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Cuba.

PRE-FEASIBILITY STUDY ON PRODUCTION OF NEWSPRINT FROM BAGASSE

UC/CUB/84/014

CUBA

Terminal Report *

Prepared for the Government of Cuba
by the United Nations Industrial Development Organization

Based on the work of
O. Heinonen, W. Hübner, D. Rosati

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STUDY CONTENTS

C H A P T E R I

PROJECT BACKGROUND AND HISTORY

Cuba is the world's largest sugar exporter. With sugar accounting for the bulk /ca. 80%/ of export earnings and around 9% of national income, overall economic performance of the country is still heavily influenced by this branch.

The importance of sugar production for Cuba's economy is unquestionable but its high dependancy on this item may be considered as a drawback, largely exposed by the recent international market situation. Extremely low international sugar prices in recent years have created an unfavourable situation for Cuba's economic development.

Since 1971 diversification of the economy has been the central feature of economic policy in Cuba. The diversification, however, has proved to be a difficult and long term process. Thus, up to now, sugar is central to income generation, even within the industrial sector.

This is the main reason why the Cuban government attaches great importance to the implementation of two objectives of economic policy:

- expansion of sugar by-product industries[1/];
- promotion of non-traditional exports connected with sugar industry;

Production of furfural, torula yeast, sucro-chemicals, board, pulp and paper have been planned to grow and are treated as priority.

In line with these plans, among others, a large bagasse pulp and paper mill at Játibomico /equipped by Creusot-Loire, France/ was constructed, technology to manufacture textiles from bagasse was developed in cooperation with G.D.R. and the largest rum destillery has been under construction.

1/ - "It has become increasingly clear in recent years that the future of the sugar industry depends on its successful development of sugar by-products". O. Almazán del Olmo: "By-products of the sugar industry in Cuba", in: Appropriate Industrial Technology for Sugar, UNIDO, Monographs on Appropriate Industrial Technology, No.8, UN, New York, 1980, p.81

The production of newsprint from bagasse, a sugar by-product still in abundance in the country has been identified as a further opportunity to maintain this orientation. Simultaneously bagasse newsprint, being a substitute for imported newsprint could ensure self sufficiency of Cuba economy in this field.

The Cuban Institute for Sugar Cane By-Products /ICIDCA/ was carrying in the 1970's some investigation concerning technology in question. The results obtained were promising. Original technologies using sugar cane bagasse for production of pulp and different types of paper - among them newsprint - were developed.

Research on the chemi-mechanical bagasse pulp in laboratory scale began in ICIDCA about 1970.

In 1973 some studies about impregnation of bagasse with caustic soda were carried out. This process has been patented.

From 1974 to 1978 different products for impregnation were tried, as well as bleaching with hydrogen peroxide in the tower and inside the refiner. An extensive research has been carried out on the characterization of pulps. Properties of the pulps obtained with caustic soda impregnation were considered to be suitable for newsprint paper-making, low quality printing and writing papers and light-weight-coated papers /LWC/.

The cold soda chemi-mechanical pulping process was started on semi-industrial scale in Cuba - 9 Project Installations in Quivican and newsprint paper of good quality was obtained with furnishes containing 75-80% of bagasse pulp.

Own technology achievements were supported therefore by considerable experience in the field of know-how.

According to Cuban experts´ opinion the newsprint paper obtained could be used basically for newspapers and magazines. Moreover, it would be possible to use it in printing cheap books and copybooks.

On the basis of positive results in the field of technology an idea has been formulated to proceed with industrial, large scale production of bagasse based newsprint.

The possibility of foreign participation in the project has been considered, so the possible investment could be carried out as a joint-venture on the basis of new Cuban law from 1982[2/].

According to the declaration by ICIDCA´s experts[3/] the project sponsor on behalf of Cuba would be the Ministerio del Azúcar /MINAZ/, that could apport a share of the equity, supply the process technology, part of the engineering and design and act as the legal agent of the enterprise in the country.

Other Cuban enterprises, belonging to the Ministerio del Azúcar could undertake other parts of the project such as construction and installation of facilities with some technical assistance of the suppliers, in case of basic equipments.

It was expected on the Cuban side that despite the overproduction of newsprint in developed countries, the Third World countries, due to the demographic increase, low level of present consumption, and the efforts to achieve a higher educational level would represent constantly growing demand for news-

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2/ - Regulations complementing Legislative Decree 50, of February 15, 1982; Camara de Comercio de la Republica de Cuba, September 1982

3/ - Compare Appendix 1, p. 10-12

print. Thus, consumption of newsprint in developing countries was supposed to increase more rapidly than in the developed ones.

C H A P T E R II

MARKET AND DEMAND STUDY

1. Newsprint in the World Markets.

1.1. Consumption

Newsprint, a paper generally made of mechanical pulp and produced mainly by the North American and Scandinavian industries, is one of the major paper and board commodities.

Newsprint is accounted for ca. 20% of total paper and board tonnage consumer in 1969, for ca. 15% in 1980.

