OCCASION

This publication has been made available to the public on the occasion of the 50th anniversary of the United Nations Industrial Development Organisation.

DISCLAIMER

FAIR USE POLICY

CONTACT

Please contact publications@unido.org for further information concerning UNIDO publications.

For more information about UNIDO, please visit us at www.unido.org

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna International Centre, P.O. Box 300, 1400 Vienna, Austria
Tel: (+43-1) 26026-0 · www.unido.org · unido@unido.org

18750

AN INDICATIVE AGROFOOD INDUSTRIAL PROGRAMME FOR COTTON IN ZIMBABWE

By Dr A.C. Mosha

UNIDO Consultant
Tanzania Food and Nutrition Centre
P.O. Box 977
Dar es Salaam, Tanzania
March 1990.

AN INDICATIVE AGROFOOD INDUSTRIAL INTEGRATED PROGRAMME FOR COTTON IN ZIMBABWE

By Dr. A.C. Mosha

UNIDO Consultant
Tanzania Food and Nutrition Centre,
P.O. Box 977
Dar es salaam
Tanzania

(March 1990)

AN INDICATIVE AGROINDUSTRIAL INTEGRATED PROGRAMME FOR COTTON IN ZIMBABWE

CONTENTS

INTRODUCTORY BASIC INFORMATION

Zimbabwe is situated in South Central Africa and has a total area of 390.757 square kilometers. The land is divided into four natural topographical regions with varying agricultural potential. The climate is tropical and continental ranging by altitude especially in the central plateau.

The rainfall varies from 300 mm in the south to over 1000 mm in the north eastern highlands averaging 650 mm per annum. The country produces tropical and temperate crops especially maize and other cereals, cash crops such as tobacco, cotton, tea and coffee and horticultural crops. The country is also ideal for dairy and beef cattle as well as goats, sheep, pigs and poultry; hence a high potential for a viable armatory industry.

The population was 8.86 million in 1989, growing at about 3% per annum. 73% of the population lives in rural areas whereas 27% lives in urban centres.

Physical communication is fairly well developed within the country which is land locked. It has troubled outlets through mainly South Africa and Mozambique. The railway network is well developed to the main agricultural, mining and urban centres. The same applies to the road network.

Socioeconomic indicators are on the average better than most African countries. The GDP in 1988 at current prices and factor costs was Z$ 8,295 mil. (US$ 4879). The GDP per capita in 1986 was US$ 660. The sectoral composition of the GDP which has not changed very much was in 1985: agriculture 13.0%, industry 43%, and services 44%. The inflation rate is currently estimated at 15%. The Zimbabwe dollar was 0.6 to the US$ but by December 1989, stood at 2.2 Z $ to the $ dollar.

Raw material sources for the agroindustry are food and cash crops and livestock which provides a ready market for cottonseed by-products. The main energy sources are electricity which was 4339.6 million kilowatt hours in 1984 while coal produced was 3.1 million tons.
Foreign trade as shown by exports in 1986, was ZS 2,170.3 mil total value, mainly from tobacco, ferroalloys, maize, cotton lint and some minerals, whose major destinations were South Africa, United Kingdom, West Germany, Netherlands and Italy.

Imports in 1986 amounted to ZS 1,640.4 million mainly, petroleum products chemicals and transport equipment basically from the above mentioned destinations and the USA.
Political philosophy and stability has directly influenced the agrofood industry. The country has been independent since 1980 followed by reconstruction and some political strife. The major political parties have recently merged to form a single united party that is dedicated to spear head integrated national development through rapid industrialization and social equity.

1.0 PROGRAMME DESCRIPTION AND CONTEXT

1.1 Description of the Cotton System Main Components and Linkages

(a) Production Component

Zimbabwe has 38.7 million hectares of land of which 2.8 million hectares were under crops in 1987. 271,787 hectares were under cotton in 1987/88 which is the second most important cash crop next to tobacco and the most important source of edible vegetable oil compared to sovabeans, groundnuts and sunflower.

Cotton grows all over the country with high concentration in the North East (Glendale, Bindura, Mt. Darwin), Midlands (Kadoma, Chegutu, Gokwe, Sanyati and the low veld (Save valley).

Large scale commercial farmers used to grow most cotton up to 1980 but since then smallholder communal and resettlement farmers have increased their share from 8% to 67% by 1988 as indicated in Table 1.

Table 1: Cotton Production for the major Production Groups and Projections

Years	Commercial	Communal + Re settlement ARDA	Total (Tons)
1980	145,533	12,000	157,553
1981	125,594	45,000	170,594
1982	107,886	27,000	135,886
1983	114,021	32,500	146,521
1984	107,916	60,545	168,461
1985	148,198	102,136	250,334
1986	154,144	141,336	295,480
1987	111,512	136,644	248,156
1988	116,108	124,005	240,113
1989	151,000	159,000	310,000
1990*	153,000	187,000	340,000
1995*	170,000	240,000	410,000
2000*	175,000	277,000	450,000

*Projections, ARDA - Agricultural Rural Development Authority.

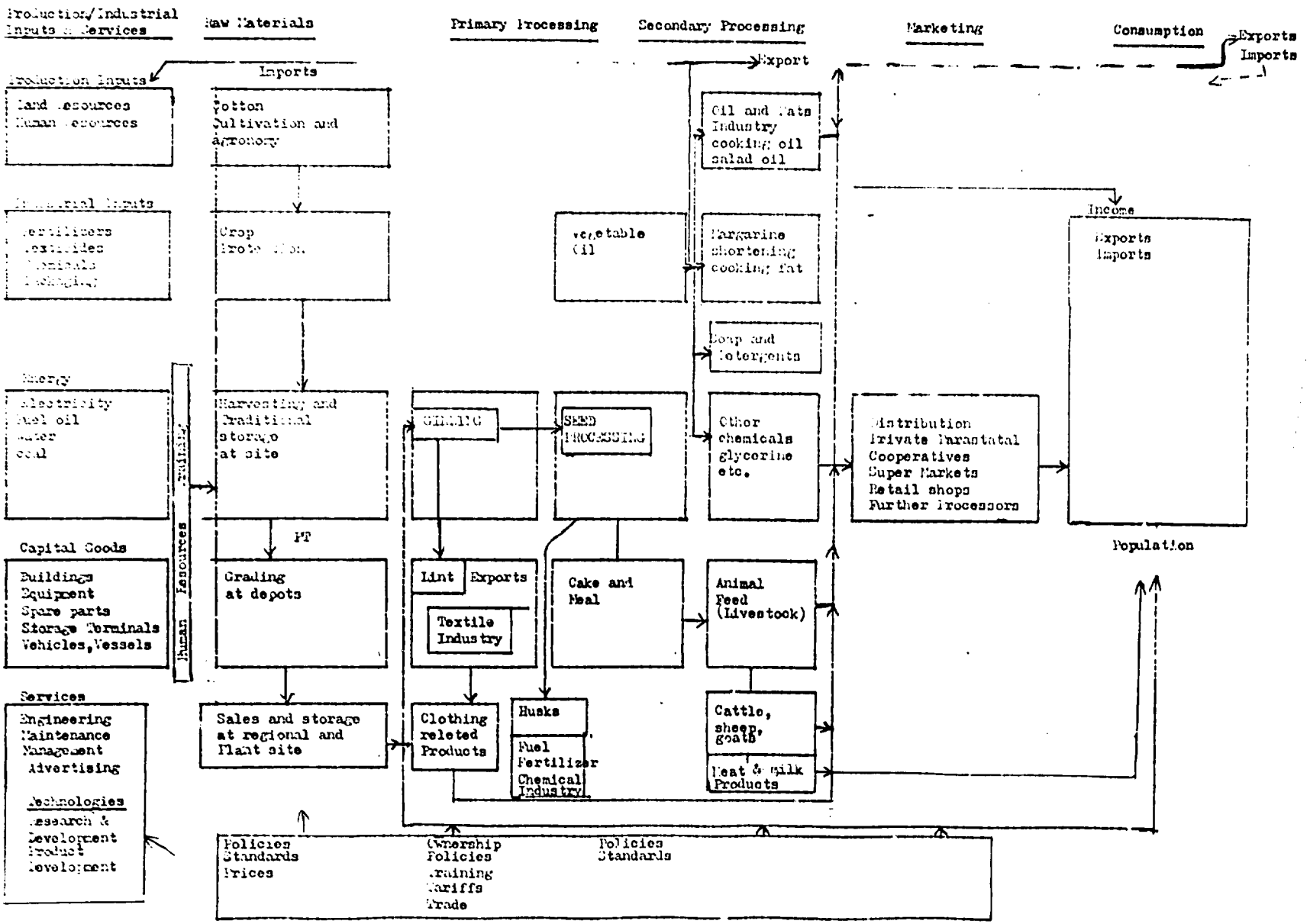
Sources: SOFRECO (1988) and CMB Annual Reports

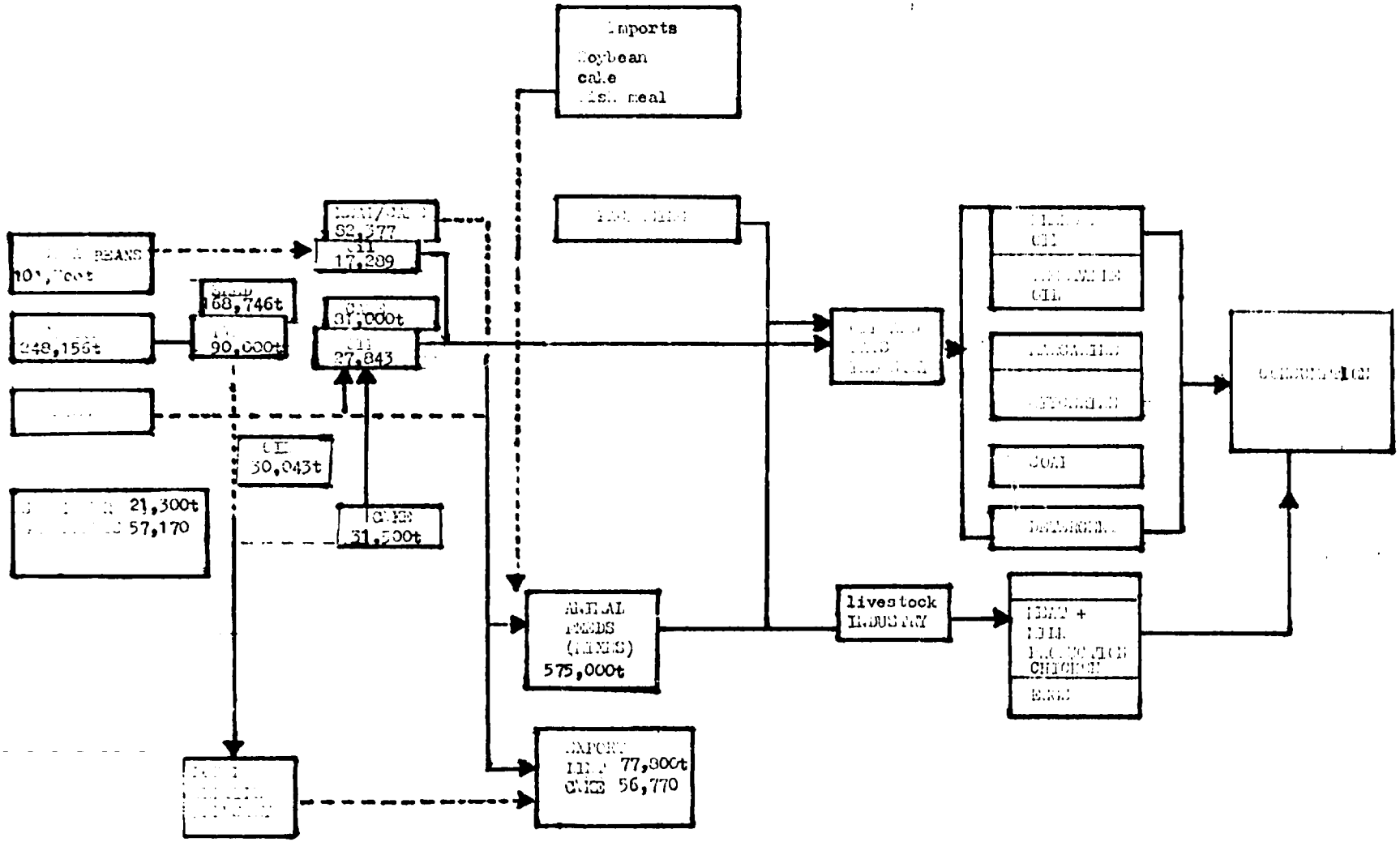
An overview base scheme diagram of the cotton system which is already integrated is given in Figure 1. Figure 2 presents the main productive components of the whole system with emphasis on cotton.

Figure 1:

Figure 2:

FIG. 1 OVERVIEW BASE SCHEME FOR [illegible] COTTON AGROINDUSTRY





Source: SONEDO (1988)

---- Supplementary and competing lines.

Production of seed cotton in comparison with competing oilseeds from 1980 to 1988 indicates that soyabeans fluctuated between 72 881 in 1981 and 104.000 tons in 1988. Groundnuts ranged from 6.194 in 1983 to 16.750 tons in 1988. Sunflower production was 3,342 to 22.200 in 1988. Contribution from cotton averaged 63% over the period.

Production of seed cotton shows that from 1984 to 1989, the average yield per hectare in all sectors was 1160kg hectare yielding 271.459 tons per year. The price was 68.6 Z cents per kg with an average value of Z $ 187.3 million per annum. A summary of major oil seeds produced is given in Table 2.

Table 2: Summary Zimbabwe Production of Seed Cotton Soyabeans, Sunflower and Groundnuts (thousand tons) 1980-1987

	Seed Cotton		Soyabeans		Sunflower	Groundnuts	
	Production ('000 tons)	Yield t/ha	Production ('000 tons)	Yield t/ha	Production ('000 tons)	Production ('000 tons)	Yield t/ha
1980	157.6	1.75	97.4	1.85	8.5	77.7	0.43
1981	170.6	1.36	72.9	1.82	12.7	118.8	0.38
1982	135.9	1.24	91.6	1.65	9.0	111.4	0.44
1983	146.5	1.10	80.6	1.37	3.3	31.7	0.17
1984	160.5	1.23	88.8	1.64	6.4	24.9	0.17
1985	250.3	1.31	85.6	1.99	18.4	67.9	0.54
1986	295.5	1.30	83.4	2.06	18.4	69.1	0.55
1987	248.2	1.29	101.7	2.20	21.3	70.2	0.56
Total	1316.9		701.5		100.0	57.7	
Annual Average	164.6	1.32	87.7	1.82	12.5	71.5	0.41

Source: SOFRECO and Cotton Marketing Board Annual Reports

Table 2 shows that cotton production between 1980 and 1987 rose steadily averaging 1.32 t/ha. The higher production from 1985 was due to increased hectarage especially in communal smallholder areas. Soya bean sunflower and groundnuts production fluctuated over the period mainly due to weather conditions.

