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EXPERT ASSISTANCE FOR THE ESTABLISHMENT OF A PESTICIDE PILOT PLANT UNDER A SOFT LOAN ADVANCE FROM THE ITALIAN GOVERNMENT

SI/URT/86/875

UNITED REPUBLIC OF TANZANIA

Technical report: Engineering, construction and commissioning of chemical plants

Addendum*
Revised financial analysis of the project

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

Based on the work of K. Szabo, expert in engineering, construction and commissioning of chemical plants

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Conclusions and Recommendations:

1. The very substantial devaluation of the Tanzanian Shilling did not drastically alter the feasibility of the project. Already the first year operation is likely to make profit and accumulated profits rise to Tanzanian Shillings 3,481 by the end of the tenth year, which is about three times higher than the profit envisaged by the feasibility study prepared by TISCO in 1984, before the 300% devaluation of T.Sh.

2. Similarly, all other important parameters of profitability (e.g. internal rate of return, payback period, break-even point, accumulation of cash), proportionately show little deviation form those in the original study.

3. The more than 300% devaluation and inflation of the local currency substantially affects the capital requirement and financing of the project mainly because of the foreign currency components of the project. Thus both bank credits and equity participation will have to be increased by more than 300%.

4. The change of unit of payment from USD to ECU as agreed upon in Amendment No. 3 of the contract seems to be disadvantageous to Tanzania as it represents a more than 50% cost increase on the unpaid balance of the contract. It also raises the question of the need for additional foreign credits to be secured, preferentially from the Italian Government. In view of the great impact this change has on the project finances, the re-examination and revision of Amendment No. 3 would seem to be advisable and justified.

5. Should constraints in financing force a stepwise rephased implementation of the project, priority is to be given to the most profitable plant units, probably the formulation units. An appropriate assessment of the priorities should be carried out in this case before a decision will have been reached.

6. The cost of pesticides to the Tanzanian farmers has been vastly increased by the currency rate changes, which could result in a reduction in pesticide usage. If necessary, the prices used in this study can be substantially lowered, as indicated by a price safety margin of 54%, arrived at by the securitivity analysis.

7. Economically the project is to be considered solid and profitable yielding substantial foreign exchange savings, a net present value of T.Shs. 1,910 million at a 22% discount rate, new government revenues (in form of taxes and custom duties), new employment at the plant and co-operating industries and above all a better supply of plant protection materials so important for an effective, up-to-date agricultural production.

8. Outside assistance in the initial operation of the plant seems to be vitally important. Technical long range support by a qualified R&D unit in developing up-to-date local formulations is equally indispensable. Therefore, it is suggested that the two supporting projects (Establishment of an R&D Laboratory for Pesticide Formulations at the Tropical Research Institute (TPRI), Arusha and Assistance in the Establishment, Start-up and Initial Operation of a Pesticide Plant in Moshi (recommended for UNDP/UNIDO implementation within the framework of the country programme (IPF) should be given high priority both by the Government and the UN Agencies.

Introduction

While on behalf of UNIDO on a technical assistance mission to Tanzania last December/January, the writer has been asked to revise and update the financial evaluation of the feasibility study prepared by TISCO in 1984 on the establishment of a pesticide production plant at Hoshi. The revision became necessary because of wild foreign currency rate fluctuations and the severe devaluation and continuous inflation of the Tanzanian Shilling. The Shilling was devaluated by 300% against the major foreign currencies around mid 1986 and the continuous and rather rampant inflation further aggrevated its loss of value both internationally and domestically. It has been pointed out that because of these conditions the up-dating of the financial analysis will have only limited practical value as the quickened inflation could make it obsolete in a relatively short time. In spite of this, local authorities, particularly potential future creditors (lender banks), considered the updating a necessary precondition for the establishment of the framework and mechanism for the financial management of the project. Throughout this exercise it has been assumed that the financing of the project, both the convertible and local component is fully agreed upon between the Governments, investors and creditors involved, and the appropriate administrative steps are well integrated with and adjusted to the schedule of implementation. Therefore no alternatives for production programme parameters (optimization) have been considered. In other words, the revision is based basically on data provided by the TISCO report, except the cost, revenue and financial analysis figures.

In updating the financial and economic analysis the following key assumptions have been made:

i) All capital costs and price estimates were based on figures valid end January 1987 and have been considered constant over the first ten years operating on the assumption that costs and prices move paralelly.

ii) Imports and international obligations were calculated at a rate of one US$ = T.Sh. 50 and one ECU = T.Sh. 70

iii) Loan and bank overdraft interest rates to remain constant at 21%.

iv) Physical and personal requirements, inputs and data unchanged as compared with the TISCO report.

The important changes occured in the scope of "Investment and Financing", "Cost of Operations" and "Financial Analysis" as demonstrated in the appropriate Annexes. Those of great impact and importance are highlighted as follows:

Investment and Financing

The fixed capital requirement increased from T.Shs. 444 million to T.Shs. 1,866 million (Annex 13), about fourfold. The initial working capital cost grew from T.Shs. 123 million to T.Shs. 317 million (Annex 12), reflecting the higher import prices of intermediates and other raw materials and bringing the total initital capital requirement from T.Shs. 567 million to T.Shs. 2,183 million. Unexpectedly not only the foreign currency components (subcontract) have shown explosive cost increases but also civil works (threefold) (Annex 1). The large increase in pre-operational expenses (Annex 10) was mainly due to inflated interest rates. Re-investment was stipulated in the case of vehicles (every

4th year) but no change in the pattern of financing (Annex 17).

Cost of Operation

Higher raw material costs and interest rates have caused first of all the increases, however, the interest rates only for the inital four years, since by the 5th year operation all loans and overdrafts shall be repaid. Because of the large investment allowance (20% on fixed assets) tax payments start earnestly only in the fourth year of operation (Annex 16). Utility requirements have been re-calculated according to the stipulations of the contract with Tecnomont (Annex 7/iii). Packaging materials were considered according to the TISCO projection (Annex 7/ii), but it is felt that in view of the market structure smaller package units (1/2 - 1 kg) shall also be marketed. This may increase this cost component by T.Shs. 7 to 8 million, which would have no impact of practical importance on the cost of operation.

