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**UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION
(UNIDO)**

17029

**ESTABLISHMENT OF A PILOT
PESTICIDE FORMULATION PLANT
IN
ETHIOPIA**

(FINANCIAL AND ECONOMIC ANALYSES)

Final Report



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INDUSTRIAL PROJECTS SERVICE**

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PESTICIDE FORMULATION PLANT

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JUNE 1988

INDUSTRIAL PROJECTS SERVICE
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INTRODUCTION

The United Nations Industrial Development Organization (UNIDO), as part of its assistance for the establishment of a Pilot Pesticide Formulation Plant in Ethiopia, requested the Industrial Projects Service (IPS), to undertake the financial and economic analyses aspects of the study to be made on the project in its letter dated 13 February 1987 (for proposal No. 87/5 - project No UC/ETH/85/214-Assistance for the Establishment of a Pilot Pesticide Formulation Plant in Ethiopia).

IPS, appreciating the request, submitted its proposal on March 10, 1987 Ref. NO. IPS/0378/87, which UNIDO accepted and on the basis of which it awarded a contract to IPS which was then signed on April 24, 1987. Following the signing of the Contract, IPS deployed its financial and economic analyst supported by other in-house experts to conduct the financial and economic analyses.

The technical data including raw materials, engineering costs etc. were obtained from the UNIDO expert, with some adjustments made by the National Chemicals Corporation (NCC). The other data related to market and plant organization were provided by NCC. The last piece of information was submitted by NCC on January 28, 1988. Based on the data provided by the UNIDO expert and NCC, IPS conducted the financial and economic analyses which will be part of the feasibility study report to be compiled by NCC. The finding of the study is hereby submitted to UNIDO and NCC.

I. FINANCIAL AND ECONOMIC ANALYSES

A. FINANCIAL ANALYSIS

1. Some Major Assumptions

The prices of the machinery and equipment indicated in this study are based on 1987 prices as given by the pesticides expert. This information was obtained from the National Chemicals Corporation together with other cost estimates.

As far as prices of the raw materials and the selling prices of the output are concerned, the 1984-1987 prices as given by NCC were adopted in this study.

The life of the project is estimated to be 18 years, including a pre-production period of 3 years. It is assumed that the plant will attain full capacity on the third year of operation.

The financial statements and tables required for the financial analysis of the project are given in the appendix.

2. Total Initial Investment

The major breakdown of the total initial investment cost is shown in Table I.

TABLE I
SUMMARY OF THE TOTAL INITIAL INVESTMENT COST
('000 BIRR)

Cost Items	Currency		
	Foreign	Local	Total
Buildings and Civil Works	60.00	1439.10	1499.10
Machinery and Equipment	1007.20	345.40	1352.60
Transport and Material			
Handling Equipment	148.50	110.00	258.50
Office Furniture and Equipment	11.44	85.58	97.02
Pre-Production Expenditure	497.75	434.50	932.25
Total	1724.89	2414.58	4139.47

The foreign currency component of the total initial investment cost will be about 42%. About 58% of the total foreign currency requirement will be for machinery and equipment.

About 60% of the total local currency requirement is needed to finance the buildings and civil works. Of the total initial investment cost about 36% will be spent for buildings and civil works, about 33% for machinery and equipment, about 23% for pre-production expenditures and the rest 8% for vehicles and office equipment.

3. Working Capital Requirement

The following parameters were used to estimate the working capital requirements of the pesticides formulation plant.

<u>Items</u>	<u>Months of Coverage</u>
Cash in hand	0.5
Accounts receivable	1.0
Raw Materials - Foreign	6.0
Raw Materials - Local	1.0
Spare parts	12.0
Finished Products	2.0
Accounts Payable	1.0

The net working capital requirement at full capacity will be Birr 4.91 million of which Birr 3.73 million will be required in foreign currency. The net working capital will increase to Birr 4.92 million on the 9th year of production as a result of additional drums to be imported - reaching Birr 4.94 million on the 10th year of production.

4. Production Cost Estimation

The detailed production cost estimation is given in the Appendix. The production cost summary at full capacity is given in Table II.

TABLE II
PRODUCTION COST SUMMARY
(AT FULL CAPACITY - IN '000 BIRR)

Cost Items	Currency		
	Foreign	Local	Total
Main Raw Materials	5585.24	1889.50	7474.74
Other Raw Materials	976.05	621.01	1597.06
Repairs and Maintenance	46.27	46.69	92.96
Utilities	-	35.32	35.32
Labour	-	31.03	31.03
Depreciation	-	458.07	458.07
Administrative Overheads	-	199.10	199.10
Total	6607.56	3280.72	9888.28

Of the total production cost, about 69% will be required in foreign currency which will be mainly the cost of raw materials and inputs. The other costs will include costs of utilities, labour, and administrative overheads.

5. Financing

Although the financial analysis was computed on a total investment basis without any outside financing, the following calculations were carried out to determine the

capital structure and to assess the maximum borrowing capacity of the new plant. In this connection, a debt service ratio of 2:1 was used, meaning the plant can repay only one-third of the net cash surplus after tax when the plant runs at an optimal capacity. Similarly, an interest cover ratio of 4:1 was used, implying that the capacity of the plant to pay interest should not exceed more than 20% of the net cash surplus before tax. Thus, taking production year 3 as base, the following results were attained.

	<u>'000 BIRR</u>
Net Sales	13,550.00
Operating Costs	<u>9,430.21</u>
Net Cash Surplus before tax	4,119.79
Tax	<u>1,830.86</u>
Net Cash Surplus after tax	2,288.93
Annual loan repayment capacity	823.96
Annual interest repayment capacity	762.98

The above results indicate that the maximum borrowing capacity of the project will be about Birr 7.55 million, repayable in 10 years at an interest rate of 11% per annum. The borrowing capacity of the plant is very high as a result of its high liquidity position.

6. Internal Rate of Return (IRR)

The pesticides formulation plant will be financially viable, with an IRR of 24.83% and a net present value of Birr 7.72 million discounted at 10% p.a.

The selling prices assumed in the financial analysis, as obtained from NCC, were the following:

TABLE III
SELLING PRICES OF END PRODUCTS

Product		Price/m ³ (Birr)
Endosulfan	35 EC	10100
Endosulfan	25 ULV	10100
Dimethoate	40 EC	8100
Dimethoate	40 ULV	8100
Malathion	50 EC	7100
Fenithrotion	50 EC	10100
Diazinon	60 EC	13100

The selling prices seem a little bit on the high side and in order to see the adverse effect on the viability of the project, sensitivity analysis on selling prices was carried out.

7. Break-even Analysis

The break-even point would be reached at a production of 225 m³ of pesticides. The total revenue generated at the break-even point would be about Birr 2 million. In a nut shell the plant would break-even at a capacity utilization of about 15%.

8. Sensitivity Analysis

The sensitivity of the project to some adverse changes has been analysed and the results are indicated in Table IV.

TABLE IV
SUMMARY OF SENSITIVITY ANALYSIS

Changes	IRR%	NPV ('000 BIRR)
20% higher investment cost	22.53	7172.21
10% higher operating costs	17.98	4295.00
20% higher raw material and inputs prices	12.02	1126.78
15% lower selling price	11.94	980.68
20% lower selling price	7.46	-1266.06

The project is very sensitive to selling price. A 15% decrease in the selling price reduces the IRR from 24.83% to 11.94%. In addition to selling price the project is also sensitive to an increase in raw materials and inputs costs.

A 20% increase in materials and inputs costs reduces the IRR from 24.83% to 12.02%.

On the other hand, the project is not very sensitive to an increase in investment costs. A 20% increase in investment costs reduced the IRR from 24.83% to only 22.53%.

B. ECONOMIC ANALYSIS

The viability of the project from the national economic point of view was assessed using the guidelines set by the Development Projects Study Agency (DPSA). The following standard factors were used to convert the market prices to accounting prices.

Imported goods and service	1.00
Local goods and service	0.75
Skilled labour	0.75
Unskilled labour	0.50
Taxes and subsidies	0.00

Accordingly the economic rate of return turned out to be 35.11%, with a net present value of Birr 12.59 million discounted at 10% p.a.

The project will create employment for about 60 people.