Varieties of Seed Cotton Grown as Indicated by Deliting Outturn by Crop/Stage (1987/88)

Only Six varieties of cotton are grown, Albar K 502 being the most common, followed by Albar K 603, Albar 501 and Delmac. In 1987 88 ginned seed amounted to 7,022 tons, planting seed was 5,856 tons and 401 tons were culls for the oil industry.

Table 3: Sector Producers Registration and Participation in Cotton Production 1987.88

Sector	Registered Growers	Growers Participation	% of Total	Participants as % of Registration
Large Scale Commercial	1,089	641	0.5	60
Small Scale Commercial	3,397	2,100	1.7	62
Communal Farmers	22,391	110,999	90.2	49
Rural Areas	18,205	9,384	7.6	52
National Total	45,082	123,125	100	

Source: CMB Annual report 1989

Participating communal farmers formed 90% of the producers followed by smallholders in rural areas at 7.6%. On the other hand large scale and small scale commercial farmers were most active with participation at 60 and 62% respectively above the national average of 56% in 1987/88.

b) Agricultural Inputs

These are summarized and costed in a representative example quoted from estimates by the Commercial Cotton Growers Association for 1988/89. Cotton is a capital intensive crop requiring foreign inputs as implied in Table 4.

Table 4: Production Cost for Cotton (Z cents) 1988/89

Inputs	Cost per hectare	% of Total Variable cost (TVC)
Labour	375.18	29.2
Tractor Operation	208.50	16.2
Fertilizer & Lime	234.03	18.2
Seed	64.98	5.0
Herbicides	151.75	11.8
Insecticides	127.29	9.9
Spraying	56.07	4.4
Packing	7.22	0.6
Transport	20.35	1.6
Insurance	4.02	0.3
Levy	22.50	1.8
Sundries	12.78	1.0
Total variable Costs (TVC)	1,284.61	100.0
Gross Income	1,607.28	
Gross Margin	322.67	
Return per $ TVC	1.25	

The cost excludes all overhead expenditure. It cost 69.44 cents to produce a kilo of cotton with a return of 2% on TVC.

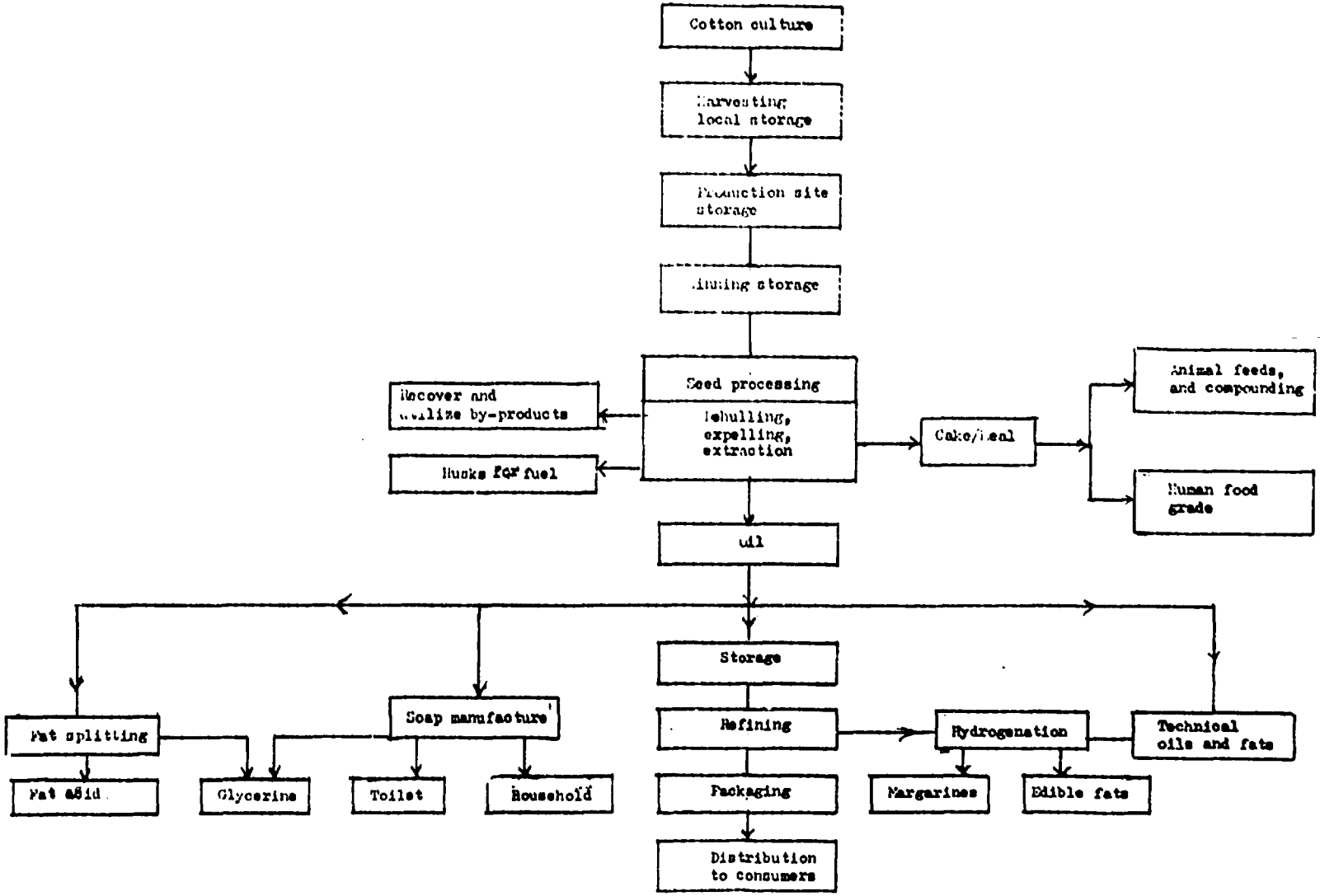
Labour in-put is the most costly item in cotton production and accounts for 29% of the TVC. On commercial farms with hired labour this could be a major constraint especially during the harvesting period when local labourers face simultaneous competition with their own household labour requirements for harvesting food and other crops. This nessecitates hiring migrant labour usually from Mozambique to save the situation.

Fertilizers and lime account for 18% of the TVC. Again this is expensive and raises production costs but since most of it is locally produced, cotton production provides a ready market. Tractor operations at 16% of TVC in 1989 are likely to rise as the price of fuel has since escalated and this might be minimized by using animal drawn implements especially among small holder producers in rural areas.

1.2: INDUSTRIAL AND MANUFACTURING COMPONENT

A summary of disaggregation of this component is given in Figure 3.

FIG. 1.....OVERVIEW OF JEE COTTON SEED OIL PROCESSING INDUSTRY



The main subsystem operations cover ginning, oil seed expression, related industries and animal feeds manufacture. Ginneries are owned by th Cotton Marketing Board which is a parastatal. Oilseed expression and animal feeds operations are privately owned with government having shares.

Table 5: GINNERIES LOCATION AND CAPACITY (Tons/Year)

Location	Capacity (tons per year)
1. Kadoma	20,700
2. Shamva	25,300
3. Banket	27,600
4. Mutare	25,300
5. Glendale	25,300
6. Chemutu	57,500
7. Samvati	25,300
8. Bindura	50,600
9. Triangle	29,900*
Total	287,500

* Privately owned but contracted by CMB

Average capacity utilization was about 90% over the last five years. The total capacity of 287,500 is regarded as insufficient since production of seed cotton reached 323,282 tons in 1987/88 and is projected to reach 450,000 by the year 2000.

The ginneries are served by on site depots and another nine transit depots. The ginneries in 1987/88 provided 195,000 ginned seed for the oil industry.

1.2.1: COTTON SEED EXPRESSION

A summary of cotton derived products and major oil seeds is given in Tables 6(a) and (b).

Table 6 (a) Summary Production of Cotton Derived Products and Other major Oil Seed (000 tons)

Year	Cotton Prod.	Cotton Seed allocated*	Crude Oil	Refined Oil	Cake Meal	Stock Feed **
1980	157.6	96.6	18.8	15.9	46.4	510
1981	170.6	122.4	23.4	20.2	58.8	525
1982	135.9	91.6	17.8	15.1	44.0	510
1983	146.5	101.4	19.7	16.7	48.7	660
1984	160.5	123.2	23.9	20.3	59.1	580
1985	250.3	163.2	31.7	26.9	78.3	450
1986	295.5	141.6	27.5	23.4	68.0	512
1987	246.2	136.4	26.5	22.5	65.5	575
Annual Aver.	195.6	122.1	23.7	20.1	58.6	540.3

Source: SOFRECO (1988)

* On average only 60% of cotton seed was allocated for processing containing 48% cake 19.5% crude oil and 16.3% refined oil.

** Formula contains cotton cake soyabean meal cereals and other additives.

From table 6(a) it can be implied that on average 195,600 tons of seed cotton when ginned yielded 69,100 tons of lint (35.3% of seed cotton). Since only 60% of the seed produced was allocated to processors it means that only 122,100 tons were used to produce 20,100 tons of refined oil and 58,600 tons of cake. Since imports of seed are not substantial, the above gives a fair approximation. This implies that:

X (tons of cotton) = 0.624 x (cotton seed) + 0.37 x (lint).

Ideally: x tons of seed cotton = 0.32 x (lint) + 0.68 (seed)
= 0.32 x (lint) + 0.46 x (cake) + 0.20 x oil

This is based on the fact that seed cotton contains 32% lint, 48% cake, 19.5% crude oil and 16.5% refined oil.

Using the natural composition of cotton seed, soya beans, sunflower and groundnuts gives the approximate amounts of crude and refined oil produced in Zimbabwe per year between 1980 and 1987 as shown in Table 6(b).

Table 6(b): Production Summary of Major Oil Seeds and Derived Products in Zimbabwe (1980-1987 tonnes average per year)

Seed Cotton	195,623
Cotton Seed	107,593
Cotton Seed oil Crude	20,981
edible refined	17,753
Cotton cake & meal	93,899
Soyaben *	
Crude	17,109
Refined	14,476
Sunflower**	
Crude	4,213
Refined	3,875
Groundnuts ***	
Crude	29,315
Refined	24,918

* Sova beans give 18.5 % crude oil and 17.0% refined oil

** Sunflower gives 33.7% crude oil and 31.0% refined oil

*** Groundnuts give 44.6% oil and 41.4% refined oil

(a) Cotton Seed Oil

There are four oil expressors as shown in Table 7. They handle all oil seeds produced in the country

Table 7: Oil Seed Porcessing Companies

Company	Location	Capacity share for cotton 87/88 (tons)	Installed capacity per Year (tons) (all oil seeds)
Olivine Industry	Harare	54,845	75,800
Lever Brothers	Harare	54,261	96,000
Blue Ribbons	Harare	27,250	56,000
National Foods	Harare and Bulawayo	10,000	75,000
Total	4	91,511	303,800

Table 8: Production of refined oil based on allocated oil seeds (Cottonseed, sovabeans, groundnuts, sunflower, groundnuts, + maize germ) (Tons)

Year	1983/84	1984/85	1985/86	1986/87	1987/88
Quantity (tons)	35,000	46,000	49,800	50,300	54,700

Source: SOPRECO (1988).

Cotton refined oil averaged 47,160 tons over the period. The oil is usually blended with oil from soyabeans, sunflower and groundnuts, then marketed.

The oil based industries produced cooking oil, margarine and hardened fats. Discussions in Zimbabwe showed that little vegetable oil is used for soap, detergents, glycerine, paints and varnishes since supply for human consumption is not enough.

b) Cotton Cake/Meal

Table 9: Production of Cotton Cake/Meal ('000 tons)

1980/81	1981/82	1982/83	1983/84	1984/85	1985/86	1986/87	1987/88
46.4	58.8	44.0	48.7	59.1	78.3	68.3	65.5

Cotton seed was expressed using mostly expeller equipment which leaves about 12% oil in the cake. Three processors use solvent extraction plants to produce high quality cotton meal. Quantities averaged 58,600 tons over the period most of which was sold to livestock keepers

c) Stock Feed

Stockfeed production is summarized in Table 10:

Table 10: Stock Feed Production tons year :'000 tons)from all local oil seeds)

1980/81	1981/82	1982/83	1983/84	1984/85	1985/86	1986/87	1987/88
510	525	510	660	560	450	512	575

The major components and flow system for stock feed manufacture have been summaized in Figure 2. Cotton seed cake is mixed with soyabean or sunflower cake. Energy sources such as milled cereals grain especially maize are added along with molasses, vitamins, minerals and antibiotics. Stock-feed production rose from 510,000 tons to 575,000 tons from 1980 to 1988 as shown in Table 10.

The major consumer of oil meal is the commercial livestock sector. There is good correlation between the cotton meal demand and the ratio price of beef, to the price of cotton meal whereby to be profitable it should ideally be 3:1 respectively. As seen in table 10, stock feed production reached 660,000 tons in 1983 but fell to 450,000 in 1985 and rose again to 575,000 in 1987. This negatively correlated with the price of cotton meal.

The price of cotton seed was Z $ 150 ton which was fairly low in 1981 to 1983 so there was a good demand of seed by beef producers. However from 1984-1987 the price was Z $ 291 ton which was high, thus lowering demand for cake and stockfeed sales declined as beef producers reduced their winter feeding levels in order to maximize their returns.

It is not easy to predict future demand since cotton seed prices are unpredictable and depends on national and international whims. The Cattle Producers Association assumes that it could possibly use more than 100,000 tons of seed a year if the right price ratio is found. The local stockfeed industry does not absorb all the cotton seed produced, but the surplus has a ready export market to the Republic of South Africa and neighbouring SADCC countries where transport costs are low because of the proximity of the market. Bearing in mind the sensitivity of this market, it would be safe to assume that future demand prospects for stock feed is good since the livestock industry in the region is still growing and there is demand for lean beef in importing countries.

1.2.2.:Marketing and Consumption of Edible Oil

Cotton seed oil which is 50% of total oil production is marketed by the major producers in a variety of packages, through a chain of big super markets in urban areas and numerous retail shops. It is packed in glass tin and plastic bottles and packets. The major products are cooking oil, margarine and cooking fat.

The government controlled prices, recently averaged about one US dollar per liter ex factory or US $ 1000 per ton for blended oil, which is higher than the world market price.

Local demand for oil is rising sharply yearly and is higher than production. The current consumption of about 6 kg per capita is far of actual demand and is limited by supply.

National demand by 1986 was 60,000 tons of oil. Projected demand is over 100,000 tons annually by the end of the century. The income elasticity of the demand of edible oil is estimated at 0.5.