Financial Analysis

Annual sales revenues have increased almost threefold from T.Shs. 640 million to T.Shs. 1,778 million at full capacity operation (Annex 14 + 16). Ex-factory sales prices have been based on current CIF import prices. Profits are achieved already in the first year of operation and accumulated profit gradually increases to T.Shs. 3,481 million by the 10th year of operation. Loans and bank overdrafts shall be repaid by the 4th year of operation. The profitability of the investment is clearly illustrated by an internal rate of return of 25.57% (Annexes 21, 22 and 23), a payback period of 3 years and 10.2 months of operation (Annex 24) and the break-even capacity utilization (Annex 25 and 26). Those values were confirmed by an alternate method of analysis (Annex 27). The safety margin of the proposed investment has been demonstrated through sensitivity analysis (Annex 27). Assuming a 20% drop in the sales prices, it should result in a BEP of T.Shs. 1,033 million or a capacity utilization of 72.65%. Alternatively an increase of 20% in the cost of raw materials and packaging materials would yield a BEP of T.Shs. 967 million or a 54.49% capacity utilization. As for the pricing of the products the analysis yielded a safety margin of 53.81%, leaving ample room for manipulating prices if needed, particularly during the period of market penetration.

Economic Assessment

A foreign exchange savings analysis, discounted at 22%, shows an initial increase in annual savings from T.Shs. 474 million to T.Shs. 542 million in the third year, then a gradual decline to T.Shs. 135 million by the end of the 10th year. These figures seem to be more advantageous than the original projections. The same goes for the net present value (NPV) which comes to T.Shs. 1,910 million, almost ten times higher than that envisaged by the TISCO report (Annex 28). In addition the project shall generate new government revenues in form of taxes and custom duties, now employment at the plant and associated industries and supply the agriculture with plant protection materials according to the local needs and condition, which shall result in a great improvement in the safety and output of the national agricultural production.

ANNEX 1

CIVIL WORKS, COST ESTIMATE

Item	Description	Total area (m^2)	Cost/m^2	Total Cost (T. Shs.
	1. BUILDINGS			
A.	Insecticide Formulation and Packaging	1,219	42,750	52,112,250
B.	Herbicide Formulation and Packaging	674	40,860	27,539,640
C.	Oxychloride Production, Formulation and Packaging	1,704	40,860	69,625,440
D.	Amenities	300	24,840	7,452,000
E.	Laboratory	78	21,200	1,653,600
F.	Workshops	300	21,200	6,360,000
G.	Administration	300	24,840	7,452,000
H.	Gate House, Scale Room	40	20,875	835,000
I.	Utilities Center	400	18,650	7,460,000
J.	Warehouse	970	20,875	20,248,750
K.	Electrical substation	12	20,875	250,500
	2. WEIGH BRIDGE	One		1,750,000
	3. EXTERNAL WORKS (Roads, Parking areas, Water treatment basins, Drainage and Establishment costs)			82,059,350
	4. CONTINGENCIES (10%)			28,500,000
	5. HOUSING (Project personnel)	2,100	20,000	42,000,000
	GRAND TOTAL			355,298,530

ANNEX 2

PLANT MACHINERY AND EQUIPMENT

ESTIMATED COST

DESCRIPTION	LC	FC	ECU	LOCAL	~~TOTAL~~ T.Shs '000
Production Equipment		+	9,769,200	-	683,844
Auxiliary Equipment	+	+	558,240		39,076.80
Service Equipment (lab)		+	195,384		13,676.88
Spare Parts		+	837,360		58,615.20
Freight and Insurance		+	1,136,018		79,521.26
Import Duty 20% CIF	+			159,042,570	159,042,57
Post charges, Forwarding, Clearance (25%)	+			19,880,321	19,880.32
Total			12,496,202	178,922,891	1,053,651

ANNEX 3

INITIAL FIXEX INVESTMENT COST
(THOUSANDS)

ITEM	INVESTMENT CATEGORY	US$	ECU	LOCAL CURRENCY (TShs)	TShs '000 US$ = TShs 50 ECU = TShs 70
1.	Land	-	-	-	-
2.	Site Preparation and Development	-	-	21,715,000	21,715
3.	Structures (civil works)				
	a. Production buildings			231,239,000	231,239
	b. Auxiliary and service facilities			82,059,000	82,059
	c. Housing			42,000,000	42,000
4.	Incorporated Fixed Assets (Know-how + Engineering)	1,482,000	358,620		99,203
5.	Plant Machinery + Freight and Insurance		12,496,202	178,922,890	1,053,657
6.	Erection and Supervision		3,475,000	8,700,000	251,930
	TOTAL INITIAL FIXED INVESTMENT COST				1,781,803

ANNEX 4

VEHICLES

TShs '000

2 x 10 ton lorry	Shs. 2,500	5,000
2 x Saloon	Shs. 350	700
1 x Pick up	500	500
3 x Landrovers	1,000	3,000
Contingency 10%		920
Total		10,120

(Imported) Intermediates - FOB Prices + 10%

Plant/Intermediates	Required Qty/yr/ton)	Unit Price US$/kg	Unit Price TShs/Ton	Total TShs '000
1. COPPER OXYCHLORIDE				
1.1 Copper wires/scrapes	1,607	1.40	70,000	112,490
1.2 Hydrochloride Acid (Locally produced)	1,590		48,000	79,500
1.3 Separan	0.6	3.6	165,160	108
Imports Subtotal				112,598
2. FORMULATION UNITS WETTABLE POWDERS				
DDT	950	1.50	75,000	71,250
Dieldrin	105	7.15	357,500	37,537
Aldrin	84	4.80	240,000	20,160
Lindane	87	7.15	357,500	31,100
Endosulfan	200	8.80	440,000	88,000
Carbaryl	157	3.85	192,500	30,220
HERBICIDES				
Atrazine	105	2.90	145,000	15,225
Simazine	250	3.00	150,00	37,500
Diquat	191	3.80	190.00	36.300
Paraquat	45	14.30	715.000	32,175
Ametryn/Terbutryn	21	5.00	250,000	5,250
Others	100	5.00	250,000	25,000
GRANULARS				
Endosulfan	40	8.80	440,000	17,600
Lindane	32.5	7.15	357,500	11,600
Diazinone	25	3.60	181,000	4,540
TOTAL ACTIVE MATERIALS (INTERMEDIATES) IMPORTS				652,375