A P P E N D I X A

APPENDIX A
FINANCIAL ANALYSIS
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TABLE A.1
ANNUAL REQUIREMENT OF MATERIALS AND INPUTS
(BASED ON THE RECIPE GIVEN BY NCC)

Items	Tons
Endosulfan Tech.	239.30
Malathion Tech.	236.70
Dimethoate Tech.	84.20
Fenithrotion Tech.	26.30
Diazinon Tech.	31.40
Xylene (Solvent I)	165.00
Cyclohexanone (Solvent II)	329.00
White Spirit (Solvent III)	399.00
Emulsifier	43.00
Epichlorohydrin	11.50

TABLE A.2
BREAKDOWN OF FOREIGN AND LOCAL COST OF
MATERIALS AND INPUTS
(BIRR)

Items	F.O.B Price	Local Costs	Total Cost Per Ton
Endosulfan Tech.	13,000	4366.62	17,366.62
Malathion Tech.	5,300	1,822.54	7,122.54
Dimethoate Tech.	6,300	2,152.94	8,452.94
Fenithrotion Tech.	8,900	3,011.98	11,911.98
Diazinon Tech.	14,500	4,862.22	19,362.22
Xylene (Solvent I)	1,800	666.14	2,466.14
Cyclohexanone (Solvent II)	900	368.78	1,268.78
White Spirit (Solvent III)	-	650.00	650.00
Emulsifier	6,900	2,351.18	9,251.18
Ephichlorohydrin	7,500	2,549.42	10,049.42

TABLE A.3
ANNUAL COST OF MATERIALS AND INPUTS

Items	Quantity Tons	Cost ('000 Birr)		
		F.c	L.C.	Total
Endosulfan Tech.	239.30	3110.90	1044.93	4155.83
Malathion Tech.	236.70	1254.51	431.40	1685.91
Dimethoate Tech.	84.20	530.46	181.28	711.74
Fenithrotion Tech.	26.30	234.07	79.22	313.29
Diazinon Tech.	31.40	455.30	152.67	607.97
Xylene (Solvent I)	165.00	297.00	109.91	406.91
Cyclohexane (Solvent II)	329.00	296.10	121.33	417.43
White Spirit (Solvent III)	399.00	-	259.35	259.35
Emulsifier	43.00	296.70	101.10	397.80
Epichlorohydrin	11.50	86.25	29.32	115.57
Total		6561.29	2510.51	9071.80

SOURCE: NCC

TABLE A.4
MANPOWER REQUIRMEENT AND ANNUAL WAGE BILL

Position	Number	Monthly Salary (Birr)	Total (Birr)
I. <u>Administrative Staff</u>			
General Manager	1	1500	1500
Secretary	1	500	500
Administrator	1	1000	1000
Clerk - Administration	1	400	400
Chief Accountant	1	1000	1000
Senior Accountant	1	800	800
Cashier	1	350	350
Accounts Clerk	2	450	900
Commercial head	1	1000	1000
Sales Officer	1	800	800
Procurement Officer	1	500	500
Clerks (Procurement)	2	400	800
Stores Head	1	500	500
Clerks (Stores)	2	300	600
Chief Guard	1	250	250
Guards	5	100	500
Secretary-Typists	3	450	1350
Cleaners	2	60	120
Messenger	1	60	60
Telephone Operators	2	200	400
Drivers	3	200	600
Nurse	1	500	500
Transport Officer	1	500	500
Guardner	1	100	100
Sub-total	37		15030

TABLE A.4 (Cont'd)

Position	Number	Monthly Salary (Birr)	Total (Birr)
II. <u>Production & Maintenance Staff</u>			
Technical Manager	1	1200	1200
Production Head	1	1000	1000
Maintenance Head	1	700	700
Formulation Supervisors	2	500	1000
Packing Supervisors	2	450	900
Mechanics	2	450	900
Electricians	2	450	900
Welders	2	400	800
Helpers	2	250	500
Quality Control Officer	1	1000	1000
Laboratory Technician	2	400	800
Formulation Chemist	1	800	800
Site Engineer	1	1200	1200
Forklift Operator	1	250	250
Sub Total	21		11950
Total	58		26980
Employees benefits (15%)			4047
Grand Total	58		31027

SOURCE: National Chemicals Corporation

TABLE A.4 (Cont'd)

Utilities	Annual Requirement	Variable	Fixed	Total
Electricity	160,000 Kwh	28424	5016	33440
Water	3750 Cu.m.	1406	469	1875
Total		29830	5485	35315

Repairs and Maintenance Cost

	Cost (Birr)		
	F.C	L.C.	Total
Machinery and equipment (3% Foreign) (2% Local)	30.22	6.91	37.13
Building and Civil Works (2%)	1.20	28.78	29.98
Vehicles (10%)	14.85	11.00	25.85
Total	46.27	46.69	92.96

<u>Administrative Overhead Costs</u>	<u>Total Birr</u>
Telephone	6,000
Office Supplies	10,000
Travel and Perdiem	10,000
Audit Fees	10,000
Corporation Contribution	120,000
Insurance	25,000
(Contingency 10%)	18,100
	199,100
	199,100

TABLE A.5
REVENUE FROM SALES AT FULL CAPACITY
(YEAR 3 - YEAR 17)

Product	Quantity (M ³)	Selling Price Per M ³ (Birr)	Revenue ('000 Birr)
Endosulfan 35 EC	400	10,100	4040
Endosulfan 25 ULV	350	10,100	3535
Malathion 50 EC	450	7,100	3195
Dimethoate 40EC	100	8,100	810
Dimethoate 40 ULV	100	8,100	810
Fenithrothion 50 EC	50	10,100	505
Diazinon 60 EC	50	13,100	655
Total	1500		13550

TABLE A.5
LANDED COSTS OF END PRODUCTS
IN BIRR PER KILO LITRE (M³)
(1984 - 1987)

Product Type	Landed Costs			
	1984	1985	1986	1987
Endosulfan 35 EC	7490	7380	11850	10080
Endosulfan 25 ULV	7010	7350	10040	9320
Dimethoate 40 EC	N.A.	N.A.	N.A.	N.A.
Dimethoate 40 ULV	5990	6730	7395	N.A.
Malathion 50 EC	5920	6070	5400	6990
Fenithroton 50 EC	N.A.	N.A.	N.A.	N.A.
Diazinon 60 EC	14800	N.A.	N.A.	12720

N.A. = Data not available

SOURCE: Ministry of State Farms Development

TABLE A.7
F.O.B. PRICES OF END PRODUCTS

Product Type	Y E A R				Remarks
	1984	1985	1986	1987	
Endosulfan 35 EC	6500	5980	9470	7440	N.A = Not Available
Endosulfan 25 ULV	5410	5650	8130	6920	
Dimethoate 40 EC	N.A.	N.A.	N.A.	N.A.	
Dimethoate 40 ULV	5070	5290	5800	N.A.	
Malathion 50 EC	3620	3690	4120	5330	
Fenithrothion 50 EC	N.A.	N.A.	N.A.	N.A.	
Diazinon 60 EC	11990	N.A.	N.A.	9930	

SOURCE: Ministry of State Farms Development

TABLE A.8
ANNUAL DRUMS REQUIREMENT POSITION

Sources/Disposal of Drums	Y E A R S														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
A. Excess drums b/d from immediate previous year	-	-	3477	7689	7455	6407	4702	3034	1366	-	-	-	-	-	-
B. Imported drums containing raw materials*	4383	5249	5832	5832	5832	5832	5832	5832	5832	5832	5832	5832	5832	5832	5832
C. Recycled drums after allowing 10% for losses distributed equally between the two recycling periods	-	5353	6130	6787	6750	6750	6750	6750	6750	6750	6750	6750	6750	6750	6750
D. Drums released from finished Products and receivables	-	1875	2250	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500
E. Drums tied-up in finished products and receivables	1875	2250	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500
F. Drums required for finished Products	5635	6750	7500	7500	7500	7500	7500	7500	7500	7500	7500	7500	7500	7500	7500
G. Out of service drums (after being recycled for two years)	-	-	-	5353	6130	6787	6750	6750	6750	6750	6750	6750	6750	6750	6750
H. Excess (shortage of) drums (required imports) (A+B+C+D) - (E+F+G)	(3127)	3477	7689	7455	6407	4702	3034	1366	(302)	(1668)	(1668)	(1668)	(1668)	(1668)	(1668)

* This quantity does not include drums containing raw materials (stocks) for following year's production.

SOURCE: National Chemicals Corporation.

TABLE A.9

NOTES ON THE COMPUTATION OF RECYCLED DRUMS

	Y E A R S														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
A. Total recycled drums (if no losses)	-	5635	6750	7500	7500	7500	7500	7500	7500	7500	7500	7500	7500	7500	7500
B. Less 5% losses of total during first recycling	-	282	338	375	375	375	375	375	375	375	375	375	375	375	375
C. Less another 5% losses of total during second recycling	-	-	282	338	375	375	375	375	375	.75	375	375	375	375	375
Net recycled drums (A) - (B + C)	-	5353	6130	6787	6750	6750	6750	6750	6750	6750	6750	6750	6750	6750	6750

SOURCE: National Chemicals Corporation.