Exports of edible oil are minimal, to neighbouring countries, due to local high demand and imports are limited by foreign exchange shortage. Cotton seed cake/meal is sold by private processors (Agrifoods, National Foods and Rumevite) under government control. The major buyers are commercial livestock farmers organized in associations (Cattle Producers and Dairy Famers). Prices averaged about US $ 150 per ton in 1986 which was lower than the world price. Future demand is high as the national livestock herd grows and more smallholders go commercial but the price of feed is sensitive and dependent on beef and dairy products controlled prices.

1.2.3: Transport

International trade routes for landlocked Zimbabwe include the railway lines to ports such as Beira (recently opened and guarded), Maputo and South African ports, and links to other neighbouring countries. Road transport augments rail traffic for goods and passengers while Air Zimbabwe and international lines provide freight and passenger services.

(a) Railways

The cotton system is served mostly by rail and road. The domestic rail network extends 2,836 km linking all main centres of economic activity with some branch lines to plantations. Recent rehabilitation, purchase of rolling stock and partial electrification has improved the situation slightly.

(b) Roads

The country has 85,000 km of roads with 15% tarred and 54% gravelled. Rehabilitation of major roads is underway with heavy lorry traffic challenging rail freight.

Road haulage fleets are private company or individually owned. Upgrading of country roads (dirt tracks previously) in communal areas has recently improved some feeder roads.

1.2.4 Human Resources

Zimbabwe is rich in human resources, with 8.88 million people in 1989 and increasing at 3.0% annually. The overal sex ratio is 96 males to 106 females who provide most of the labour force in rural areas. The population is mostly young as shown by the age structure. About 47% of the population is below 15 years, while 3% is over 65 years, hence a high child dependency ratio. The life expectancy averages about 55 years. The population density varies with ecology averaging about 23 people per square kilometer. 69% of the population is engaged in agricultural activities. 70% of the economic active population is agricultural too. Overal the population is well supplied with food as indicated by crude balance sheets. Per capita dietary energy supply is estimated at 1,843 kcal per day mainly from cereals, oils and fats.

1.2.5 Training in Cotton Production and Handling

The Cotton Training Centre at Kadoma, owned and funded by the Commercial Cotton Growers Association is very well built and equipped for national and regional (SADCC) training with focus on communal smallholders. It has full residential facilities for 300 students and five qualified staff members. It runs several courses on cotton production for agricultural extension workers. The centre could cater for more trainees but is hampered by limited funds though it is aided by funds from USAID and the EEC which will end in 2 to 4 years time respectively.

1.2.6 Research and Development

Research and Development on cotton production is carried out at the Cotton Research Centre at Kadoma. It is well built and staffed. It is funded and owned by the Commercial Cotton Growers Association but runs under government policy guidelines. It oversees all cotton research in breeding, agronomy, entomology and pathology.

1.3 Importance of the Cotton System in the Economy of Zimbabwe

a) Volume and Value

The production and value of cotton in Zimbabwe ranks it second to tobacco in importance averaging Z $ 172.4 million between 1985-1988, hence it is a big contributor to total national earnings as indicated in sales to CMB in Table 11.

Table 11: Volume and value of cotton sold to CMB

	1981/82	1982/83	1983/84	1984 85	1985/86	1986/87	1987 88
Volume 000 tons	201	158	167	250	298	253	234
Value (million Z$	76.8	79.3	83.4	138.0	193.2	163.9	174.6

Source: Economic Intelligence Unit (1989)

b) Contribution of Cotton to Industry and Employment

Table 12: Net output of manufacturing industries and workers employed in cotton related industries 1984 (indicative year)

	Net output Z S m)	Employees ('000)
Food Stuffs & Stock feeds	278.7	26.2
Textiles Incl. Ginning	202.5	21.2
Clothing & Footwear	123.2	19.9
Total Manufacture	188.8	67.3
% of Cotton Related Industries	32%	41%

c) Cotton Related Manufacture

The important role of cotton and cotton related products in earning is given in Table 13

Table 13: Derivation of Gross Output Excluding Sales of Goods not Produced on Premises Z S ('000)

	1980	1981	1982	1983	1984
i) Grain mill products and animal feeds	145.7	211.1	272.2	286.4	299.9
ii) Cotton Ginning Spining, Weaving Textiles & carpets	212.2	258.8	251.0	268.3	429.9
iii) Slaughtering & Processing of Meat	121.5	140.6	213.4	288.6	241.1
Total Manufacturing (i + ii + iii)	2180.9	2721.5	3049.0	3583.7	3961.1
iv) % Cotton Related	22.0	22.5	24.0	23.5	2.45

Table 13 further stresses the importance of cotton based industries such as ginning spinning, weaving, textiles finishing and carpet making along with linked industries such as animal feeds and livestock slaughtering and meat processing. Direct cotton industries accounted for 10% of total manufacturing output over the period when the cotton industry was dominated by large scale farmers before small holder producers made an impact on the scene. Considering related industries such as grain milling and animal feeds and livestock slaughtering together with cotton, these components contributed 23% of total manufacture gross output which is a substantial contribution to domestic income.

The index of cotton related products is given in Table 14 further stressing the importance of cotton in local industries.

Table 14: Index of Industrial Production in Zimbabwe (1980=100)

	Weight	1982	1983	1984	1985	1986
Food stuffs - feeds	135	123.7	126.9	119.4	113.6	125.6
Drink - Tobacco	104	91.7	90.1	86.4	94.5	90.6
Textiles (incl. ginning)	79	116.8	108.8	124.1	175.0	130.4
Clothing & Footwear	72	118.6	109.2	99.9	111.5	106.6
All Industrial Production	1000	108.7	105.8	100.7	112.2	116.4

* Weights are based on net output values in 1980

Source: RBZ Country Profile 1988-89

Table 14 indicates that the cotton related industries textiles and clothing over the period grew well above the 1980 levels. However in the second half of the 1980s food processing, clothing and textiles had an edge over metals and chemicals which enormously dominated the manufacturing sector which produced below 1980 levels. It is therefore obvious that cotton related industries dominated and grew at a rate above the national average and contributed well to the national economy.

e) Foreign Trade Balance of Payments (1980–1987). This is given in table 15.

Table 15: Summary of External Trade [1] Including Transactions where no Currency was involved. Z $ million

	Total Exports [2]	Total Imports	Visible Balance
1980	909.2	809.4	99.8
1981	971.7	1017.7	- 46.9
1982	968.4	1081.8	-113.4
1983	1150.2	1061.6	88.6
1984	1453.0	1200.7	252.3
1985	1795.5	1446.5	349.0
1986	2170.3	1640.4	529.8
1987	2371.4	1741.7	629.7
Total	11789.7	9999.6	
Average	1473.7	1250.0	+223.7

Source: Quarterly Digest of Statistics, March 1988, Harare

1. Migrants effects imported prior to 1980 and exported prior to 1979 are excluded. Value added on repairs are excluded.
2. Includes domestic exports, gold sales and exports. Domestic exports and imports include food products, beverages and tobacco.

Table 15 shows that total exports averaged ZS 1473.7 million yearly between 1980-1987 while imports average ZS 250.0 million with an average positive trade balance of about ZS 223.7 million. It is estimated that cotton and derived products contribution of just over 10% was second only to tobacco and mineral exports. Details on cotton exports is given in Table 16.

Table 16: Zimbabwe Cotton Exports (Crude Materials)

Year	Cotton Lint		Raw Cotton
	Tonnes	ZS '000	ZS '000
1980	53,787	57,191	86
1981	53,534	60,299	941
1982	47,245	51,759	1005
1983	48,378	73,574	1142
1984	54,506	115,262	2159
1985	62,970	149,344	2334
1986	77,211	130,548	2277
Average	56,804	91,140	1421

Source: Quarterly Digest of Statistics March 1989, Central Statistical Office, Harare.

From Table 16 cotton lint exports increased rapidly from 1983/84 along with the corresponding values of lint and raw cotton to almost double in 1986. Lint exports averaged 56,804 tons with an average value of ZS 91 million from 1980-1986. Raw cotton exports averaged only ZS 1.4 million indicating high national priority placed on exporting processed agricultural produce and the substantial contribution from cotton to the national foreign trade and earning the country valuable foreign exchange.

Table 17: Exports of Cotton Seed Oil, Margarine and Cake from Zimbabwe

	1986		1987	
	Tons	Value FOB (ZS '000)	Tons	Value FOB (ZS '000)
Cotton Seed Oil	6.4	9.6	45.2	64.5
Margarine	354.7	623.3	349.6	614.4
Cotton Seed Crude meal	28,906.5	5014.5	29,936.7	7161.2
Total		5647.4		7830.7

Source: SOFECO Tables 10.3.3 a and b

From table 17 it is indicated that cotton cake and meal were the principal exports with about 30,000 tons annum followed by cotton seed oil earning about ZS 6.1 million annually in 1986 and 1987, thus contributing much to the country forex earnings. Exports were mainly to Zambia, Mozambique, Botswana and South Africa.

Imports

Zimbabwe imports of oils and associated products are very low compared to local output. However in 1986 and 87, the country imported from Zambia a total of 835.6 tons of cotton seed valued at ZS 159,385 to supplement local processing for oil and cake.

1.4 Government Development Objectives Related to Cotton:

a) General Objectives

According to the First Five Year Development Plan (1986-1990) and recent amendments the long term broad government objectives related to the cotton system are:

- To transform and control the economy and economic expansion towards local ownership and domination as the cotton system is largely run by commercial large scale growers and processing is in foreign dominated private hands.
- To undertake land reform and efficient utilization of land with focus on communal farmers.
- To raise living standards especially for peasant farmers through raising income and social services.
- To increase employment and manpower development with priority on rural areas, for economic expansion. Cotton offers a unique opportunity.
- To further develop science and technology and research and development and link raw material production with processing into goods.
- To maintain a correct balance between the enviroment and development (cotton uses potentially dangerous inputs such as pesticides, herbicides and other chemicals).

(b) Agricultural and Manufacturing Sectors Objectives

- To rapidly transform rural areas into productive and economic units especially in maize and cotton.
- To enhance and develop irrigation schemes for key crops with priority on smallholder farmers.
- To enhance the use of local raw materials and integrated processing for high quality products for import substitution, local consumers goods and raise value added for exports.
- To improve transport and communication systems.

1.5 Ongoing Development Activities related to Cotton

On going activities are reflected clearly in the objectives and are outlined in programmes and projects in the First Development Plan both generally and specifically. Just a few are mentioned here. Briefly agriculture and rural resettlement activities are of high priority aimed at settling 750,000 families by 1990. This has not been realized due to economic difficulties. Measures are underway to provide credit to small holder farmers to raise agricultural output including cotton.

In the manufacturing sector restructing is underway with the introduction of modern equipment and techniques (where forex availability allows) to raise productivity and efficiency using local materials for major required inputs. These include manufacture of hydrochloric acid gas and ammonia from coal, fertilizer manufacture; iron and steel for equipment and machinery. Improvement of transport and communication systems now going on is vital to the cotton industry.

Details of related recent ongoing and pipeline projects from international agencies lateral cooperation and financial institutions are given in table 18.

Table 18: On going Projects and Status

Ongoing Projects	Costs US $	Status 1988
- Expansion of Sulphuric acid plant (Zimbabwe)	12 (DECD)	Funds Secured being implemented
- Expansion of special steel plant	(n.a.)	(n.a.)
Projects with SADCC		
Regional Implementation		
- Study on market for fertilizers and integrated product plan	0.12 (IDA)	Study completed
- Develonment pesticided manuf.	0.12 (IDA)	Study completed
- Tractor + components	0.10 (IDA)	Study completed
- Tractor assembly leading to manuf.	0.10 (IDA)	Study completed
- Rationalization + dev. of farm equipment + testing facilities	0.50 (UNIDO)	Study completed
- Indicative Industrial Plan	0.50 (EEC)	Study completed
- Rehabilitation of Textile Industry	0.17 (EEC)	Study completed
- Irrigation pumps + equipment	0.18 (EEC)	Study completed
- Rehabilitation of foundries	0.18 (EEC)	Study completed
- Rehabilitation of edible oils and by products facilities	0.10 (EEC)	Study completed
- Industrial chemicals (sodium-starch	0.20 (EEC)	Funds committed
- Industrial dye stuffs	0.12 (EEC)	Funds committed
- Rehabilitation of fertilizer plants	0.11 (India)	Funds Committed

Source: SADCC Industry and Trade Activities - 1988 Annual Report Addendum, Gaborone Botswana

In addition, an Agricultural Credit and Export Promotion Project involves provision of financial support to the Agricultural Finance Corporation. This provides credit to farmers to grow cotton and horticultural produce. The project also provides money for building a ginnery and storage facilities in the Mount Darwin area. Disbursement is US $ 36.6 million and this project which is underway will last six years.

Recent Pipeline Projects Related to the Cotton System in Zimbabwe by June 1989 are summarised hereunder

Project (in Pipeline)	Status
- Survey of Training Capacity Management Institutions in E & S Africa	Under negotation
- Estab. Foundry Training Centre in Zimbabwe	Submitted for approv.
- BioMethanation of Agro industrial waste	
- Industrial Management Dev. Programme for PTA (Cost US $ 1.2 mil)	Under Examination
- Promotion of Commercialization of Smallscale In. + Rural Technology (costs US $ 600,000)	Under examination
- Dev. of manpower capabilities for projects (US $ 500,000)	Under examination
- Opportunity study in Biotechnology	Under examination
- Manufacture + diffusion of low cost rural transport devices	Under examination Under examination

Source: SIDFA/JPO Quarterly report, UNIDO Office Zimbabwe

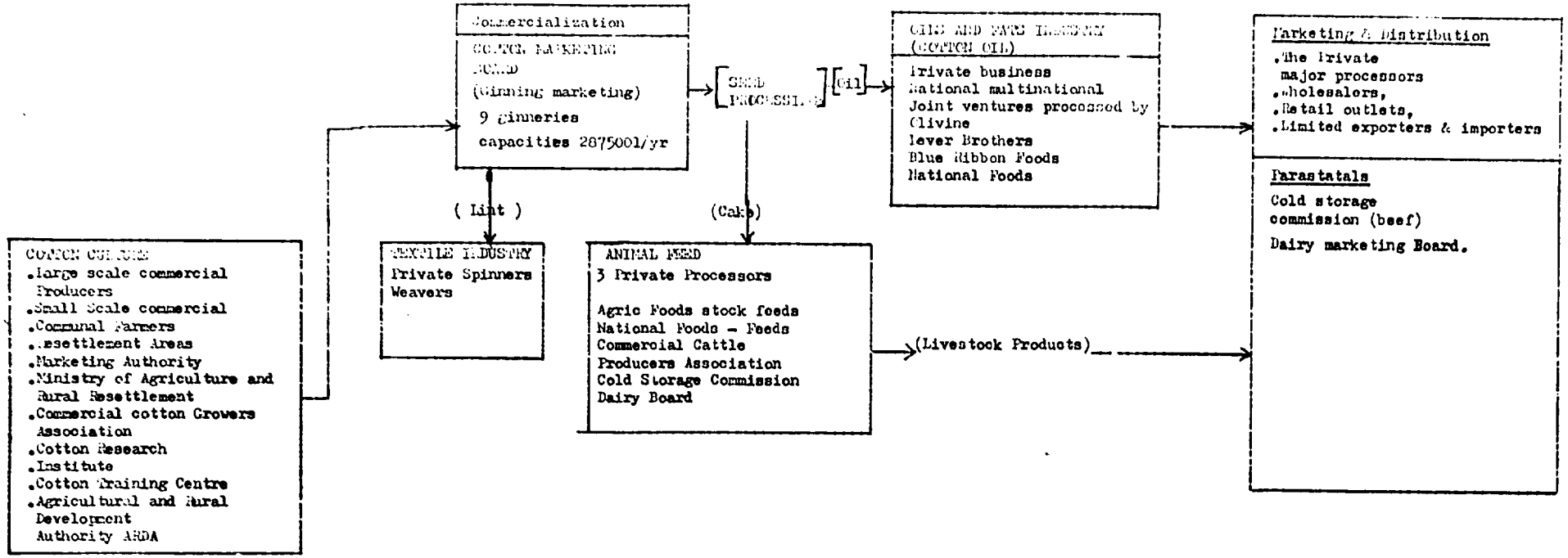
On going and pipeline projects as already presented indicate the levels of investment and technical assistance from UNIDO, EEC and bilateral sources. SADCC related projects form a major component indicating close regional cooperation. The status indicate good implementation all in accordance with government development policies to address the identified constraints.