ANNEX 6

OTHER IMPORTED RAW MATERIALS

ITEMS	REQUIRED QTY/YR(TON)	UNIT PRICE TSHS/TON	TOTAL SHS '000
Tauride Methylolein	57	92,200	5,260
Urea	12	10,860	130
Sodium Polycarboxylate	38	141,180	5,365
" Laurylsulfonate	7	65,160	456
" Diisopropylnaphtalate	53	70,600	3,740
Fossil Meal	42	10,500	440
Dinaphtylmethylsulfonate	164	65,160	10,690
Epychlorohydrin	21	70,600	1,480
Ethoxylated Castoroil	16	34,700	550
Nonyl Phenol	2	48,900	98
Sodium Lignosulfonate	189	11,400	2,150
" Sulphate, Anhydrous	10	41,700	417
Calcium Hydrate Silicate	23	72,000	1,650
Ethoxypolyamine Salt	20	92,310	1,850
Ethoxylated Alcohols	5	92,310	460
Formaline	0.6	15,750	10
Polysaccaaride	39	10,200	398
Sodium Sulphite	1	41,838	42
" Carbonate	4	18,000	72
Calcium Lignosulphate	2	11,400	23
Coconut Oil	16	42,000	672
Acetic Acid	Negligible		
Silicon Antifoam	3	1,110,435	3,330
Diethylene Glycol	3	13,000	39
	Total		39,322

Total Raw materials:

Imported:

Technical Active Ingredients		652,375
Others		39,322
	Sub-total	691,697
Local		19,560
Grand Total		711,257

LOCAL RAW MATERIALS

MATERIALS	REQUIREMENT TONS/YEAR	UNIT COST TON/TShs	ANNUAL COST TShs '000
Kaolin	662	2,400	1,590
Silica	799	1,690	1,350
Sodium Hydroxyde	Negligible		
Calcium Carbonate	1,878	3,800	7,140
Marine Salt	948	10,000	9,480
Total			19,560

PACKAGING MATERIALS

PRODUCT	PACKAGING UNIT	UNIT PRICE TShs	UNIT REQUIREMENT/YR	ANNUAL COST TShs '000
Copper Oxychloride	50 kg polypack bag	20	60,000	1,200
Wettable Powders	25 kg paper bag	13.40	120,000	1,608
Granules	25 kg paper bag	13.40	80,000	1,070
Herbicides	5 lt. plastic containers	65.0	300,000	19,500
Total				23,378

UTILITIES

ITEM	UNIT	UNIT COST TShs	DAILY REQUIREMENT	ANNUAL REQUIREMENT '000	ANNUAL COST TShs '000
Water	m^3	0.5	400	120	60
Power	KWh	1.20	60,000	18,000	21,600
Fuel	Kg	4.00	3,000	900	3,600
Total					25,260

MANPOWER, WAGES AND SALARIES
(15% increase over the 1984 forecast)

Personnel		Wages/Salaries TShs/year
A.	Management (7 persons) (455,400 x 1.15)	512,340
B.	Supervision (28 persons) (1,074,720 x 1.15	1,235,930
C.	Skilled/Semi-skilled workers (66) (1,507,020 x 1.15)	1,733,073
D.	Labourers/Attendants (21)	234,738
	Total A+B+C+D (122)	3,716,100
	12% Social cost	445,929
	Total (local) salaries, wages	4,162,000
E.	Expatriates	
	Production Manager	3,000,000
	Maintenance Engineer	2,400,000
	Grand (A+B-C+D+E) Total	9,562,000

Administration Cost

TISCO figures have been used except that insurance cost was calculated on fixed investments - minus incorporated fixed assets - resulting in 14.3 MM TShs, thus increasing the total administration cost by 10.1 MM to 14.6 MM.

Vehicle running expenses

35% of original cost = 3.5 MM

Repairs and Maintenance

Based on 2% and 4% for civil works and plant machinery.

Civil works	MM	7,100
Equipment	MM	42,150
	MM	49,250

ANNEX 10

PREOPERATIONAL EXPENSES

Item	Description	Cost TShs '000
1.	Consultancy fees	200
2.	Recruitment cost (15% increase)	28.75
3.	Legal fee + company charges	30
4.	Vehicle running expenses	172.80
5.	Salaries before production	1,120
6.	Training expenses	80
7.	Contingency (10%)	158.15
8.	Management of project implementation	1,789.70
9.	Interest, Commitment	70,293.85
	Total	72,082.85

COST OF OPERATION
(FULL CAPACITY)

Item	Component	TShs '000	
1.	Raw materials	711,257	
2.	Packaging materials	23,378	
3.	Fuel	3,600	
4.	Electricity	21,600	
5.	Water	60	
6.	Wages and Salaries	9,562	4,162 from 5th year
7.	Administration	14,600	
8.	Vehicle Running Cost	350	
9.	Repairs and Maintenance	49,250	836,807
10.	Contingency (5%)	41,840	
	Total	878,647	

ANNEX 12

WORKING CAPITAL

TShs '000

Item	Min. Reserves	Year 0	1	2	3	4	5
Raw Materials							
- Copper	4 mo. stock	22,498	29,996	37,496	37,496	37,496	37,496
- Separan	4 mo. stock	23	29	36	36	36	36
- Other imported materials	" " "	142,252	189,669	237,086	237,086	237,086	237,086
- Local materials	1 " "	976	1,340	1,630	1,630	1,630	1,630
Packaging materials	3 " "	3,495	4.660	5,825	5,825	5,825	5,825
Spares	80% of maintenance for 6 mo. (14,650 x .8)	11,723	11,723	11,723	11,723	11,723	11,723
Goods in process	1 week production cost	10,138	13,518	16,897	16,897	16,897	16,817
Finished stock	1 mo. production cost	43,932	58,576	73,220	73,220	73,220	72,873
Cash in hand	1 mo. salaries, wages	800	800	800	800	800	450
Debtors	1 mo. sales	88,905	118,540	148,175	148,175	148,175	148,175
	Sub-total	324,749	428,851	532,888	532,888	532,888	532,111
Less Creditors	1 mo. raw materials and packaging	36,726	46,969	61,211	61,211	61,211	61,211
	Total	288,016	379,882	471,677	471,677	471,677	470,900
Contingency 10%		28,802	37,988	47,168	47,168	47,168	47,090
Total Working Capital		316,818	417,870	518,845	518,845	518,845	517,990
Increase in Working Capital			101,057	100,975			-(855)