TABLE A.10



----- COMFAR 2.1 - INDUSTRIAL PROJECTS SERVICE, ADDIS ABABA -----

Total Initial Investment in '000 Birr

Year	1	2
Fixed investment costs		
Land, site preparation, development	0.00	0.00
Buildings and civil works	686.00	813.10
Auxiliary and service facilities	104.50	154.00
Incorporated fixed assets	37.29	59.73
Plant machinery and equipment	334.20	1010.40
Total fixed investment costs	1161.99	2045.23
Pre-production capital expenditures.	250.69	681.56
Net working capital	0.00	0.00
Total initial investment costs	1412.68	2726.79
Of it foreign, in \$	40.07	42.50

Pesticides Formulation Plant --- Financial Analysis

TABLE A.11



COMFAR 2.1 - INDUSTRIAL PROJECTS SERVICE, ADDIS ABABA

Total Current Investment in '000 Birr

Year	3	4	5	6-7	8	9
Fixed investment costs						
Land, site preparation, development	0.00	0.00	0.00	0.00	0.00	0.00
Buildings and civil works	0.00	0.00	0.00	0.00	0.00	0.00
Auxiliary and service facilities	0.00	0.00	0.00	0.00	180.00	0.00
Incorporated fixed assets	0.00	0.00	0.00	0.00	4.00	1.00
Plant, machinery and equipment	0.00	0.00	0.00	0.00	0.00	0.00
Total fixed investment costs	0.00	0.00	0.00	0.00	184.00	1.00
Preproduction capitale expenditures.	0.00	0.00	0.00	0.00	0.00	0.00
Working capital	3750.24	678.51	485.99	0.00	0.00	0.00
Total current investment costs	3750.24	678.51	485.99	0.00	184.00	1.00
Of it foreign, %	74.91	81.42	76.15	0.00	53.26	0.00

Pesticides Formulation Plant --- Financial Analysis

TABLE A.11 (Cont'd)

----- CONPAD 2.1 - INDUSTRIAL PROJECTS SERVICE, ADDIS ABABA -----

Total Current Investment in '000 Birr

Year	10-11	12	13	14
Fixed investment costs				
Land, site preparation, development	0.00	0.00	0.00	0.00
Buildings and civil works	0.00	0.00	0.00	0.00
Auxiliary and service facilities	0.00	0.00	235.00	0.00
Incorporated fixed assets	0.00	0.00	25.60	6.40
Plant, machinery and equipment	0.00	0.00	0.00	0.00
Total fixed investment costs	0.00	0.00	260.60	6.40
Preproduction capitals expenditures.	0.00	0.00	0.00	0.00
Working capital	0.00	4.53	20.49	-25.02
Total current investment costs	0.00	4.53	281.09	-18.62
Of it foreign, %	0.00	0.00	48.03	0.00

Pesticides Formulation Plant --- Financial Analysis

TABLE A.12



COMFAR 2.1 - INDUSTRIAL PROJECTS SERVICE, ADDIS ABABA

Total Production Costs in '000 Birr		3	4	5-7	8	9	10-11
Year							
% of nom. capacity (single product).	74.96	89.96	100.00	100.00	100.00	100.00	100.00
Raw material 1	5804.08	6724.51	7474.74	7474.74	7474.74	7474.74	7474.74
Other raw materials	1385.12	1436.76	1597.06	1597.06	1597.06	1597.06	1597.06
Utilities	28.25	32.48	35.32	35.32	35.32	35.32	35.32
Energy	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Labour, direct	23.27	27.92	31.03	31.03	31.03	31.03	31.03
Repair, maintenance	23.24	23.24	23.24	23.24	23.24	23.24	23.24
Spares	69.72	69.72	69.72	69.72	69.72	69.72	69.72
Factory overheads	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Factory costs	7134.27	8314.63	9231.11	9231.11	9231.11	9231.11	9231.11
Administrative overheads	161.74	184.11	199.10	199.10	199.10	199.10	199.10
Indir. costs, sales and distribution	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Direct costs, sales and distribution	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Depreciation	458.07	458.07	458.07	219.92	219.92	256.32	256.42
Financial costs	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total production costs	7754.08	8956.81	9888.28	9850.13	9866.53	9866.63	9866.63
Costs per unit (single product)	0.76	0.73	0.73	0.71	0.71	0.71	0.71
Of it foreign, %	67.96	69.03	69.19	69.56	69.50	69.50	69.50
Of it variable, %	89.74	93.21	93.85	96.17	95.81	95.81	95.81
Total labour	23.27	27.92	31.03	31.03	31.03	31.03	31.03

Pesticides Formulation Plant --- Financial Analysis

TABLE A.12 (Cont'd)



COMFAR 2.1 - INDUSTRIAL PROJECTS SERVICE, ADDIS ABABA

	12	13	14	15-17
Total Production Costs in '000 Birr				
Year	12	13	14	15-17
3 of 300 capacity (single product).	100.00	100.00	100.00	100.00
Raw material 1	7474.74	7474.74	7474.74	7474.74
Other raw materials	1615.16	1697.14	1597.06	1597.66
Utilities	35.32	35.32	35.32	35.32
Energy	0.00	0.00	0.00	0.00
Labour, direct	31.03	31.03	31.03	31.03
Repair, maintenance	23.24	23.24	23.24	23.24
Spare	69.72	69.72	69.72	69.72
Factory overheads	0.00	0.00	0.00	0.00
Factory costs	9249.23	9331.19	9231.11	9231.11
Administrative overheads	199.10	199.10	199.10	199.10
Indir. costs, sales and distribution	0.00	0.00	0.00	0.00
Direct costs, sales and distribution	0.00	0.00	0.00	0.00
Depreciation	256.42	111.45	125.01	125.65
Financial costs	0.00	0.00	0.00	0.00
Total production costs	9704.75	9641.75	9555.22	9555.07
Costs per unit (single product)				
Of it foreign, \$	0.72	0.71	0.71	0.71
Of it variable, \$	69.37	30.77	69.47	69.46
Of it variable, \$	95.63	96.25	97.12	97.12
Total labour	31.03	31.03	31.03	31.03

Pesticides Formulation Plant --- Financial Analysis

TABLE A.13



COMFAR
CENTRAL OFFICE FOR
MANAGEMENT OF FINANCIAL RESOURCES

----- COMPAR 2.1 - INDUSTRIAL PROJECTS SERVICE, ADDIS ABABA -----

Net Working Capital in '000 Birr							
Year			3	4	5	6-11	12
Coverage	ndc	coto					
Current assets &							
Accounts receivable	30	12.0	608.00	708.23	785.85	785.85	787.36
Inventory and materials	130	2.0	2471.56	2946.62	3275.37	3275.37	3276.88
Energy	0	---	0.00	0.00	0.00	0.00	0.00
Spares	194	1.9	37.62	37.62	37.62	37.62	37.62
Work in progress	0	---	0.00	0.00	0.00	0.00	0.00
Finished products	60	6.0	1216.00	1416.46	1571.70	1571.70	1574.72
Cash in hand	15	24.0	11.58	12.71	13.46	13.46	13.46
Total current assets			4344.76	5121.64	5884.00	5884.00	5890.04
Current liabilities and							
Accounts payable	30	12.0	594.52	692.89	769.26	769.26	770.77
Net working capital			3750.24	4428.75	4914.74	4914.74	4919.27
Increase in working capital			3750.24	678.51	485.99	0.00	4.53
Net working capital, local			941.88	1067.17	1183.07	1183.07	1187.60
Net working capital, foreign			2809.16	3361.58	3731.67	3731.67	3731.67

Note: ndc = minimum days of coverage ; coto = coefficient of turnover .

TABLE A.13 (Cont'd)

----- COMPAR 2.1 - INDUSTRIAL PROJECTS SERVICE, ADDIS ABABA -----

Net Working Capital in '000 Birr

Year			13	14	15-17
Coverage	ndc	coto			
Current assets &					
Accounts receivable	30	12.0	794.19	785.85	785.85
Inventory and materials	130	2.8	3283.71	3275.37	3275.37
Energy	0	---	0.00	0.00	0.00
Spares	194	1.9	37.62	37.62	37.62
Work in progress	0	---	0.00	0.00	0.00
Finished products	60	6.0	1588.38	1571.70	1571.70
Cash in hand	15	24.0	13.46	13.46	13.46
Total current assets			5717.36	5684.00	5684.00
Current liabilities and					
Accounts payable	30	12.0	777.60	769.26	769.26
Net working capital			4939.76	4914.74	4914.74
Increase in working capital			20.49	-25.02	0.00
Net working capital, local			1288.09	1183.07	1183.07
Net working capital, foreign			3731.67	3731.67	3731.67

Note: ndc = minimum days of coverage ; coto = coefficient of turnover .

