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CHECKLISTS FOR INDIVIDUAL STUDIES AND PLANNING STAGES AS USED IN PROJECT SCREENING OPERATION[1]

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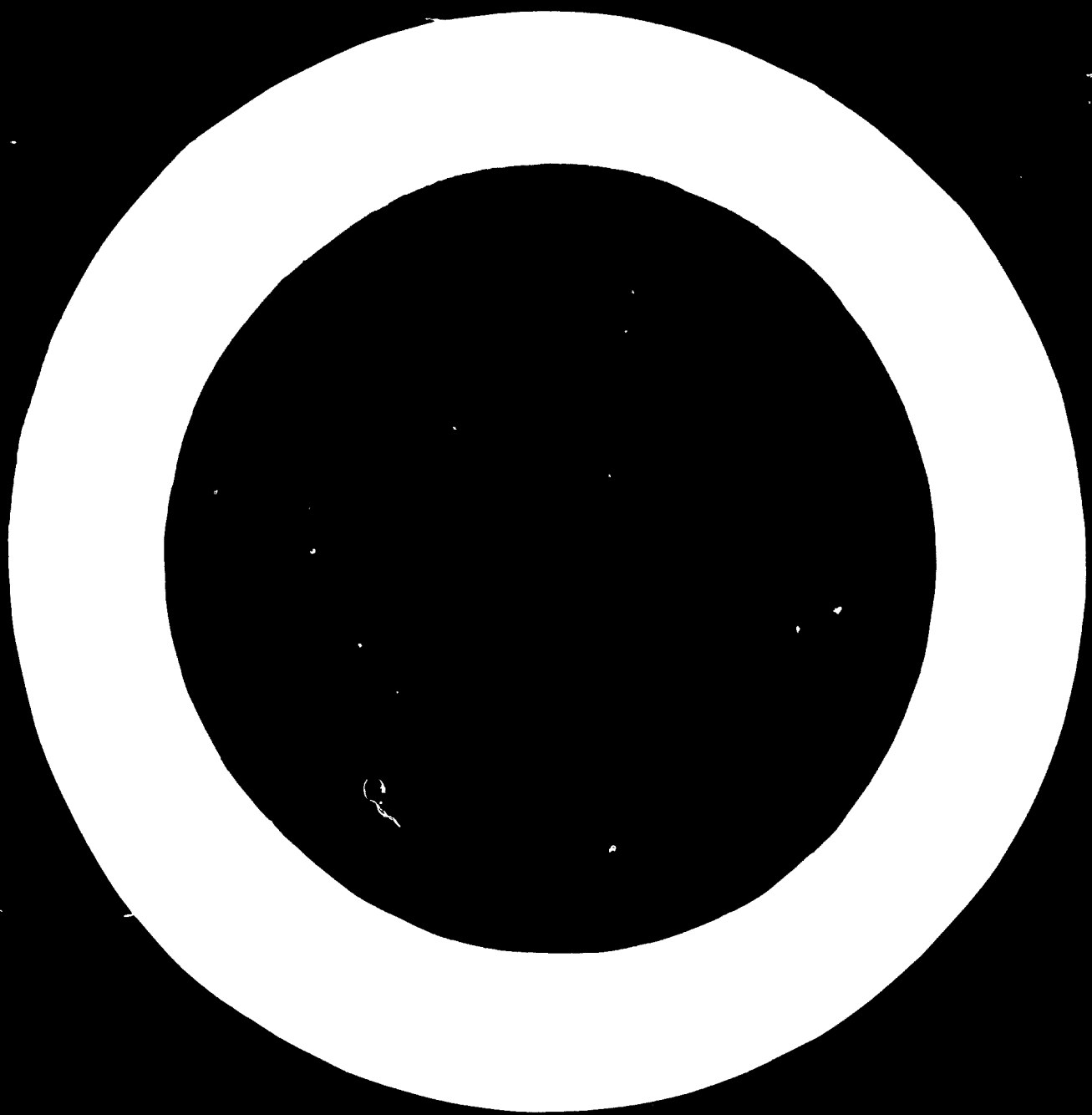

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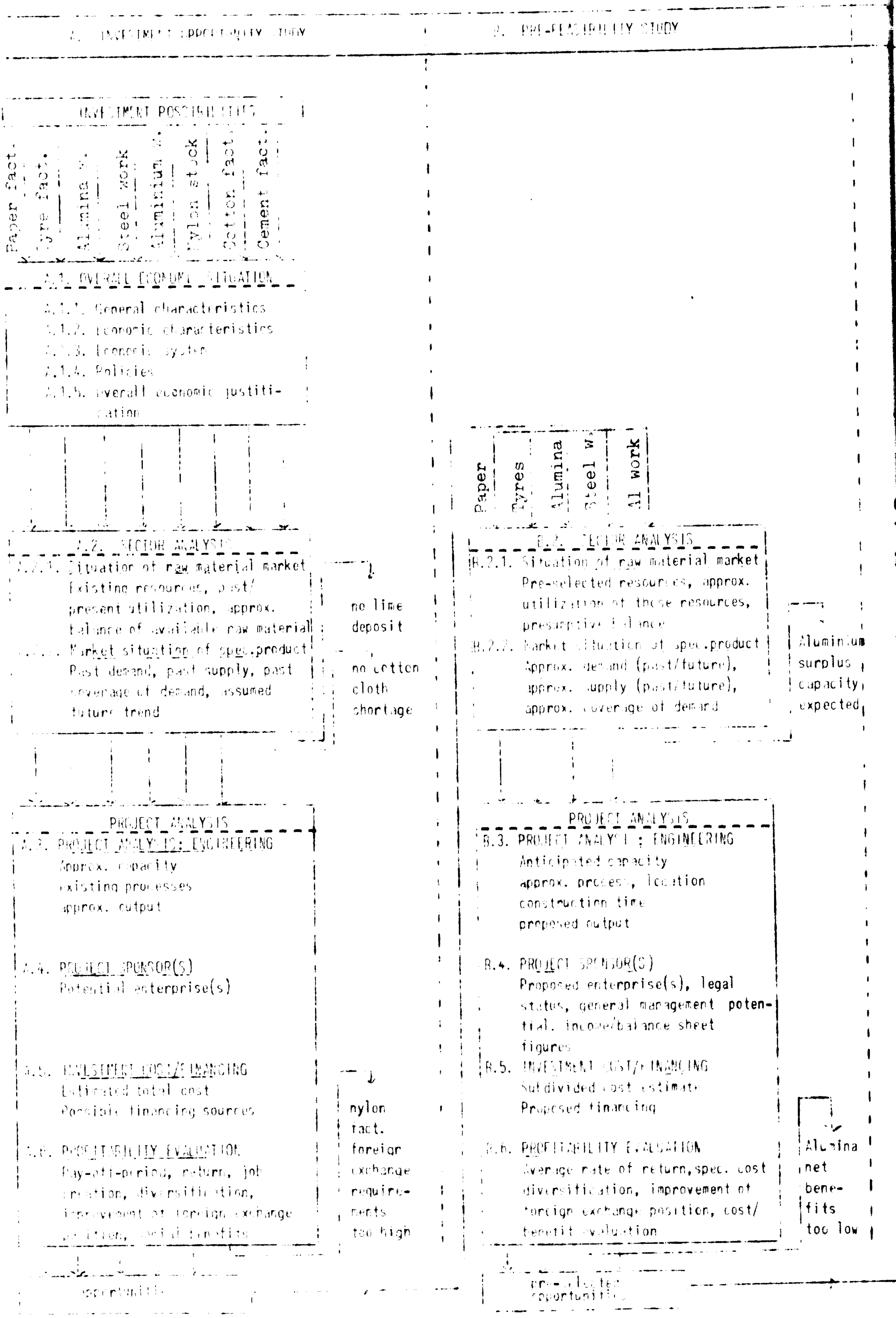
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Tyres
Alumina
Steel w.
Al work
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Steel

