is that there are technology policies scattered all over the different ministries but the essential thing is to have all these harmonized, especially in the aspects affecting agro-industry or agro-processing.

2.3. Changes or improvements in government policies on technology surveyed companies would like to see introduced:

- Research stations to be reactivated to revamp research and training on cotton, groundnuts, Mikolongwe Black Australorp chicken, veterinary officers, etc;
- Private sector participation on trade policy issue developments as it affects agro-industry;
- Tax and Surtax to be removed on raw materials for production and additives;
- Duty and Surtax to be removed on production line machinery, spare parts and accessories;
- Government to provide scholarships for training of entrepreneurs in new technology;
- Prioritize training of more engineering students at the polytechnic;
- Provide more soft loans for technology acquisition;
- Government to work with Reserve Bank to ensure reduction on cost of finance;
- Removal of levy imposed on electricity generation with fossil fuels in industrial sites;
- Improve the trade policy agreements conditionalities with regional trading partners;
- Provide adequate skills training institutions in the country;
- Encourage Trade Unions to provide more training assistance to their members on Junior Staff discipline and work ethics in general;
- Support local promotion of technology oriented trade fairs;
- Improvement on communication technologies across the country;
- Government should get out of agro-business and complete the privatization process;

Region and K1,600 per month in the Northern Region. In cases where the wages fall below the minimum wages indicate signs of underemployed workers.

g) Employment of Expatriates

Fundamental changes continued to take place under review concerning the policy on the employment of expatriates. The policy continue to get reviewed in order to make Malawi's labour market competitive and flexible so as to let the investors have a freedom of choice in recruiting the kind of personnel they need to guarantee adequate returns on their investments.

While trade unions found the new policy discriminatory and disadvantageous to the local Malawians in terms of remuneration packages and creation of employment, there are indications that the policy has improved investor confidence for Malawi. Some of these investors are allowed to bring in technical managers to resolve immediate management problems and train local managers to take over their positions. The maintenance of this improvement in the investor confidence is, however, being marred by other factors not related to labour and employment, such as inadequacy or lack of working capital and in some cases the inadequacy of locally sourced raw materials e.g. maize for food and feed composition.

h) Occupational Safety and Health

The Directorate of Occupational Safety and Health has continued to inspect workplaces in order to improve working environment and conditions so as to reduce risk of bodily injury and health impairment to workers in industries. Inspection is a means of enforcing the Occupational Safety Health and Welfare Act, No. 21 of 1997 which has a provision of establishing safety committees aimed at involving workers in the development of implementation of safety and health programmes.

i) Workers Compensation

Amendments to the Workers Compensation Act No 21 of 1990 were effected after exhaustive consultations with employers, trade unions and other stakeholders in 1999. A bill called Workers Compensation Bill, 1999 was finalized into law. The next step was to establish the Workers Compensation Fund that will form the basis for a comprehensive social security scheme. The structure of Workers Terminal Benefits is presently under debate amongst unions and employers in the country.

j) Key Development Strategies

- The industrial sector in Malawi is reasonably developed, with a 14% share in GDP, in relation to many countries in the region, excluding South Africa and Zimbabwe (26%). It is characterized by the legacy of the past import substitution policy and dependence on the exports of primary agriculture produce. This also implies a need for, as well as an opportunity for, industrial re-orientation and diversification.
- The development of export industries requires duty free status and automatic access to working capital. This would mean existing fiscal incentives need to be streamlined and the existing export development finance scheme modified and made operational.
- The role of the private sector would be to promote the industrial activities where Malawi already has or could have comparative advantage. Exporters should exploit the existing

- opportunities in both domestic and export markets and seek new processes, products, markets and trading or manufacturing foreign partners. Participation of foreign investors is desirable as they bring in technology, capital, managerial skill and links with international markets.
- To improve operating environment there is need for infrastructure development covering the provision of serviced industrial lands and buildings (empty shells), warehousing and cold storage facilities, freight services, power and utilities.
 - One of the principal sources of comparative advantage is the surplus of labour. The majority of them are unskilled, but trainable. The human resources development programme should therefore comprise; training and skill development programmes as the short term measure (e.g. TEVET) and further investment in technical education sector (e.g. computer technology centres) to meet the demand for skilled labour in the private sector.
 - The other major area of comparative advantage is the natural resources that are largely agriculture, forestry, fishery and poultry. There are quite a number of opportunities in these areas, ranging from primary production and extraction, to processing and manufacturing. Many of them are local resource based and have good potential for export or import substitution. For instance, fish, cotton, rice, soyabean, honey, dried fruits and organic farming are few examples.
 - The local market is small but there are many different product groups that show substantial domestic supply gap implying potential for their local production.
 - The Government should encourage expenditure in entrepreneurship development through training and sourcing soft loans for acquisition of machinery and equipment for those with potential. Development Banks e.g. Inde-Bank and Inde-Finance should provide leadership.
 - Government should encourage private sector partnership in machinery and equipment assembly and fabrication. Sectoral Ministries and parastatal organization e.g. MIRTDC, MRFC, DEMAT should provide assistance in this area.