The largest consumers of newsprint are traditionally the OECD countries with a share of 85% in 1960 and 77% in 1980. During 1960-80, the countries in the third world increased newsprint consumption by ca. 200%, while the total world consumption grew by less than 100%.

Newsprint Consumption

YEAR	1960	1970	1980
	1,000.000 tons		
WORLD	14.1	20.8	25.9
OECD	12.0	16.9	20.0
COMECON	0.6	1.4	1.8
THIRD WORLD	1.4	2.6	4.2

/Source: PPI, November, 1984/

Since newspapers and related products like weekly supplements, free sheet and advertising inserts are the biggest printed products to use newsprint, countries with high newspaper circulation as well as annual quantity of issues and pages consume a major part of the world newsprint production. The number of issues and pages printed is highest where the

share of advertising content is high. In the United States, newsprint consumption consists of two thirds advertising and one third editorial material. Consequently, the US per capita consumption of newsprint consists of ca. 25 kg advertising and 14 kg editorial material.

In the Nordic countries, where newspapers are partly subsidized by the government, the share of advertising is higher in the regional papers with high circulation coverage. On the average, at least 50% of the per capita newsprint consumption /ca. 30 kg/ is caused by advertising.

In the remaining OECD countries, we estimate the advertising share of newsprint consumption, to reach at least 10 kg per capita.

Since newspapers in many COMECON and third world countries do not publish advertising for commercial purposes and the press in many cases is a medium for carrying government and other official messages, the levels of consumption are much lower than those in the OECD countries and can hardly be expected to reach them.

1.2. Production

In the main OECD areas, North America, Western Europe and Asia/Oceania, newsprint demand is to an increasing extent covered by the producers in the respective areas.

Newsprint Consumption and Production in the OECD Areas in 1981:

Area	Consumption million tons	Production million tons	% Change from 1960-62 Production
NORTH AMERICA			
Canada	1.0	8.9	46
U.S.A.	11.0	4.8	153
Total	12.0	13.7	73
OECD EUROPE			
Scandinavia	0.7	4.0	135
Others	5.3	2.2	-3
Total	6.0	6.2	51
JAPAN	2.6	2.6	225
AUSTRALIA AND NEW ZELAND	0.7	0.6	215

The East European COMECON countries produced in 1983 /CPPA 1983/ 1.8 million tons of newsprint, while the apparent demand reached 1.7 million tons.

Africa´s net imports were in 1983 ca. 52.000 tons, ca. 26% of the apparent demand.

Asia imported in 1983 ca. 1.0 million tons, roughly one half of the apparent demand.

Latin America, traditionally one of the most import-dependent newsprint consumers, produced ca.44% of the total apparent demand in 1979 and 49% in 1983.

Newsprint Apparent Consumption and Production in 1980 /CPPA/

Area	Consumption million tons	Production million tons	% Changes from 1960-62 Production
EASTERN EUROPE	1.8	1.7	143
AFRICA	0.4	0.3	1400
ASIA /excl. Japan/	1.8	0.9	125
LATIN AMERICA	1.2	0.6	280

According to the above statistics, the OECD countries produced roughly 23 million tons and consumed ca. 21 million tons of newsprint in 1981. They were net exporters with ca. 2 million tons of production in excess of the apparent demand. Theoretically, this surplus production could be consumed by the African, Asian and Latin American areas. The productive capacity in most OECD countries, especially in North America and Scandinavia could easily be expanded and utilised to supply even increasing net import demand in the Third World.

Political, social, strategic and economic considerations, however, combined with technological progress and new local sources of newsprint raw material are causing a major shift towards increasing self-sufficiency in the developing countries, especially in Asia and Latin America. This is to be seen as part of the accelarating drive of the developing countries to subsitute local production for imports in all paper and board categories.

Self-Sufficiency in the Third World, "Other Paper and Board" Categories /PPI, November 1984/

PRODUCTION AS PER CENT OF DEMAND		
REGION	1950	1980
ASIA	69	79
LATIN AMERICA	68	89
AFRICA	13	69
THIRD WORLD TOTAL	59	80

If and when the major areas of the Third World reach self-sufficiency in newsprint production, and because these cyclically sensitive industries historically tend to undertake simultaneous investments in steeply rising capacities by installing new, large-scale and optimum-size machinery and equipment, temporary difficulties will result from overcapacities and low operating rates.

This situation resembles earlier crises in the newsprint industry. Over 20 years ago Arne Sundelin described the situation in Western Europe as follows /FAO: Pulp and Paper Prospects in Western Europe, Münich, 1963/:
" ... There is no doubt that the large newsprint standby capacities in 1965 in Western Europe and North America will exert a considerable pressure on the world newsprint market in the immediate and near future".

Sudelin predicted, that this could cause a collapse of prices, voluntary curtailments of production and capacity

transfers to other grades of printing and writing papers. In the early 80's, once again, we have witnessed all these developments.