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C.2. Market situation of spec.product
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detailed supply (past/future)
detailed coverage of demand

Paper

Paper

PROJECT ANALYSIS

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C.6. PROFITABILITY EVALUATION
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tyre profitability too low

PROJECT ANALYSIS

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A.1.	A. INVESTMENT OPPORTUNITY STUDY	
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A.1. OVERALL ECONOMIC SITUATION		
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	Demographic data	Population, regional distribution, age structure, education, religion
	Political data	History, government
A.1.2. Economic characteristics	GNP data	Level, development, ratios of GNP: investment, savings, consumption, exports, imports, public expenditure, labour income
	Foreign exchange position	Balance of payment situation and development, foreign exchange reserves, indebtedness, debt service
A.1.3. Economic system and policies	Private vs. state property	
	Overall economic planning	Range, intensity, targets, priorities, adopted means of influence on economy
	Trade, tariff, foreign exchange policies, regulations concerning foreign investors	
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A.2.2. Market situation for specific products	Past demand for specific item	Past sales in quantities and prices
	Past supply of specific item	Approx. totals of past local manufacturing and imports
	Past coverage of demand, assumed future trends	Approx. quantities, qualities, prices
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A.3.1. Design, layout	Approx. capacity	From ... to ...
	Existing (known) processes	
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A.4./5./6.	A. INVESTMENT OPPORTUNITY STUDY (contd.)	
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A.4.1. Organizational and management aspects	Potential enterprises	Names only
A.4.2. - - -		
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A.5.2. Financing	Possible financing sources	Names only
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	Diversification	
	Estimated improvement of foreign exchange position	
	Enumeration of social costs and benefits	

B. PRE-FEASIBILITY STUDY .1. .

CHAPTER Section	Contents	Remarks
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B.1.2. - - -	- - -	See: A. 1.2.
B.1.3. - - -	- - -	See: A. 1.3.
B.1.4. Overall economic justification of projects considered	Profitability, GNP increase, job creation, foreign exchange savings/earnings, diversification	
B.2. SECTOR ANALYSIS		
B.2.1. Situation of raw material market	Pre-selected resources	Names, location, quantities and qualities, other main data
	Approx. utilization of resources	Main consumers, local and abroad, yearly consumption, individual supply situation, general raw material policy, laws/regulations
	Presumptive balance of available raw material(s) vs. present utilization	Possible supply sources covering present + future demand
B.2.2. Market situation for specific products	Approx. demand for specific item	Past/future total sales/ demand in quantity, values, spec. prices for all local/ foreign customers
	Approx. supply of specific item by suppliers	Present total local manufacturing capacity, general quality of goods, past imports, their expected future trend, volumes and prices
	Approx. coverage of demand	Past/future quantities, qualities, prices

B.3./4. B. PRE-FEASIBILITY STUDY (contd.)

CHAPTER Section	Contents	Remarks
B.3. PROJECT ANALYSIS: ENGINEERING		
B.3.1. Design, layout	Anticipated capacity	
	Approx. production programme	Approx. quantities of products
	Approx. processes	Process A - D
	Approx. labour	Foreign/local
	Approx. basic process pre-conditions	Raw material, power/water requirements
	Approx. location	Suitable sites, general infra-structure conditions
B.3.2. Construction	Construction time	Total only
B.3.3. Operation	Proposed output	Quantity, average price, main customers
B.4. PROJECT SPONSOR(S)		
B.4.1. Organizational and management aspects	Proposed enterprises	Names only
	Legal status	Type of ownership, business objectives and production targets
	General management potentialities	General characteristics of top management and supervisory boa overall business/administrativ policy
B.4.2. Financial situation	Pro-forma or recent years' (if applicable) profit and loss figures	
	Pro-forma or recent years' (if applicable) balance sheet figures	
	Presumptive credit worthi-ness	Opinion only

B. PRE-FEASIBILITY STUDY (contd.) B.5./6.

CHAPTER Section	Contents	Remarks
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B.5.1. Investment cost	Subdivided cost estimate	Land and site development, civil works, machinery completely erected, required working capital, interest during construction, consultants fees, contingencies; all broken down by local costs and costs in foreign exchange
B.5.2. Financing	Proposed financing	Subdivided in equity, long- and short-term loans and/or others; all broken down by local currency and foreign exchange
B.6. PROFITABILITY EVALUATION		
B.6.1. Commercial profitability	Pay-off-period, average rate of return	Average revenues - average production cost = average earnings : invested capital
	Approx. specific cost of investment, approx. specific cost of production	
	Enlargement of product-mix, increased profitability and other advantages of diversification	

B.6. B. PRE-FEASIBILITY STUDY (contd.)

CHAPTER Section	Contents	Remarks
B.6.2. Overall economic benefits	Diversification	
	Approx. improvement of foreign exchange position	Additional exports plus import substitution minus additional current imports, depreciation on investment in foreign currency and interest on foreign exchange loans
	Cost/benefit evaluation based on commercial profitability considerations	Addition of non-commercial costs and benefits, elimination of non-social costs and revenues, revision of prices, wages and interest rates, re-adjustment of exchange rate

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C.1.2. - - -		See: A.1.2.
C.1.3. - - -		See: A.1.3.
C.1.4. Overall economic justification of projects considered	Profitability, GNP increase, job creation, foreign exchange savings/earnings, diversification	
C.2. SECTOR ANALYSIS		
C.2.1. Situation of raw material market	Chosen resource(s)	Detailed data concerning topographical distribution of raw material, quantities, itemized material analysis
	Detailed utilization of resources	Supply situation, kind of specific enterprises, specific customers, their part and estimated purchases, price at place of production
	Detailed balance of available raw material(s)	Adequacy of supply: quantities, qualities, prices

C.2.3/	C. FEASIBILITY STUDY (cont'd.)	
CHAPTER Section	Contents	Remarks
C.2.3. Market situation for specific products	Detailed demand for specific item	Past/future local/foreign sales demand, main consumers, spec. consumption per capita, prices, fluctuation, regional distribution, quality requirements, influence on market situation caused by laws and regulations
	Detailed supply of specific item by suppliers	Present manufacturing/importing companies, manufacturing units, capacities, age, load factors, product qualities, location, past sales, expected future sales, transport facilities, new units under construction/planning, expected elimination of local plants and imports, prices
	Detailed coverage of demand	Past/future quantities, qualities, prices, regional distribution
C.3. PROJECT ANALYSIS: ENGINEERING		
C.3.1. Design, layout	Adopted capacity	
	Adopted production program	Number of products, their specifications, quantities
	Adopted process	Process A
	Main process data	Input data, conversion data, output data, flow data of auxil. agents
	Main process preconditions	Raw material composition, water, quantity/quality, humidity
	Process alternatives	Advantages/disadvantages of process B,C,D
	Selected location	Cities, inhabitants, transport connexions, power/water supply, climate, soil conditions
	Approx. layout	General plan view drawing of plant and infrastructure

C. FEASIBILITY STUDY (cont'd.) C.4.

CHAPTER Section	Contents	Remarks
C.3.2. Construction	Itemized time table	Tendering, evaluation, negociations, civil-works, manufacturing, supply, erection
	Main manufacturing requirements	Know-how, standards
	General transport situation	Port of entry, railway/ road/waterway/air connexions
	General erection conditions	Local participation, labour, auxil. agents, foreign experts
C.3.3. Operation	General needs for management	Processing and marketing experience
	Staff requirements	Number, structure, training, housing facilities, social benefits
	Raw material supply	Main suppliers, requirements for supply contracts, storage facilities
	Auxil. agents and spare parts	Local sources, qualities, stock of spare parts, imports
	Adopted output	Quantities of product items, price assumptions, distributions, customers