3.2. Enterprises Human Resources Survey Analysis

The enterprise selection was done randomly to cover all sectors of the agro-industry in the country. Particular attention was paid to choose companies based on the ISIC economic activities existing in the country. 16 enterprises were interviewed using the questionnaire as for technology.

Enterprise Locations

68.75 % of the enterprise surveyed are located in the southern part of Malawi, while 18.75 % are located in the central part and 12.5 % are located in the northern part of the country. In actual fact the bulk of Malawi industries are located in the southern region, where the commercial capital, Blantyre and the colonial headquarters are located.

Staff Employed

In the last two years 50 % of companies surveyed have experienced decrease in their staff roll, while 25 % have increased their staff and 25 % have not experienced any change. Those with increased staff are mainly in the livestock feed and poultry industry sector, which might have been as a result of recent change in Government policy to ban importation of poultry and encourage local investments in this sector.

Most of those that have suffered decrease in staff numbers are in the sector where raw materials are sourced locally. These raw materials are grains, including maize, cotton, base milk, all of which the local productions have gone drastically in recent years, and many have relied on importation. Those who have been able to retain their staff have either diversified into other production lines, such as found in the tea estates or are mainly producing hardware or tools of agriculture.

Privatization

The Government has privatized some of the agro-industrial companies in which it has interests. The government recently privatized 25 % of the enterprises surveyed. All seems to be doing well under their new management, including one with management buy-out having majority shares.

All the privatized companies that we surveyed are doing well except those in the dairy sector that have had to lay down staff due to inadequacy of supply of base milk from milk-sheds and smallholder dairy farmers. 75 % of the privatized companies have increased their staff, while another 25 % retained the number of staff inherited.

Staff Recruitment

When it comes to recruitment of new senior or management staff, 100 % of the enterprise interviewed advertise such vacancies in the newspaper. In the case of junior staff, methods of recruitment vary from company to company and from one job to the other. For instance, all companies interviewed recruit casual labourers regularly near their premises and require no advertisement, while 81 % of those surveyed do recruit some workers through staff relations and through the labour office, especially for the drivers and where some confidentiality is required.

In filling job vacancies for production-line workers, some companies prefer to use school leavers whom they can train on the job. These are about 37.5 % of those interviewed. The others prefer those with experience or no experience but could meet the other physical needs of the job.

Only about 18.75 % of those surveyed have no problem with finding suitable people to fill their vacancies in the last two years. The others have had one problem or the other most especially when it comes to recruiting professionally qualified people in the engineering or technical areas. Such areas of need are artisans, electrical engineering, electric motor re-winder, laboratory and quality control, food technologist, production line managers, qualified accountant, senior sugar technologists.

There seem to be adequacy of office professional staff. About 56 % of those surveyed found problem with recruiting experienced engineering staff, 25 % had delays in recruiting artisans while another 25 % had delays in recruiting laboratory staff.

In some instances, people have been given employment and they will just disappear only to find out that they have been employed on higher wages at some place else. About 81 % of those surveyed claimed that there is overall scarcity of people with skills and experience in their field. Less than 1 % of those enterprise interviewed attribute the difficulty in finding qualified person for their advertised vacancies to their factory location. In this case they are located far away from the metropolitan area, especially the wood industry. About 25 % claimed that people want higher wages than they can afford.

Training

All the employers surveyed provide one kind of training or the other for their employees. 100 % provide on-the job training by existing workers or supervisors. About 37.5 % provide training in

on roll in the company. Most of them occupy positions that Malawians have no qualified professional expertise.

Administrative Problems with Foreign Staff Recruitment

As at now the Malawi Government has made MIPA a one-stop centre for investors' needs on procurement of Work-Permits and other issues on investment. This has reduced the problems associated with this issue greatly. Out of the companies surveyed only 25 % claimed to have had problem with obtaining work permit for their staff, another 25 % claimed to have had problem with renewal of the work permits and only 12.5 % complained of problems with remitting of salaries or fees abroad. 68.75 % claimed not to have had any problem on issues relating to work permit and remittance of money.