1.6 Institutional Framework for the Development of the Cotton System

The major institutional framework for the development of the cotton system is summarized in Figure 4 which indicates the agents for production and the consumption subsystems.

Figure 4:

FIG. 4..... BASE SCENARIO OF THE MAIN AGENTS OF OIL PRODUCTION & CONSUMPTION SYSTEM FOCUS ON COTTON OIL



The major components include different economic agents such as cotton culture by the large scale and small holder producers as well as the activities of the major producers. This component provides raw materials and links nicely with primary processing namely ginning which provides seed for processing into oil and cake. The oil feeds the vegetable oil industry which provides margarine, cooking fats and other products. The lint feeds the textile industry and related industries or is exported.

The seed cake neatly links into stockfeed manufacture and animal production especially cattle, sheep and goats since cotton cake contains gassypol which is unsuitable for monogastric animals.

The system therefore links horizontally and vertically and culminates in marketing distribution and consumption by the population providing both income and good nutrition as shown in Figure 1. and Figure 4. Details of related major institutional framework is given in the following section.

1.6.1 The Ministry of Agriculture and Rural Resettlement

The ministry controls cotton production and marketing, while Industry and Trade looks after processing aspects. The ministry of agriculture sets out policy guidelines in relation to government objectives and controls the prices of cotton lint, seed, oil and cake. It operates through her parastatals such as the Agricultural & Rural Development Authority (ARDA) and the Cotton Marketing Board (CMB). Government therefore has a very important role as it links cotton to the overall agricultural and industrial manufacture and marketing infrastructure.

1.6.2 The Cotton Marketing Board (CMB)

The board (a parastal) was established in 1969 to promote cotton production by providing among other things processing and marketing facilities and services. It is therefore organized into operations, engineering, marketing, finance and personnel management sections and is answerable to the Agricultural Marketing Authority (AMA).

The well staffed board runs in house and external courses for its staff including technicians in mechanical electrical and hydraulic subjects in order to enhance maintenance and repair services.

The board undertakes the following functions.

- Registration of cotton growers (commercial large and small scale)
- The CMB runs seed multiplication and certification schemes and purchases all seed which it distributes to cotton growers after ginning in order to maintain high quality production.
- The CMB purchases all cotton produced in the country which it stores in its depots for grading, handling, storage and further processing for sale and export.
- Ginning is solely done by CMB in its 8 gineries or under contract (See Table 4) with a total capacity of 287,000 tons per year. The lint is cleaned and bailed, while the seed is delinted ready for sale.
- The CMB markets all cotton in domestic and external markets so it participates in setting government controlled prices and looking for markets. It also brokers cotton world wide in collaboration with international agencies. CMB therefore sales cotton lint to local textile firms and seed processors for oil extraction and cake. It also pays cotton producers and in collaboration with financial institutions render support to credit schemes for the purchase of inputs.
- The board also transports cotton using hired trucks by road or through the national railways to sea ports for export. The CMB is therefore the nerve centre of the cotton system (as shown in Figure 4) serving the producers, buying off their producers, processing and marketing it, thus providing vital income to farmers and the government. It also gives back seed for planting and allocates cotton seed to processors and lint to the textile industry. It therefore links cotton producers, oil seed processors livestock feed makers and consumers.

In addition the CMB in a unique position as it controls operations in the cotton system and could develop an agroindustrial complex through complementary down stream activities. In accordance with the national Five Year Development Plan, the government has called for state participation in strategic enterprises and in joint ventures. This would provide vertical and horizontal integration involving textile and packaging related products, oil seed processing and related chemical industries and livestock feed making in collaboration with private manufacturers in the country where demand is established. This approach would have advantages such as adding value to its products, gain from reduced inputs and save forex through export opportunities or import substitution. For example the CMB could establish an oil processing plant near a ginnery situated in a rich cotton growing area such as Glendale. This would reduce transportation and production costs and produce competitive oil and cake products.

1.6.3 The Cotton Research Centre at Kadoma

The centre run by the Commercial Cotton Growers Association researches on all aspects of cotton. Major activities include breeding for varieties which are regularly released to farmers through the CMB. Areas covered are agronomy, pathology, pest management harvesting handling and storage. The work is geared towards long staple cotton whose lint is in high demand on the world market. The centre also compiles relevant research findings on cotton culture which are disseminated to cotton producers in order to realize better quality and higher income.

1.6.4 The Cotton Training Centre at Kadoma

The cotton training centre, run by the Commercial Cotton Growers Association (C.C.G.A.) facilitates training and advisory services to cotton producers to meet their requirements and the international market.

The major training activities related to cotton are given to commercial cotton farmers or employees, communal smallholder farmers and employees of the ministry of agriculture extension services (AGRITEX) and from neighbouring SADCC countries.

Courses run include:-

- Three week cotton production for communal farmers. This residential course teaches cotton husbandry from land preparation planting weeding, pest control to picking and handling, through theory, practical demonstration and participation in all operations.

- Two week course for agricultural extension workers which gives expertise for adivising cotton growers.

- Pest management short course which enables farmers to correctly interpret pest scouting data, timing and methods of choosing and applying correct doses of insecticides at the right time.

- Cotton counting courses teach pest recognition scouting methods including spraying and chemical handling methods.

- Cotton picking courses aimed at supervisors among commercial farmers and communal farmers, focuses on improvement of labour utilization productivity and quality of crop delivered.

Extension services on cotton production are also offered to growers on demand by the training staff in collaboration with government extension staff. This means that the centre is a very important institution in the cotton system in Zimbabwe and has halped the country to maintain the high standard demanded for cotton in the world market.

1.6.5 Cotton Seed Processing Institutions

Cotton seed processing, done by the four private companies (See Table 5) involved seed purchases from the CMB ginneries, transportation, storage, seed preparation, pretreatment and oil extraction. Ginned seed arrives at the mill by road usually in lorries. The seed is stored in godowns which have facilities for cleaning and proper storage to avoid spoilage. The seed is cleaned to remove sand, stalks and other foreign matter, using sieves or air aspiration. Where cotton seed arrives with linters, it is delinted using a chemical process. Pretreated cotton seed is size reduced by roller mills, flaked and conditioned with moisture and heat. Olivine Southern National Foods and Lever Brothers use mechanical expellers while Ribbon Foods have a solvent extraction system. The equipment installed handles cotton seed, groundnuts, sunflower and maize germ in batches to produce oil and cake or meal.

The cake is usually ragged and stored for sale or incorporation into livestock feeds. At National Foods the animal feed plant is in the same compound where livestock feed is made and sold to livestock keepers such as the Cattle Producers Association, the Cold Storage Commission and the Dairy Board as well as small private farmers who are often also cotton growers, thus benefiting from their own cotton production. Some cake is also exported into the South African region.

Refining of the crude oil is done in all the five factories and involves degumming, neutralizing, bleaching, winterizing and deodorization and is packed into glass, metal or plastic containers and sold to whole salers and retailers for resale and to consumers.

Some of the oil is further processed, into margarine or cooking vegetable fat which is packed and sold for domestic use and the bakery and confectionery industry. Blending of liquid oil with oils from cotton, sunflower, soyabeans and groundnut oil is also done to meet consumer taste and demand.

The marketing and distribution system for oil products is dominated by whole sellers and retailers in urban and rural areas. From the afore mentioned it is obvious that the processing component of the cotton system is very well linked to producers through the CMB, the oils and fat industry and the livestock feed manufacturing sector and the consuming populace.

The textile industry in Zimbabwe plays a major role in the cotton system since lint is the major objective for which cotton is produced, while cotton seed products could be regarded as important by products. The textile industry purchases ginned cotton from the CMB and spins, weaves it into string for local use or export and the manufacture of products like clothes, blankets, canvas and fillers for mattresses and cushions.

So far this report indicated that the major potential partners in an integrated programme would be:

- The Ministry of Agriculture and Rural Resettlement on policy matters and extension (Agritex)

- The Cotton Marketing Board through (ginneries, marketing and transport),

- The Large Scale Commercial Cotton Growers Association

- The Small Scale Commercial Cotton Growers.
- Communal farmers growing cotton
- The Cotton Research Centre (R & D)
- The Cotton Training Centre
- The Parastals such as the Agricultural and Rural Development Authority and the Cold Storage Commission
- The Oil Seed Processing Industrialists (Olevine Industries, Lever Brothers, Ribbon Foods and National Foods)
- Stock Feed Manufacturers (Agrifoods and National Feeds)
- Textile Manufacturers (Whitehead Co. Ltd)
- United Nation Agencies (FAO, UNDP and UNIDO)
- Financial institutions such as the World Bank and local commercial banks
- Bilateral and Unilateral aid and collaborating Agencies such as the EEC countries, Scandinavian countries, north American countries and countries such as India through South - South cooperation.

2.0 PROGRAMME JUSTIFICATION

The need for an integrated cotton programme is hereby presented covering problems to be addressed in production, processing and marketing components.

2.1 PROBLEMS TO BE ADDRESSED

As described in the previous section covering the main components in the cotton industry, the following main constraints and bottlenecks need to be addressed to overcome hinderances to the government development objectives already outlined. The focus is on agrofood components and closely related linkages since this is considered a first priority objective in this programme. The problems to be tackled are systematically presented from production to processing, marketing and consumption.

2.1.1 Production Subsystem

Cotton production expansion has increased dramatically during the past decade and has potential to double in the future in the Communal Lands and Rural Resettlement areas. Other constraints include low land fertility, low rainfall probability and distribution.

Where water resources are available, irrigation facilities which are expensive to install, for scattered small farmers, have hardly been developed.

Furthermore resettlement into new areas like the Zambezi valley has been slow due to limited funds from government.

Inadequate training on cotton culture among the communal and rural farmers is a limiting factor since cotton demands accurate crop husbandry. This applies mostly to new or recently registered farmers.

Land preparation except for the commercial farmers is hampered by aging traction power such as tractors and high fuel costs. However, the use of cheaper animal draught power such as oxen and donkeys is not widely used simply because farmers have not been fully exposed to the technology.

Cotton pest control is expensive among small farmers with low income. Limited access to credit facilities for purchasing inputs by small rural farmers due to either lack of awareness and logistical limitations, further constraints this subsystem.

Fertilizers and pesticides require foreign exchange imported inputs and this further hinders wider use of these inputs.

Harvesting seed cotton is done solely by hand, hence the high quality of seed cotton produced. Harvesting is therefore highly labour intensive so inadequate labour is a big constraint during peak harvest time, especially on commercial farms where seasonal labour is not easily available. Migrant labour from neighbouring Mozambique is now rare due to the destabilization war in the country. Mechanical harvesting of cotton has not been introduced yet. On the other hand government controlled wages for farm workers are high. This limits the number of employees farmers can employ for picking cotton.

Handling and storage of harvested cotton among small farmers at household level leads to contamination, moisture absorption, mould growth and mycotoxin formation in the seed. This lowers quality overall. Transportation of the harvest from the field to the homestead is labourious and is mostly done by already overburdened women aided by limited animal drawn carts.

2.1.2 Packaging and Storage at Depots

Most of the depots have limited covered ware houses as cotton is bulky. The cotton is therefore packed in jute bags stacked in the open on a concrete floor and covered with waterproof tarpaulins. This exposes the lint to spoilage especially when it rains and cotton has to be moved.

2.1.3 Ginning

Ginning capacity is limited. The eight ginneries run by the CPA and one by a private operator can hardly cope with production. The gins are mainly of the roller type and are aged over 20 years on the average. Only two sawgins are recent.

Inadequate spares availability due to limited forex, causes poor maintenance and frequent stoppages and slightly below par capacity utilization of the gins which is estimated at about 90%.

Mislocation of the ginneries - While cotton production has shifted to communal areas only one of the existing ginneries and a few of the transit depots are located in communal areas. The cotton therefore has to be transported long distances for marketing and processing thus raising costs.

The gins in use are mostly suitable for short and medium length staple cotton varieties. However research has produced long staple varieties which are now being increasingly grown by commercial farmers as the lint is preferred in the export market for the textile industry.

2.1.4 SEED COTTON PROCESSING

Limited capacity. The four privately owned processors (2 with additional solvent extraction facilities) handle cotton seed and the other oil seeds. The installed capacity allocation for cotton seed cannot cope with current production, so the projected increase will definetly mean increasing facilities or time allocated for cotton seed.

Inadequate condition of machinery and equipment, arose from shortage of forex which limited availability of spares and subsequent poor maintenance, hence the need for rehabilitation.

Capacity utilization was medium ranging from 60 to 80% at Olivine in 1989 and the other processor were within the same range for cotton seed.

2.1.5 Secondary Processing

The vegetable oils industry producing cooking oils and fats, has the same type of problems i.e. aged equipment, lack of spares, limited maintenance and inadequate capacity utilization.

2.1.6 Livestock feeds Industry:

Livestock feed manufacture is privately owned. This component has the constraints and bottlenecks similar to those of the other components already described above.

2.1.7 Packaging

Shortage of jute bags for handling seed cotton is mainly due to import limitations. Limited supply of cans for cooking oils and fats arise from low local fabrication since the sheet metal must be imported. Inadequate availability of glass containers is a result of limited imports of chemicals especially sodium hydroxide for local manufacture of glass. Currently most of the bottles used are imported.