C.4.	C. FEASIBILITY STUDY (contd.)	
CONTENTS Section	Contents	Remarks
C.4. PROJECT SPONSOR(S)		
C.4.1. Organizational and management aspects	Selected enterprise	Name only
	Specific legal status	Type of ownership, main owners, statute, sectors of activity, external co-operation
	Organization	Departments, their responsibilities, co-ordination of departments, hierarchy, decision making
	Specific data on management	Characteristics of members of the board, department chiefs, professionals, decision making, outline of general policies for operation
	Personal data of staff	Structure, abilities, training, fluctuation, morale, salary/wage level
C.4.2. Financial situation	Financial statements	Accounting practices: methods, accuracy
	Detailed income statement for recent years (if applicable) and/or forecast	
	Detailed balance sheet for recent years (if applicable) and/or forecast, debt/equity ratio, current ratio	
	Checked credit worthiness	Recommendable credit lines

C. FEASIBILITY STUDY (contd.) C.[illegible]

CHAPTER Section	Contents	Remarks
C.5. INVESTMENT COST/ FINANCING		
C.5.1. Investment cost	Detailed cost schedule	Land, foundations, roads, buildings, plant sections, auxil. sections, supply of goods and services, required working capital, interest during construction, consultants fees, taxes and duties, contingencies, all broken down by local costs and costs in foreign exchange
	Approx. financing schedule	Itemized equity, govt. contribution, suppliers' credits, other loans - amounts, terms and conditions; broken down by local currency and foreign exchange
C.6. PROFITABILITY EVALUATION		
C.6.1. Commercial profitability	Pay-off period, break even point, return on investment, cash flow, internal rate of return calculation	
	Specific cost of investment, Specific cost of production	
C.6.2. Overall economic benefits	Detailed improvement of foreign exchange position	Additional exports plus import substitution minus additional current imports, depreciation on investment in foreign currency and interest on foreign exchange loans
	Detailed cost/benefit analysis based on commercial profitability data	Addition of non-commercial costs and benefits, elimination of non-social costs and revenues, revision of prices, wages and interest rates, re-adjustment of exchange rate

D.1./3. D. PREPARATION OF TENDER DOCUMENTS

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D.1.3. - - -		
D.1.4. - - -		
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D.2.1. - - -		
D.2.2. - - -		
D.3. PROJECT ANALYSIS: ENGINEERING		
D.3.1. Design, layout	Required capacity	Specific or order of magnitude
	Required production program	Number of products, their specifications, quantities
	Prescribed process	Process A
	Permissable process data	Variation of input, conversion, output data, performance
	Basic process preconditions	Raw material composition, water quantity/quality, humidity
	Construction site	Place, inhabitants, transport connexions, power/water supply, climate, soil conditions
	Detailed layout	Detailed plan views and cross sections at different levels
	Details of plant sections	Optimal co-ordination of sections to meet material flow requirements
	Machinery details	Preferred manufacturers, specific capacities, efficiences, type of drives, overrating of motors, isolation, tolerances, permissable vibrations and sound nuissance etc.

D. PREPARATION OF TENDER DOCUMENTS (contd.) D.3./...

CHAPTER Section	Contents	Remarks
D.3.2. Construction	Itemized time table	Civil works, manufacturing, supply, erection, commissioning, semi-commercial operation
	Detailed manufacturing requirements	Standards, laws and regulations, inspection, standardization
	Detailed transport situation	Limitations in choice of transportation facilities, insurance requirements, port/road/railway/storage facilities
	Detailed erection conditions	Availabilities: local skilled/unskilled labour, tools/tackles, housing facilities, site access, auxil. agents, restrictions for foreign personnel
	Commissioning and semi-commercial operation	Tests, training, reconditioning
D.3.3. Operation	Detailed needs for management	Delegation of supervisory staff
	Detailed personnel situation	Labour laws and regulations, training programs, housing facilities, other fringe benefits
	Raw material supply	Required storage facilities, transport means
	Spare parts	List of recommendable spare parts, order point system
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D.4.2. - - -		

D.5./6. D. PREPARATION OF TENDER DOCUMENTS (contd.)

CHAPTER Section	Contents	Remarks
D.5. INVESTMENT COST/ FINANCING		
D.5.1. Investment cost	List of prices	Subdivided
D.5.2. Financing	General conditions of supply	Payment terms, price variation, bank guarantees, interest, etc.
D.6. PROFITABILITY EVALUATION		
D.6.1. Commercial profitability	Rules of tender evaluation	Load factor, raw material, labour, power, etc. prices, interest rate, foreign exchange conversion
D.6.2. - - -		See: C.6.

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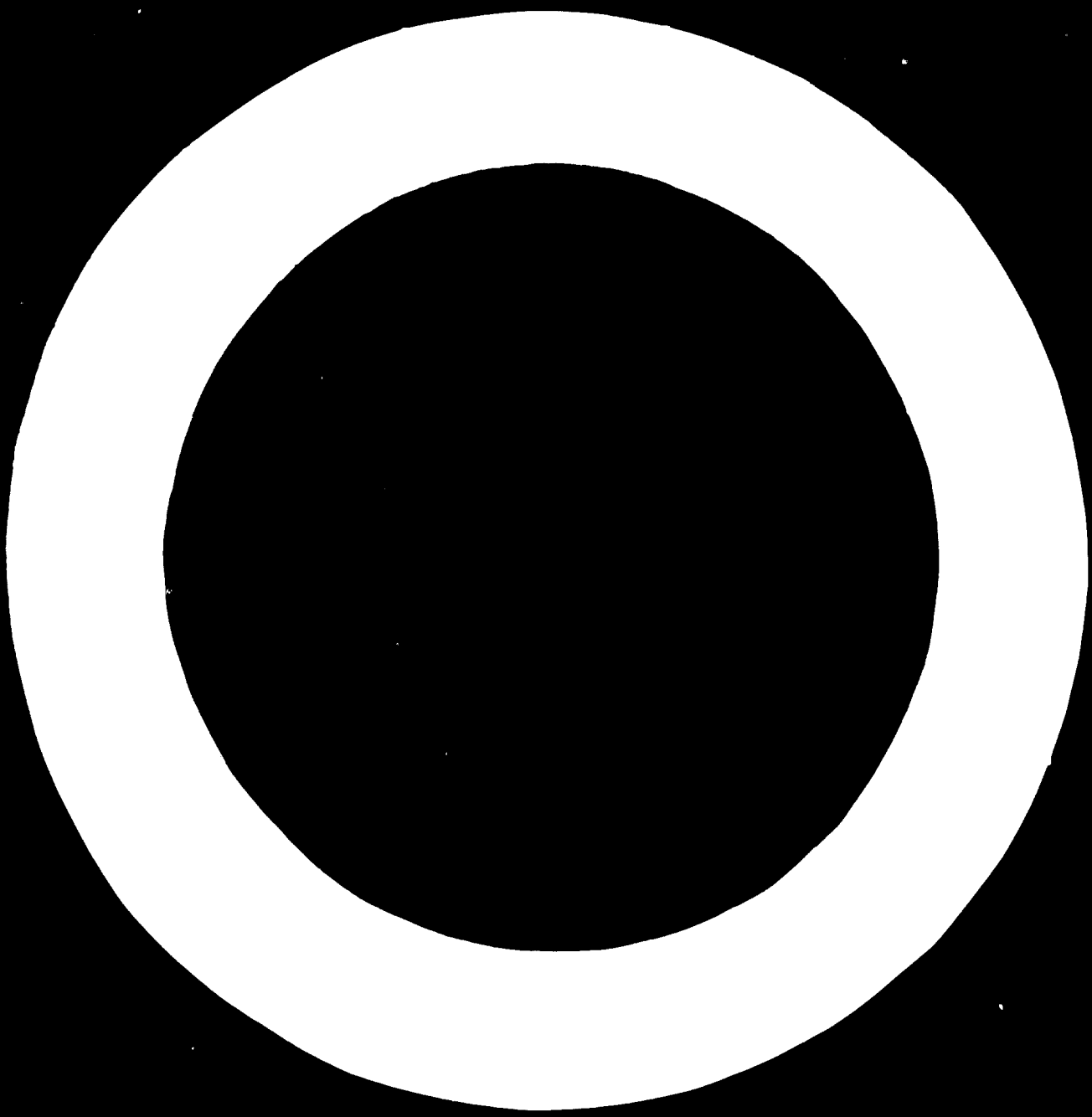
E.1.2. - - -		
E.1.3. - - -		
E.1.4. - - -		
E.2. SECTOR ANALYSIS		
E.2.1. - - -		
E.2.2. - - -		
E.3. PROJECT ANALYSIS: ENGINEERING		
E.3.1. Design, layout	Tendered capacity	
	Tendered production programme	Number of products, their specifications, quantities
	Tendered processes	Variations of process A
	Tendered process data	Variation of input, conversion, output data, performance
	Complience with basic preconditions	Raw material composition, water quantity/quality, humidity
	Tendered layout	Detailed plan views and cross sections at different levels
	Tendered details of plant sections	Optimal co-ordination of sections to meet material flow requirements
	Tendered machinery details	Preferred manufacturers, specific capacities, efficiences, type of drive, overrating of motors, isolation, tolerances, permissable vibrations and sound nuisance etc.