ANNEX 13

TOTAL CAPITAL REQUIREMENT

Item	Description	TShs '000
1.	Initial fixed investment cost	1,781,803
2.	Vehicles	10,120
3.	Fittings, furnitures	2,100
4.	Preoperational expenses	72,083
	Sub-total	1,866,106
5.	Working capital	316,818
	Total	2,182,924

ANNUAL SALES (AT FULL CAPACITY UTILIZATION)

ITEM/CONCENTRATION %	OUTPUT TONS/YR	PRICE TShs/Kg (US$=50 TShs)	TOTAL TShs '000
A. Copper Oxychloride (50)	3,000	87.5	262,500
B. Wettable Powders			
DDT (50)	1,800	170	306,000
Dieldrin (Aldrin 50/40)	400	475	190,000
BHC (Lindine) (40)	200	450	90,000
Endosulfan (35/50)	300	237	71,100
Carbaryl (50)	300	180	54,000
Total B	3,000		711,100
C. Herbicides			
Atrazine (50)	200	325	65,000
Terbutryn/ Metryn (20)	100	250	25,000
Paraquat (20)	200	350	70,000
Simazine (80)	300	450	135,000
Diquat (20)	200	300	60,000
Others	500	400	200,000
Total C	1,500		555,000
D. Granulars			
Endosulfane (4)	1,000	57	57,000
BHC (Lindane) (6.5)	500	125	62,500
Diazinon (5)	500	80	40,000
Total D	2,000		159,500
E. Caustic Soda (50)	1,800	50	90,000
Grand Total			1,778,100

ANNEX 15

DEPRECIATION SCHEDULE

TShs '000

ITEM	OPENING VALUE	Years 1	2	3	4	5	6	7	8	9	10	RESIDUAL VALUE
Civil Works 4% SL	335,300	13,412	13,412	13,412	13,412	13,412	13,412	13,412	13,412	13,412	13,412	201,180
Machinery, Equipment and incorporated fixed assets, DV 12.5%	1,484,310	185,539	162,346	142,053	124,297	108,759	95,164	83,269	72,860	63,752	55,783	390,485
Vehicles *, SL 25%	10,120	2,530	2,530	2,530	2,530	2,530	2,530	2,530	2,530	2,530	2,530	5,060
Furniture and Fittings, DV 12.5%	2,100	262	230	201	176	154	135	118	103	90	79	552
Preoperational Expenditures including import duties SL 20%	231,124	46,226	46,226	46,226	46,226	46,226						
Total	2,062,954	247,968	224,743	204,421	186,640	171,180	111,241	99,329	88,905	79,784	71,804	597,277

* assuming vehicle reinvestment every 4th year.

ANNEX 16

(all figures in 1,000 Tans. Sh.)

INCOME AND EXPENDITURE STATEMENT

Year/Capacity Utilisation	1 60%	2 80%	3 100%	4 100%	5 100%	6 100%	7 100%	8 100%	9 100%	10 100%
Income										
Copper Oxychloride (3000 tons)	157,500	210,000	262,500	262,500	262,500	262,500	262,500	262,500	262,500	262,500
Wettable Powders (3000 tons)	426,660	568,880	711,100	711,100	711,100	711,100	711,100	711,100	711,100	711,100
Herbicides (1500 tons)	333,000	444,000	555,000	555,000	555,000	555,000	555,000	555,000	555,000	555,000
Granules (2000 tons)	95,700	127,600	159,500	159,500	159,500	159,500	159,500	159,500	159,500	159,500
Caustic Soda (1800 tons)	54,000	72,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000
TOTAL SALES REVENUE	1,066,860	1,422,480	1,778,100	1,778,100	1,778,100	1,778,100	1,778,100	1,778,100	1,778,100	1,778,100
Expenditures										
Raw Materials:										
- Copper	67,494	89,992	112,490	112,490	112,490	112,490	112,490	112,490	112,490	112,490
- Techn. Pesticide Active Mater.	278,074	370,766	463,457	463,457	463,457	463,457	463,457	463,457	463,457	463,457
- Other Imported Chemicals	23,658	31,544	39,430	39,430	39,430	39,430	39,430	39,430	39,430	39,430
- Local Materials	57,528	76,704	95,880	95,880	95,880	95,880	95,880	95,880	95,880	95,880
Packing Material	14,027	18,702	23,378	23,378	23,378	23,378	23,378	23,378	23,378	23,378
Fuel	2,160	2,880	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600
Utilities (Water, Power)	12,996	17,328	21,660	21,660	21,660	21,660	21,660	21,660	21,660	21,660
Salaries and Wages	9,562	9,562	9,562	9,562	5,400	5,400	5,400	5,400	5,400	5,400
Administrative Overheads	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600
Vehicle Running Expenses	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500
Repairs and Maintenance	49,250	49,250	49,250	49,250	49,250	49,250	49,250	49,250	49,250	49,250
Contingency 5%	25,104	33,472	41,840	41,840	41,840	41,840	41,840	41,840	41,840	41,840
TOTAL PRODUCTION COST	527,188	702,917	878,647	878,647	874,485	874,485	874,485	874,485	874,485	874,485
Profit Before Depreciation + Inter.	539,672	719,563	899,453	899,453	903,615	903,6[illegible]	903,615	903,615	903,615	903,615
Depreciation	247,968	224,743	204,421	186,640	171,180	111,241	99,329	88,905	79,784	71,804
Interest	285,028	252,774	175,953	298,011	-	-	-	-	-	-
TOTAL EXPENDITURE	1,060,184	1,180,434	1,259,021	1,095,088	1,045,6[illegible]	985,726	973,814	963,390	954,269	946,289
Profit Before Tax	6,676	242,046	519,079	683,012	732,435	792,374	804,286	814,710	823,831	831,811
Corporation Tax 50%	-	-	27,539	341,506	366,218	396,187	402,143	407,355	411,915	415,906
Profit After Tax	6,676	242,046	491,540	341,506	366,218	396,187	402,143	407,355	411,915	415,906
Accumulated Profits	6,676	284,722	740,262	1,081,768	1,447,986	1,844,173	2,246,316	2,653,671	3,065,586	3,481,492