The shortages of paper and plastic packaging material suitable for food products is another serious problem.

2.1.8 MARKETING DISTRIBUTION AND CONSUMPTION

(a) Inadequate Pricing Policies. Cotton and derived products are subject to government price controls which are updated as need arises. Usually producer prices are announced in advance. Currently the producer price is below the world market price and this discourages, especially the large scale commercial growers who are slowly considering diversification into other crops.

(b) Pressure on government by local textile manufacturers. About 80% of good quality lint produced is exported at world market prices and the local textile mills use the remaining 20% at a lower price, hence pressure on government to keep prices down. Indirect government subsidy through CMB keeps the board under permanent indebtedness but sustains the industry.

2.2 ANALYSIS EVALUATION AND CHOICE OF DEVELOPMENT STRATEGY FOR ACTION

2.2.1 Seed Cotton Production

A summary of components and constraints in relation to ongoing projects and the proposed programme projects is given in Table 19.

Table 19: Summary Components and Related Constraints Ongoing Projects and Proposed Programme

Component	Description	Constraints	Ongoing Projects	Proposed Progr. Projects
Production	Cotton cultivation agronomy protection harv. & Storage Research Dev. Training and extension agents. Commercial farmers Smallholders	- low land fertility - low rainfall probability & poor distribution - limited expensive irrigation - low govt. funds for resettlement into new areas - land/population pressure in Communal areas due to poor land tenure and policy.	-Agric. credit -Export Promotion -Cotton (World Bank group US$ 3.6 million). -Irrigation Dev. (UNDP) -Training & -Extension by Cotton Growers Association and 7we govt. Tractor components (IDC) Irrigation	- Training in Cotton Husbandry - Strengthening R & D and extension services - Small scale irrigation studies - Resolving Credit Enhancing Biotechnology pest control

- High cost of tractorization - High pest incidence and expensive control measures High input costs/ - limited forex. - Labour shortage during harvesting due to competition - Poor handling & storage and transportation by small farmers Selling at CMB depots with inadequate facilities - Limited Research facilities due to little fund allocation and forex shortage - Limited training to producers and extension services due to funds + manpower shortage	mimos & equipment (FEC)

Processing	Ginning at CMB and 9 Ginneries (saw and roller machines). Grading Seed and lint handling cotton seed and lint products. Delinting - Transportation	Limited Ginning Capacity Mislocated ginneries away from high producing areas (Communnal lands) Aged machinery Poor spares supply due to limited forex. Frequent break downs + stoppages shortage of storage space. Limited packaging material (Jute bags, paper and plastic) Poorly trained technicians Inadequate transportation	-Agric. Credit Export Promotion.World Bank (US$ 36.6M) -Textile Ind. rehabilitation -Industrial chemicals -Rehab. of edible oil facilities (EEC)	-Training Technicians Manag. -Integrated ginneries System -Transport fleet for CMB -Studies on paper and packaging materials from cotton - Down stream cotton industries (spinning weaving oil & cake products) by CMB & Joint Partners
Processing	Extraction at 4 private mills: storage delinting dehulling grinding heating,	Suboptimal capacity -Aged equipment.lack of spares & poor maintanance, poorly trained technicians -inefficient capacity utilization+shortage, Govt.	Feasibility of one plant with 330t day capacity at Kadoma US$ 30m -(UNIDO) French	

expression or solvent extraction for oil and cake. Oil refining, blending, or making magarine + cooking fat Blending, packaging and marketing	of packaging materials (plastic glass + metal containers)
Cake treatment stock feed making by Agrifoods National feeds. Lint at textile mills spun & woven into clothes & other products	

Marketing and Consumption	Firms for oil + cake: Olivine industries. Lever Brothers, Blue Ribbons & National Foods. -Super markets, retail shops, CMB markets seed and lint under govrt. control	Inadequate marketing and pricing policies Low prices paid to producers with govt. control. Fluctuating local and world prices for cotton, lint, seed, cake and oil. Local lint purchase price lower than world prices.	Marketing and pricing policy study

2.2.2 Strategy Options

In view of the above mentioned problems in the different components of the cotton system, the different strategy options given in the following section indicate an appropriate combination of choices that could lead to a successful programme. The major assumptions are also given.

Scheme of Strategy Summary and Assumptions

Production	Strategy	Assumptions
1989 310,100 Seed Cotton t) 1995 410,000 " (t)	- Increase Cotton Area - Revise yields/ha - Reduce losses in storage & transportation	- No exports - Favourable prices - good weather - rural labour stability - resonable farm wages
Ginning 1989: Capacity:287,500t/yr 1995: Need for: 410,000t/yr Deficit: 122,500 t/yr	-Ginning Rehabilitation- -Modernization for long staple New Ginneries	- Production of cotton is sustained
Oil Seed Processing 1989: Capacity 1310t/day 1995: Capacity Needed 1733/ t/day Deficit: 423 t/day	- Increase Production share - Modernization - Increased efficiency	Ginning Capacity sustained
Lint (Textiles) 1989: 99,200 t/yr 1995: 131,200 t/yr Extra: 32,000 t/yr	- Monitor International demand (by CMB) - Further development & promotion of long staple cotton by cotton Research Centre and Extension	Cotton R & D Succeeds Farmers accept long staple cotton varities

2.2.3 Inferences from the Scheme:

- Production oriented projects could be undertaken in collaboration with FAO while storage and transportation ones are carried out with UNIDO
- The first strategy would be to adopt the ginnery subsystem to the market needs lint, seed, oil and cake and to reduce production and marketing costs.
- The second strategy is totally dependent on the first strategy, and this would involve increasing the cotton production share and efficiency of the cotton, oil industry.
- All the afore mentioned would depend on government policy and objectives especially for the textile industry and CMB readiness to go into downstream industries. Details of each strategy are given in the following section.

2.2.4 Production Strategies

a) Increase Cotton Area

Cotton is concentrated in Mashona and Manicaland provinces. There is room for expansion especially in Manicaland (Mount Darwin area and Matabeleland north). The biggest potential is in the communal and rural resettlement areas and ARDA estates, where cotton production including commercial farmers has risen from 157,603 tons in 1960 to 310,000 tons in 1989 and is projected to 410,000 tons by the year 1995. As cotton is currently second to tobacco as a forex earner, if the rapid growth is maintained it could easily overtake tobacco whose future is threatened by the anti-smoking lobby.

b) Increasing Cotton Yield per Unit Area

This strategy applies mainly to small holder producers. Between 1970-1985 communal production areas rose from 16,000 ha to 130,000 ha, respectively but the yield averaged only 687kg ha and accounted for 67% of the total crop. Meanwhile commercial production fluctuated from 66,226 ha, 1970 to 104,000 ha in 1974 and 79,656 in 1985 indicating no steady growth, but yields averaged 1679 kg ha which was 2.4 times the communal yield. Some trained communal and rural resettlement are already approaching this yield level.

c) Cotton Irrigation:

This strategy is already commercially practised in Triangle in the low yield. High yields are realized but the input especially irrigation infrastructure are very costly. It might be economical if grown in rotation with wheat or another cereal. This is already done on some commercial farms but still there is need to carry out a study on small scale irrigation feasibility in Zimbabwe.

d) Training in Cotton Husbandry and Handling:

This approach applies mostly to small holder farmers in rural areas who need modern effective methods. Commercial producers are already knowledgeable. This approach would augment the other strategies outlined above. In the 1988 season there were 22,391 registered communal growers in the country most of whom require some training.

The Kadoma Cotton Training Centre can handle only 300 farmers a year for the cotton production course. The centre will therefore need to work extra hard to train those who have not been to the course or exposed to trainees. This makes it a viable feasible option that will boost cotton production within a short time.

e) Manipulation of Cotton Prices:

The above strategies need to be followed by adequate marketing and pricing policies in order to succeed. Local prices undercut the producers and created liquidity problems for the CMB.

There was talk of selling the lint to local textile mills at world prices and possibly raise the producer price, but again this might have negative effects on secondary products such as oil, cake and textiles. A fair balance could be struck between the producers and the users so as to ensure an acceptable deal for all. It is therefore desirable to study prices and related credit facilities and make relevant recommendations.

2.2.5 Cotton Seed Processing Strategies

(a) Cotton Ginning

There are only nine ginneries as shown in Table 5 which had a capacity of ginning 267,500 tons of seed cotton in 1989. In that season production of cotton was 330,000 tons, indicating a deficit of 22,500 tons in ginning capacity which was confirmed by the Cotton Marketing Board. The projection for cotton production is 410,000 tons by the year 1995, which demands an increase of about 30% ginning capacity in order to cope with the deficit of 122,500 t.year as shown in the scheme.

Furthermore, current capacity utilization estimated at about 90%, is undermined by old machines, most of which have not been rehabilitated recently. Maintenance is subnormal because of lack of enough foreign exchange and inadequate trained technicians hence the need to modernize and increase efficiency.

Again most of the ginneries are located within commercial cotton growing areas. Only two are within easy reach of the rapidly expanding communal small farmers who grow cotton. In view of the expansion potential into new areas along the eastern and northern areas as well as Matabeleland North, there is a genuine need to invest in more ginneries to handle the increased cotton crop.

b) Cotton Oil Seed Processing

i) Cotton Seed Oil

Cotton seed is processed mainly for its oil and cake as shown in figure 1. There are only four factories, three of them in Harare and the other in Bulawayo, all along major transport routes and within areas of high urban demand for edible oil.

Total oil production from sunflower, groundnuts, soya beans and cotton seed averaged 47,000 a year between 1983 and 1986, cotton contributing about 30% of the total. This is not enough as the current national demand is estimated to be 70,000 tons of vegetable oil for human consumption and limited industrial uses.

The seed oil processing factories are worse off compared to the ginneries. They are mostly old and they are privately owned. They suffer the same constraints of low capacity utilization of about 70%, and inadequate maintenance due to poor availability of foreign exchange and inadequately skilled maintenance personnel. The expeller equipment used, is inefficient and leaves 12% of oil in the cake which leads to a loss of oil and poor quality cake. Good quality cake should contain about 5% oil only. Solvent extraction facilities which have been recently installed will alleviate the situation.

ii) Cotton Seed Cake

Stockfeed production (See table 10), amounted 540,000 tons annually from all local oil seeds (mainly soya beans, sunflower and cotton seed) with cotton seed contributing about 40%. However, cotton seed cake is only suitable for ruminants such as cattle, sheep and goats, since monogastric animals such as pigs cannot handle the antidigestive chemical, gossypol which occurs in cotton as a natural substance. In addition, poorly handled seed cotton, develops the mycotoxin, aflatoxin which endangers human and livestock lives. Provision of up to the mark facilities to handle cotton seed processing appropriately is a highly desirable proposition.

2.2.6 Selected strategies for Cotton Seed Processing

In view of the above mentioned the following choice of strategies and activities would provide cost effective interventions:-

a) Adapting the ginnery subsystem to market needs and reduce costs would involve rehabilitation of existing ginning facilities with adequate provision of spare parts. This approach will certainly be cheap as it will need minimal forex, make full use of existing facilities and extend the operational life of the units.

b) Provision of new gins and equipment in old establishments. This provision is a logical follow up from alternative (a) and might be necessitated by the projected increment in cotton production. Upstream processing must keep pace with raw material production.

c) To increase effeciency of the seed processing subsystem.

This can be achieved by rehabilitating and modernizing old oil seed processing establishments. The projected expansion of cotton growing into new areas will also require establishment of new processing units to cut down on transport costs which are currently escalating in a situation where the road fleet and rolling stock are inadequate. This is more costly compared to the first strategy but it is a logical consequence. Projects under consideration by the CMB to build new ginneries suitable for long staple cotton to cater for projected increased production lends weight to this option.

d) Training of technicians and required electrical, hydraulic and mechanical maintenance artisans. This strategy is aimed at rectifying associated problems in the industry, increase operational effeciency and capacity utilization.

e) Establishment of down stream cotton processing by the Cotton Marketing Board (CMB).

This attempt is subject to confirmation by feasibility studies for textile products, by products from ginneries, paper and packaging materials and industrial products from oil such as chemicals, soap and detergents. However, the potential exists.

2.2.7 Transportation

Transport affects production and marketing, including exports, distribution and the consumption components of the system. An obvious strategy would be to improve and increase feeder roads in the old and projected cotton growing areas as part of the national road improvement programme. The same would apply to improving the railway system.

2.3 EXPECTED END OF PROGRAMME SITUATION: The situation for cotton is summarized below

Component		Recent 1987/88	At the End 2000
Production	Area ha ('000)	271	351
	Yields kg/ha	1160	1500
	Mass (000 tons)	323	450
	Value mill ZS	256	350
	Cotton Seed ('000 tons)	195	270
Processing	Cotton oil (000 tons)	40	55
	Cotton cake (000 tons)	66	85
	Ginneries for seed cotton	9	14
	Capacity (000 ton)	286	400
Processing	Capacity utilization*	85	95
	Units	5	8
Consumption	Oil availability/capita/ day kg)	6	9
Transport:	CMB own fleet (vehicles)	0	25
Training	Skilled Smallholder farmers	n.a	3000

3. INDICATIVE INTEGRATED DEVELOPMENT PROGRAMME FOR COTTON IN ZIMBABWE

3.1 Programme Objectives

Overall Objective: To improve the development and integration of the cotton agrofood industry in the country.

Specific Objectives within government objectives

a) To increase cotton production by 35% by the year 2000 through increased hectarage, higher yields per unit area and improved crop management by small farmer training from communal and rural ressettlement areas.
b) To improve cotton ginning and seed processing facilities through machinery rehabilitation and better capacity utilization.
c) To raise consumption of edible vegetable oil by 30% by the year 2000.
d) To provide training of cotton growers and technicians for the processing component.
e) To provide own road transport fleet for the Cotton Marketing Board.
f) To better rural and urban employment and raise income levels
g) To create more down stream industries.
h) To institute adequate prices and policies.

3.2 Policy Measures.

The Zimbabwe government currently has relevant policies which just require enhancement and implementation.

a) Production

- Reforms in the land reallocation policy and acceleration of resettlement and land acquisition by government in new areas to provide land to small farmers to expand cotton production is a necessary prerequisite.

- Improvement of the wages of agricultural workers to keep farmers in rural areas in rewarding employment is essential.
- Enhancement of research and development towards long staple cotton to respond to market needs must be maintained.
- Emphasis on irrigation of crops especially cotton should be a priority in marginal rainfall areas. It would be desirable to first make the best use of existing irrigation structure before any other investments are proposed. The feasibility of new irrigation schemes should first be studied. This would have a local component (spare parts - maintenance) and training which would interest government and UNIDO.

b) Manufacturing and Related Inputs

- Deliberate enhancement of integrated development covering the industrial sector, processing, marketing and consumption must be maintained.
- Promotion of internal trade exports and imports at regional (SADCC and PTA) and international levels will sustain the cotton industry.
- Where necessary tariffs to protect local industries and preferential allocation of forex could be instituted.

c) Energy and Water

Measures towards self sufficiency through wider use of coal and hydro sources and rural electrification to provide energy for rapid cotton processing are vital policy measures.

d) Transport and Communication

The government policy to improve this sector through deliberate higher allocation of resources should be maintained.

e) Marketing and Pricing

Structures and policies for favourable development of the cotton system have an important role to play.

f) Consumption

This subsystem just requires improvement in distribution channels at grass root level and growth points. Credits to small businessmen could enhance the situation.