TABLE A.14



COMFAR
21 CENTRE

----- COMFAR 2.1 - INDUSTRIAL PROJECTS SERVICE, ADDIS ABABA -----

Cashflow Tables, construction in '000 Birr

Year	1	2
Total cash inflow . .	1412.68	2726.79
Financial resources .	1412.68	2726.79
Sales, net of tax . .	0.00	0.00
Total cash outflow . .	1412.68	2726.79
Total assets	1412.68	2726.79
Operating costs . . .	0.00	0.00
Cost of finance . . .	0.00	0.00
Repayment	0.00	0.00
Corporate tax	0.00	0.00
Dividends paid . . .	0.00	0.00
Surplus (deficit) .	0.00	0.00
Cumulated cash balance	0.00	0.00
Inflow, local	846.68	1567.90
Outflow, local	846.68	1567.90
Surplus (deficit) .	0.00	0.00
Inflow, foreign . . .	566.00	1158.89
Outflow, foreign . . .	566.00	1158.89
Surplus (deficit) .	0.00	0.00
Net cashflow	-1412.68	-2726.79
Cumulated net cashflow	-1412.68	-4139.47

TABLE A.14 (Cont'd)



COMPAR 2.1 - INDUSTRIAL PROJECTS SERVICE, ADDIS ABABA

Cashflow tables, production in '000 Birr

Year	3	4	5	6	7	8
Total cash inflow	10754.52	12280.36	13626.37	13550.00	13550.00	13550.00
Financial resources	594.52	98.36	76.37	0.00	0.00	0.00
Sales, net of tax	10160.00	12180.00	13550.00	13550.00	13550.00	13550.00
Total cash outflow	12843.74	10892.21	11823.44	11261.07	11261.07	11564.15
Total assets	4344.76	776.87	562.37	0.00	0.00	184.00
Operating costs	7296.02	8496.74	9430.21	9430.21	9430.21	9430.21
Cost of finance	0.00	0.00	0.00	0.00	0.00	0.00
Repayment	0.00	0.00	0.00	0.00	0.00	0.00
Corporate tax	1282.96	1616.59	1830.86	1830.86	1830.86	1949.94
Dividends paid	0.00	0.00	0.00	0.00	0.00	0.00
Surplus (deficit)	-2089.21	1396.15	1802.93	2288.93	2288.93	1985.85
Cumulated cash balance	-2089.21	-693.06	1109.87	3398.80	5687.73	7673.58
Inflow, local	10340.69	12206.45	13571.49	13550.00	13550.00	13550.00
Outflow, local	4654.71	4308.87	4790.90	4653.51	4653.51	4858.59
Surplus (deficit)	5685.97	7897.58	8780.59	8896.49	8896.49	8691.41
Inflow, foreign	413.84	81.92	54.88	0.00	0.00	0.00
Outflow, foreign	8189.02	6583.34	7032.53	6607.56	6607.56	6785.56
Surplus (deficit)	-7775.19	-6501.43	-6977.65	-6607.56	-6607.56	-6705.56
Net cashflow	-2089.21	1396.15	1802.93	2288.93	2288.93	1985.85
Cumulated net cashflow	-6228.66	-4832.53	-3029.60	-740.67	1548.26	3534.11

Pesticides Formulation Plant --- Financial Analysis



TABLE A.14 (Cont'd)

COMFAR 2.1 - INDUSTRIAL PROJECTS SERVICE, ADDIS ABABA

Cashflow tables, production in '000 Birr

Year	9	10	11	12	13	14
Total cash inflow	13550.00	13550.00	13550.00	13551.51	13556.83	13550.00
Financial resources	0.00	0.00	0.00	1.51	6.83	0.00
Sales, net of tax	13550.00	13550.00	13550.00	13550.00	13550.00	13550.00
Total cash outflow	11362.95	11361.90	11361.90	11377.00	11772.34	11408.98
Total assets	1.00	0.00	0.00	6.04	287.92	-26.96
Operating costs	9430.21	9430.21	9430.21	9448.33	9530.29	9430.21
Cost of finance	0.00	0.00	0.00	0.00	0.00	0.00
Repayment	0.00	0.00	0.00	0.00	0.00	8.94
Corporate tax	1931.74	1931.69	1931.69	1922.63	1954.13	1997.39
Dividends paid	0.00	0.00	0.00	0.00	0.00	0.00
Surplus (deficit)	2187.05	2188.10	2188.10	2174.51	1784.49	2141.02
Cumulated cash balance	9860.83	12048.73	14236.84	16411.35	18195.85	20336.87
Inflow, local	13550.00	13550.00	13550.00	13551.51	13556.83	13550.00
Outflow, local	4755.39	4754.34	4754.34	4769.44	5029.78	4801.42
Surplus (deficit)	8794.61	8795.66	8795.66	8782.07	8527.05	8748.58
Inflow, foreign	0.00	0.00	0.00	0.00	0.00	0.00
Outflow, foreign	6607.56	6607.56	6607.56	6607.56	6742.56	6607.56
Surplus (deficit)	-6607.56	-6607.56	-6607.56	-6607.56	-6742.56	-6607.56
Net cashflow	2187.05	2188.10	2188.10	2174.51	1784.49	2141.02
Cumulated net cashflow	5721.16	7909.27	10097.37	12271.88	14056.38	16197.40



----- COMPAR 2.1 - INDUSTRIAL PROJECTS SERVICE, ADDIS ABABA -----

TABLE A.14 (Cont'd)

Cashflow tables, production in '000 Birr		15	16	17
Year				
Total cash inflow	13550.00	13550.00	13550.00	13550.00
Financial resources	0.00	0.00	0.00	0.00
Sales, net of tax	13550.00	13550.00	13550.00	13550.00
Total cash outflow	11427.28	11427.28	11427.28	11427.28
Total assets	0.00	0.00	0.00	0.00
Operating costs	9430.21	9430.21	9430.21	9430.21
Cost of finance	0.00	0.00	0.00	0.00
Repayment	0.00	0.00	0.00	0.00
Corporate tax	1997.07	1997.07	1997.07	1997.07
Dividends paid	0.00	0.00	0.00	0.00
Surplus (deficit)	2122.72	2122.72	2122.72	2122.72
Cumulated cash balance	22459.59	24582.31	26705.04	28705.04
Inflow, local	13550.00	13550.00	13550.00	13550.00
Outflow, local	4819.72	4819.72	4819.72	4819.72
Surplus (deficit)	8730.28	8730.28	8730.28	8730.28
Inflow, foreign	0.00	0.00	0.00	0.00
Outflow, foreign	6607.56	6607.56	6607.56	6607.56
Surplus (deficit)	-6607.56	-6607.56	-6607.56	-6607.56
Net cashflow	2122.72	2122.72	2122.72	2122.72
Cumulated net cashflow	10320.12	20442.84	22565.56	22565.56

----- Pesticides Formulation Plant --- Financial Analysis -----

TABLE A.14 (Cont'd)



----- COMFAR 2.1 - INDUSTRIAL PROJECTS SERVICE, ADDIS ABABA -----

Cashflow Discounting:

a) Equity paid versus Net income flow:		
Net present value	8517.41	at 10.00 %
Internal Rate of Return (IRR1) ..	35.17 %	
b) Net Worth versus Net cash return:		
Net present value	7720.90	at 10.00 %
Internal Rate of Return (IRR2) ..	24.83 %	
c) Internal Rate of Return on total investment:		
Net present value	7720.90	at 10.00 %
Internal Rate of Return (IRR) ..	24.83 %	
Net Worth : Equity paid plus reserves		

Pesticides Formulation Plant --- Financial Analysis

TABLE A.15



CONVAR 2.1 - INDUSTRIAL PROJECTS SERVICE, ADDIS ABABA

Net Income Statement in '000 Birr

Year	3	4	5	6	7
Total sales, incl. sales tax	10160.00	12190.00	13550.00	13550.00	13550.00
Less: variable costs, incl. sales tax	6958.60	8348.95	9280.41	9280.41	9280.41
Variable margin	3201.40	3841.05	4269.59	4269.59	4269.59
As % of total sales	31.51	31.51	31.51	31.51	31.51
Non-variable costs, incl. depreciation	795.49	607.87	607.87	607.87	607.87
Operational margin	2405.92	3233.19	3661.72	3661.72	3661.72
As % of total sales	23.68	26.52	27.02	27.02	27.02
Cost of finance	0.00	0.00	0.00	0.00	0.00
Gross profit	2405.92	3233.19	3661.72	3661.72	3661.72
Allowances	0.00	0.00	0.00	0.00	0.00
Taxable profit	2405.92	3233.19	3661.72	3661.72	3661.72
Tax	1202.96	1616.59	1830.86	1830.86	1830.86
Net profit	1202.96	1616.59	1830.86	1830.86	1830.86
Dividends paid	0.00	0.00	0.00	0.00	0.00
Undistributed profit	1202.96	1616.59	1830.86	1830.86	1830.86
Accumulated undistributed profit	1202.96	2819.55	4650.41	6481.28	8312.14
Gross profit, % of total sales	23.68	26.52	27.02	27.02	27.02
Net profit, % of total sales	11.84	13.26	13.51	13.51	13.51
ROE, Net profit, % of equity	29.06	39.05	44.23	44.23	44.23
ROI, Net profit/interest, % of invest.	15.25	18.81	20.27	20.27	20.27



TABLE A.15 (Cont'd)