Tax allowance 20% on fix assets = T. Sh. 356,360,600

ANNEX 17

CAPITAL STRUCTURE OF THE INVESTMENT

Item	Total	% of Total
Initial Fixed Investment Cost	1,781,803	81.6
Vehicles	10,120	0.46
Fittings, Furnitures	2,100	0.1
Preoperational Expenses	72,083	3.3
Total Investment Cost	1,866,106	85.46
Initial Working Capital	316,818	14.59
Total Capital Requirement	2,182,924	100.00

PROPOSED FINANCING PATTERN

Item			T. Shs. '000
A) Fixed Assets and Preoperative Expenses			
Loan	60%		1,119,664
Equity	40%		746,442
		TOTAL	1,866,106
B) Initial Working Capital			
Bank Overdraft	75%		237,614
Equity	25%		79,204
			316,818
C) Long Term Loan (21% Interest)			1,119,664
Bank Overdraft (21% Interest)			237,614
		TOTAL LOAN	1,357,278
		TOTAL EQUITY	825,646
		TOTAL CAPITAL REQUIREMENT	2,182,924

ANNEX 18
T. Shs. '000

SOURCES AND APPLICATION OF FUNDS

	YEARS											
	-1	0	1	2	3	4	5	6	7	8	9	10
Sources												
Profit before interest and deprec.	-	-	539,672	719,563	899,453	899,453	903,615	903,615	903,615	903,615	903,615	903,615
Loans	26,312	1.093,352	-	-	-	-	-	-	-	-	-	-
Overdraft	-	237,614	-	-	-	-	-	-	-	-	-	-
Equity	703,395	122,251	-	-	-	-	-	-	-	-	-	-
TOTAL SOURCES	729,707	1.453,217	539,672	719,563	899,453	899,453	903,615	903,615	903,615	903,615	903,615	903,615
Applications												
Capital Expenditure	729,707	1,136,399	-	-	-	10,120	-	-	-	10,120	-	-
Working Capital	-	316,818	101,052	100,975	-	-	(855)	-	-	-	-	-
Cash	-	-	-	-	-	367,115	538,252	507,428	501,472	486,140	491,700	487,709
Tax	-	-	-	-	27,539	341,506	366,218	396,187	402,143	407,355	411,915	415,906
SUBTOTAL	729,707	1,453,217	101,052	100,975	27,539	727,741	903,615	903,615	903,615	903,615	903,615	903,615
Debt Service												
Loans	-	-	-	281,792	695,961	141,911	-	-	-	-	-	-
Bank Overdraft	-	-	153,592	84,022	-	-	-	-	-	-	-	-
Interest	-	-	285,028	252,744	175,953	29,801	-	-	-	-	-	-
Total Debt Service	-	-	438,620	618,588	871,914	171,712	-	-	-	-	-	-
TOTAL APPLICATIONS	729,707	1,453,217	539,672	719,563	899,453	899,453	903,615	903,615	903,615	903,615	903,615	903,615
Accumulated Cash	-	-	-	-	-	376,115	914,368	1,421,796	1,923,267	2,409,407	2,901,107	3,388,816
Necessary Working Capital	-	316,818	417,870	518,845	518,845	518,845	517,990	517,990	517,990	517,990	517,990	517,990

ANNEX 19
(T. Shs. '000)

LOANS AND BANK OVERDRAFT

Years	Loans			Bank Overdraft				Total Bank Credits		
	Inward Balance	Interest 21%	ADDS/REDS	Inward Balance	Interest 21%	ADDS/REDS	Interests	Reduction	Total Expend.	Additions
-1	-	-	26,312	-	-	-	-	-	-	26,312
0	-	-	1,093,352	-	-	237,614	-	-	-	1,330,966
1	1,119,664	235,129	-	237,614	19,449	(153,592)	285,025	153,592	438,617	-
2	1,119,664	235,129	(281,792)	84,022	17,645	(84,022)	252,774	365,814	618,588	-
3	837,872	175,953	(695,961)	-	-	-	175,953	695,961	871,914	-
4	141,911	29,801	(141,911)	-	-	-	29,801	141,911	171,712	-

ANNEX 20
T. Shs. '000

B A L A N C E   S H E E T

Fixed Assets	YEARS -1	0	1	2	3	4	5	6	7	8	9	10
Opening Balance	729,707	729,707	1,866,106	1,618,138	1,393,395	1,188,974	1,012,454	841,274	730,033	630,704	551,919	472,135
Additions	-	1,136,399	-	-	-	10,120	-	-	-	10,120	-	-
Total Fixed Assets	729,707	1,866,106	1,866,106	1,618,138	1,393,395	1,199,094	1,012,454	841,274	730,033	64,824	551,919	472,135
Less Depreciation	-	-	247,968	224,743	204,421	186,640	171,180	111,241	99,329	88,905	79,784	71,804
Closing Balance	729,707	1,866,106	1,618,138	1,393,395	1,188,974	1,012,454	841,274	730,033	630,704	551,919	472,135	400,331
Accumulated W/Capital	-	316,818	417,870	518,845	518,845	518,845	517,990	517,990	517,990	517,990	517,990	517,990
Accumulated Cash	-	-	-	-	-	376,115	914,368	1,421,796	1,923,268	2,409,408	2,901,107	3,388,817
TOTAL ASSETS	729,707	2,182,924	2,036,008	1,912,240	1,707,819	1,907,414	2,273,632	2,669,819	3,071,962	3,479,317	3,891,232	4,307,138
Financed by:												
Equity	703,395	825,646	825,646	825,646	825,646	825,646	825,646	825,646	825,646	825,646	825,646	825,646
Accumulated Profit	-	-	6,676	248,722	740,262	1,081,768	1,447,986	1,844,173	2,246,316	2,653,671	3,065,586	3,481,492
TOTAL EQUITY	703,395	825,646	832,322	1,074,368	1,565,908	1,907,414	2,273,632	2,669,819	3,071,962	3,479,317	3,891,232	4,307,138
Loans	26,312	1,119,664	1,119,664	837,872	141,911	-	-	-	-	-	-	-
Bank Overdraft	-	237,614	84,022	-	-	-	-	-	-	-	-	-
TOTAL EQUITY AND DEBTS	729,707	2,182,924	2,036,008	1,912,240	1,707,819	1,907,414	2,273,632	2,669,819	3,071,962	3,479,317	3,891,232	4,307,138

ANNEX 21
('000 T. Shs.)