2. Newsprint and Other Printing and Writing Papers.

Consumption of All Printing and Writing Papers Including Newsprint In Million Tons /PPI, November 1984/:

AREA	1960	1980	Index 1960=10C
WORLD			
Newsprint	14.1	25.9	184
Other PR/WR	13.3	40.3	303
Total	27.4	66.2	242
OECD			
Newsprint	12.0	20.0	167
Other PR/WR	10.5	32.1	306
Total	22.5	52.1	232
COMECON			
Newsprint	0.6	1.8	300
Other PR/WR	1.3	2.4	185
Total	1.9	4.2	221
THIRD WORLD			
Newsprint	1.4	4.2	263
Other PR/WR	1.6	5.9	369
Total	3.0	10.1	337

Paper Consumption, Main "Culture" Categories in Thousand Tons

AREA	1969	1981	Index 1969 = 100
OECD - TOTAL			
Newsprint	16.373	21.051	129
Other PR/WR	20.340	32.453	160
- Uncoated	/14.553/*	22.143	152
- Coated	/5.134/*	10.310	201
OECD - EUROPE			
Newsprint	5.145	5.955	116
Other PR/WR	8.170	12.762	156
- Uncoated	6.416	8.623	134
- Coated	1.697	4.139	243
NORTH AMERICA			
Newsprint	9.455	11.827	125
Other PR/WR	10.358	15.528	150
- Uncoated	/6.828/*	10.528	159
- Coated	/2.934/*	4.673	159
JAPAN			
Newsprint	1.773	2.603	147
Other PR/WR	1.812	3.610	199
- Uncoated	1.309	2.276	174
- Coated	503	1.334	265

* - Figures in brackets are estimates

During 1960-80, the world consumption of newsprint grew by 84%, while the consumption of other printing and writing papers was trebled. In the OECD markets the difference in growth rates was still more distinct: other printing and writing papers grew at nearly double the rate of newsprint.

The OECD markets represented 82% of the world consumption of the other printing/writing papers in 1960 and 79% in 1980.

The COMECON countries increased their consumption of newsprint by 200% and other printing and writing papers by 85%. The Third World consumption grew rapidly in all printing/writing categories.

Among the other printing/writing categories, coated papers increased their share of consumption most rapidly. In the OECD countries, coated papers grew in 1969-1981 from ca. 5.1 million tons to 10.3 million tons. The growth was fastest in OECD-EUROPE and JAPAN, where the consumption of coated papers increased from 2.2 million tons to 5.5 million tons.

3. Newsprint Demand and Supply 1980-1995.

3.1. Previous Forecasts

Generally speaking, newsprint consumption in the 1970's and 1980's has grown at a slower rate than previously predicted. One obvious reason is the slow economic growth in 1973-82, difficult to forecast with the information available in the sixties.

FAO forecasts of 1963 and 1967 were excessively optimistic as to the growth prospects in the early seventies. FAO 1967 forecast predicted that newsprint consumption in Western world would hit 6.5-7.2 million tons in 1975. After having reached 5.5 million in 1973 the consumption has actually not grown at all. The 1983 figure /CPPA/ was 5.5 million tons. The forecast published by FAO in 1967 /Wood: World Trends and Prospects/ projected the world consumption of newsprint to grow in 1961-1975 by 82% and other printing and writing papers by 115%.

In 1975, newsprint was over 3 million tons short of the forecast and other printing and writing papers nearly 4 million above it. Concerning newsprint, the forecast proved to be optimistic about Europe and the Third World, pessimistic about North America.

The Pöyry group predicted in 1979, that the West European newsprint consumption in 1990 would be one third higher than in 1977, or grow by some 1.7 million tons. The information available today suggests that the predicted consumption level will not be attained by 1990.

3.2. Capacity Utilization

The operating ratio /rate/ expresses the proportion of production in per cent of the nominal, rated or maximum capacity.

In the newsprint industry, the operating ratio has historically been closer to 80 than to 90%.

In the favourable business conditions of mid 1950's the West European ratio could even reach nearly 100% but in 1958 it was 83% and in 1965 81%.

In the Nordic countries it could go down to 75% even in the sixties. In the seventies, world capacity was nearly fully utilized.

In the North American newsprint industry, the operating ratio was 86-88% in the 1920's, 62-76% in the 1930's and 93-102% in the 1950's.

In the Latin American countries the average operating ratio 1979-1983 was 80% .

3.3. Capacity Expansion

Economic prospects, productivity pressures, and new market opportunities, competition for raw material and the benefits of integration and optimum size have in the past led the newsprint producers to expand mill capacities and create supply surpluses, which have depressed the prices and caused grave financial losses.

At the world level, forecasters are predicting an over-capacity in 1985 of 3.5 - 4.0 million tons, resulting in an operating rate of 85-90%.

In Latin America alone, capacity expanded by 23% in 1979-1983 to ca. 0.75 million tons /CPPA/. Further expansions have been planned or announced for over one million tons in 1984-1990.