CONFAR 2.1 - INDUSTRIAL PROJECTS SERVICE, ADDIS ABABA

Net Income Statement in '000 Birr	8	9	10	11	12
Year					
Total sales, incl. sales tax	13550.00	13550.00	13550.00	13550.00	13550.00
Less: variable costs, incl. sales tax	9280.41	9280.41	9280.41	9280.41	9280.41
Variable margin	4269.59	4269.59	4269.59	4269.59	4269.59
As % of total sales	31.51	31.51	31.51	31.51	31.51
Non-variable costs, incl. depreciation	369.72	406.12	406.22	406.22	424.34
Operational margin	3899.87	3863.47	3863.37	3863.37	3845.25
As % of total sales	28.78	28.51	28.51	28.51	28.38
Cost of finance	0.00	0.00	0.00	0.00	0.00
Gross profit	3899.87	3863.47	3863.37	3863.37	3845.25
Allowances	0.00	0.00	0.00	0.00	0.00
Taxable profit	3899.87	3863.47	3863.37	3863.37	3845.25
Tax	1949.94	1931.74	1931.69	1931.69	1922.63
Net profit	1949.94	1931.74	1931.69	1931.69	1922.63
Dividends paid	0.00	0.00	0.00	0.00	0.00
Redistributed profit	1949.94	1931.74	1931.69	1931.69	1922.63
Accumulated undistributed profit	10282.07	12193.01	14125.50	16057.18	17979.01
Gross profit, % of total sales	28.78	28.51	28.51	28.51	28.38
Net profit, % of total sales	14.39	14.26	14.26	14.26	14.19
ROS, Net profit, % of equity	47.11	46.67	46.67	46.67	46.45
ROI, Net profit+interest, % of invest.	21.11	20.91	20.91	20.91	20.80

Pesticides Formulation Plant --- Financial Analysis

TABLE A.15 (Cont'd)



COMPAR 2.1 - INDUSTRIAL PROJECTS SERVICE, ADDIS ABABA

Net Income Statement in '000 Birr

Year	13	14	15	16	17
Total sales, incl. sales tax	13550.00	13550.00	13550.00	13550.00	13550.00
Less: variable costs, incl. sales tax	9280.41	9280.41	9280.41	9280.41	9280.41
Variable margin	4269.59	4269.59	4269.59	4269.59	4269.59
As % of total sales	31.51	31.51	31.51	31.51	31.51
Non-variable costs, incl. depreciation	361.33	274.81	275.45	275.45	275.45
Operational margin	3908.25	3994.78	3994.13	3994.13	3994.13
As % of total sales	28.84	29.48	29.48	29.48	29.48
Cost of finance	0.00	0.00	0.00	0.00	0.00
Gross profit	3908.25	3994.78	3994.13	3994.13	3994.13
Allowances	0.00	0.00	0.00	0.00	0.00
Taxable profit	3908.25	3994.78	3994.13	3994.13	3994.13
Tax	1954.13	1997.39	1997.07	1997.07	1997.07
Net profit	1954.13	1997.39	1997.07	1997.07	1997.07
Dividends paid	0.09	0.00	0.00	0.00	0.00
Undistributed profit	1954.13	1997.39	1997.07	1997.07	1997.07
Accumulated undistributed profit	19933.94	21931.32	23920.39	25925.46	27922.52
Gross profit, % of total sales	28.84	29.48	29.48	29.48	29.48
Net profit, % of total sales	14.42	14.74	14.74	14.74	14.74
ROE, Net profit, % of equity	47.21	48.25	48.24	48.24	48.24
ROI, Net profit+interest, % of invest.	20.52	21.01	21.01	21.01	21.01

TABLE A.16



COMFAR
CENTRAL OFFICE FOR
MINERAL AND FUEL RESOURCES
ADMINISTRATION

----- COMFAR 2.1 - INDUSTRIAL PROJECTS SERVICE, ADDIS ABABA -----

Projected Balance Sheets, construction in '000 Birr

Year	1	2
Total assets	1412.68	4139.47
-----	-----	-----
Fixed assets, net of depreciation	0.00	1412.68
Construction in progress	1412.68	2726.79
Current assets	0.00	0.00
Cash, bank	0.00	0.00
Cash surplus, finance available	0.00	0.00
Loss carried forward	0.00	0.00
Loss	0.00	0.00
Total liabilities	1412.68	4139.47
-----	-----	-----
Equity capital	1412.68	4139.47
Reserves, retained profit	0.00	0.00
Profit	0.00	0.00
Long and medium term debt	0.00	0.00
Current liabilities	0.00	0.00
Bank overdraft, finance required	0.00	0.00
Total debt	0.00	0.00
Equity, % of liabilities	100.00	100.00

Pesticides Formulation Plant --- Financial Analysis

TABLE A.16 (Cont'd)



----- COMPAR 2.1 - INDUSTRIAL PROJECTS SERVICE, ADDIS ABABA -----

Projected Balance Sheets, Production in '000 Birr

Year	3	4	5	6	7	8
Total assets	8026.16	8344.97	9559.14	11390.00	13220.87	15170.80
Fixed assets, net of depreciation	3681.40	3223.34	2765.27	2307.20	1849.14	1629.22
Construction in progress	0.00	0.00	0.00	0.00	0.00	184.00
Current assets	4333.18	5108.93	5670.54	5670.54	5670.54	5670.54
Cash, bank	11.58	12.71	13.46	13.46	13.46	13.46
Cash surplus, finance available .	0.00	0.00	1109.87	3398.80	5687.73	7673.58
Loss carried forward	0.00	0.00	0.00	0.00	0.00	0.00
Loss	0.00	0.00	0.00	0.00	0.00	0.00
Total liabilities	8026.16	8344.97	9559.14	11390.00	13220.87	15170.80
Equity capital	4139.47	4139.47	4139.47	4139.47	4139.47	4139.47
Reserves, retained profit	0.00	1202.96	2819.55	4650.41	6481.28	8312.14
Profit	1202.96	1618.59	1830.86	1830.86	1830.86	1949.94
Long and medium term debt	0.00	0.00	0.00	0.00	0.00	0.00
Current liabilities	594.52	692.89	769.26	769.26	769.26	769.26
Bank overdraft, finance required.	2089.21	693.08	0.00	0.00	0.00	0.00
Total debt	2683.74	1385.95	769.26	769.26	769.26	769.26
Equity, % of liabilities	51.57	49.60	43.30	36.34	31.31	27.29

TABLE A.16 (Cont'd)

----- COMPAR 2.1 - INDUSTRIAL PROJECTS SERVICE, ADDIS ABABA -----

Projected Balance Sheets, Production in '000 Birr

Year	9	10	11	12	13	14
Total assets	17102.54	19034.23	20965.91	22890.05	24851.01	26840.05
Fixed assets, net of depreciation	1556.90	1301.40	1045.07	788.65	677.20	812.78
Construction in progress	1.00	0.00	0.00	0.00	268.60	6.40
Current assets	5670.54	5670.54	5670.54	5676.58	5703.90	5670.54
Cash, bank	13.46	13.46	13.46	13.46	13.46	13.46
Cash surplus, finance available .	9860.64	12048.74	14236.84	16411.36	18195.85	20336.87
Loss carried forward	0.00	0.00	0.00	0.00	0.00	0.00
Loss	0.00	0.00	0.00	0.00	0.00	0.00
Total liabilities	17102.54	19034.23	20965.91	22890.05	24851.01	26840.05
Equity capital	4139.47	4139.47	4139.47	4139.47	4139.47	4139.47
Reserves, retained profit	10262.07	12193.81	14125.50	16057.18	17979.81	19933.94
Profit	1931.74	1931.69	1931.89	1922.83	1954.13	1997.39
Long and medium term debt	0.00	0.00	0.00	0.00	0.00	0.00
Current liabilities	769.26	769.26	769.26	770.77	777.60	769.26
Bank overdraft, finance required.	0.00	0.00	0.00	0.00	0.00	0.00
Total debt	769.26	769.26	769.26	770.77	777.60	769.26
Equity, % of liabilities	24.20	21.75	19.74	18.08	16.66	15.42

TABLE A.16 (Cont'd)



----- COMFAR 2.1 - INDUSTRIAL PROJECTS SERVICE, ADDIS ABABA -----

Projected Balance Sheets, Production in '000 Birr

Year	15	16	17
Total assets'	28837.12	30834.19	32831.25
Fixed assets, net of depreciation	693.53	567.87	442.22
Construction in progress	0.00	0.00	0.00
Current assets	5670.54	5670.54	5670.54
Cash, bank	13.46	13.46	13.46
Cash surplus, finance available .	22459.59	24582.31	26705.83
Loss carried forward	0.00	0.00	0.00
Loss	0.00	0.00	0.00
Total liabilities	28837.12	30834.19	32831.25
Equity capital	4139.47	4139.47	4139.47
Reserves, retained profit	21931.32	23928.39	25925.46
Profit	1997.07	1997.07	1997.07
Long and medium term debt	0.00	0.00	0.00
Current liabilities	769.26	769.26	769.26
Bank overdraft, finance required.	0.00	0.00	0.00
Total debt	769.26	769.26	769.26
Equity, % of liabilities	14.35	13.42	12.61

Pesticides Formulation Plant --- Financial Analysis

A P P E N D I X B

APPENDIX B

ECONOMIC ANALYSES
SUPPORTING

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TABLE B.1
INITIAL FIXED INVESTMENT COST AT SHADOW PRICES
('000 BIRR)