INTERNAL RATE OF RETURN

Year	INVESTMENTS		Profit bef. Depreciation and Interest	Net Cash Flow	Tax	Net Value (after tax)
	Fixed Assets	Necessary Work. Capit.				
-1	(729,707)	-	-	(729,707)	-	(729,707)
0	(1,136,399)	(316,818)	-	(1,453,217)	-	(1,453,217)
1	-	(101,052)	539,672	438,620	-	438,620
2	-	(100,975)	719,563	618,588	-	618,588
3	-	-	899,453	899,453	27,539	871,914
4	(10,120)	-	899,453	889,333	341,506	547,827
5	-	855	903,615	904,470	366,218	538,252
6	-	-	903,615	903,615	396,187	507,428
7	-	-	903,615	903,615	402,143	501,472
8	(10,120)	-	903,615	893,495	407,355	486,140
9	-	-	903,615	903,615	411,915	491,700
10	597,277	517,990	903,615	2,018,882	415,906	1,602,976

IRR = 25.57%

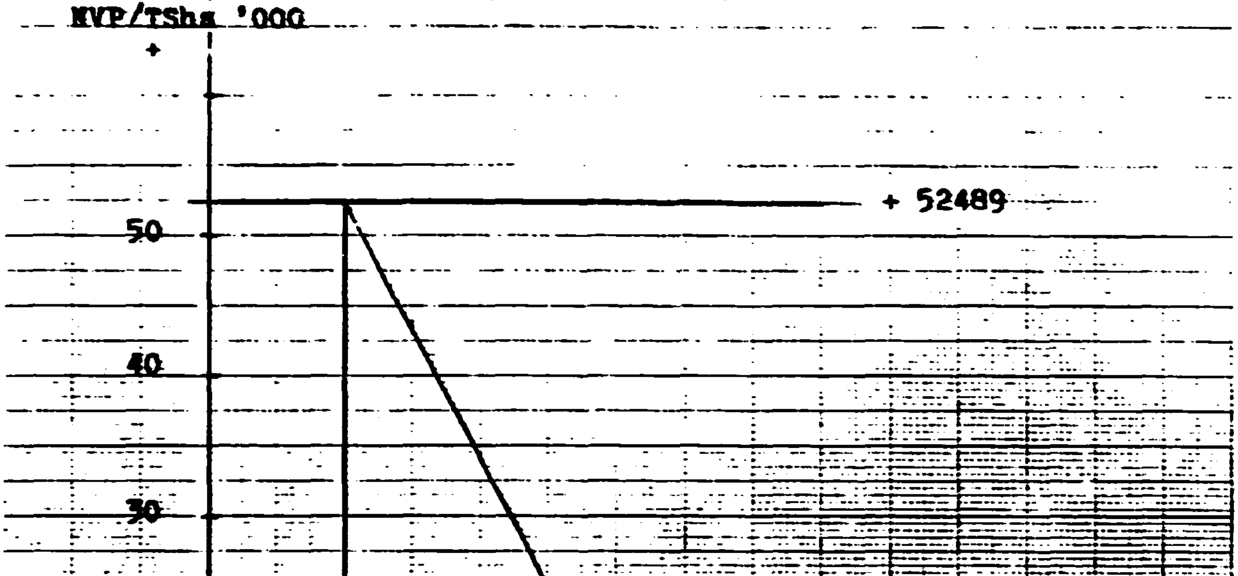
IRR (after tax) = 22.42%

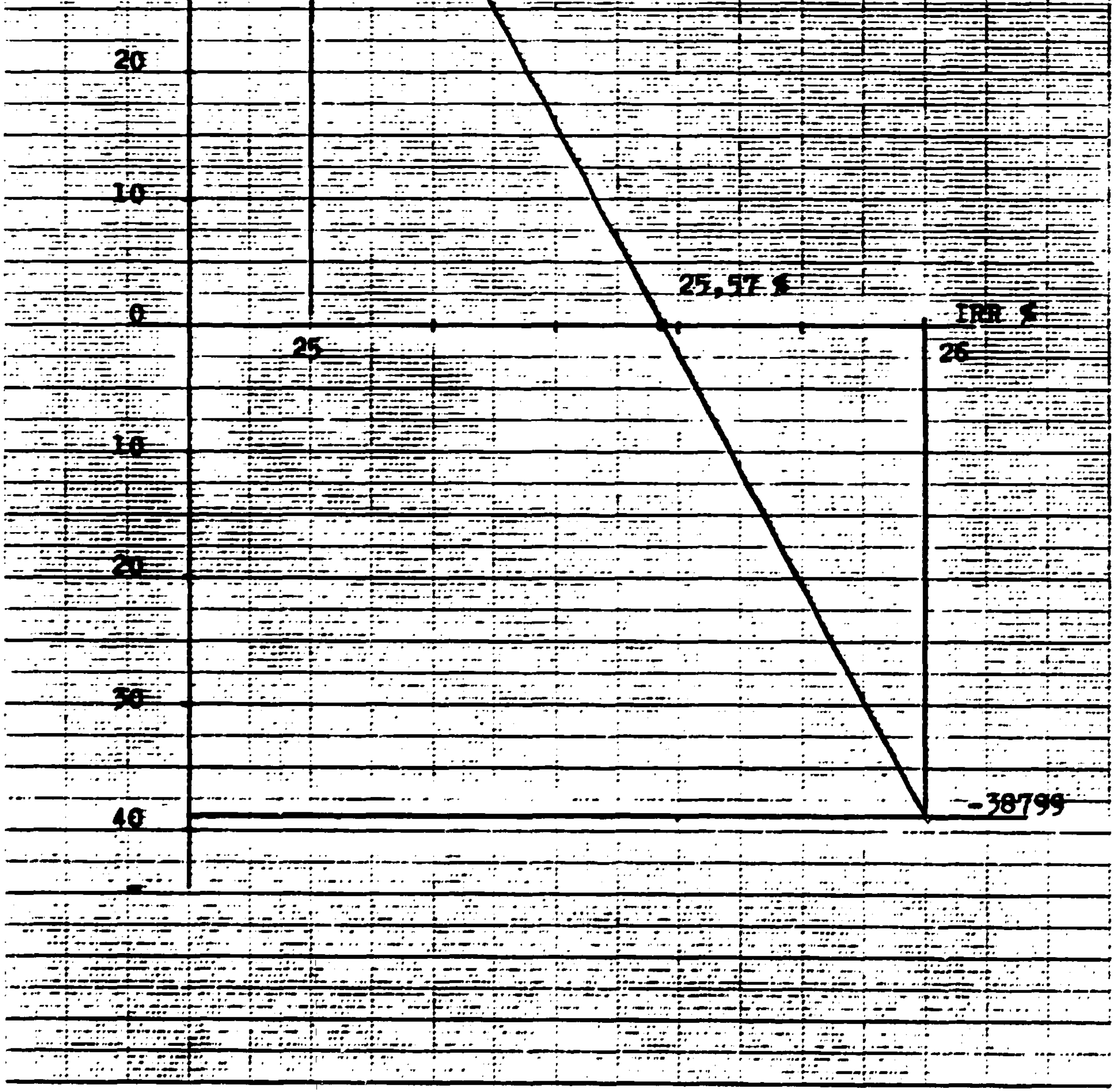
ANNEX 22
T. Shs. '000

INTERNAL RATE OF RETURN

Year	Before Tax					After Tax				
	Net Cash Flow	Disc. Factor at 25%	NPV	Disc. Factor at 26%	NPV	Net Cash Flow	Disc. Rate 22%	NPV	Disc. Rate 23%	NPV
-1	(729,707)	1.25	(912,133)	1.26	(919,431)	(729,707)	1.22	(890,242)	1.23	(897,540)
0	1.453,217	1.00	(1.453,217)	1.00	(1.453,217)	(1.453,217)	1.00	(1.453,217)	1.00	(1.453,217)
1	438,620	.800	350,896	.793,651	348,111	438,620	.819,672	359,525	.813,008	356,602
2	618,588	.640	395,896	.629,882	389,637	618,588	.671,862	415,605	.660,982	408,875
3	899,453	.512	460,519	.499,906	449,642	871,914	.550,707	480,169	.537,384	468,552