Programme Monitoring and Evaluation

The following will be monitored to measure programme success.

- Physical cotton production and value added.
- Number of jobs created and increment of registered cotton growers.
- Trade balance as indicated by contribution by the cotton system to GDP and foreign exchange earnings.
- Price changes and payment to farmers reflecting income levels.
- Changes in consumption of edible oil and products derived from cotton.
- Changes in capacity utilization in ginneries and the cotton oils processing industry.
- Number of established down stream industries by CMS and collaboration institutions
- Number of trained farmers, technicians and management personnel.

3.3 Technical Assistance Projects Summary

The afore mentioned problems, contraints and potential strategies will effectively be addessed through the following technical assistance projects by UNIDO or in cooperation with other agencies such as FAO or the World Bank. A summary of the programme projects is given in Table 20 with a varying duration of 3 months to 10 years and a foreign component of about US $ 4.95 million and a local component of ZS 3.6 million.

Table 20: Programme/Projects Summary

Projects	Duration	Contribution/Cost: UNIDO US$	Local ZS
1. Training in Cotton Husbandry	10 years	200,000	200,000
2. Strengthening Res. Dev.	5 years	230,000	175,000
3. Biotechnology Pest Control	4 years	508,000	200,000
4. Small scale Irrigation Feasibility	4 months	45,000	0
5. Price Policy and Credit	5 years	59,000	2.0 mil.
6. Technicians Training	5 years	990,000	435,000
7. Development of Ginnery System	1 year	138,000	139,000
8. Strengthening OMB Management	4 years	610,000	240,000
9. Road Transport Fleet	5 years	2.1 mil.	200,000
10. Downstream Industries (Feasibility)	5 months	35,000	0
11. Packaging Manufacture Study	3 months	20,000	0
12. Paper Manufacture Study	3 months	20,000	0
Total		4,046,000	3,559,000

3.4 PROJECT CONCEPTS

TECHNICAL ASSISTANCE AND INVESTMENT PROJECT CONCEPTS FOR ZIMBABWE

1. Title Training of Smallholder Cotton Farmers

Estimated Duration: 10 years
UNIDO Constribution: US $ 200,000
Estimated Government
Constribution: Z $ 200,000

Brief Project Description

A. Problems to be addressed

1. Sectoral Level.

- Insufficient production of cotton to raise national income and export earnings from the agricultural sector.
- Low foreign exchange from agriculture.

2. Project area.

- Underutilization of land in areas suitable for cotton.
- Inadequate training on cotton husbandry and handling
- Low knowledge in cultivation practices using animal drawn implements
- Limited skills in cotton pest control.
- Poor knowledge on cotton harvesting, storage and handling during transportation.
- Heavy women workload in cotton production.

B. Target Beneficiaries

Smallholder cotton growers especially women in rural areas as identified by the Cotton Marketing Board and made known to UNIDO by the consultant.

C. Preproject and Expected End of Project Situation

1. Preproject: (1987 88 Season)
   - Low skills on cotton culture and handling.
   - The season had 271,000 ha under cotton.
   - Cotton yield was 1160 kg/ha.
   - Production was 323,000 tons valued at ZS 256 million.

2. End of project. High skills on cotton culture. 3000 trained small cotton growers. 6,000 small growers with better skills through interaction with trained farmers (diffusion of knowledge)
   - 351,000 hectares under cotton (30% increase)
   - Seed cotton yield raised to 1,500 kg ha
   - 450,000 tons of seed cotton produced annually.
   - Valued at Z S 350 million.

D. Special Considerations

- More women will be integrated into the cotton industry as they indulge heavily in production and related industries such as ginning, textiles and livestock keeping.
- Fertilizers and pesticides used in cotton production and processing adversely affect the environment if improperly used. Careful use of these items will minimize enviromental degradation.

- Cotton growers from East, Central and Southern Africa and South-South cooperation groups will train at the centre.

E. Other Projects by Donors

- Small farmers credit scheme under the World Bank
- The European Economic Community aid to Kadoma Training Centre
- United States Agency for International development aid to the same centre (next 2-4 years).

F. Major Elements

1. Objectives

- To increase area under cotton by 30% over 10 years
- To raise 3,000 farmers skills in cotton agronomy, pest management and handling at the Kadoma Cotton Training centre.
- To increase yield per unit area.

2. Output

- Trained 3000 small holder farmers
- Better skills on cotton husbandry
- Better crop protection and handling skills

3. Activities

- Courses on cotton growing
- Pest scouting
- Pesticide application
- Harvesting and storage of cotton

G. Host Country Commitment

. Cotton production is high on government priority and the Cotton Marketing Board.

H. Risks

1. Insufficient rainfall and its improper distribution in the country.
2. Low world market prices prevailing now along with unfavourable pricing policies in Zimbabwe.
3. In the long run, depressed world market prices, high costs of inputs (fertilizers and pesticides) and environmental degradation might affect output and lower producers' morale.

I. Inputs

Skeletal Budget	UNIDO US $	National Inputs ZS
Personnel	-	200.000
Training	200,000	-
Equipment	100.000	-
Miscellaneous	50,000	-
Total	350,000	200,000

J. Work Plan

Courses	Years 1	2	3	4	5	6	7	8	9	10
Cotton Growing	----------									
Pest Scouting control	----------									
Harvesting storage and movement	----------									

Comments: This projects would be of interest to FAO as this agency has wide experience in this field.

2. Title Strengthening Research and Development on Cotton

Estimated Duration: 5 years

UNIDO Contribution: US 230,000

Estimated Contribution

from the commerical Cotton Growers Association - ZS 175,000

Brief Project Description

A. Problemms to be addressed

1. Sectoral

- Insufficient realization of agricultural potential
- Limited foreign earnings from agricultural produce
- Inadequate production of the latest Research and Development technologies in agriculture.

2. Project Area

- Subnormal cotton yields per hectare among small growers
- Limited use of desirable long staple cotton varieties
- Limited computer facilities for research
- Insufficient exposure to cotton research findings.

B. Concerned Parties and Target Beneficiaries

1. Problems were identified by the Cotton Research Centre at Kadoma and the consultant.
2. All cotton growers especially small cotton growers will benefit.

C. Preproject and End of Project Situation

1. Preproject:

- Subnormal cotton yields per hectare
- About 20% of growers use long staple cotton varieties.
- Poor computer facilities for research
- Little exposure to advances in cotton research through publications and attendance at external meetings.
- Low dissemination of own findings.

2. End of Project situation.

- More farmers growing long staple cotton
- Adequate computer facilities
- Wider knowledge on cotton research
- Sufficient dissemination of cotton research findings.

D. Special Consideration

- Careful use of fertilizers and pesticides on cotton will preserve the soil and avoid environment pollution
- The Commercial Cotton Growers Association will reap effective benefits from funding the research centre at Kadoma.
- Other countries in the region and developing countries will benefit from the high quality research work going on at Kadoma (Zimbabwe).

E. Other Projects by Agencies or Donors None were identified.

F. Major Elements

1. Objectives

- To produce higher yielding cotton varieties with long staple
- To disseminate research findings to farmers more widely
- To widen knowledge on current activities elsewhere in cotton research and adopt findings to the local situation.

2. Output

- Enhanced R and D skills on cotton
- Published reports and extension related information
- Higher yielding cotton varieties.

3. Activities

- Provision of relevant scientific journals
- Sponsoring study tours, attendance at seminars and workshops by cotton scientists
- Enhancement of information collection, processing and dissemination using computer systems including data base and informatics engineering.
- Publication and distribution of reports from the cotton research institute at Kadoma.
- Strengthening postharvest systems mechanization.

G. Host Country Commitment

1. Zimbabwe is highly interested in cotton research for higher agricultural production and foreign export earnings
2. Nationally, the Ministry of Agriculture, Research and Specialist Services and Extension departments are committed much.
3. The Southern African Centre for Cooperation in Agricultural Research (SACCAR) takes active interest on behalf of the Southern African Development Coordination Conference (SADCC) countries.

H. Risks

Fluctuating cotton prices on the world market might affect the financial contribution made to the centre by cotton growers.

I Inputs

Skeleton Budget	UNIDO US $	National ZS
Personnel	-	100,000
Training and seminars	50,000	50,000
Equipment	150,000	20,000
Miscellaneous	30,000	5,000
Total	230,000	175,000

J. Work Plan

Major Activities	Years 1	2	3	4	5
Provision of commuter facilities	----				
Provision of Scietific journals	----------	----------			
Study visits and meetings		----------	----------		
Information collection processing & dissemination	----------	----------			
Publication and reports		----------	----------		

Comments: UNIDO is involved in research and development in this field has strong capability in mechanization of crops, postharvest systems, data base and informatics engineering.

3. Title Strengthening Cotton Pest Control Using Biotechnological Techniques

Estimated Duration: 4 years
UNIDO Contribution: US $ 506,000
Government Local Contribution Z $ 200,000

Brief Project Description

A. Problems to be addressed

- Inadequate returns from the agricultural sector
- Reduced cotton yields due to insect pests
- Development of resistance to conventional cotton pesticides

B. Concerned Parties/Target Beneficieries

1. The problems were identified by the Ministry of Agriculture, the cotton Research Centre and are now brought to the attention of UNIDO.
2. Target groups and beneficiaries are cotton growers, in particular small cotton growers in rural areas.

C. Pre-project and End of Project Situation

1. Preproject

- Low biotechnological skills
- Unsatisfactory cotton yields due to pests
- Subnormal cotton quality
- Increased resistance of pests to pesticides.

2. End of Project Situation

- Higher yields and production of cotton
- Better quality cotton lint
- Pest resistant varieties of cotton
- Better skills in biotechnology as applied to cotton.

D. Special Consideration

- Achievements in this project will reduce the workload of women in cotton culture.
- The environment will be saved from the scourge of pesticides and pollution
- Neighbouring countries and other developing countries will benefit from the findings in reducing production costs drastically.

E. Other Projects executed by UNIDO and other donors - None identified

F. Major Elements

1. Objectives

- To effectively control cotton pests (boll worm, and leaf miner)
- To cut down cotton pest control costs using suitable material
- To provide assistance to the planned national biotechnology institute

2. Output

- Effective cotton pest management and control
- Higher cotton yields per unit area and overall total production
- Higher individual and national income through higher sales of cotton.

3. Activities

- Recruiting plant biotechnology expert
- Identification of resistant compatible genes
- Provide laboratory facilities and equipment
- Use gene[illegible] engineering to include the genes in cotton
- Incorporat[illegible] of resistance into national planting seed material

G. Host Country Commitment

1. Zimbabwe is highly interested in biotechnology and is currently developing a project on biotechnological cotton pest control, hence this proposal.

2. The University of Zimbabwe crop science and chemistry departments are already undertaking some aspects of biotechnology.

H. Risks

1. Lack of knowledge in advanced biotechnology methods might delay the project.
2. In the longterm one cannot predict how the new varieties might behave in the local environment.

I. Inputs

Skeleton Budget	USTDO	National
Personnel	300,000	Z $ 160,000
Training	80,000	-
Equipment	120,000	25,000
Miscellaneous	8,000	Z $ 15,000
Total	508,000	200,000

J. Work Plan

Major Activities	1	2	3	4 (years)
Recruitment of expert and deployment	----------			
Provision of laboratory facilities	----			
Biotechnological Work		-------		
Field tests			-------	
Dissemination of proven material				------

Comments: UNIDO is strongly placed to provide assistance to the planned national biotechnology centre.

4. Title: Feasibility Study on Strenghtening Small Scale Irrigation Schemes in Small Scale Rural Cotton Growing Areas

Estimated Duration: 4 months

UNIDO Contribution: US $ 45,000.00

Local contribution: Nill

Brief Description of Project

A. Problems to be Addressed

1. Sectoral level

- Suboptimal agricultural production of food and cash crops.

2. Project Area

- Subnormal production of cotton due to insufficient and erratically distributed rainfall in cotton growing areas.
- Under utilization of natural water sources for cotton irrigation.

B. Concerned Parties and Beneficiaries

1. The problems were identified by the ministry of agriculture, the Cotton Growers Association and the Cotton Marketing Board.

2. If the project is feasible cotton growers and in particular small cotton growers will benefit from better returns from expanded cotton production.

C. Preproject and End of Project Situation

1. Preproject

- Limited cotton grown under irrigation mainly confined to commercial scale growers.

2. End of Project

If project identifies areas for profitable irrigated cotton, plans will have been drawn up for cotton production under irrigation with higher production and good returns for small scale growers.

D. Special Considerations

Establishment of small scale irrigation schemes is expensive because of the initial capital costs for dams, water holes and distribution infrastructure. It would therefore be advisable to explore profitable crops to rotate with cotton so as to make full use of facilities throughout the year.

Irrigation schemes could have adverse environment effects, so this aspects requires special consideration to achieve a balance with the environment.

E. Other Projects

The Ministry of Agriculture and Rural Resettlement is undertaking some projects on small scale irrigation.

F. Major Elements

1. Objectives

- To establish the feasibility of strengthening or expanding small scale irrigation of cotton in rural areas.
- To increase area under cotton production and raise farmers income.

2. Output

- A report on the feasibility on strengthening small scale irrigation schemes for cotton and other rotational crops.

3. Activities

- To carry out studies on all aspects to establish the feasibility for small scale irrigation schemes for cotton production in rural areas.
- To make adequate recommendations as part of the study reports.

G. Local Country Commitment

- The need for the project was expressed by the ministry of agriculture and its cotton parastatals especially the Cotton Marketing Board and the Agricultural Marketing Authority.
- If the project is feasible, small cotton growers will benefit much.

H. Risks: There are no risks involved in the feasibility studies

1. Inputs

Skeleton Budget:

- Four months consultancy (UNIDO funded) US $ 25,000.00
- No local contribution.

J. Work Plan

	1 2 3 4 months
Feasibility study	----------
Final Report	----

Title 5: Price Policy and Strengthening Credit Facilties in the Cotton System

Estimated Duration 5 years

UNIDO Contribution: US $ 50,000 (4 months only)

National Contribution Z $ 2,000,000

Brief Project Description

A. Problems to be addressed

1. Sectoral Level

- Uninspiring price structure and policies in major agricultural products in the countries
- Inadequate funds for credit to small rural farmers
- Unrealized agricultural production potential

2. Problem areas at project level

- Low cotton prices paid to farmers are discouraging
- No parity between local prices and export prices
- Textile manufactures gaining at the expense of cotton producers
- Liquidity problems in the Cotton Marketing Board and high subsidy by government
- Inadequate access to credit by small cotton growers in rural areas.
- Low cotton yields and production among small cotton producers.