Obviously there exists in the country two major umbrella trade union organizations, COMATU and MACTU. But 68.75 of the companies surveyed claimed not to belong to any, while 31.25 % of the companies have workers belonging to different workers union groups. Such union include, Sugar plantation and Allied Workers Union, Textile and Garments Workers Union, Hotel Catering and Food Workers Union, Agro-allied Workers Union.

For those companies whose workers are unionized, they claim not to have problems with the unions and rate the relationship as good. This is about 31.25 % of the companies surveyed.

Labour and Employment Regulations

The Malawi Government has the Employment Act and the Labour Laws and Regulations Act.

- Wage guidelines, 12.5 % of the companies surveyed would like it strengthened and claimed the minimum wage is too low, but all 100 % pay above the minimum wage.
- Severance Pay, 31.25 % of the companies said there is still some confusion in this area as some of them used to pay both the severance and pension scheme to their workers. This decision needs to be strengthened.
- Labour court, 37.50 % claimed that the court always favour the workers. They will like to see this provision strengthened in a way that both sides are treated equally.
- Medical Leave, 18.75 % of the companies will like this law strengthened, especially in the aspect of staff suffering from HIV/AIDS diseases.

3.3. Suggestions from Enterprises Surveyed

- There is need for civic education of workers, either by the Workers' Union or by the Government, as attitude to work of many staff is below expectation.
- There is need for review of the medical leave to support leaves requirement of staff suffering from HIV/AIDS.
- That the TEVET programme needs to be reviewed as most found it to be an albatross that does not benefit them. They say it is too costly for them and very demanding on their time. That, it is not a good return for their time and money. They feel that the levy being remitted should have been done as in the case of the fuel levy. They do not see why they should be paying for the TEVET student's needs amongst others.
- That the Polytechnics should not just be turning out students but producing graduates with relevance to the industry requirements.

4. THE FIRST WORKSHOP REQUEST RECOMMENDATION

a) Appropriate Technologies

Good farming system, inputs and implements are required to eliminate farming drudgeries. It is also essential to prevent wastage of harvested produce. It is a common scenario in the villages and rural areas to see fruits wasting away during the harvesting season of the year. The main reason for this is that these tropical fruits are highly perishable and cannot be stored for longer than few days unless they are processed and the juice extracted for short term refrigerated storage or medium term prolonged storage with chemical preservatives or autoclave sterilizer.

Apart from fruits, tropical vegetables are other products that can have their shelf life prolonged beyond the rainy season when they are usually most available, except on irrigated farms in the dry season. In recent years, scientists have come to realize the benefits of food preservation with sunlight energy, a method that our forefathers had been using but ignored by modern man.

Solar Drying: Solar drying is a process familiar to all farmers, where the heat of the sun is used to dry and preserve produce. The process also makes it more possible to transport the produce from one place to the other without fear of rotting, etc. Traditional solar drying has been used with crops like coffee, millet, sorghum, maize, beans, groundnuts, cassava, potatoes, etc. It usually involves spreading produce on the ground, concrete slabs or grass matting.

There are advantages of drying produce in this way, as explained above. There are also, however, many disadvantages to these practices. These include the fact that produce is not protected from harmful Ultra-Violet (UV) rays, which destroy nutrients, or from rain, dust, mould, animals or insects which contaminate or spoil the produce.

Furthermore, traditional drying is inefficient, as temperatures in natural sunlight are often not hot enough and airflow is unstable, so drying can take a long time. For these reasons, produce dried using traditional methods is liable to high levels of wastage and is usually not of sufficient quality to be sold on the open market. Perishable crops, including most fruits cannot successfully be dried using traditional methods.

Modern Solar Dryer: The modern solar dryer tries to overcome those disadvantages by improving on traditional methods. The drier is a structure designed to enhance the sun's energy and the drying properties of prevailing breezes. With this technology it is possible to dry most perishable produce in 2 to 3 day, with little wastage. Such dryers are now marketed as Solar Tunnel Dryer in Germany.

The drier is usually designed for produce with a high water content such as fruit, including mangoes, bananas, pineapples, tomatoes and jack fruits; vegetables, including onions, cabbage and carrots. It is also possible to dry beans, coffee, grains, cassava and herbs and spices, such as chilies, ginger, turmeric, cloves and black pepper. It has also been successfully used to dry fish in areas where fish is usually preserved by deep-frying or smoking (as in Malawi), practices that have contributed to widespread deforestation (as in Malawi). The solar drying of produce has many advantages that include:

- Solar drying can reduce natural wastage and enable producers to add value to their produce, often by marketing products at times when the fresh equivalent is unavailable and the dried produce can fetch a higher price.