Item	Year 1			Year 2		Remarks	
		CF	MP	SP	MP		SP
I. Plant Machinery and Equipment	F.C	1.00	265.10	265.10	742.10	742.10	C.F= Conversion Factor
	L.C	0.75	69.10	51.83	276.30	207.23	
	Sub-total		334.20	316.93	1018.40	949.33	
II. Buildings and Civil Works	F.C	1.00	60.00	60.00	-	-	MP = Market Price
	L.C	0.75	626.00	469.50	813.10	609.83	
	Sub-Total		626.00	529.50	813.10	609.83	
III. Transport and Material Handling Equipment	F.C	1.00	66.00	66.00	82.50	82.50	SP= Shadow Price
	L.C	0.75	25.03	18.77	46.47	34.86	
	Tax		13.47		25.03		
Sub-Total			104.50	84.77	154.00	117.36	
IV. Office Furniture and Equipment	F.C	1.00	-	-	11.44	11.44	
	L.C	0.75	37.29	27.97	48.29	36.22	
	Sub-Total		37.29	27.97	59.73	47.66	
V. Pre-Production Expenditure	F.C	1.00	174.90	174.90	322.85	322.85	
	L.C	0.75	75.79	56.84	358.71	269.03	
	Sub-Total		250.69	231.74	681.56	591.88	
Grand Total			1352.68	1190.91	2726.79	2316.06	

TABLE B.2



COMFAR
S.A. LIMITED

----- COMFAR 2.1 - INDUSTRIAL PROJECTS SERVICE, ADDIS ABABA -----

Total Initial Investment in '000 Birr		
Year	1	2
Fixed investment costs		
Land, site preparation, development	0.00	0.00
Buildings and civil works	529.50	609.83
Auxiliary and service facilities	84.77	117.36
Incorporated fixed assets	27.97	47.66
Plant machinery and equipment	316.93	949.33
Total fixed investment costs	959.17	1724.18
Pre-production capital expenditures.	231.75	591.88
Net working capital	0.00	0.00
Total initial investment costs	1190.92	2316.06
Of it foreign, in %	47.53	51.04

TABLE B.3



(*)
COMFAR
CENTRAL OFFICE OF MANUFACTURING AND FINANCIAL ANALYSIS RESEARCH

----- COMFAR 2.1 - INDUSTRIAL PROJECTS SERVICE, ADDIS ABABA -----

Total Production Costs in '000 Birr

Year	3	4	5-11	12	13	14-17
% of nom. capacity (single product).	75.00	90.00	100.00	100.00	100.00	100.00
Raw material 1	5012.04	6015.41	6683.79	6683.79	6683.79	6683.79
Other raw materials	1145.23	1205.41	1339.35	1352.94	1414.41	1339.35
Utilities	21.19	24.37	26.49	26.49	26.49	26.49
Energy	0.00	0.00	0.00	0.00	0.00	0.00
Labour, direct	18.54	22.25	24.72	24.72	24.72	24.72
Repair, maintenance	20.33	20.33	20.33	20.33	20.33	20.33
Spares	60.97	60.97	60.97	60.97	60.97	60.97
Factory overheads	0.00	0.00	0.00	0.00	0.00	0.00
Factory costs	6279.11	7348.75	8155.65	8169.24	8230.71	8155.65
Administrative overheads	121.33	138.13	149.33	149.33	149.33	149.33
Indir. costs, sales and distribution	0.00	0.00	0.00	0.00	0.00	0.00
Direct costs, sales and distribution	0.00	0.00	0.00	0.00	0.00	0.00
Depreciation	0.00	0.00	0.00	0.00	0.00	0.00
Financial costs	0.00	0.00	0.00	0.00	0.00	0.00
Total production costs	6400.44	7486.88	8304.98	8318.57	8380.04	8304.98
Costs per unit (single product)	0.77	0.75	0.75	0.75	0.76	0.75
Of it foreign, %	77.61	79.49	79.56	79.43	78.85	79.56
Of it variable, %	95.87	98.34	98.51	98.35	97.63	98.51
Total labour	18.54	22.25	24.72	24.72	24.72	24.72

Pesticides Formulation Plant --- Economic Analysis - June 1980

TABLE B.4



COMFAR
21 JULY 1988

----- COMFAR 2.1 - INDUSTRIAL PROJECTS SERVICE, ADDIS ABABA -----

Cashflow Tables, construction in '000 Birr

Year	1	2
Total cash inflow . .	1190.92	2316.06
Financial resources .	1190.92	2316.06
Sales, net of tax . .	0.00	0.00
Total cash outflow . .	1190.92	2316.06
Total assets	1190.92	2316.06
Operating costs . . .	0.00	0.00
Cost of finance . . .	0.00	0.00
Repayment	0.00	0.00
Corporate tax	0.00	0.00
Dividends paid	0.00	0.00
Surplus (deficit) .	0.00	0.00
Cumulated cash balance	0.00	0.00
Inflow, local	624.92	1157.17
Outflow, local	624.92	1157.17
Surplus (deficit) .	0.00	0.00
Inflow, foreign	566.00	1158.89
Outflow, foreign	566.00	1158.89
Surplus (deficit) .	0.00	0.00
Net cashflow	-1190.92	-2316.06
Cumulated net cashflow	-1190.92	-3506.98

TABLE B.4 (Cont'd)



----- COMFAR 2.1 - INDUSTRIAL PROJECTS SERVICES, ADDIS ABABA -----

Cashflow tables, production in '000 Birr

Year	3	4	5	6	7	8
Total cash inflow	8793.51	10013.44	11094.24	11027.00	11027.00	11027.00
Financial resources	523.26	89.14	67.24	0.00	0.00	0.00
Sales, net of tax	8270.25	9924.30	11027.00	11027.00	11027.00	11027.00
Total cash outflow	10301.12	8196.16	8889.11	8304.98	8304.98	8304.98
Total assets	3900.68	703.28	504.13	0.00	0.00	0.00
Operating costs	6400.44	7406.88	8304.98	8304.98	8304.98	8304.98
Cost of finance	0.00	0.00	0.00	0.00	0.00	0.00
Repayment	0.00	0.00	0.00	0.00	0.00	0.00
Corporate tax	0.00	0.00	0.00	0.00	0.00	0.00
Dividends paid	0.00	0.00	0.00	0.00	0.00	0.00
Surplus (deficit)	-1507.61	1817.28	2285.14	2722.02	2722.02	2722.02
Calculated cash balance	-1507.61	309.67	2594.80	5316.82	8038.84	10760.86
Inflow, local	6379.57	9931.42	11039.56	11027.00	11027.00	11027.00
Outflow, local	2116.11	79.61	1778.14	1697.42	1697.42	1697.42
Surplus (deficit)	4263.47	9721.81	9261.43	9329.58	9329.58	9329.58
Inflow, foreign	413.94	82.02	54.61	0.90	0.00	0.00
Outflow, foreign	8191.01	6586.55	7036.97	6607.56	6607.56	6607.56
Surplus (deficit)	-7777.00	-6504.53	-6976.29	-6607.56	-6607.56	-6607.56
Net cashflow	-1507.61	1817.28	2285.14	2722.02	2722.02	2722.02
Calculated net cashflow	-5014.59	-3197.31	-912.16	1009.84	4531.86	7253.86

----- Pesticides Formulation Plant ---- Economic Analysis -----



TABLE B.4 (Cont'd)

----- COMPAR 2.1 - INDUSTRIAL PROJECTS SERVICE, ADDIS ABABA -----

Cashflow tables, production in '000 Birr

Year	9	10	11	12	13	14
Total cash inflow . .	11027.00	11027.00	11027.00	11028.13	11032.12	11027.00
Financial resources .	0.00	0.00	0.00	1.13	5.12	0.00
Sales, net of tax . .	11027.00	11027.00	11027.00	11027.00	11027.00	11027.00
Total cash outflow . .	8304.98	8304.98	8304.98	8323.10	8400.53	8286.21
Total assets	0.00	0.00	0.00	4.53	20.49	-25.02
Operating costs	8304.98	8304.98	8304.98	8318.57	8380.04	8304.98
Cost of finance	0.00	0.00	0.00	0.00	0.00	0.00
Repayment	0.00	0.00	0.00	0.00	0.00	6.26
Corporate tax	0.00	0.00	0.00	0.00	0.00	0.00
Dividends paid	0.00	0.00	0.00	0.00	0.00	0.00
Surplus (deficit) . .	2722.02	2722.02	2722.02	2705.03	2631.59	2740.79
Cumulated cash balance	13482.88	16204.90	18926.92	21631.95	24263.55	27004.33
Inflow, local	11027.00	11027.00	11027.00	11028.13	11032.12	11027.00
Outflow, local	1697.42	1697.42	1697.42	1715.54	1792.97	1678.65
Surplus (deficit) . .	9329.58	9329.58	9329.58	9312.59	9239.15	9348.34
Inflow, foreign	0.00	0.00	0.00	0.00	0.00	0.00
Outflow, foreign	6607.56	6607.56	6607.56	6607.56	6607.56	6607.56
Surplus (deficit) . .	-6607.56	-6607.56	-6607.56	-6607.56	-6607.56	-6607.56
Net cashflow	2722.02	2722.02	2722.02	2705.03	2631.59	2740.79
Cumulated net cashflow	9975.90	12697.92	15419.94	18124.97	20756.57	23497.35