Europe: Largest Consumer Countries */

AREA	1969		1978	1979	1983		INDEX
	absolute figure	%			absolute figure	%	1969 = 100
OECD EUROPE	5.145	100	5.237	5.355	5.450	100	106
UK	1.554	30	1.331	1.366	1.289	24	83
FRG	1.035	20	1.165	1.094	1.121	21	108
FRANCE	573	11	616	559	538	10	104
NETHERLANDS	326	6	412	457	392	7	120
SWEDEN	313	6	227	294	316	6	102
Total		73				70	

* Figures for 1969 and 1978 Source - OECD
Figures for 1979 and 1983 Source - CPPA

Observations:

a/ - UK Consumption Declining;
b/ - Netherlands Consumption Growing;
c/ - Others Stangnant;
d/ - Great Concentration of Markets;

Growth of Consumption:

Newsprint and Printing/Writing Papers

Annual Growth Sales, Per Cent

AREA	1960-65	1965-70	1970-75	1975-80	1980-85	1985-90	1990-95
USA							
Newsprint	2.8	2.4	1.9	1.5	1.1	0.6	0.2
PR/WR	5.6	4.8	4.1	3.2	2.5	1.7	0.9
REST OECD							
Newsprint	4.0	4.9	0.6	2.8	-0.1	0.5	-1.2
PR/WR	11.0	8.6	6.6	2.8	4.0	2.4	1.0
COMECON							
Newsprint	9.5	6.7	3.9	1.2	-1.4	-4.0	-6.6
PR/WR	5.8	3.7	3.0	1.4	1.8	1.0	0.3
III WORLD							
Newsprint	6.5	6.0	5.2	4.6	3.9	3.3	2.6
PR/WR	7.5	7.0	6.6	6.1	5.6	5.2	4.6
TOTAL							
Newsprint	4.0	4.0	2.0	2.4	1.0	0.8	0
PR/WR	7.7	6.5	5.4	3.3	3.6	2.6	1.6

Source: Peter Graff/Feldmühle, PPI, November 1984

4. Newsprint Prices: History and Future Prospects.

4.1. History

Simultaneous investments in the major newsprint - producing countries have in the past resulted in temporary excess capacity and in subsequent price competition.

Newsprint world production increased by nearly 5 million tons in 1950-1960 from ca. 9 million tons to ca. 14 million. With high operating rates and acceptable profitability, the industry was willing and able to invest in new and improved facilities.

In the 1960´s, the OECD countries increased their paper and board consumption by more than 50%, but production capacity increased even faster. Newsprint consumption and production increased rapidly until 1974, when world capacity reached 23-24 million tons /depending on the method used for measurements/.

During the sixties, newsprint prices reflected the stable relation between demand and supply. In the US, newsprint cost 148 dollars in 1970 /current prices/. In 1974, however, the forest industry prices were destabilized by the rapid increases of oil prices. Pulp prices in the OECD area rose in 1972-74 by 70-80%. In the US, newsprint cost 231 dollars a ton in 1974 and 287 dollars in 1975. The price rise in 1970-75 was 48%, which was considerably less than the rise in pulp prices. At the same time, newsprint consumption was growing slower than before.

While the market has grown 48% from 14 million tons in 1960 to 21 million tons in 1970, the increase in 1965-1975 was only 34%, from 17 million to 23 million tons.

The market grew still more slowly in 1970-1980, 24% from 21 million to 26 million tons. Newsprint consumers struggled to diminish their paper costs in different ways, reducing page quantities and paper weights.

In 1980, newsprint lost 436 dollars a ton in U.S.A. Between 1974-83 the price in deflated dollars has actually declined.

In Finland newsprint prices in real terms held stable in 1960-1982, in spite of a rapid nominal increase in the middle and late seventies which nearly quadrupled the price.

Compared to the 1960´s the real prices of Finnish newsprint fell in 1971-76 and 73-78.

During the "Second Oil Crisis" the prices rose, but only to fall again in the early 1980´s.

4.2. Future Prospects

Overcapacity in most paper-making countries, distorted currency exchange rates and severe import restrictions have been characteristic for the early 1980´s.

Although the production of newsprint in Latin America has expanded much slower than previously expected, most producers in this region are suffering losses caused by low operating rates.

With the exception of the US, paper importers paid in 1984 less for newsprint than they did in 1982.

When Finnish newsprint exports in 1982 brought export

of ca. 370 US$ per ton, the price /FOB/ in 1984 was ca. 325 US$ per ton.

The Canadian industry made some profit in 1984, after a "disastrous"1983, but not on off-shore shipments. These brought an "average mill net" of CAD 410 = US$ 315 per ton in revenue 60 CAD or 46 US$ per ton in losses before interest and taxes. The gross selling price of these shipments was CAD 500 in 1984, against CAD 635 in 1981 and 620 in 1982.

In other categories of printing and writing papers the prices have risen. Finnish SC exports rose in 1984 to the average level of 100.000 tons a month, against newsprint monthly exports of 130-140.000 tons. From December 1983 to December 1984, the price rose from 2.400 FIM/ton to 2.800 FIM/ton.

Finnish LWC exports reached ca. 50.000 tons a month in 1984, with prices rising from 3.200 FIM/ton to 3.700 FIM/ton during December 1983-December 1984.

The US$ prices of Finnish exports of other printing and writing paper have during 1980-1984 on the average been ca. 100 US$ higher than the newsprint prices.