B. Concerned Parties/Target Beneficieries

1. The Ministry of Agriculture, Ministry of Trade and Industry, the CMB and Agriculture and Marketing Authority are all concerned.
2. Beneficieries would be all cotton producers in the country, CMB, oil processors and textile manufactures.

C. Preproject and End of Project Situation

- Discontent with pricing structures and policies in the cotton industry
- Lack of parity between local cotton prices and export prices
- Lack of liquidity at the CMB
- Limited access to credit by small producers
- Comparatively low credit funds
- Limited purchasing power for inputs needed for cotton production.

2. End of Project Situation

- Hopefully satisfied cotton producers, processors and consumers of cotton derived products
- Parity between local and export prices
- Liquidity and profit at CMB
- Move access to credit, higher amounts revolved and more purchase of inputs

D. Special Considerations

- Integrated and rationalized prices between Zimbabwe and neighbouring importers of cotton derived products might enhance regional economic stability
- More low income farmers especially women should get favourable consideration

E. Other Donor Projects

The World Bank partly supported project on Agricultural Credit and Export Promotion, collaborating with the Agric. Finance Company of Zimbabwe.

F. Major Elements

1. Objectives

- To better understand the pricing structure, policies interaction in the cotton system and rectify anomalies
- To facilitate setting of fair prices and policies by government and the CMB for mutual benefit between producers and consumers
- To sustain the cotton industry
- To facilitate acquisition of credit by small cotton producer
- To increase the existing revolving fund for credit
- To expand cotton production among smallholders.

2. Output

- Comprehensive report on prices and policies in the cotton system
- Effective prices and policies
- A bigger revolving fund for credit
- Hopefully sustainable cotton industry

3. Major Activities

- Study and evaluate cotton related price structure and policies
- Compare alternatives and options
- Recommended potentially effective price structure and policies for the cotton system
- Strengthen the credit fund available to cotton growers

G. Country Commitment

- The Government is now studying trade liberalization and decontrolling prices
- Government has provided export inventives including partial retention of export earning.

- Counterpart institutions include the Agricultural Finance Company and local commercial banks.

H. Risks

- Fluctuating world cotton prices might affect repayment of loans by small farmers.

- Bad weather and drought might adversely affect production

I. Inputs

Skeleton Budget	UNIDO		National	
Consultancy (Pricing Policy and Credit)	US $	45,000		
Revolving Fund			ZS	2,000,000

J. Work Plan

	Period (years)				
Activities	1	2	3	4	5
Consultancy	--				
Revolving credit Fund in phases	----------				
Evaluation of repayment					----

6. Title: Training of technicians in Electrical Hydraulic and Mechanical skills for cotton ginning and oil processing industries

Estimated Duration: 5 years
UNIDO Contribution: US $ 990,000
Local Funding ZS 435,000

Brief Project Description

A. Problems to be addressed

1. Sectoral

- Preventable breakdowns and stoppages in agroindustries
- Lack of enough technicians for innovations, repair and maintenance in the industrial sector.
- Inadequate utilization of installed capacity

2. Project Area

- undesirable breakdowns and soppages in the cotton industry
- Limited availability of technicians in electrical, hydraulic and mechanical fields.
- Under capacity utilization in ginneries and oil extraction factories

B. Concerned Parties/Target Beneficiaries

1. The problems were outlined by the Cotton Marketing Board, the Food Manufacturers Association, factory managers as presented here

2. Direct beneficiaries will be the semiskilled technicians in the industry, the owners and consumers of cotton and seed products (oil and cake).

C. Pre-project and End of Project Situation

1. Pre-project

- Insufficient number of trained relevant technicians with enough skills
- Inadequate maintenace
- Substandard capacity utilization
- Unexpected breakdowns and stoppages

2. End of Project Situation

- Well trained technicians with good skills
- Proper maintenance and repairs
- Good capacity utilization
- Higher good quality cotton derived products.

D. Special considerations

- Female technicians should get preference inorder to integrate them in the cotton industry
- Technicians from neighbouring countries should be included in the training programme.

E. Other Projects

The World Bank under the Small Credit Scheme is planning to build new ginneries and train technicians for one facility in the Mount Darwin area.

F. Major Elements

1. Objectives
   - To acquire better relevant skills.
   - Improve maintenance and repair of ginning and processing equipment and machinery.

- Prevent frequent breakdowns and raise capacity utilization.

2. Main Output

- More skilled technicians
- Enhanced operations and efficiency
- Higher capacity utilization
- Higher productivity and quality.

3. Major Activities

- Recruit and deploy UNIDO expert
- Identify and quatify training needs.
- Prepare and provide teaching aids (manuals, handouts, videos and leaflets).
- Short courses for local trainers
- Short term courses for technicians in batches.

G. Zimbabwe Commitment

- The country is heavily committed in trained technical personnel and acquiring modern technology in order to industrialize fast.
- Countermart institutions include polytechnics in the country and infactory on the job training.

H. Risks: None are forseen.

I. Inputs

1. Skeleton Budget	UNIDO Contribution US$	Local Inputs Z$
Personnel	90,000	150,000
Subcontractors	50,000	-
Training	400,000	280,000
Equipment	300,000	-
Miscellaneous	150,000	5,000
Total	990,000	435,000

J. Work Plan

	Period (years)				
Major Activities	1	2	3	4	5
Recruit and deploy UNIDO experts	---				---
Identify training needs		---			
Teaching aids and materials development		---			
Short courses for local trainers	------				
Technician courses			----------		
Evaluation					--

7. Title: Integrated Development of Ginneries in Zimbabwe

Estimated Duration:	12 months
Estimated UNIDO Contribution	US $ 138,000
Local Contribution:	ZS 139,000

Brief Project Description

A. Problems to be addressed

1. Sectoral

- Inadequate industrial output due to aged machinery which is poorly maintained
- Suboptimal capacity utilization
- Limited agroindustrial development

2. Project Area

- Limited ginning capacity which is also about 80-90% utilized
- Gins are mostly roller type which are unsuitable for long staple cotton varieties
- Most gins are old (over 20 years
- Gins and depots are mislocated away from current high producers in communal lands
- Inadequate spare parts availability and poor maintenance
- Inadequately trained technicians and operators

B. Concerned Parties/Beneficiaries

1. The problems were identified through discussions with the CMB and ginnery management at depots
- Beneficiaries include the CMB who have monopoly on cotton ginning and staff of the ginneries

C. Pre-project and End of Project Situation

1. Pre-project

- Unsatisfactory ginning capacity
- Inadequate production of lint and cotton seed
- Suboptimal ginning capacity utilization
- Limited storage & handling facilities
- Shortage of spares
- Inadequate maintenance and management skills at ginneries & depots
- Limited storage and handling facilities
- Insufficient trained technicians

2. End of Project Situation

- Well trained technicians
- Proper regular maintenance & repairs
- Enough spares
- Higher capacity utilization and output
- Better ginning management
- Enough storage & handling facilities
- Feasibility or otherwise of new ginneries possibly joint venture with the CMB

D. Special Consideration

1. Neighbouring SADCC countries could export seed cotton to Zimbabwe for ginning
2. The CMB could also consider down stream cotton industries adjuscent to the ginneries such as oil seed processing livestock feeds and allied products to reduce operation costs and produce competetive products.

E. Other Projects by Donors - Limited Gric. Credit + Export Promotion by the World Bank

F. Host Country Commitment

1. The country is highly committed to rehabilitate the cotton industry and is willing to grant export/import incentives such as granting more forex or retaining foreign exchange earned for importing needed inputs

2. Counterpart institutions include the SADCC industrial sector and relevant institutions in member countries

G. Risks

Insufficient local capacity to fabricate some parts of the machinery might delay the project.

Import regulations and granting of licences is another potential risk.

H. Major Objectives

1. Objectives

- To rehabilitate ginning equipment, machinery storage & handling facilities.
- To provide a sustainable spare parts and maintenance system
- To train ginnery technicians and management
- To examine the feasibility of new ginneries

2. Output

- Rehabilitated ginneries equipment and machinery.
- Better storage & handling facilities
- Stock of vital spares
- Regular maintenance
- Trained technicians & operators
- Improved efficiency and productivity

3. Major Activities

- Carry out a situation analysis of the 9 ginneries in Zimbabwe under CMB guidance with focus on:-

- location of ginneries in relation to production.
- Examination of marketing details on purchase of seed cotton from farmers, sale of cotton seed to producers and oil seed processors and local sales to the textile industry and exports
- Ginnery storage capacity, needs and handling facilities
- Transport requirements
- State of the equipment and machinery
- Rehabilitation including spare parts or new units
- Training of manpower in skills (technicians, operators and management).

I. Inputs

Budget Skeleton	UNIDO US $	National Z$
Personnel (4 months consultancy for situation analysis & ginnery pre-feasibility study)	45,000	-
Local Training (refresher courses)	15,000	20,000
Repair Equipment and spares	70,000	60,000
Storage & handling facilities	-	50,000
Miscellaneous	8,000	9,000
Total	138,000	139,000

J. Work Plan

Activities	Months											
	1	2	3	4	5	6	7	8	9	10	11	12
Situation analysis of ginneries (Consultancy	----------											
Feasibility study on new ginneries			-------									
Refresher Training (technicians and management skills)			----------									
Rehabilitation and improvement of storage and handling facilities					----------					----------		

8. Title: Strengthening Management Skills and Operations for the Cotton Marketing Board Institutions

Estimated Duration: 4 years
UNIDO Contribution: US $ 610,000
Local Fundings: ZS 240,000

Brief Project Description

A. Problems to be addressed

1. At Sectoral level
   - Lack of enough well trained management and operational staff.

2. At Problem Area level
   - Lack of the latest management and operational state of the art
   - Limited supply of up to date facilities such as computer hardware and software.

B. Concerned Parties/Target Beneficiaries

1. The problems were identified in collaboration with the Cotton Makreting Board.
2. The CMB Management and operational staff will benefit directly. Cotton growers and staff in the board will get better services and supervision.

C. Pre-project and Expected End of Project Situation

1. Pre-project
   Limited up to date management and operational skills.
2. End of Project
   - Skills need satisfied
   - Head office and depot managers and relevant operational staff endowed with up to date skills.

D. Special Consideration

Some of the operations especially computer operations and data processing appeal to women and this will integrate them into the industry more closely.

The skills acquired could easily be passed on to neighbouring African countries all of whom produce cotton.

E. Other Projects -None directly related to the cotton industry.

F. Major Elements

1. Objectives

To raise management and operational skills of CMB staff.
To improve financial handling and control within the board,
To enhance efficiency in the board.

2. Output

- Staff trained in uptodate management and operational skills
- Improved financial management, marketing and overall performance.

3. Activities

- Recruit and deploy expert on management and operations in commercial institutions
- Identify up todate skills needed and institutions offering them.
- Offer relevant fellowships to CMB staff under UNIDO within and outside Zimbabwe.
- Provision of 12 computers and soft ware and training on their use for the head office and depots.
- National Training Workshop of managers and technical staff in the cotton industry.

G. Country Commitment

1. This is unquestionable as shown by efforts to promote the cotton industry in Zimbabwe.
2. Preferential Trade Area (PTA) and SADCC industrial units could play a more active role in collaborating in this project to promote regional cooperation.

H. Risks - None forseen

I. Inputs

Skeleton Budget	UNIDO US $	National Z $
Personnel & Consultants	180,000	80,000
Training and Fellowships	250,000	120,000
Equipment	180,000	40,000
Total	610,000	240,000

J. Work Plan

	Period (years)			
Major Activities	1	2	3	4
Recruitment & deployment of expert	--			
Identify needs	--			
Fellowships for CMB		----------		
Provision of computer systems and backup	-----		---	
National workshop			----	

9. Title: Establishment of a Road Transport Fleet for the Cotton Marketing Board.

Estimated Duration: 5 years
UNIDO Contribution: US $ 2,100,000
National Contribution: ZS 200,000

Brief Project Description

A. Problems to be Addressed

1. Sectoral level

- Shortage of road haulage facilities
- Limited foreign exchange

2. Project level

- The Cotton Marketing Board has no transport fleet of its own
- Delayed delivery of inputs and collection of produce.

B. Concerned Parties and Target Beneficiaries

1. The problems were highlighted by the CMB hence their presentation here.
2. The CMB and Cotton Growing Association and smallholders will benefit directly.

C. Pre-project and End of Project Situation

1. Pre-project

- No own fleet by CMB
- Producers depend on hired transport
- CMB relies on hired transport and haulage fleets

2. End of Project

- Road transport fleet owned and operated by the CVs
- More efficient delivery of inputs and transport of cotton.

D. Special Considerations

The fleet should emphasize moving produce in the communal areas to ease the workload of women.

E. Other Donor Projects - None identified

F. Major Elements

1. Objectives

- To establish a road transport fleet for the Cotton Marketing Board
- To speed up inputs and delivery of cotton
- To minimize transport costs

2. Output

- A fleet of trucks
- Rapid and effecient transport of inputs and cotton by the CVs

3. Activities

- First studying the transport system and costs involved
- Identification and choice of vehicles (imported or locally assembled).
- Ordering of vehicles in phases
- Training in fleet running and management
- Procurement of spares
- Setting up maintenance facilities

G. Host Country Commitment

The country has expressed very keen interest

H Risks

1. Unavailability of enough locally assembled trucks (if this option is chosen) might delay take off.
2. In the longrun, fluctuation in cotton production might reduce capacity utilization but the trucks could be hired out to augment the ailing national fleet.

I. Inputs

Skeleton Budget	UNIDO US $	National ZS
Personnel	-	-
Training	50,000	160,000
Transport Vehicles	1,600,000	-
Essential spares	450,000	-
Miscellaneous	-	200,000
Total	2,100,000	200,000

J. Work Plan

Activities	1	2	3	4	5
Studying transport system and costs	---				
Choice of trucks	--				
Truck orders	---		----		
Training	----				
Spares procurement	----		---		-----
Maintenance facilities	--------				

10. Title A Feasibility Study on Downstream Cotton Based Industries by the Cotton Marketing Board

Estimated Duration: 6 months
UNIDO Contribution US $ 35,000
National Contribution None

Brief Project Description

A. Problems to be addressed

1. Sectoral level

- Inadequate degree of industrialization
- Inadequate employment in the industrial sector
- Low level of agroindustries

2. Project Area

- Limited processing of cotton confined to ginning and marketing only
- Wastage of cotton by products
- Limited returns from the cotton system

B. Concerned Parties and beneficiaries

1. The Ministries of Agriculture, Trade and Industry and the Cotton Marketing Board are involved.
2. The Cotton Marketing Board and Cotton growers will benefit directly if the project is viable and takes off.