4	899,333	.4096	364,271	.396,751	352,843	547,827	.451,399	247,288	.436,897	239,343
5	904,470	.32,768	296,376	.314,882	284,801	538,252	.369,999	199,152	.355,201	191,187
6	903,615	.262,144	236,877	.249,906	225,819	507,428	.303,278	153,892	.288,781	146,536
7	903,615	.209,715	189,501	.198,338	179,259	501,472	.248,589	124,660	.234,782	177,737
8	893,495	.167,772	149,903	.157,411	140,645	486,140	.203,761	99,056	.190,879	92,794
9	903,615	.134,218	121,281	.124,930	112,888	491,700	.167,017	82,122	.155,187	76,306
10	2,018,882	.107,374	216,775	.099,150	200,878	1,602,976	.136,899	219,445	.126,168	202,244
			52,489		- 38,799			37,456		- 50,581

Internal Rate of Return
/Graphical Method/




20
10
0
10
20
30
40
25
25,57 %
IRR %
26
-38799

ANNEX 24

T. Shs. '000

PAYBACK PERIOD

Year	Profit After Tax	Depreciation	Total Cash Flow	Accumulated Cash
1	6,676	247,968	254,644	254,644
2	242,046	224,743	466,789	721,433
3	491,540	204,421	695,961	1,417,394
4	341,506	186,640	528,146	1,945,540
5	366,218	171,180	537,398	2,482,938
6	369,187	111,241	507,428	2,990,366
7	402,143	99,329	501,472	3,491,838
8	407,355	88,905	496,260	3,988,098
9	411,915	79,784	491,699	4,479,797
10	415,906	71,804	487,710	4,967,507

The initial investment capital requirement was T. Shs. 1,866,106. Payback period 3 years and 10.2 months of operaticn as scheduled or 6 years and a little more than 4 months after the starting date of the project.