At the projected rate of demand growth, recently announced capacity expansions will at least during 1985-1990 cause serious problems for the newsprint producers. These gloomy perspectives may even cause the industry to intensify the struggle for market share. The most productive and financially solid mills will cut prices to eliminate competition in their "home markets".

Inevitably, prices will suffer on the other hand, it is difficult to imagine that any producer could deem monopolize

any market area and determine the price level. There are still several major groups in the industry competing on an international scale.

It is our conclusion that newsprint will be available at stable real prices for the rest of the century. On the other hand, the drive to reach self-sufficiency in most market areas will decrease the international trade in newsprint which stood still in 1979-83.

Depending on the timing of the capacity expansions and the intensity of competition, newsprint prices may in 1985-1990 even fall, in real terms, at least temporarily.

Newsprint Export Prices in 1980 - 1984

/US$ per TON/

YEAR	CANADA /Exports to USA and Offshore/ "MILL NET"	FINLAND / FOB /
1980	389	400
1981	427	400
1982	417	370
1983	386	350
1984	415	324
AVERAGE	407	369

5. Potential Markets For Cuban Newsprint, Based on Baga 20 Pulp.

5.1. The Product and the Price

The newsprint produced in Cuba-9 and tested by Cuban newspaper printers has a higher basic weight, lower brightness and opality than what could be described as the "Standard International First Class" paper.

When producers in North America and Scandinavia are capable of offering newsprint surface weight grades of 36-48 g/m^2 at brightness rates of 60 to 65, the Cuban newsprint must be considered as a totally different product, which cannot replace the paper used by modern offset printers except for special purposes requiring technically less advanced, low -cost paper.

Since the paper so far specified and presented by Cuba-9 is both dissimilar and technically inferior to standard newsprint, Cuban producers will also face problems in attaining the position of an alternative supplier, when printers want to secure continuous paper supply.

If the Cuban newsprint cannot be better, it has to be cheaper. Providing that specific users can be identified and persuaded to use the paper, the prices to export customers paying in hard currency must be distinctly lower than standard newsprint prices.

Based on interviews with Finnish technical and commercial experts, the net export price of Cuban bagasse newsprint should be 10-20 per cent lower than the average world market prices.

Due to favourable trading conditions in USA, the Canadian newsprint industry was in 1984 able to sell newsprint

at the average mill net of CAD 525 or US$ 404 per ton. A price undercutting this level by 20% would be US$ 300 per ton.

According to our calculations, this price level would be unprofitable for the projected paper mill.

5.1.1. Pricing Strategy

During January-November 1984, the Finnish newsprint suppliers shipped 1.5 million tons of paper to export markets, mainly to Western Europe. The average FOB price of these shipments was FIM 2099 per ton or US$ 325.

In 1984 the Canadian newsprint industry shipped the following amounts to the main markets /1000 tons/.

1050	to Canada	at /mill net/	CAD 460	US$ 354
6400	to U.S.A.	at /mill net/	CAD 565	US$ 435
1300	to overseas /Europe, Latin America, etc/	at /mill net/	CAD 410	US$ 315
8750	ALLTOGETHER	AT	525	404

The European prices were in 1984 much /even over 100 US$/ lower than the North American but we have to accept the price of US$ 400 as a 1984 market price in the North American area.

To be both competitive and profitable, the Cuban newsprint will have to be sold at prices that:

1. Attract customers with an advantage in the "list" or gross selling price /CIF or final delivered price in the receiving country/;
2. Cover the cost of production, the depreciation and the gross profit including interest and taxes.

According to our calculations, the Cuban newsprint must be sold at no less than US$ 400 per ton in the export markets to break even, i.e. to cover the cost but no profit. If this price is accepted as the minimum export FOB price, the CIF price /including shipping cost, insurance, freight and other delivery cost/ would in a favourable case be US$ 450 per ton. This price can be compared with the "list" or gross selling prices of Canadian newsprint in 1984:

US MARKETS	CAD 650	US$ 500
CANADIAN MARKETS	CAD 520	US$ 400
OVERSEAS MARKETS	CAD 500	US$ 385
T O T A L :	CAD 610	US$ 469

One of the reasons for low prices in the "off-shore" markets is the exchange rate of the US$ coupled with very favourable demand conditions in USA during 1984.

Should the US currency go down in relation to the major European currencies, newsprint prices might go up in dollar terms. On the other hand, this might also influence the cost of equipment and materials.

In our opinion when newsprint would still not be competitive in the near markets at US$ 450 and this price yielding a net selling price of US$ 400 would not be attractive from the investment perspective.

5.1.2. Short-Term Prospects

A telephone call on April 11, 1985 to Mr. Soisaco, Samap, Sao Paulo, the largest trader in paper in Latin America, selling newsprint from Canada, Scandinavia, Argentina and Chile, confirmed our earlier analysis of the market situation. It also established that during the first quarter of 1985, the world market for newsprint has collapsed. The FOB price for North American and Scandinavian newsprint is less than US$ 300 per ton and even the gross selling price including all delivery costs has fallen to the level of plus-minus US$ 300.

In the US market, spot deliveries of newsprint are sold at US$ 400-450 at the printer's warehouse.