E.3.	D. TENDER EVALUATION (contd.)	
CHAPTER Section	Contents	Remarks
E.3.2. Construction	Itemized time table	Critical path method based on tender data: civil works, manufacturing, supply, erection, commissioning, semi-commercial operation
	Tendered data on the manufacturing process	Standards, laws and regulations, inspection, standardization
	Tendered data concerning transport	Limitations in choice of transportation facilities, insurance requirements, port/road/railway/storage facilities
	Tendered details concerning erection	Availabilities: local skilled/unskilled labour, tools/tackles, housing facilities, site access, auxil. agents, restrictions for foreign personnel
	Tendered details concerning commissioning and semi-commercial operation	Tests, training, reconditioning
E.3.3. Operation	Tendered details concerning management	Delegation of supervisory staff
	Tendered details concerning staff	Labour laws and regulations, training programs, housing facilities, other fringe benefits
	Proposed details concerning raw material supply	Required storage facilities, transport means
	Tendered data on spare parts and supply	List of recommendable spare parts, order point system

E. FINAL EVALUATION (contd.) E.1.6.

CHAPTER Section	Contents	Remarks
E.4. PROJECT SPONSOR(S)		
E.4.1. - - -		
E.4.2. - - -		
E.5. INVESTMENT COST/ FINANCING		
E.5.1. Investment cost	Detailed construction time/ cost schedule	Tendered prices, subdivided in foreign exchange / local cost
E.5.2. Financing	Detailed financing of construction time / cost schedule	Sources of financing, subdivided in foreign exchange, local cost components
E.6. PROFITABILITY EVALUATION		
E.6.1. Commercial profitability	Revised calculations	Pay-off period, break even point, return on investment, cash flow, internal rate of return calculation
	Revised specific cost of investment, revised specific cost of production	
E.6.2. Overall economic benefits	Revised cost/benefit analysis based on commercial profitability data	Addition of non-commercial costs and benefits, elimination of non-social costs and revenues, revision of prices, wages and interest rates, re-adjustment of exchange rate



EXAMPLES (Paper Mill)

A. Investment Opportunity Study

B. Pre-feasibility Study

C. Feasibility Study

A. 1. (SX) A. INVESTMENT OPPORTUNITY STUDY

A.1. OVERALL ECONOMIC AND SECTOR ANALYSIS

A.1.1. General characteristics

Country data sheet (not produced here)

A.1.2. Economic characteristics

- GNP at 1954 factor cost prices (million DM)

	1965	1966	1967	1968
Totals	x xxx	x xxx	x xxx	x xxx
Rate of increase	2,5 %	3,7 %	4,4 %	8,3 %

GNP per capita in 1965: DM 551

Ratios of GNP at market prices in 1967

Gross investment	14%
Gross savings	10%
Balance of payments current account deficit	4%
Government revenues	23%

- Balance of payments situation and development (million DM)

	1965	1966	1967
Exports	x xxx	x xxx	x xxx
Imports	x xxx	x xxx	x xxx
Trade balance	- 288	- 2[illegible]	- 244
Over-all balance	- 2[illegible]	- 11[illegible]	- 116

- Gross foreign exchange reserves (million DM; end of period)

	1966	1967	1968	1969(June)
Total	264	300	312	-
Central bank	12[illegible]	17[illegible]	160	108

Total external debt outstanding	million DM	1,400
Rate of debt service ratio to export earnings		7,6 %

A.1.3. Economic system

A.1.4 Economic policy

Government declaration, Development plan (not produced here)

A.1.5. Overall economic justification of projects considered

Range of preference: import saving - job creation - profitability

B.1. OVERALL ECONOMIC SITUATION

B.1.1. General characteristics

See: A.1.1.

B.1.2. Economic characteristics

See: A.1.2.

B.1.3. Economic system

B.1.4. Economic policy

See: A.1.4.

B.1.5. Overall economic justification of projects considered

Range of preference: import saving - job creation - profitability

A.2./3.(EX) A. INVESTMENT OPPORTUNITY STUDY (cont'd.)

A.2. SECTOR ANALYSIS

A.2.1. Situation of raw material market

- Plenty of paddy straw available, not used so far.
- Waste paper available in all towns, no separate collection and not re-used so far.

A.2.2. Market situation of specific product

- About 30,000 tons paper have been imported in recent years.

- Demand was not fully covered and is rising at a rate of about 5 - 10% p.a.
- Additional capacity of 12,500 tons p.a. under construction.
- Further capacity addition of 10,000 to 20,000 tons p.a. recommendable.
- Fixed local sales prices about 1,000 DM/ton, import price about 1,200 DM/ton.

A.3. PROJECT ANALYSIS: ENGINEERING

A.3.1. Design, layout

- Approx. capacity = 15,000 tons p.a.

- Existing process: several different processes are known, they are fully developed and require normal skill in operation only.

- Approx. labour: 800 - 900 men.

-

-

B.2. SECTOR ANALYSIS

B.2.1. Situation of raw material market

- Several districts allow paddy straw collection of 50,000 to 100,000 tons p.a. within a range of about 50 km. Estimated price free centrum about 65 DM/ton.
- Waste paper collection favourable in capital. Cost for collection and transport estimated to be about 200 DM/ton.
- Supplementary pulp: local hemp straw or eucalypt wood available in near future, imports as far as necessary.

B.2.2. Market situation of specific product

- Market balance 1967:

Consumption	39,000 tons
Local production	10,000 tons
Imports	29,000 tons

- New local production capacity under construction 12,500 tons p.a.
- Consumption restricted by import regulation. Assumed open demand in 1967 about 40,000 tons.
- Yearly increase of consumption in the past about 7 % p.a., similar increase to be expected in the near future.
- Additional capacity of about 15,000 tons p.a. would find market outlays since sales price of locally produced product is fixed at about 1,000 DM/ton vs. about 1,200 DM/ton for the imported good.

B.3. PROJECT ANALYSIS: ENGINEERING

B.3.1. Design, layout

- Anticipated capacity

Printing paper	6,500 tons p.a.
Writing paper	8,500 tons p.a.
Total	15,000 tons p.a.