ANNEX 25
T. Shs. '000

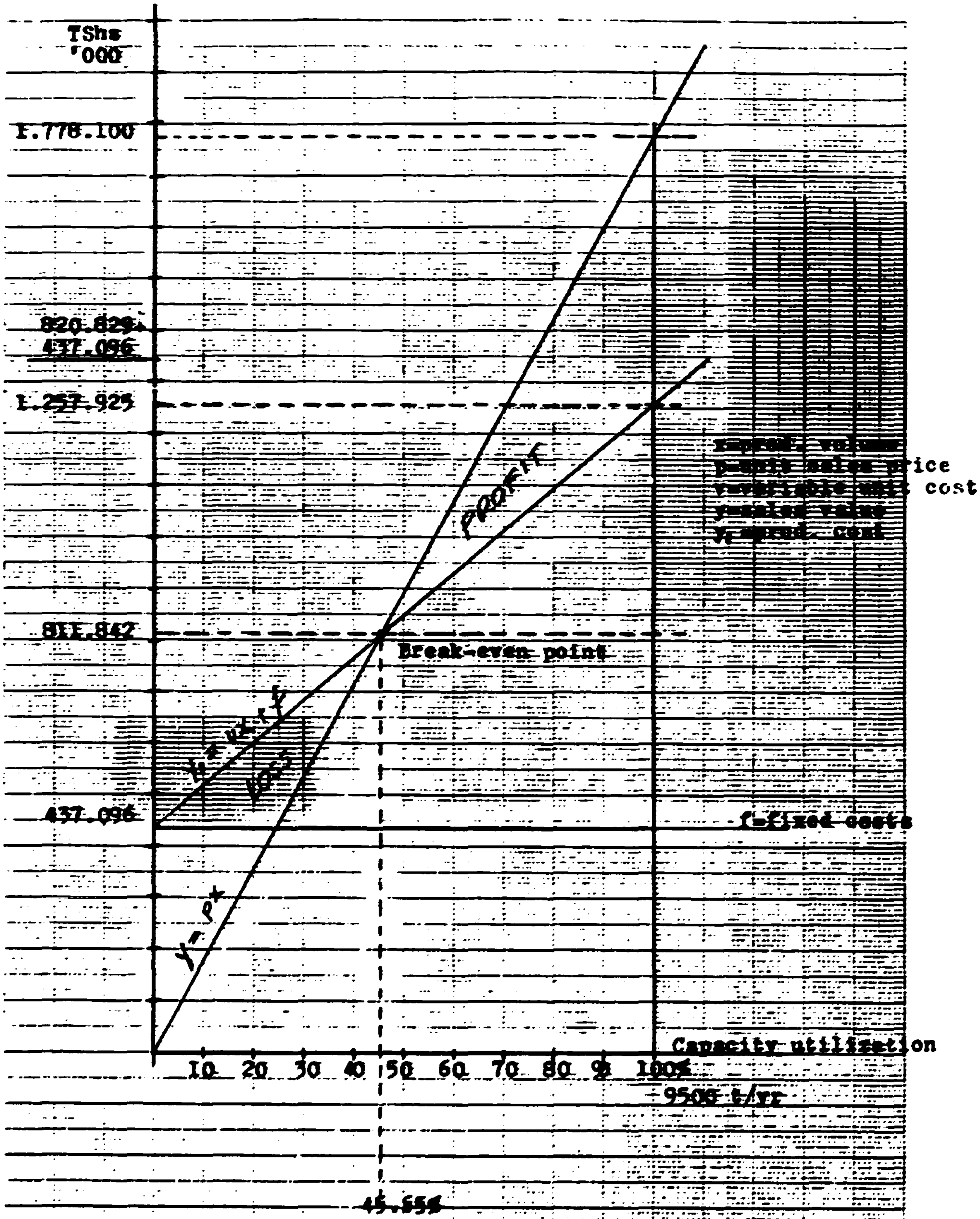
BREAKEVEN ANALYSIS

(3rd Year at Full Capacity)

Item	Fixed Costs	Variable Costs	Total Costs
Raw Material	-	711,257	711,257
Packing Material	-	23,378	23,378
Utilities	3,600	21,660	25,260
Salaries and Wages	9,562	-	9,562
Administration	14,600	-	14,600
Vehicle Running Expense	1,750	1,750	3,500
Repairs and Maintenance	24,625	24,625	49,250
Depreciation	204,421	-	204,421
Interest	175,953	-	175,953
Contingencies	2,585	38,159	40,744
	437,096	820,829	1,257,925

		T. Shs. '000
A.	Sales revenue	1,778,100
B.	Total variable costs	820,829
C.	Contribution margin	957,271
D.	Fixed costs	473,096
E.	Contribution ratio ($\frac{C}{A}$ x 100)	53.84%
F.	Breakeven sales (D/E)	811,842
G.	Breakeven capacity (F/A)	45.65%

Graphical Determination of the Break-even Point.



ANNEX 27

BREAKEVEN POINT AND SENSITIVITY ANALYSIS

$BEP = p\left(\frac{f}{p-v}\right)$

p = unit sales price (price/ton)
f = fixed cost
v = variable unit cost (cost/ton)

$p = \frac{1,778,100}{9,500} = 187,168$ / ton

f = 437,096

v = 86,400

BEP = T. Shs. 811,868,000

or expressed in capacity utilization

$BEP = \frac{f}{r-v}$ where r = total sales revenue at full production capacity
v = total variable cost

$BEP_c = 45.66\%$

A.) Assuming that the unit price (p) drops 20% to T. Shs. 149,734, the breakeven point rises to

BEP = T. Shs. 1,033,165,000

expressed in capacity utilization (r = 1,422,480)

BEP = 72.65%.

B.) Assuming that the raw material and packaging material cost increases by 20%, the BEP will cahnge as follows:

BEP = T. Shs. 967,658,000

expressed in capacity utilization

$BEP_c = 54.49\%$

Using the formula

$p_{be}x = vx + f$ p_{be} = selling price for unit (ton)

the unit selling price at which the project breaks even comes to

$p_{be} = 86,446$ / ton.

At full capacity utilization the project has a safety margin of

$$\frac{187,165 - 86,446}{187,165} \times 100 = 53,81\%$$

which is available for price variations and manipulations, should need arise.

ANNEX 28
T. Shs. '000

FOREIGN EXCHANGE SAVINGS

Year	-1	0	1	2	3	4	5	6	7	8	9	10
Foreign Exchange Inflow												
Import Substit. of Pest.*	-	-	1,066,860	1,422,480	1,778,100	1,778,100	1,778,100	1,778,100	1,778,100	1,778,100	1,778,100	1,778,100
Foreign Exchange Outflow												
Civil Works	35,400	35,400	-	-	-	-	-	-	-	-	-	-
Machinery cif	-	1,404,790	-	-	-	-	-	-	-	-	-	-
Vehicles	5,060	5,060	-	-	-	10,020	-	-	-	10,020	-	-
Other Invest. Cost	-	868	-	-	-	-	-	-	-	-	-	-
Operating Costs												
- Raw Materials	-	-	426,754	569,005	711,257	711,257	711,257	711,257	711,257	711,257	711,257	711,257
- Packaging Mat.	-	-	14,027	18,702	23,378	23,378	23,378	23,378	23,378	23,378	23,378	23,378
- Salaries	-	2,700	5,400	5,400	5,400	-	-	-	-	-	-	-
- Other	-	-	31,650	42,200	52,750	52,750	52,750	52,750	52,750	52,750	52,750	52,750
TOTAL OUTFLOW	40,460	1,448,818	488,381	635,307	792,785	787,385	787,385	787,385	787,385	787,385	787,385	787,385
Net Savings	(40,460)	(1,448,818)	578,479	787,173	985,315	990,715	990,715	990,715	990,715	990,715	990,715	990,715
Disc. Fact. at 22% Rate	1.22	1.00	.819,672	.671,862	.550,707	.451,399	.369,999	.303,278	.248,589	.203,761	.167,017	.136,899
Discounted Net Savings	(49,361)	(1,448,818)	474,163	528,871	542,529	447,207	366,563	300,462	246,280	201,869	165,466	135,628

NPV +1,910,859 (T. Shs. 1,910 million)

* Sales prices are based on CIF import prices, thus the import substitution equals sales prices.