As far as the bagasse newsprint is concerned, the Paramonga plant in Peru is not operating, while the Tucuman mill is operating at 50% of capacity.

According to Mr. Soisaco, the present crisis in the newsprint markets will last at least two years, since the production capacities are excessive and cannot be converted very quickly to other grades of paper.

At the moment the market for other printing and

writing papers is more favourable than for newsprint, but it can be expected to deteriorate when the machinery being installed is starting up in 2-3 years.

5.1.3. Cuban Newsprint - Sales Volume and Prices

From the documents submitted by ICIDCA we conclude that the entire production /operating ratio 90%/ can be marketed to the domestic and the export markets. The quantities vary in the three versions of this study.

As a base for the calculations of financial and economic feasibility we have chosen the domestic of US$ 400 and the export price of US$ 350 per ton.

The former price has been selected by ICIDCA after studying the present prices.

The export price reflects the development of world market prices and the necessity to undercut competition in new markets.

5.2. Potential Customers

5.2.1. Cuba

According to ICIDCA figures, the Cuban demand for newsprint will grow as follows /ICIDCA, March 1985/:

ICIDCA FORECAST/NEWSPRINT IN TONS

1985	-	43.200	
1986	-	45.900	
1987	-	46.400	
1988	-	52.200	
1989	-	55.800	
1990	-	59.800	
1995	-	75.000	- /preliminary/
2000	-	95.000	- /preliminary/

This increase of consumption would average 5.4% per annum.

During 1979-83 apparent consumption in Cuba grew 2.4% annually /CPPA figures/ which can be compared with a slight decrease of Latin American consumption during the period.

It has been forecasted that the Latin American consumption of newsprint will grow at faster rates than world consumption. These vary from 1.2% to 2.0 - 2.5% annually.

In spite of differences in projected growth rates, forecasters agree that newsprint consumption will grow slower than before and face increasing competition from new electronic media.

Our information about the population and GNP /NMP/ development does not suggest that the Cuban consumption of newsprint will grow at the rate projected to grow at 0.6% per annum and the economy at 2.5 - 3.0% per annum.

On the other hand, the paper produced by the mill under consideration can be easily sold to other than traditional newsprint uses.

We think that projecting paper consumption by traditional methods on the basis of past developments or population and GNP figures can be misleading. Newsprint consumption in the UK is over 100% less higher than in France, even if the population figures are nearly equal and the French GNP/capita is nearly 50% higher /1980/.

5.2.2. Latin America

The newsprint produced in Cuba can only compete in export markets where it can offer a distinct price advantage or count on exceptionally high customer acceptance.

In practical terms this means that the potential customers have to meet the following qualifications:

1. Demand exceeds local production. Imports from Canada, Chile, and Scandinavia /plus other potential suppliers/ are uncompetitive because of high CIF prices resulting from high freight expenses.
2. Political conditions, customs and import taxes enable Cuba to enter markets where tariff and non-tariff barriers cause other suppliers to be excluded.

In the first category we would recommend closer study of the following markets:

Near Markets by Size /PPI, CPPA/

C O U N T R Y	POPULATION 1982 1,000.000	P and B CONS PER CAPITA-1982	NEWSPRINT IMPORTS 1983 - 1000 TONS	CANADIAN SHARE % OF IMPORTS - 1982
BRAZIL	127	26	160 - 190	51 - 52
MEXICO	75	29	40 - 70	24 - 38
COLOMBIA	28	16	70 - 80	83 - 87
PERU	19	9	36 - 42	38 - 47
VENEZUELA	17	46	160	70
ECUADOR	9	11	30	71
DOMINICAN REP.	6	12	14	88
NICARAGUA	3	-	2	60
COSTA RICA	2	51	9	100
PANAMA	2	38	7	70
T O T A L :		ca. 550		ca. 60

5.2.3. Eastern Europe

In the second category, politically friendly countries are trading with Cuba on a bilateral basis, which means that the projected mill cannot rely on the hard-currency revenue to cover the hard-currency expenses for imported inputs. It is important, however, that we in this study survey the CMEA market potential.

During 1979-83 East European newsprint capacity increased from 2.2 million tons to ca. 2.4 million. Production, foreign trade and apparent demand changed only marginally. Soviet Union is the major producer and exporter.

East European Markets - Capacity Production Imports/Exports Demand

COUNTRY	79	83	79	83	79	83	79	83	79	83
SOVIET UNION	1600	1800	1353	1380	16	13	303	320	1066	1073
GDR	165	165	104	107	45	44	10	10	139	141
ROMANIA	140	140	102	100	12	11	17	16	97	95
YUGOSLAVIA	120	120	84	31	6	15	20	9	70	37
POLAND	95	90	91	83	45	42	-	-	136	125
CZEKOSLOVAKIA	80	80	75	74	8	9	10	12	73	71
HUNGARY	-	-	-	-	65	67	-	-	65	67
BULGARIA	-	-	-	-	48	42	-	-	48	42
TOTAL :	2200	2395	1809	1775	245	243	360	367	1694	1651