- Approx. process: soda, sulphate and sulphide process, chemicals for caustic soda process available locally to a large extent, caustic soda process must produce comparatively best paper products (specific consumption figures not produced here).
- Operation personnel

Foreign supervisors	about 2 men
Skilled staff	about 200 men
Unskilled labour	about 600 men
Total	about 800 men

- Approx. basic process preconditions: water (sufficient quantity/quality), disposal facilities of waste waters, power supply, road connections, low humidity, good construction ground.
- Location: suitable construction sites = town A + B, village C
  Town B has comparatively best basic process preconditions, favourably placed within paddy rice development area, no housing problems for staff, power line connections to factory easily possible.

A.3./A./5.(EX) A. INVESTMENT OPPORTUNITY STUDY (contd.)

A.3.2. Construction

-

A.3.3. Operation

- Approx. output = 80 - 100%, i.e. 12,000 - 15,000 tons p.a.

A.4. PROJECT SPONSOR

- Not produced here.

A.5. INVESTMENT COST/FINANCING

A.5.1. Investment cost

- Estimated total cost = about 75 million DM, of which about 40 million DM in foreign exchange (specific investment about 5,000 DM/ton of paper).

A.5.2. Financing

- Equity of sponsor = 35%
- Foreign capital aid = 35%
- Supplier's credit = 30%.

B. PRE-FEASIBILITY STUDY (contd.) B.3./[illegible]/5.(EX)

B.3.2. Construction

- Total construction time about 4 years.

B.3.3. Operation

- Proposed output = 100% i.e. 15,000 tons p.a., main customers
  Printing press A = 4,000 tons p.a. printing paper
  Stationary factory B - 5,000 tons p.a. writing paper

B.4. PROJECT SPONSOR

-

B.5. INVESTMENT COST/FINANCING

B.5.1. Investment cost

- Subdivided cost estimate: (million DM)

	Local currency	Foreign exchange	Total
Land	0,5	-	0,5
Civil works	8,0	-	8,0
Machinery ready erected	9,0	31,0	40,0
Licence	6,0	-	6,0
Overheads	3,0	4,0	7,0
	26,5	35,0	61,5
Contingency	3,0	2,5	5,5
	29,5	37,5	67,0
Working capital	5,0	-	5,0
	34,5	37,5	72,0

B.5.2. Financing

- Proposed financing: (million DM)

	Local currency	Foreign exchange	Total
Equity	25,0	-	25,0
Foreign aid	-	30,0 (*)	30,0
Supplier's credit	-	17,0	17,0
	25,0	47,0	72,0

(*) partly useable for local works.

A.6. PROFITABILITY ANALYSIS

A.6.1. Commercial profitability

- Pay off period

Revenue 1,9 x 1,05	=	28,5 Million DM
Operating cost	=	18,0 Million DM
Average interest (6% p.a.)	=	2,2 Million DM
Cash flow	=	8,3 Million DM

Pay off period $\frac{75,0}{8,3}$ = ca. 9 years

- Rate of return

Revenue	=	28,5 Million DM
Operating cost	=	18,0 Million DM
Depreciation (6,7% p.a.)	=	5,0 Million DM
Return		5,5 Million DM

Rate of return (average) $\frac{5,5}{0,5 \times 75,0}$ = about 14,5% p.a.

B.6. PROFITABILITY EVALUATION

B.6.1. Commercial profitability

- Pay off period

Revenue	=	28,5 Million DM
Operating cost	=	16,5 Million DM
Average interest (6% p.a.)	=	2,2 Million DM
Cash flow	=	9,8 Million DM

Pay off period $\frac{72,0}{9,8}$ = about 7,3 years

- Rate of return (average)

Revenue		=	28,5 Million DM
Operating cost			
Straw	2,0 Million DM		
Pulp	3,0 Million DM		
Waste paper	0,5 Million DM		
Chemicals	4,0 Million DM		
Others + power	2,5 Million DM		
Labour	1,0 Million DM		
Administration	1,5 Million DM		
Distribution	1,0 Million DM		
Sales tax	1,0 Million DM	16,5 Million DM	
		12,0 Million DM	
Depreciation (6,7% p.a.)		4,8 Million DM	
		7,2 Million DM	

Rate of return (average) $\frac{7,2}{0,5 \times 72}$ = 20% p.a.

- Specific investment cost of plant
(72 - 5) Million DM : 15,000 tons = 4,500 DM/ton

- Specific cost of production

Operating cost	=	16,5 Million DM
Depreciation	=	4,8 Million DM
Interest (6% p.a.)	=	2,2 Million DM
		23,5 Million DM

23,5 Million DM : 15,000 tons = 1,565 DM/ton

A.6.2.(EX) . INVESTMENT OPPORTUNITY STUDY

A.6.2. Overall economic benefit

- Job creation,
  Specific capital requirement:

  Total $\frac{75,0 \text{ Million DM}}{350}$ = about 90,000 DM/job

  Foreign exchange $\frac{39,2 \text{ Million DM}}{350}$ = 47,000 DM/job

- Foreign exchange savings:

Import substitution (15,000 x 1,200)		= 18,0 Million DM
Depreciation (*)	3,5 Million DM	
Interest	1,1 Million DM	
Current imports	2,0 Million DM	8,6 Million DM
Foreign exchange savings p.a.		= 9,1 Million DM

(*) On foreign exchange parts only

- Enumeration of social costs and benefits (not produced here)

B.6.2. Overall economic benefit

-

- Foreign exchange savings:

Import substitution		18,0 Million DM
Export		-
Depreciation (*)	2,5 Million DM	
Interest (*)	1,5 Million DM	
Current imports	4,5 Million DM	8,5 Million DM
		9,5 Million DM

(*) Based on world market prices

- Cost/benefit evaluation

Revenue 15,000 x 1,200 (*)		18,0 Million DM
Operation cost (**)		
Straw	- Million DM	
Pulp	2,0 Million DM	
Wast paper	- Million DM	
Chemicals	3,5 Million DM	
Others + power	2,0 Million DM	
Labour	0,5 Million DM	
Administration	0,8 Million DM	
Distribution	0,5 Million DM	
Sales tax	- Million DM	9,3 Million DM
		8,7 Million DM
Depreciation		4,8 Million DM
		3,9 Million DM

Rate of return $\frac{3,9}{0,5 \times 72}$ = ca. 11%

(*) Based on world market prices
(**) Social costs

C.1.(BX) [illegible] STUDY (abridged)

C.1. [illegible] (*)

C.1.1. General presentation

Country note sheet (not produced here)

C.1.2. Economic characteristics

GNP at 1962 factor cost prices (million DM)

	1965	1966	1967	1968
Totals	x xxx	x xxx	x xxx	x xxx
Rate of increase	2,5	3,7	4,4	8,3

GNP per capita in 1968 : DM 551

Ratios of GNP at market prices in 1967

Gross investment	14
Gross savings	10
Balance of payments current account deficit	4
Government revenues	23

Balance of payments situation and development (million DM)

	1965	1966	1967
Exports	x xxx	x xxx	x xxx
Imports	x xxx	x xxx	x xxx
Trade balance	- 298	- 280	- 244
Overall balance	- 200	- 116	- 116

Gross foreign exchange reserves (million DM, end of period)

	1966	1967	1968	1969 (June)
Total	268	300	312	-
Central bank	120	176	160	108

Total external debt outstanding 1,400 million DM

Rate of debt service ratio to export earnings 7,6 %.

C.1.3. Economic sectors

C.1.4. Economic policy

Government declaration, Development plan (not produced here)

C.1.5. Overall economic justification of projects considered

Terms of preference: import saving - job creation - profitability

(*) Items C.1. - 4. to be covered only if no investment opportunity or pre-feasibility study preceding.