Pesticides Formulation Plant --- Economic Analysis - June 1988

TABLE B.4 (Cont'd)



COMFAR
CENTRAL OFFICE OF MANUFACTURING
FACTORIES ADMINISTRATION

CONFAR 2.1 - INDUSTRIAL PROJECTS SERVICE, ADDIS ABABA

Cashflow tables, production in '000 Birr

Year	15	16	17
Total cash inflow . .	11027.00	11027.00	11027.00
Financial resources .	0.00	0.00	0.00
Sales, net of tax . .	11027.00	11027.00	11027.00
Total cash outflow . .	8304.98	8304.98	8304.98
Total assets	0.00	0.00	0.00
Operating costs . . .	8304.98	8304.98	8304.98
Cost of finance . . .	0.00	0.00	0.00
Repayment	0.00	0.00	0.00
Corporate tax	0.00	0.00	0.00
Dividends paid	0.00	0.00	0.00
Surplus (deficit) .	2722.02	2722.02	2722.02
Cumulated cash balance	29726.35	32440.37	35170.39
Inflow, local	11027.00	11027.00	11027.00
Outflow, local	1697.42	1697.42	1697.42
Surplus (deficit) .	9329.58	9329.58	9329.58
Inflow, foreign . . .	0.00	0.00	0.00
Outflow, foreign . . .	6607.56	6607.56	6607.56
Surplus (deficit) .	-6607.56	-6607.56	-6607.56
Net cashflow	2722.02	2722.02	2722.02
Cumulated net cashflow	26219.37	28941.39	31663.41

TABLE B.4 (Cont'd)



----- COMFAR 2.1 - INDUSTRIAL PROJECTS SERVICE, ADDIS ABABA -----

Cashflow Discounting:

a) Equity paid versus Net income flow:		
Net present value	14578.49	at 10.00 %
Internal Rate of Return (IRRR1) ..	56.18 %	
b) Net Worth versus Net cash return:		
Net present value	12593.42	at 10.00 %
Internal Rate of Return (IRRR2) ..	35.11 %	
c) Internal Rate of Return on total investment:		
Net present value	12593.42	at 10.00 %
Internal Rate of Return (IRR) ..	35.11 %	
Net Worth = Equity paid plus reserves		

Pesticides Formulation Plant --- Economic Analysis - June 1988

TABLE B.5



(a)
COMFAR
CENTRAL OFFICE FOR
MARKETING AND FINANCE

----- COMFAR 2.1 - INDUSTRIAL PROJECTS SERVICE, ADDIS ABABA -----

Net Income Statement in '000 Birr

Year	3	4	5	6	7
Total sales, incl. sales tax	8270.25	9924.30	11027.00	11027.00	11027.00
Less: variable costs, incl. sales tax.	6135.79	7362.94	8181.05	8181.05	8181.05
Variable margin	2134.46	2561.35	2845.95	2845.95	2845.95
As % of total sales	25.81	25.81	25.81	25.81	25.81
Non-variable costs, incl. depreciation	264.65	123.93	123.93	123.93	123.93
Operational margin	1869.81	2437.42	2722.02	2722.02	2722.02
As % of total sales	22.61	24.56	24.69	24.69	24.69
Cost of finance	0.00	0.00	0.00	0.00	0.00
Gross profit	1869.81	2437.42	2722.02	2722.02	2722.02
Allowances	0.00	0.00	0.00	0.00	0.00
Taxable profit	1869.81	2437.42	2722.02	2722.02	2722.02
Tax	0.00	0.00	0.00	0.00	0.00
Net profit	1869.81	2437.42	2722.02	2722.02	2722.02
Dividends paid	0.00	0.00	0.00	0.00	0.00
Undistributed profit	1869.81	2437.42	2722.02	2722.02	2722.02
Accumulated undistributed profit . . .	1869.81	4307.24	7029.26	9751.28	12473.29
Gross profit, % of total sales	22.61	24.56	24.69	24.69	24.69
Net profit, % of total sales	22.61	24.56	24.69	24.69	24.69
ROE, Net profit, % of equity	53.32	69.50	77.62	77.62	77.62
ROI, Net profit+interest, % of invest.	27.10	32.48	34.28	34.28	34.28



COMFAR
21

TABLE B.5 (Cont'd)

COMFAR 2.1 - INDUSTRIAL PROJECTS SERVICE, ADDIS ABABA

Net Income Statement in '000 Birr

Year	8	9	10	11	12
Total sales, incl. sales tax	11027.00	11027.00	11027.00	11027.00	11027.00
Less: variable costs, incl. sales tax.	8181.05	8181.05	8181.05	8181.05	8181.05
Variable margin	2845.95	2845.95	2845.95	2845.95	2845.95
As % of total sales	25.81	25.81	25.81	25.81	25.81
Non-variable costs, incl. depreciation	123.93	123.93	123.93	123.93	137.52
Operational margin	2722.02	2722.02	2722.02	2722.02	2708.43
As % of total sales	24.69	24.69	24.69	24.69	24.56
Cost of finance	0.00	0.00	0.00	0.00	0.00
Gross profit	2722.02	2722.02	2722.02	2722.02	2708.43
Allowances	0.00	0.00	0.00	0.00	0.00
Taxable profit	2722.02	2722.02	2722.02	2722.02	2708.43
Tax	0.00	0.00	0.00	0.00	0.00
Net profit	2722.02	2722.02	2722.02	2722.02	2708.43
Dividends paid	0.00	0.00	0.00	0.00	0.00
Undistributed profit	2722.02	2722.02	2722.02	2722.02	2708.43
Accumulated undistributed profit . . .	15195.31	17917.33	20639.35	23381.37	26089.80
Gross profit, % of total sales	24.69	24.69	24.69	24.69	24.56
Net profit, % of total sales	24.69	24.69	24.69	24.69	24.56
ROE, Net profit, % of equity	77.62	77.62	77.62	77.62	77.23
ROI, Net profit+interest, % of invest.	34.28	34.28	34.28	34.28	34.09



COMFAR
CENTRAL OFFICE OF
MARKETING AND FINANCIAL
ADMINISTRATION

TABLE B.5 (Cont'd)

----- COMFAR 2.1 - INDUSTRIAL PROJECTS SERVICE, ADDIS ABABA -----

Net Income Statement in '000 Birr

Year	13	14	15	16	17
Total sales, incl. sales tax	11027.00	11027.00	11027.00	11027.00	11027.00
Less: variable costs, incl. sales tax.	8181.05	8181.05	8181.05	8181.05	8181.05
Variable margin	2845.95	2845.95	2845.95	2845.95	2845.95
As % of total sales	25.81	25.81	25.81	25.81	25.81
Non-variable costs, incl. depreciation	198.99	123.93	123.93	123.93	123.93
Operational margin	2646.96	2722.02	2722.02	2722.02	2722.02
As % of total sales	24.00	24.69	24.69	24.69	24.69
Cost of finance	0.00	0.00	0.00	0.00	0.00
Gross profit	2646.96	2722.02	2722.02	2722.02	2722.02
Allowances	0.00	0.00	0.00	0.00	0.00
Taxable profit	2646.96	2722.02	2722.02	2722.02	2722.02
Tax	0.00	0.00	0.00	0.00	0.00
Net profit	2646.96	2722.02	2722.02	2722.02	2722.02
Dividends paid	0.00	0.00	0.00	0.00	0.00
Undistributed profit	2646.96	2722.02	2722.02	2722.02	2722.02
Accumulated undistributed profit . . .	28716.76	31438.78	34160.80	36882.82	39604.84
Gross profit, % of total sales	24.00	24.69	24.69	24.69	24.69
Net profit, % of total sales	24.00	24.69	24.69	24.69	24.69
ROE, Net profit, % of equity	75.48	77.62	77.62	77.62	77.62
ROI, Net profit+interest, % of invest.	33.25	34.28	34.28	34.28	34.28

TABLE B.6



CONFAR 2.1 - INDUSTRIAL PROJECTS SERVICE, ADDIS ABABA

Projected Balance Sheets, construction in '000 Birr

Year	1	2
Total assets	1190.92	3506.98
Fixed assets, net of depreciation	0.00	1190.92
Construction in progress	1190.92	2316.06
Current assets	0.00	0.00
Cash, bank	0.00	0.00
Cash surplus, finance available	0.00	0.00
Loss carried forward	0.00	0.00
Loss	0.00	0.00
Total liabilities	1190.92	3506.98
Equity capital	1190.92	3506.98
Reserves, retained profit	0.00	0.00
Profit	0.00	0.00
Long and medium term debt	0.00	0.00
Current liabilities	0.00	0.00
Bank overdraft, finance required	0.00	0.00
Total debt	0.00	0.00
Equity, % of liabilities	100.00	100.00