Source: CPPA

6. Potential Competition.

Between 1983 and 1993 at least the following capacities for newsprint will be available in Latin America, provided the mills operating now will go on producing newsprint and the planned expansions will materialize /published sources, FINNPAP Studies/:

COUNTRY	TOTAL CAPACITY 1983*	PLANNED 1993*
ARGENTINA	185	500
BRAZIL	130	330
CHILE	185	ca. 360
MEXICO	210	ca. 400
PERU	/75/	-
ECUADOR	-	50
PARAGUAY	-	75
VENEZUELA	-	100
T O T A L	ca.700	ca.1800

* / - All figures in 1.000 tons

Brazil and Mexico are aiming at self-sufficiency in the mid-1980's. Argentina and Chile export newsprint mainly to Latin America. A rapid growth of the economies can naturally contribute to an increase of consumption but this can be restricted by the governments.

Since the Latin American markets are trouble by political instability and external economic imbalances, the growth of newsprint consumption can easily be surpassed by rapid expan-

sions of capacity. Coupled with the competition from Canada, this may result in a paper glut with prices and profits severely depressed.

Newsprint Mills in Latin America - Installed and Under Construction or Consideration in 1983

LOCATION	COMPANY	ANNUAL CAPACITY 1.000 tons	START-UP
ARGENTINA	PAPER DEL TUCUMAN	100	1983
ARGENTINA	BUENOS AIRES ENTRERIOS	100/200	1980´s
MEXICO	TUXTAPEC	100	1983
MEXICO	TUXTAPEC	100	1984
BRAZIL	PISA	130	1985
BRAZIL	KLABIN	70	-
MEXICO	PAPER DESTINADO,SAN LUIS POTOS	50	1983
MEXICO	PAPER PERIODICO TRES VALLES	100	1980´s
VENEZUELA	RIO TURPIO	100/bagasse/	1980´s
PARAGUAY	EL FORPAR	75	1986-87
CHILE	MAIPO-MATAQUITO	180	1989
ECUADOR	RIO MAMBA	50	1989

7. Market Survey - Conclusions.

1. The world consumption of newsprint is growing increasingly slowly.
2. In the largest consumer countries of Latin America, recent and projected expansions of production capacity are creating a situation of self-sufficiency in newsprint.
3. Historically, newsprint prices have been stable at FOB US$ 400 per ton /in 1980 dollars/ from 1960 to 1980.
4. In 1980-1984, FOB export prices for newsprint average ca. US$ 410 per ton in North America and ca. US$ 370 in other market areas.
5. In early 1985 newsprint export prices collapsed to ca. US$ 300 per ton /FOB/, a clearly unprofitable level for any producer. This was caused by sluggish demand and rapid expansion of capacity in the early 1980's.
6. If excess capacity is retired or converted to other paper grades, and if demand growth will accelerate, newsprint prices may in a few years regain the levels of 1980-1984.
7. Newsprint imports and exports are stagnant and may decrease both in absolute and relative terms, because the traditional importers, especially those in the Third World are becoming self-sufficient.
8. If Cuba starts producing newsprint for the export markets it can hardly expect to sell for more than FOB US$ 350 per ton during the initial period of product adaptation and market penetration.
9. In the long run only large-scale producers integrated to diversified paper groups with superior resources can survive the competition for newsprint markets.
10. Apart from the Cuban home market where the demand exceeds present supply, other printing and writing papers have more attractive demand and price prospects than newsprint.

8. Appendices to Market Survey.

1. Siivonen - Karttunen: Mass Communication Media in the Year 2000 - A Technology Forecast /Salsjübaden, Sweden, 1983/

2. Canadian Paper Analyst 1984-1985
   - Peter Graff - March 1984
   - PPI - November 1984

3. Han-Roe´s Papertree Letter /Papertree Economics Ltd./ - OLT 1984

4. Canadian Newsprint - Export Statistics in 1982

5. CPPA Statistics 1983

6. FINNPAP Surveys on Newsprint Capacity Latest 1985

C H A P T E R III

FINANCIAL EVALUATION

1.1. Introduction

The purpose of the financial analysis is to examine the commercial profitability of the project using data provided by market study and technical outline as well as to recommend most suitable pattern of financing of the project. In order to produce reliable and specific results, financial analysis has to be carried out in several steps. These are the following:

1. Cost estimates /both investment and production/,
2. Revenues estimates /both sales revenues and other revenues/,
3. Financing and required capital structure of the project,
4. Profitability analysis, using commonly known instruments like NPV, ICRR, break-even analysis and sensitivity analysis.

An extensive market and demand analysis has been made in Chapter II. One of the most important conclusions is that the maximum net selling price for one ton of bagasse newsprint is ca. US$ 350 f.o.b. for exports and ca. US$ 400 for domestic market. Those selling prices will be taken into account within financial evaluation of the project.

Project engineering has been designed by ICIDCA, a Cuban institution responsible for research and development of bagasse-based paper industry in Cuba. The technical data has been therefore provided by Cubans, among them a detailed list of production equipment as well as a description of materials and inputs required for the manufacture of the bagasse newsprint according to the original Cuban technology. ICIDCA provided also preliminary cost estimates for the equipment and main material inputs, based on most recent quotations received from Scandinavian suppliers of paper and pulp machinery. The whole background material prepared by ICIDCA was given to the UNIDO experts in the form of a 34 page report /Appendix 1/.