- Dried produce is more durable, normally lasting for 12 months or more, and lighter, making transportation over long distances, in hot climates, much more practical.
- Solar drying can provide employment opportunities in poor rural areas. It can create a sustainable income generation at low cost.
- Solar drying can improve the food security base in households.
- Solar drying is ideal in processing and production of dried organic products (no chemicals or preservatives used) for the export market in Europe and the USA, where high premium prices are paid for dried organic fruits, vegetables, herbs and spices.
- The drier is an enclosed structure, affording protection against dust, insects and animals.
- The dried product can be used in a number of ways, including as a snack, as ingredients for food dishes, e.g. in baking, in yogurts, in soups or other cooked foods or for making juice.

Cabinet Dryers: The cabinet dryer was developed with two objectives on mind: (a) on the one hand to attain a uniform drying of all trays regardless of the position within the drying chamber; (b) on the other hand a minimization of the specific energy requirement and therefore of the operational cost.

The dryer does not require continuous supervision, which is important to farmers. In the standard version the dryer is equipped with an electric heater. Instead of the electric heater a heat exchanger can be installed. This will give you the possibility to couple the cabinet dryer to a conventional heating system (gas or fuel heater) or to systems utilizing renewable energy sources such as a bio-mass furnace or solar water heater.

Stone Mills: This is an old technology that has just been modernized for the production of well-pulverized fine flours for the baking industry. It is now available for small and medium enterprises. It is specially designed for Wheat Milling for Bakery use as an integrated plant. It is also ideal for milling maize into quality mealy meals, a staple Malawi food. It is a multipurpose flour-mill.

Power Tillers: These are small walking tractors with all typical tractor attachments such as ridger, harrow, trailer, sprayer and many more accessories can be attached. The benefit of this tractor is that it is versatile and can be easily managed by a group of farmers and it is affordable. This tractor will eliminate the drudgery associated with land preparation and other farming operations. It is a necessity for our farmers associations and co-operatives, especially when they agree to pool their land resources together for easy management. The tractor is also ideal for a sizeable vegetable garden owner. This is the best alternative to hoes and cutlasses to improve smallholder farmer productivity.

Three Wheeled Motorized Vehicles: These vehicles are very much in use in Asian countries. They are ideal for rural transportation of goods and people. They will contribute in no small measure to the agro-industrial development of the country. The advantage is that they can be easily repaired by local motorcycle mechanics, even in the rural areas.

b) Potential Investment Areas

(Note: These projects will be import substitute and export focused. Most of the ingredients will be sourced from local farms).

- Baby Food
- Breakfast Cereals
- Oil Extraction
- Margarine
- Fruits and Vegetables Canning
- Dried Vegetables
- Pulp and Puree Factory
- Fruit Concentrates
- Jam Factory
- Spices Processing and Packaging
- Food Condiments
- Instant Coffee
- Milk Powder
- Cotton Yarn and Cotton Yard
- Ready Made Garments (Shirts)
- Essential Oils, Herbs and Organic Products
- Farm Machinery and Hand Tools Assembly Plant (Agriculture)
- Dried Products (Fruits and Vegetable)

5. MAIN FINDINGS AND POLICY OPTIONS

There has been limited outlined strategy or articulated policy to transform the subsistence-based farming systems, to those that will ensure sustainable technology based agriculture, incorporating appropriate low cost technology adoption and value adding.

Interventions on soil fertility, seed multiplication and distribution, diversification and agricultural finance, low cost technology adoption and fabrication amongst others are inadequate or lacking. Only in the Irrigation sector is something being done but this is insufficient. There is need for strengthening of institutions and for a direct agro-industry policy integrated into the general agriculture and general industry policy. The policy objectives should be matched with focused appropriate interventions in the Plan of Action:

- **Inadequate Technology Adoption and Marketing Mix Strategies:** Agro-Processing companies have not been able to balance their objectives with the consumer objectives. In the international products market, the effect of the technological development and --vigorous competition-- has resulted in products and prices of competing companies in most industries becoming increasingly similar. Consequently, the first two elements of the mix, "price and product range" are becoming less important than "presentation" to consumer choice. This emphasizes the role of technology in achieving a competitive advantage for Malawi products. This is presently not in any of the policy agendas of many Malawi industries.
- **Department of Mechanization and Technology Services:** One missing link in the Ministry of Agriculture and Irrigation is the Department of Mechanization and Technology Services, which should have two units of Mechanization with Engineering Services and the Post-Harvest Technology Services. The units will meet the requirements of the nation in issues relating to agro-processing and related operations as enumerated above. The Research

- **Department or Unit of Co-operative Development:** Another missing link in the Ministry of Agriculture and Irrigation is the Department or Unit of Co-operative Development and this should have a Director for Co-operatives under the Department of Extension Services at the Ministry of Agriculture and Irrigation. This should be implemented with supporting co-operative officers at each district.

There may be need to explore how the co-operatives could ensure better use of the land and improve smallholder agriculture to provide adequate raw materials for the agro-industry. In this regard one of the main activity of the co-operative unit will be to enhance Contract Farming by co-operatives and estates to feed the industries (private sector) with raw materials. The existing farmers and women's groups and clubs need to be developed further.

- **Privatization of the Ministry Agro-Industry Facilities:** Privatization aimed at diminishing the role of the public enterprise sector and strengthening the role of the private sector in enterprise management with a view to enhance competition and economic efficiency should be well analyzed before selling off any company or facility. This should be done with a review of the initial assumption that the private sector has requisite business acumen and that the economic environment is conducive to investment.

Recent indicators show that this assumptions does not seem apply to Malawi and that the initial development concerns upon which some of the public companies were established, such as animal improvement and fostering forward and backward linkages through agro-processing are being compromised for quick profit. Some of them only require capacity building to become effective.

For instance, the selling of the Goat Breeding or Mikolongwe Black Australorp Chicken Facilities may not be appropriate but a rehabilitation and linkage with the Research Institute for Commercial Breeding Programme with Private Sector Interest may be more appropriate.

Capacity Building: The Ministry of Agriculture needs to train more staff in the technology and engineering areas of agriculture. There is need for more scholarships for existing staff in the M. Sc. programmes and upgrading extension officers to degree levels. Donor support may be required.

HIPC Funds: Some of these fund could be directed for provision of revolving credit for modern technology and equipment acquisition for SME's in areas of value adding or agro-processing. Only those who have the know-how should be the beneficiaries of such loans. The Research Stations activities could be revamped with some of this fund as well.

Agro-Industrial Workers: The Workers Unions and the Ministries of Labour, Industry and Agriculture should organize civic education seminars and training programmes that will enhance better working attitude and engender good relationship with their employers.

6. POTENTIAL AREAS OF STUDY RECOMMENDATION

- An analysis of the Food Chain Key Stakeholders with potential for export market for an audit of essential support requirements (such as quality improvement, raw materials sourcing, targeted markets technical trade barriers, working capital, etc.) and offering possible solutions.

- Computation of products of research that Malawi has comparative advantage with a view to development of private sector participation in further research and mass production for export and regional market. Develop a marketable package for investment.
- A study on the need for the Ministry of Agriculture and Irrigation to set up a Department of Agricultural Engineering with two units of Mechanization and Engineering Services and Post-Harvest Operations. (Note that the department will not only facilitate technical operations in the field but also serve as linkage with the agro-industry private sector).
- A survey of the Employment situation in Malawi.
- A survey of all enterprises sectors in Malawi.

7. REFERENCES

- a) Agro-Industrial Policy Reviews; Methodological Guidelines, FAO. 1997
- b) Review of Malawi Agricultural Policies and Strategies, MoA&I, November 1999.
- c) Technical, Entrepreneurial and Vocational Education and Training (TEVET) Policy, Ministry of Labour and Vocational Training. October 1998.
- d) Alternatives to Tobacco, Volume I & II, by NEC Malawi.
- e) Malawi: Industrial Sector Opportunities Study. Draft Final report, Volume I to III. Ministry of Trade and Industry, Lilongwe. By Maxwell Stamp PLC, July 1994.
- f) Baseline Survey on the Potential for Improved Small Holdings Labour Productivity and Farm Income Through Village Level Processing of Crops in Malawi with emphasis on Alternative Food Crops, by H. Mbeza and Piet Stevens, March 2000.
- g) Technical Systems for Agriculture: Post harvest Management and Storage of Maize by Odogbola R.W. and Henrikson R. UNDP/OPS, Harare. December 1991.
- h) Malawi, Economic Reports, 1991 to 2000.
- i) Concept Notes for Private Sector Development Project, Min. of Trade and Industry, 2001.
- j) GEMINI Report: Malawi MSME's Survey, by Austin Ngwira, et al. 1993.
- k) GoM-READI Project Survey, MSME's Survey, 1987