TABLE B.6 (Cont'd)



----- COMFAR 2.1 - INDUSTRIAL PROJECTS SERVICE, ADDIS ABABA -----

Projected Balance Sheets, Production in '000 Birr

Year	3	4	5	6	7	8
Total assets	7407.66	8428.61	11215.87	13937.89	18659.91	19381.93
Fixed assets, net of depreciation	3506.98	3506.98	3506.98	3506.98	3506.98	3506.98
Construction in progress	0.00	0.00	0.00	0.00	0.00	0.00
Current assets	3891.47	4599.89	5103.45	5103.45	5103.45	5103.45
Cash, bank	9.22	10.07	10.64	10.64	10.64	10.64
Cash surplus, finance available	0.00	309.67	2594.80	5316.82	8038.84	10760.86
Loss carried forward	0.00	0.00	0.00	0.00	0.00	0.00
Loss	0.00	0.00	0.00	0.00	0.00	0.00
Total liabilities	7407.66	8428.61	11215.87	13937.89	18659.91	19381.93
Equity capital	3506.98	3506.98	3506.98	3506.98	3506.98	3506.98
Reserves, retained profit	0.00	1869.81	4307.24	7029.26	9751.28	12473.29
Profit	1869.81	2437.42	2722.02	2722.02	2722.02	2722.02
Long and medium term debt	0.00	0.00	0.00	0.00	0.00	0.00
Current liabilities	523.28	612.40	679.64	679.64	679.64	679.64
Bank overdraft, finance required	1507.61	0.00	0.00	0.00	0.00	0.00
Total debt	2030.87	612.40	679.64	679.64	679.64	679.64
Equity, % of liabilities	47.34	41.62	31.27	25.16	21.05	18.09

TABLE B.6 (Cont'd)

----- COMPAR 2.1 - INDUSTRIAL PROJECTS SERVICE, ADDIS ABABA -----

Projected Balance Sheets, Production in '000 Birr

Year	9	10	11	12	13	14
Total assets	22103.95	24025.97	27547.99	30257.55	32909.63	35025.40
Fixed assets, net of depreciation	3506.98	3506.98	3506.98	3506.98	3506.98	3506.98
Construction in progress	0.00	0.00	0.00	0.00	0.00	0.00
Current assets	5103.45	5103.45	5103.45	5107.98	5128.47	5103.45
Cash, bank	10.64	10.64	10.64	* 10.64	10.64	10.64
Cash surplus, finance available .	13482.88	18204.90	18926.92	21631.95	24263.54	27004.33
Loss carried forward	0.00	0.00	0.00	0.00	0.00	0.00
Loss	0.00	0.00	0.00	0.00	0.00	0.00
Total liabilities	22103.95	24025.97	27547.99	30257.55	32909.63	35025.40
Equity, capital	3506.98	3506.98	3506.98	3506.98	3506.98	3506.98
Reserves, retained profit	15195.31	17917.33	20639.35	23361.37	26069.80	28716.76
Profit	2722.02	2722.02	2722.02	2708.43	2646.96	2722.02
Long and medium term debt	0.00	0.00	0.00	0.00	0.00	0.00
Current liabilities	679.64	679.64	679.64	680.77	685.89	679.64
Bank overdraft, finance required.	0.00	0.00	0.00	0.00	0.00	0.00
Total debt	679.64	679.64	679.64	680.77	685.89	679.64
Equity, % of liabilities	15.87	14.13	12.73	11.59	10.66	9.84

TABLE B.6 (Cont'd)



COMFAR^(C)
CENTRAL OFFICE FOR
MANUFACTURING AND FINANCIAL
ANALYSIS RESEARCH

----- COMFAR 2.1 - INDUSTRIAL PROJECTS SERVICE, ADDIS ABABA -----

Projected Balance Sheets, Production in '000 Birr

Year	15	16	17
Total assets	38347.42	41069.44	43791.46
Fixed assets, net of depreciation	3506.98	3506.98	3506.98
Construction in progress	0.00	0.00	0.00
Current assets	5103.45	5103.45	5103.45
Cash, bank	10.64	10.64	10.64
Cash surplus, finance available	29726.35	32440.37	35170.39
Loss carried forward	0.00	0.00	0.00
Loss	0.00	0.00	0.00
Total liabilities	38347.42	41069.44	43791.46
Equity capital	3506.98	3506.98	3506.98
Reserves, retained profit	31438.70	34160.80	36882.82
Profit	2722.02	2722.02	2722.02
Long and medium term debt	0.00	0.00	0.00
Current liabilities	679.64	679.64	679.64
Bank overdraft, finance required	0.00	0.00	0.00
Total debt	679.64	679.64	679.64
Equity, % of liabilities	9.15	8.54	8.01

TABLE B.7
ECONOMIC BENEFITS AT FULL CAPACITY

Product	Quantity M ³	Selling Price* (Birr)	Revenue ('000 Birr))
Endosulfan 35 EC	400	8250	3300
Endosulfan 25 ULV	350	7700	2695
Malathion 50 EC	450	6600	2970
Dimethoate 40 EC	100	6600	660
Dimethoate 40 ULV	100	5500	550
Fenithrothion 50 EC	50	7700	385
Diazinon 60 EC	50	9350	467
Total	1500		11027

* This was arrived at by adding 10% freight charges on the FOB price given by NCC.

A P P E N D I X C

ADDITIONAL ASSUMPTIONS FOR FINANCIAL AND ECONOMIC
ANALYSES OF THE PESTICIDES FORMULATION PALNT

Repairs and Maintenance

For the calculation of the annual cost of repair and maintenance, the following rates of the respective fixed investment were used.

- Buildings and Civil Works	2%
- Plant Machinery and Equipment	5%
- Vehicles	10%

Employee Benefits

This cost was assumed to be 15% of the basic wages and salaries as per the corporation's experience in its existing plants.

Overhead Cost

The administrative overhead cost includes expenses such as office supplies, audit fees, corporation contribution, insurance, telephone, postage, travel and per diem expenses, etc.

Tax Rate

An income tax rate of 50% has been applied for the project in accordance with proclamation No. 155 of 1978, Article 5, Sub Article C.

Depreciation and Amortization

A straight line method was adopted using the following rates:

Building and Civil Works	5%
Plant machinery and equipment	10%
Office furniture and equipment	10%
Transport and material handling equipment	20%
Pre-production expenditure	20%

Capital Charge

This was not included in the cost of production since it is a form of a return to the Government on its equity investment.

Contingencies

A physical cotingency of 10% was assumed on the fixed investment. No price contingency is considered.

Capital Recovery

At the end of the project life some portion of the initial fixed investment might be recovered. In this study the terminal value has been assumed to be equal to the book value of the fixed investment.

UC/ETH/85/214 - Pesticide Formulation Plant in Ethiopia
Reply to Comments Given by UNIDO on Draft Final Report

We would like to express our sincere appreciation of the comments given on the above captioned project and we hereby submit the clarifications to the queries you have raised in it.

- a) Table A-11: The current investments appearing in the 8th and 13th year are the costs associated with the replacement of vehicles and capital expenditures made on office furniture and equipment. They do not relate to the drums purchased and Mr. Handa's report does not explain this fact.
- b) Table A-12: The other raw materials increase in years 12 and 13. This is as a result of the additional costs related to the packing materials (i.e. drums). As clearly shown on Table A.8, the shortage of drums on the first year of operation is 3127 while there will not be any shortages until the 9th and 10th years of operation (i.e. year 12)

The Shortages in year 12 and 13 amount to 302 and 1668 drums respectively. In order to meet the shortages a cost of Birr 60 per drum will be incurred.

- c) Table A-12 and Table A-15: The variability of the cost of utilities is assumed to be 80% while that of direct labour is taken as 100%. We hope this would help you to cross check the figures appearing in non-variable costs in Table A-15. Moreover, the administrative overhead costs are assumed to be 75% variable.

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14.06.88

d) Table A-13: The 12th and 13th year working capital requirements increased as a result of an increase in packing materials (drums). COMFAR calculates working capital requirements of accounts receivable based on the following parameters:

- Factory costs
- + Administrative overheads
- + Marketing and Distribution costs
- Divided by the Coefficient of turnover

As the factory costs increase owing to the increase in packing material requirements in the 12th and 13th year so does the working capital requirement for accounts receivable. The basis of the calculation is given below:-

<u>Items</u>	<u>Year 6-11</u>	<u>Year 12</u>	<u>year 13</u>
Factory costs	9231.11	9311.81	9331.19
Administrative Overheads	199.10	199.10	199.10
Marketing and Distribution cost	-	-	-
Total	9430.21	9510.91	9530.29
Coefficient of turnover	12	12	12
Accounts Reveivable	785.85	792.58	794.19

The increase in packing material (drums) also results in an increase in working capital requirements of inventory and materials, finished products and also accounts payable.

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