C.2. SECTOR ANALYSIS

C.2.1. Situation of raw material market

Resources and their utilization:

Fibre

Based on the initial capacity of the project there will be a need of 22,000 tons of air dry paddy straw p.a. Within a range of 40 miles of the plant there are 130,000 acres under paddy cultivation. As a result of an irrigation project, another 30,000 acres will soon be added. Given two annual crops nearly 80,000 tons of air dry straw will be available. Up to now paddy straw is not marketable and thus of no use to the cultivator. It can be assumed that the farmer regards 35 DM/ton to be a good sales price for paddy straw. Adding 25 DM/ton as an average for costs of collecting and transporting the straw its price will be 60 DM/ton at place of production. There should be no supply problems if the plant should be expanded later on, since enough paddy straw and other fibre materials are available that could be used if necessary.

Bleached sulphate pulp

Since this pulp is not produced locally, it has to be imported. It is hoped that after some years of production part of imports can be substituted by pulping of hemp and of eucalypts which are available locally.

Waste paper

Waste paper will have to be collected in the capital. While there is no shortage of waste paper the problem will be to collect it. The cost of collecting and transporting the waste paper needed is estimated to be around 200 DM/ton.

C.2.2. Market situation of specific product

Product demand

Table 1: Past local sales and demand (sales here are identical with consumption)

Year	Consumption tons	Presumed demand tons	Rate of growth of demand	Consumption per capita/kg
1963	30,730	36,500	-	2,9
1964	36,890	40,000	9,6 %	3,4
1965	31,740	42,500	6,3 %	2,8
1966	37,930	45,000	5,9 %	3,3
1967	38,830	48,500	7,8 %	3,3

The existing unsatisfied demand is due to import restrictions in connection with regulations of local prices.
Paper in this part is dealt with as one product presuming that the development of demand for the relevant grades of paper is more or less the same.

C.2.(EX) contd. C. FEASIBILITY STUDY (contd.)

Table 2: Per capita consumption of paper and paperboard products in various countries in 1966 (in kg)

USA	248,4	Brazil	10,4
W-Germany	101,2	Turkey	5,4
Argentina	43,1	Y-Land	3,3
Spain	21,1	India	1,6

The table reveals a correlation between the levels of per capita income and per capita consumption of paper.

There were and there will be no exports of paper.

Future domestic demand

Estimated rate of growth of population	2,9% p.a.
Estimated rate of growth of GDP/capita	2,5% p.a.
Resulting rate of growth of GDP	5,3% p.a.
Estimated income elasticity of demand	1,4
Resulting rate of growth of demand	7,4% p.a.

Projection of demand on the basis of these hypotheses see Table 4.

Product supply

The productive capacity so far is concentrated in one enterprise. The increase of production from 1963 to 1967 as shown in Table 3 is due to the installation of new machinery as well as to better utilization of machinery.

Stocks are assumed to remain unchanged.

Table 3: Past domestic production and imports

Year	Local production tons	Imports tons	Imports as percentage of local consumption
1963	5,353	25,427	82,6%
1964	6,453	30,446	82,5%
1965	7,519	24,221	76,3%
1966	8,500	29,430	77,6%
1967	9,500	29,330	75,5%

Future domestic production

The following new capacities are being planned:

a) Expansion of the existing mill to produce additional 12,500 tons p.a. from 1970 on

b) The project under consideration producing 15,000 tons p.a. from 1974 on

c) Installation of a new mill producing 15,000 tons p.a. from 1975 on.

C. FEASIBILITY STUDY (contd.) C.2.(EX) contd.

Coverage of demand

Table 4: Future domestic demand and production

Year	Expected demand (tons)	Planned capacities (tons)	Expected difference (tons)	Difference as percentage of demand
1968	52,100	10,000	42,100	80,8%
1969	55,900	10,000	45,900	82,1%
1970	60,100	22,500	37,600	62,6%
1971	64,500	22,500	42,000	65,1%
1972	69,300	22,500	46,800	67,5%
1973	74,400	22,500	51,900	70,0%
1974	79,900	37,500	42,400	53,1%
1975	85,800	52,500	33,300	38,8%

Due to balance of payments difficulties import restrictions will continue. These restrictions will probably prevent imports from filling the gap between expected demand and planned production, whether the project under consideration is realized or not. So the development of demand as well as the availabilities of imports would justify the realization of the project.

Domestic prices are fixed by government. They were 1,882 DM/ton for printing paper and writing paper and 1,955 DM/ton for bond paper in 1967 as well as in 1968, respectively. These prices are expected to be valid for the products of the project.
Import prices c.i.f. in 1967/68 are 1,160 DM/ton for printing paper, 1,210 DM/ton for writing paper and 1,260 DM/ton for bond paper.

C.3.(EX) C. FEASIBILITY STUDY

C.3. PROJECT ANALYSIS: EXAMPLE

C.3.1. Design, layout

Capacity of paper mill: 15,000 tons p.a.

Production programme:	15,000 tons of paper
of which	6,500 tons of printing paper
	6,500 tons of writing paper
	2,000 tons of bond paper.

Production process:

a) Paddy straw will be pulped in a caustic soda process using continuous cooking equipment; the pulp from straw will be bleached in a three-stage process.

b) Bleached straw pulp will be the major component in the paper machine furnish, its share ranging from 51% to 61% depending on quality. Straw pulp will be supplemented by imported bleached sulphate pulp with a share of 20% to 35% and by clean, white waste paper.

Inputs of raw materials p.a.:

Straw	29,000 tons
Bleached sulphate pulp	3,760 tons
White waste paper	1,650 tons

Input of auxiliary agents p.a.:

Caustic soda	1,095 tons
Chlorine	696 tons
Alum	893 tons
Clay	670 tons
Divers chemicals	630 tons
Fuel oil	5,950 tons
Electric power	16,900 MWh
Water	880 Mio

Labour force:

Mill	
Daily paid	623 men
Salaried	150 men
Head office	
Salaried	20 men
Total	793 men

Annual operating period 300 days

Location

The selected location has been preferred to alternative sites because it guarantees an adequate supply of water and provides adequate effluent disposal facilities.
The required volumes of paddy straw can be collected within a range of 20 miles at low costs. A power station is located near the plant which provides the required electric energy at favourable conditions. There are no bottlenecks to be expected if an expansion of the plant should become desirable. Climatic and soil conditions are favourable. Transport connections are sufficient for the transport of input materials and the products of the plant.

C.3.2. Construction

Table 5: Time Schedule	Duration	Finished
Preparation of tender documents	5 months	10/69
Tendering and evaluation	6 months	4/70
Negotiations and contracting	2 months	6/70
Supply of machines	24 months	6/72
Erection after last supply	12 months	6/73
Trial run	3 months	9/73
Contingencies	3 months	12/73
Start of normal operation		1/74

Manufacturing requirements

Not produced here.

Transport situation

The plant is connected with the capital by main highways, which is the center of consumption of the products concerned, as well as with the port, where the imported equipment and inputs will be lightened; the distances are 30 miles and 110 miles, respectively.

Erection, commissioning

Not produced here.

C.3.3. Operation

Not produced here.

C.4./5.(EX) C. FEASIBILITY STUDY (contd.)

C.4. PROJECT SPONSOR

C.4.1. Organizational and management aspects

C.4.2. Financial situation

Both not produced here.