C. Preproject and End of Project Situation

Now there is uncertainty about the feasibility of establishing cotton downstream industries by the CMB.
Eventually the situation will be clear one way or the other.

D. Special Consideration

Creation of more jobs with involvement of many women, establishment of joint ventures with local and private companies as well as NGOs should be studied deeply.

E. Other Donor Projects - None so far

F. Major Elements

1. Objectives

- To establish feasibility of downstream cotton industries.
- To increase national capacity in cotton based industries (spinning, weaving, seed processing, oil and cake)
- To increase value added by selling semi processed or finished products.

2. Output

- Report on CMS possibilities to establish cotton based industries (textiles, oils, feeds, soap and chemicals)
- Ultimate-CMS owned and operated relevant industrial units derived from the above mentioned.

3. Activities

- Identify participants to undertake the study
- Carry out the study
- Report and recommendations including feasibility studies and project proposals and estimated costs for implementation

H. Risks -None

I. Inputs

Skeleton Budget	UNIDO	National
	US $	ZS
Consultancy	35,000	-

J. WorkPlan

	Period (months)				
	1	2	3	4	5
Consultancy deployment	----				
Study (field work)			---------		
Report				------	

11. Title: Consultancy on Strengthening the Production Capacity for Manufacturing Packaging Material Mainly for the Cotton Industry

Estimated Duration: 3 months
UNIDO Contribution US $ 20,000.00
Local contribution: None

Project Description

A. Problems to be addressed

1. Sectoral level

- Shortage of packaging materials (local and imported) in the industrial sector.

2. Project Area

- Shortage of jute, sisal, paper or plastic bags for packaging cotton, and cotton products.
- Shortage of materials for making paper, plastic or alluminium laminates for making packages for cooking oil and fats.
- Lack of locally made glass containers for cooking oil and fats.
- Limited foreign exchange for importing packaging materials such as those mentioned here.

B. Concerned Parties and Beneficiaries

- The ministries of Agriculture, Trade and Industry and local cotton processors and handlers.
- Cotton products processors (ginneries and oil seed processors) as well as general consumers will benefit directly by the availability of enough packaging materials

C. Preproject and End of Project Situation

1. Preproject:

- Shortage of jute, sisal, paper, plastic, aluminium and plastic bags.
- Limited availability of plastic, metal and glass containers for packaging cooking oil and fats.

2. End of Project

- Adequate supply of the items mentioned under C.1
- Attractively packaged and clearly labelled consumer products derived from cotton.

D. Special Considerations

- Emphasis should be placed on naturally occuring materials, that are available locally.
- Artificial materials based on plastics tend to degenerate slowly if ever, and cause environmental pollution
- Moreover some plastics have been reported to carry harmful chemicals.
- The degree of reusability, recycling and alternative uses of containers at industrial and household level in the Zimbabwean context requires special attention.

E. Other projects donors -None identified.

F. Major Elements

1. Objectives:

- To do a situation analysis on the packaging industry in relation to cotton and cotton products in the country.
- To identify packaging needs and potential for local manufacture of packages and containers.
- To do feasibility studies for strengthening the local packaging industry and make relevant recommendations

2. Project Outputs

- An acurate situation of the packaging materials related to the cotton industry
- Clearly stated packaging needs in the cotton system.
- Feasibility studies and recommendations on strengthening the packaging industry in Zimbabwe with focus on the cotton industry.
- Project proposals & implementation modalities

3. Project Activities

- Situation analysis on packaging materials in the cotton industry
- Identification of packaging needs for cotton derived products
- Feasibility studies on strengthening local production of paper, plastic, metal, glass and sisal containers for the cotton system.
- Recommendations on improving the packaging for the cotton industry.
- Project proposals including costs

G. Host Country Commitment

The ministries of Agriculture, Trade Industry and Minerals are interested. The Food Manufactures Association and private industry expressed much interest.

H. Risks: No current risks were identified. On the other hand future demand for packaging material is likely to rise, thus alleviating risks.

I. Inputs

Skeleton Budget:

One consultancy for 3 months: US $ 20,000 by UNIDO

J. Work Plan 1 2 3 (months)

Studies	-----		
Interviews		-----	
Final Report			----

12. Title Feasibility of Making Paper from Cotton Stover and Linters

Estimated Duration	3 months consultancy
UNIDO Contribution	US $ 20,000
Government Contribution	Nil.

Brief Project Description

A. Problems to be addressed

1. Sectoral level
   - Shortage of paper and news print
   - Lack of enough packaging material

2. Problem area
   - Shortage of paper based packaging material, paper bags, laminated paper and kraft paper for margarine and cooking fats
   - Wastage of cotton stover and cotton linters which are usually burnt away.

B. Concerned Parties/Target Beneficiaries

1. The problems were identified from the ministries of Agriculture, Trade and Industry and the CMB.
2. The cotton growing groups (Commercial Growers, and smallholder producers) and the paper and packaging industry stand to benefit.

C. Pre-project and End of Project Situation

1. Pre-project
   - Cotton stover and linters burnt away
   - Pollution of the environment
   - Carry over of pests from the previous season to next season if stovers is not burnt away timely
   - Shortage of paper.

2. End of Project Situation

- Good cotton waste prospects if project is feasible
- Potential for more income from cotton.

D. Special Consideration

- It is likely women will be most involved in gathering the raw material.
- Less environmental pollution
- Findings could be applied in neighbouring SADCC countries.

E. Other projects by Donors - None discovered

F. Major Elements

1. Objectives

- To establish feasibility of making paper from cotton
- To make use of wasted cotton stover and linters
- To alleviate shortage of paper and packaging materials.

2. Output

- Feasibility study on making paper from cotton
- Recommendations on utilization of cotton waste

3. Activities

- Recruitment of a consultant on paper making
- Setting terms of reference for the consultant
- Carrying out the study
- Report writing and presentation.

G. Country Commitment

The country is short of paper and packaging material hence government interest in the idea.

H. Risks None identified yet.

I. Inputs

Skeleton Budget	UNIDO US $	National Z$
Personnel (Consultant)	20,000	Nil
Total	20,000	Nil

J. Work Plan

	1	2	3 (months)
Deployment of Consultant	--		
Consultancy	----------		
Report			--

Investiment Project Concepts

As evident in the proposal integrated programme for cotton there were no imminent individual investment projects identified as the cotton system is fairly well developed in Zimbabwe and has heavy investiment already. Furthermore, prefeasibility and feasibility studies on the cotton system were not available apart from the proposed UNIDO/Government of France study on the vegetable oil industry done by SOFRECO of France. Consequently, the programme has proposed feasibility studies such as the development of down stream cotton industries by CMB, initially as technical assistance projects which should then identify investment project concepts.

3.5.0 IMPLEMENTATION MODALITIES

It is assumed that standard United Nation Agency procedures will be followed in taking up the proposed programme with the Government of Zimbabwe and relevant institutions in the country.

3.5.1 Major Implementation Objective

The objective is to establish and run an integrated programme for the cotton industry in Zimbabwe. This will be done following the strategy of promoting cotton production, improving and modernizing ginneries, cotton seed processing systems and associated industries.

3.5.2 Institutional Arrangements and Coordination

The Cotton Marketing Board, the Commercial Cotton Associations and small cotton growers are the major target beneficiaries. The ministry of Agriculture and Rural Resettlement would be the main implementing local agency through the Cotton Marketing Board and the Agricultural Rural Development Authority (ARDA). Details of institutional arrangements are summarised in Table 2'.

Table 21: Summary of Institutional Arrangements

Projects	Responsibility & Cooperating Institutions
1. Training in Cotton husbandry	- Ministry of Agriculture- Extension Services (AGRITEX), - Kadoma Cotton Training Centre - Cotton Marketing Board (CMB)
2. Strengthening Research	- Ministry of Agriculture and CMB - Kadoma Cotton Research Centre - FAO to support husbandry - UNIDO-ginning, oil processing, textiles
3. Biotechnology pest control	- FAO - biological aspects - UNIDO- technology aspects - Ministry of Agriculture and CMB
4. Small Scale irrigation study	- Ministry of Agriculture - CMB, Agricultural Dev. Authority
5. Price Policy and Credit Study	- Ministry of Agriculture - CMB - FAO and UNIDO
6. Technicians Training	- Cotton Marketing Board - UNIDO
7. Development of ginneries	- The Cotton Marketing Board - UNIDO
8. Strengthening CMB Managament	- Cotton Marketing Board - Ministry of Agriculture & Industries
9. Road transport fleet for CMB	- The CMB - UNIDO and joint partners
10. Down stream industries study	- CMB - UNIDO - Joint Partners
11. Packaging Manufacture study	- CMB - UNIDO
12. Paper Manufacture study	- CMB - Ministry of Trade & Industries - UNIDO

3.5.3 Time Schedule

Projects	Period - Years									
	1	2	3	4	5	6	7	8	9	10
1. Training in cotton husbandry	----------									
2. Strengthening Research	----------						--		--	--
3. Biotechnology pest control	----------					--		--		
4. Small scale irrigation study	--									
5. Price policy & Credit	----------							--	--	--
6. Technicians Training	----------						--	--		
7. Ginneries Dev.	-----									
8. Strengthening CMB	---		----							
9. Road transport fleet	----			---		---				---
10. Down stream industries study	---									
11. Packaging making feasibility	--									
12. Paper making feasibility	--									

The proposed projects address the set objectives. The priority training related projects will include normal lectures or teaching, workshops, seminars, practical demonstrations, field visits, community mobilization and mass media such as Radio Zimbabwe, Zimbabwe Television and the popular press. Engineering aspects will involve contracting and subcontracting and joint ventures between government, parastatals and the private sector.

Monitoring and Evaluation

All projects will have monitoring and evaluation components so as to ensure smooth implimentation. Participants will come from implementors the CMB, coordinators, government, FAO, UNIDO, joint partners and the private sector.

Recommendations and Conclusions

Priority should be given to improving cotton production backed up by further improving and developing cotton ginneries, rehabilitating cotton seed processing and addressing prices, marketing and credit issues.

The Cotton Marketing Board should play a leading role in close cooperation with FAO, UNIDO, the private sector and willing joint venture partners.

It is therefore urged that UNIDO and other interested institutions support the proposed programme which has so far stimulated much interest in government and related institutions in Zimbabwe.

APPENDIX 1 DOCUMENTS CONSULTED

1. Central Statistical Office (1985)
"The Census of Production 1984 85 - Mining, Manufacturing
Construction, Electricity and Water Supply" 12-13, 16,27,40-43
Ibid: 1985 86 pp. 10-13, 21, 27-32

2. Central Statistical Office (1987), "Statistical Year Book of Zimbabwe
1987", Harare Zimbabwe, 136 - 142, 191-206

3. Central Statistical Office (1989) "Quarterly Digest of Statistics
March 1989" 37 - 43, 47-49, 61-63.

4. Cotton Marketing Board (1987) "Annual Report 1985 - 1986 CMB Zimbabwe

5. Ibid: "Annual Report 1986 - 87"

6. Ibid: "Annual Report 1987 - 1988".

6a. Ibid: "Cotton - The House Journal of the CMB-1989"

7. Economic Intelligence Unit (1988 - 89 Country Profile) Zimbabwe: 14 -
35.

8. Govt. of Zimbabwe (1986) "First Five Year National Development Plan,
1986 - 1990", Vol. I, 10-24, 25-28

9. Ibid (1988), "Investment Register", 2, 20-26.

10. SADCC (1984) "Food Security - Regional Food Reserve - Preliminary
Study, Country Profiles - Zimbabwe " Annex I.

11. SADCC (1983) "Industry and Trade Activities" SADCC Conference Arusha, Tanzania 28-29th Jan. 1983, Gaborone - Botswana 11 - 24.

12. SOFRECO (1988). "Feasibility Study for Increasing the Oil Production Capacity from Cotton Seed in Zimbabwe, Multipurpose Factory": Vol. I

13. The African Review (1989). "The Economic and Business Report - 1989 245 - 253.

14. The World Bank (1989) "Staff Appraisal Report Zimbabwe - Agricultural Credit and Export Promotion Project" Rep. No. 7446 - Zimb. 15 -16 33. 96 - 97.

15. UNIDO (1977) "Guidelines for the Establishment and Operation of Vegetable Oil Factories" UNIDO - Vienna.

17. UNIDO (1986) "The Manufacturing sector in Zimbabwe" 174 - 190. 26. - 304.

17a. UNIDO (1987) "Methodology for the Assessment, Programming and Management of Production and Consumption Systems - Sectoral Study Series No. 33". UNIDO-Vienna

18. UNIDO (1988) "Human Resources in Zimbabwes Prospective Contribution of Women". Vienna, Austria.

19. UNIDO (1989). PDSU. 1612c. "The Application of the UNIDO Programme Approach to Programming Selected Agrofood Industrial Systems (AFIs) in Africa - Results to Date".

20. Central Statistical Office (1986) "The Census of Production 1985/86- Mining, Manufacturing, Construction, Electricity and Water Supply". Harare, Zimbabwe. 10-13. 21. 27-32.

21. UNIDO (1988) SOFRECO PRJ. No. US/ZIM/87/117

22. "Feasibility Study for Increasing the Oil Production Capacity from Cotton Seed in Zimbabwe. Multi purpose Factory". Vol. 1 (Final Report) 17-25. 33-46. 63-84. 86-97

23. Government of Zimbabwe (1986) "Investment Register" 2, 20 - 26. Harare Zimbabwe.

APPENDIX II. INSTITUTIONS AND PEOPLE CONTACTED

Commercial Cotton Growers - Association Harare
B. MacNiel - President

Cotton Marketing Board Depot Glendale
W. Weluzani - Lint Storage Superintendent.

The Cotton Marketing Board Harare.
S. Ngubi - Deputy General Manager
T. Wicks - Marketing Manager

Cotton Training Centre at Kadoma
B. Von Evans - Director
Cotton Research Centre - Kadoma
Graham Rabey - Director

Ministry of Agriculture and Rural Resettlement. Harare
Dr. S. Muchena - Deputy Permanent Secretary.
T. Tavakarasha - Chief Economist.

Ministry of Trade and Industry
A. Chipiso - Ass. Secretary
A. Kamchira - Admin. Officer.

Lyons Brookbond Harare.

SADCC Food Security programme Harare
J. Dhliwayo - Deputy Secretary
M. Walsh - Team Leader. Land Use
M. Lukhando - Project officer - Agric. Metereology

Olivine Oil,Industries
Mr. Beatie - Managing Director

United Nations Development
Programme - Harare.

UN Food and Agriculture Office
Harare.

UNIDO: JPO: Friedrich - Harare
Zimbabwe Spinners - Glandale
S. Chavambuka - Quality Controller.