ANNEXES

Annex 1

Table 7: Malawi Index of Industrial Production

(1984 = 100)

YEAR	1991	1992	% Change	1995	1996	% Change on Previous Year		1996	1997	% Change 1996/97	1998	1999	2000	% Change
						1995	1996							
a) Goods Manufactured for Domestic Market														
Consumer Goods:														
• Food, Beverages and Tobacco	150	155.3	8.6	125.7	126.1	-1.8	0.3	159.1	161.1	1.3	161.1	78.2	75.8	-3.1
• Clothing, Footwear and Textiles	114.7	105.2	2.7					51.6	82.6	60.1	82.6	125.4	77.5	-38.2
• Other Goods	157.5	146.6	9.9	113.8	114.1	-2.0	0.3	136.5	137.3	0.6	129.8	88.4	104.1	17.8
Total Consumer Goods	146.8	141.0	1.3					126.0	133.7	6.1	278.1	90.1	90.6	0.6
b) Export Goods	123.4	114.2	14.9	122.4	137.0	13.1	11.9	137.0	118.7	-13.4	102.1	100.4	80.8	-19.5
Total Manufacturing								120.2	116.5	-3.1	227.8	93.1	87.8	-5.6
Total Industrial Production								128.9	127.8	-0.9	123.8	112.2	111.6	-0.5

Note:

- 1991/92: Figure for 1992 are based on 9 months data while those of 1991 are on 12 months data. Calculations and comparisons are done for 9 months for both years. Trade liberalization continues to have a positive effect on growth in industrial production. Despite drought the production of export goods increased by 14.9 percent in 1992 compared to 1.3 percent in 1991.
- 1995/96: The manufacturing sector performed dismally and activity declined by 5.6 percent. The sector grew by 8.2 percent in 1995.
- 2000: In 2000, production for domestic market fell by 5.6 percent, while production for export increased by 10 percent.

(Source: NSO/Economic Reports)

Annex 5

Human Resources Questionnaire Analysis

Enterprises	Region	Start	Business Type	Staff Recruitment		Use Trainee (Tech)	Delay Finding Staff - EM/TT/TP	Scarcity of Professional Staff	Training Provided (O/P/C/P/W)	Line Worker Wage System	Minimum Wage per Month US \$		
				Adverts (Senior Posts)	Labour office/Relative						Unskilled	Semi-Skilled	Skilled + 5 years
A: > MK 1.0 Billion													
1.	D	S		Y	Y	-	E	Y	O	M	-	-	-
2.	D	S		Y	-	-	A	Y	O/P/C	M	-	32	190
3.	D	S		Y	Y	Y	EM	Y	O/P/C	M	32	-	-
B: > MK 100 Million													
4.	R	S		Y	Y	-	E/ML	Y-Wage	O/P/P/G/W	M	31	51	71
5.	I	C		Y	Y	-	E/A	Y	O/P/C/W	M	36	41	54
6.	D	S		Y	Y	-	Nil	Nil	O/P/C/W	M	14	-	63
7.	-	-		-	-	-	-	-	-	-	-	-	-
8.	R	S		Y	Y	Y	L	Y-Lab/loc	O/P/G/W/P/Phro	M	15	21	56
9.	I	N	Private	Y	Y	-	E/ML	Y-Wage	O/P/G/W	M	14	20	82
10.	I	S		Y	Y	-	Nil	Nil	O/P/G/P/W	M	19	44	127
C: > MK 100 Million													
11.	I	C	Private	Y	Y	-	E/L	Y	O/W	M	23	32	127
12.	D	C	Private	Y	Y	Y	E	Y-Wage	O/P/P/W/Ngo	M	33	88	207
13.	D	S		Y	Y	Y	E	Y-Tech	O/P/G/P/W	M	22	51	101
14.	-	-		-	-	-	-	-	-	-	-	-	-
15.	R	N		Y	-	-	Nil	Nil	O/P/P/G/W	M	32	63	127
16.	R	S	Private	-	Y	Y	E/A	Y-Abscond	O/P	M	-	38	76
17.	D	S		Y	Y	Y	E	Y-Tech	O/P/P/W	M	19	20	51
18.	D	S		Y	-	-	A	Y-Wage	O/P/P/G/P/CW	M	19	22	44