C.5. INVESTMENT COST AND FINANCING

C.5.1. Investment cost

Table 6: Estimated investment cost (million DM)

Item	Local currency	Foreign exchange	Total
Land	0,20	-	0,20
Site investigation	0,04	-	0,04
Buildings	4,57	2,96	7,53
Equipment	2,18	26,24	28,42
Construction overhead	4,64	3,09	7,73
Engineering and contingencies	0,30	6,42	6,72
Consultants fees	-	0,27	0,27
Foreign exchange licence fee	5,78	-	5,78
Interest during construction	3,07	3,82	6,89
Infrastructure	1,92	-	1,92
Working capital	4,30	-	4,30
Sum	27,00	42,80	69,80

C.5.2. Financing

Table 7: Approx. financing schedule (million DM)

Sources	Local currency	Foreign exchange	Total
Supplier's credit	-	11,5	11,5
Foreign government loan	-	27,5	27,5
Equity capital	30,8	-	30,8
	30,8	39,0	69,8

Credit conditions:

Supplier's credit: interest rate: 7%; amortization: 10 years in equal rates beginning 1974.
Foreign government loan: interest rate: 4%; amortization: 10 years in equal rates beginning 1977 after a three year grace period.

C.6. PROFITABILITY EVALUATION

C.6.1. Commercial profitability

Operating costs in a normal year at full capacity utilization.

Table 8: Estimated operating costs p.a. (in 000 DM)

Cost items	Local currency	Foreign exchange	Total
Straw (v)	1,754	-	1,754
Bleached sulphate pulp (v)	1,544	2,526	4,070
Waste paper-white (v)	333	-	333
Chemicals (v)	3,294	704	3,998
Fuel oil (v)	381	311	692
Other materials (v)	228	726	954
Electric power (v)	624	-	624
Labour (f)	900	-	900
Administration and overhead (f)	1,353	-	1,353
Contingencies (f)	172	-	172
Costs of distribution (v)	1,378	-	1,378
Sales tax (v)	1,378	-	1,378
Transport and insurance	685	-	685
Operating costs before interest and depreciation	14,024	4,267	18,291
Interest charges (f)	-	1,060 (*)	1,060 (*)
Depreciation (f)	1,331	2,634	3,965
Total operating costs	15,355	7,961	23,316

v = variable costs
f = fix costs

(*)= assumed is an average annual interest charge

C.6.(EX) contd. C. FEASIBILITY STUDY (contd.)

Estimate of revenues, profits, cash flow at full capacity utilization

Table 9: Estimated earnings p.a.

Paper product	Sales price DM/ton	Production tons	Revenues 000 DM
Bond paper	1,955	2,000	3,910
Printing and writing paper	1,882	13,000	24,461
		15,000	28,371

Yearly profit: (in 000 DM)

Revenues	28,371	Net income before interest	6,115
Total operating costs	23,316	Net income before depreciation	9,020
Profit	5,055	Net income before depreciation and interest	10,080

Pay-off-period:

$$\frac{\text{Total investment cost (DM}}{\text{Net income before depreciation (DM p.a.)}} = \frac{69,800 \text{ DM}}{9,020 \text{ DM p.a.}} = 7,7 \text{ years}$$

Return on investment:

$$\frac{\text{Profit}}{\text{Revenues}} \times \frac{\text{Revenues}}{\text{Total investment cost}} = \frac{5,055}{28,371} \times \frac{28,371}{34,900} = 14,5\ \%$$

Table 10: Cash flow (000 DM)

Year	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
Revenues	28,371	28,371	28,371	28,371	28,371	28,371	28,371	28,371	28,371	28,371	28,371	28,371	28,371
- Operating costs before interest and depreciation	18,291	18,291	18,291	18,291	18,291	18,291	18,291	18,291	18,291	18,291	18,291	18,291	18,291
= Gross cash flow	10,080	10,080	10,080	10,080	10,080	10,080	10,080	10,080	10,080	10,080	10,080	10,080	10,080
- Interest charges	1,955	1,825	1,746	1,664	1,473	1,283	1,092	902	711	521	330	220	110
- Repayments of debt	1,150	1,150	1,150	3,900	3,900	3,900	3,900	3,900	3,900	3,900	2,750	2,750	2,750
= Net cash flow	7,025	7,105	7,186	4,516	4,707	4,897	5,088	5,278	5,469	5,659	7,000	7,110	7,220
cumulated	7,025	14,130	21,316	25,832	30,539	35,436	40,524	45,802	51,271	56,930	63,930	71,040	78,260

C.6.(EX) contd. C. FEASIBILITY STUDY (contd.)

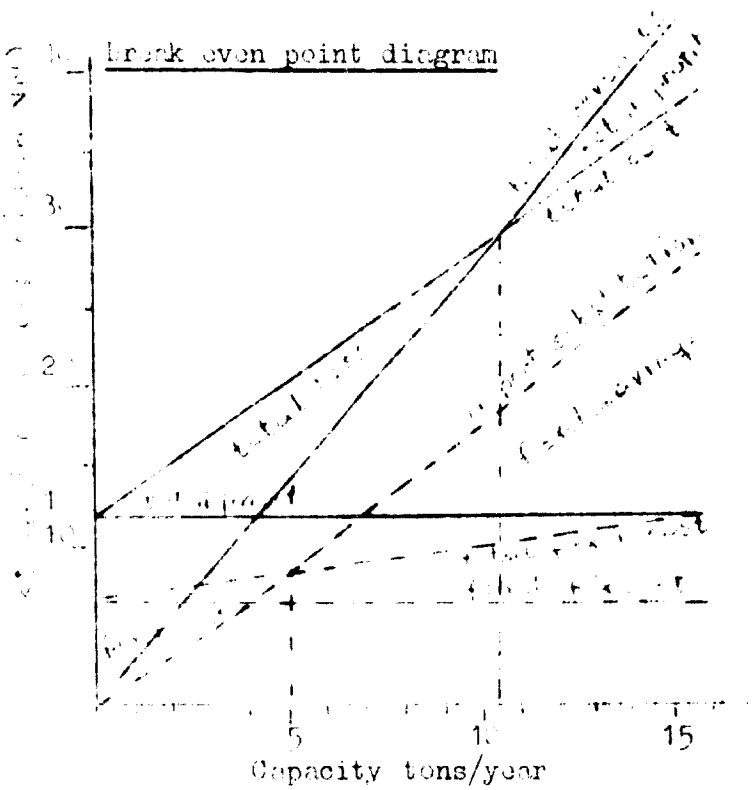
Internal rate of return

Table 11: (in million DM)

Year	Investment costs (*)	Operating costs	Revenues	Yield of liquidation	Cash flow
- 3	13,8	-	-	-	- 13,8
- 2	25,2	-	-	-	- 25,2
- 1	15,7	-	-	-	- 15,7
0	8,2	-	-	-	- 8,2
1	-	18,3	28,4	-	10,1
2	-			-	
.	-			-	
.	-			-	
11	-			-	
12	-			-	10,1
13	-	18,3	28,4	12,5	22,6

(*) Interest during construction costs are eliminated for purpose of this calculation

Internal rate of return: 10,2 %



specific cost of investment:

= 65.5[illegible] million DM = 4,365 DM/ton
15,000 tons

specific cost of production:

= 23.310 million DM = 1,554 DM/ton
15,000 tons

To diagram:
Break even point for
- total profit = about 10 years
- foreign exchange saving = about 5 years

C.6.2. Overall economic benefits

Job creation:
About [illegible] persons will be employed by the new mill;
the capital requirement per person employed will be 87,250 DM.

Cost benefit analysis (based on commercial profitability data)

Table 12: CBA- operating costs and benefits

Item	Commercial profitability [illegible]		Cost benefit calculation	
	([illegible] DM)	([illegible] NN)	([illegible] DM)	([illegible] NN)
Revenues	28,371	42,220	17,933	38,300
Operating costs				
Straw	1,754	2,610	-	-
Bleached sulphate pulp	4,070	6,057	2,829	6,057
Waste paper	333	495	14	30
Chemicals	3,998	5,949	2,778	5,949
Fuel oil	692	1,030	481	1,030
Other materials	954	1,420	663	1,420
Electric power	624	929	434	929
Labour	900	1,340	375	803
Administration and overhead	1,353	2,014	704	1,508
Contingencies	172	256	85	181
Costs of distribution	1,378	2,050	957	2,050
Sales tax	1,378	2,050	-	-
Transport and insurance	685	1,020	430	920
Operating costs before interest and depreciation	18,291	27,220	9,750	20,877

Explanations to CBA-operating costs and benefits

a) The official exchange rate is fixed at 1 NN = 0,672 DM. It is presumed that the NN is overrated by 44%. So in the CBA an exchange rate of 1 NN = 0,467 DM is applied.

C.6.(EX) contd. C. FEASIBILITY STUDY (contd.)

b) Revenues are re-calculated on the basis of world market prices instead of local prices. This induces revenues to fall from 42,2 million NN to 26,7 million NN, if calculated on the basis of the official exchange rate. Re-adjustment of the exchange rate makes CBA revenues to be 38,4 million NN.

c) The values of imported inputs are effected in two ways: The commercial cost calculation is inflated by a 4% duty on imports which has to be eliminated. On the other hand the exchange rate has to be re-adjusted. The two effects compensate each other.

d) Several local inputs were re-adjusted on the basis of presumed opportunity costs.

e) External effects do not exist.

Explanation to CBA-investment cost

a) Foreign exchange investment costs have to be corrected with respect to CBA-exchange rate (The 4% duty mentioned before is not levied on these imports).

b) The foreign exchange licence fee does not represent social costs.

c) Interest during construction is eliminated for purpose of internal rate of return calculation.

Table 13: CBA-investment cost (in '000 NN)

Item	Local costs	Foreign exchange costs: Official exchange rate	Foreign exchange costs: CBA exchange rate	Cost-benefit calculation values
– Land	3[illegible]	–	–	3[illegible]
– Site investigation	[illegible]	–	–	5[illegible]
– Buildings	6,8[illegible]	1,[illegible]	6,38[illegible]	13,136
– Equipment	3,2[illegible]	33,[illegible]	56,23[illegible]	59,482
– Construction overhead	6,9[illegible]	1,[illegible]	[illegible]621	13,524
– Engineering and contingencies	45[illegible]	9,55[illegible]	13,752	14,202
– Consultants fees	–	[illegible]	576	576
– Foreign exchange licence fee	4,6[illegible]	–	–	–
– Interest during construction	1,57[illegible]	5,68[illegible]	–	–
– Infrastructure	2,85[illegible]	–	–	2,85[illegible]
– Working capital	[illegible],[illegible]	–	–	6,4[illegible]
	[illegible],17	[illegible],[illegible]	[illegible],58[illegible]	11[illegible],52[illegible]

C. FEASIBILITY STUDY (contd.) C.6.(EX)contd.

Table 14: CBA-internal rate of return calculation (in million DM)

Year	Investment cost	Operating costs	Benefits	Yield of liquidation	Net benefits
- 3	24,1	-	-	-	- 24,1
- 2	44,3	-	-	-	- 44,3
- 1	27,7	-	-	-	- 27,7
0	14,4	-	-	-	- 14,4
1	-	20,9	38,4	-	17,5
2	-			-	
.	-			-	
11	-			-	
12	-			-	17,5
13	-	20,9	38,4	19,6	37,1

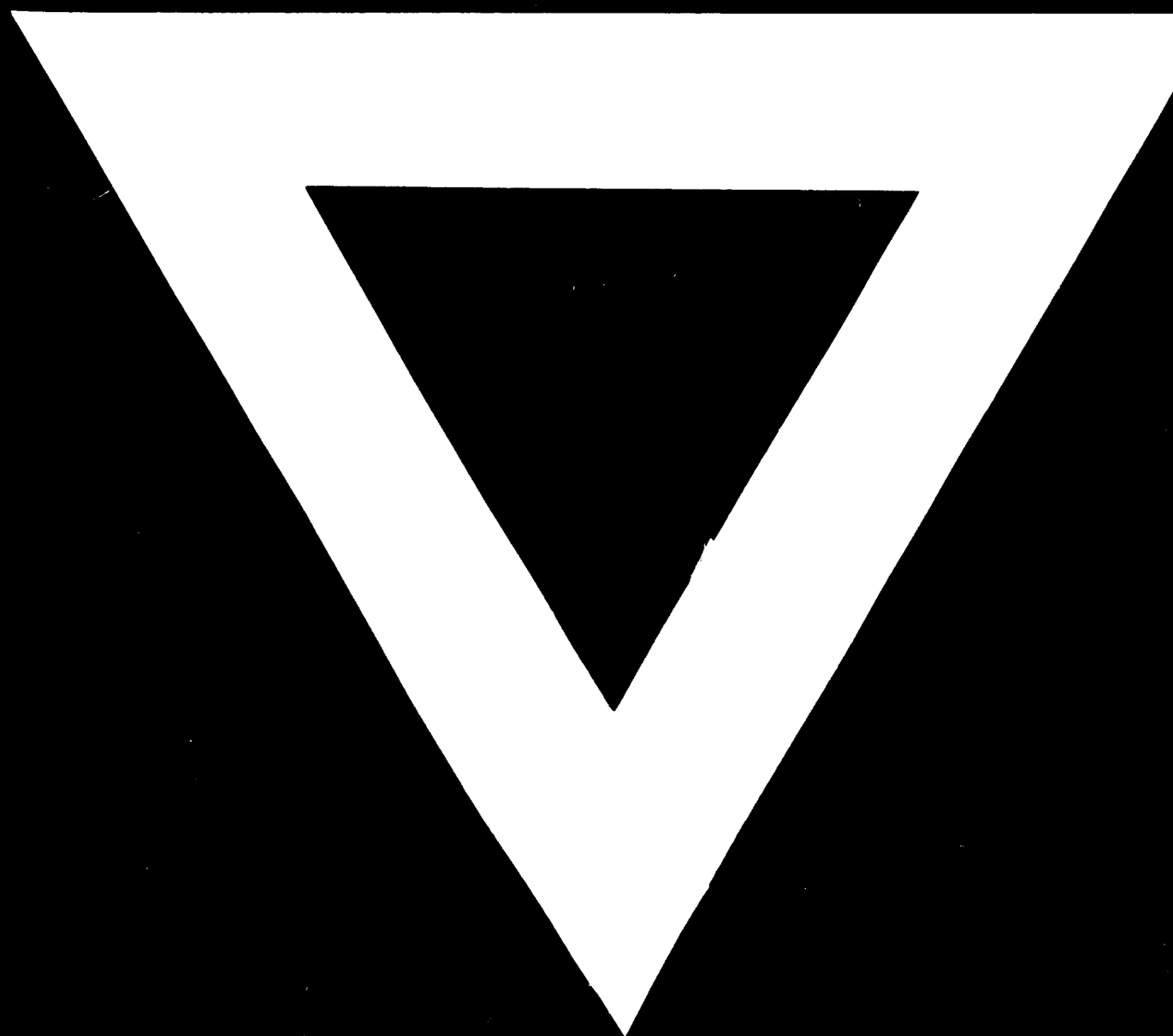
CBA-internal rate of return: 16% (approx.)

Improvement of foreign exchange position

Table 15: Foreign exchange balance

Item	Amounts
Import substitution (based on world market prices)	17,9 Million DM p.a.
Additional exports	-
Additional current imports	4,3 Million DM p.a.
Foreign exchange interest charge (average)	1,1 Million DM p.a.
Depreciation on investment in foreign currency	2,6 Million DM p.a.
Saving of foreign exchange	9,9 Million DM p.a.

Comparing the saving of foreign exchange before depreciation (12,5 million DM) with the foreign exchange costs of investment (22,8 million DM), the pay-off period of the latter is 3.1 years.



14.3.74