The entire financial analysis for bagasse based newsprint paper plant has been done in several stages and the procedure adopted was of somewhat iterative character. This was because after a thorough examination of proposals formulated by ICIDCA in the background material, it was agreed that under given assumptions the project is not financially viable. This original version - which will be referred to as Version "0"- was also dismissed immediately on the ground of economic evaluation. A more detailed presentation of results for Version "0" will be given below /point 1.2/

After several discussions among UNIDO experts and ICIDCA officials a new set of assumptions has been set forth and additional information provided. The so-called Version "1" of the project differed from the original one with respect to the cost of the machinery and equipment and also the cost of domestically procurred inputs. Within this version an alternative proposal has been also envisaged - namely the purchase of a second-hand equipment. However, all these modifications did not produce a substantial improvement of the financial viability of the project. A detailed presentation of results for the Version "1" is provided below /point 1.3/.

At the next stage a Version "2" has been examined with the production capacity increased from previous level of 54.000 t of newsprint to 110.000 t per annum. Economies of scale are comparatively large in the paper and pulp industry, so an extention of the project's size could be searched for in order to strengthen the project's financial standing. The discussion of Version "2" is given in point 1.4. However, results obtained are still not very promising. Although the project does not produce losses, the value of internal rate of return is so low /2.3%/

that practically cannot be regarded as substantially higher from zero. Break-even selling price in Version "2" is US$ 368 per ton meaning that project is more or less at border line of profitability. Therefore this version has to be rejected as well.

It should be stressed that financial standards must be strictly observed in this case since Cuban authorities have planned to finance the project from external financial sources - either in the form of joint-capital venture with the participation of foreign equity capital up to 49% of the total value of assets or in the form of long term external loan.

This financial structure requires relatively high profitability ratios which, however, can be hardly achieved within the proejct under review.

Therefore no positive recommendation can be given to start with the project implementation under given assumptions.

At the request of ICIDCA officials UNIDO experts undertook an effort to examine other possibilities of producing bagasse paper, trying to determine an optimal product-mix from the point of view of financial soundness. Some alternatives for more versatile production program have been discussed, including varying share of bagasse newsprint. However, this part of the study could not be done in depth since both UNIDO experts and ICIDCA officials have not had a relevant information at hand, concerning in particular the cost of machinery and equipment to produce other printing-and-writing paper and also marketing conditions for paper products other than newsprint. Some tentative results of this preliminary research are presented in point 1.5 of this Chapter.

1.2. Version "0".

This version was elaborated using data given in ICIDCA background paper "Answer to the Questionnaire for the Preparation of the Pre-feasibility Study for the Installation of a Newsprint Paper Plant from Bagasse" /ICIDCA, December, 1984/. It must be pointed out that a lot of necessary information was missing in this document and some data were not correctly calculated. This refers mainly to working capital estimates and some ancillary equipment cost. After having clarified most of the issues investment cost schedule and production cost schedule have been prepared in order to get a general financial picture of the project. All relevant tables are given below.

Total initial investment cost has been estimated at /US$ '000/ 79.000 including more realistic figure for working capital. Total production cost has been computed including modified figures for overhead costs and sales cost. Assuming 5% linear average depreciation rate for all assets a break-even net selling price f.o.b. /yielding neither profit nor loss/ has been calculated at US$ 465 per ton for an average year of full capacity /54000 tons of newsprint/. However, if the external finance is to be put into the project in the form of foreign equity, the depreciation rate must be higher in order to allow for faster recovery of invested capital. Hence, if 10% depreciation rate is taken for all machinery, equipment and pre-production expenses and 4% depreciation rate for all remaining fixed assets, the break-even net selling price increases to US$ 521 per ton. If, in addition annual payments of dividends on the invested foreign equity are added up to production cost /e.g. 5% on 40 million of US$/, the break-even net selling price goes up to US$ 558 per ton.

However, within market and demand study, it has been deter-

mined that the realistic selling price f.o.b. would be no more than US$ 350 per ton. Therefore it is obvious that the project would require a constant financial support from outside to cover average losses of 9,2 - 11,2 US$ millions annually.

1.3. Version "1".

This version deffers in several points from Version "0". The changes have been introduced after discussing most controversial cost items with ICIDCA officials and after additional information had been obtained. Following are the main modifications:

a. According to the information received the most recent official foreign exchange rate is 1 peso = 1 US$, i.e. the Cuban currency has been devaluated from the previous level 1 peso = 1,13 US$. It means that all imported inputs have to be valued accordingly.

b. Cheaper sources of supply of the machinery and equipment have been identified and more favourable quotations could therefore be used for the analysis /quotations obtained from suppliers from Spain and India/.

c. The government officials agreed to supply some locally procured inputs at preferential prices. This refers mainly to bagasse /price decreased by 56%/, electricity /by 43%/, steam /by 12%/. The complete list of new prices for all inputs is given below.

d. It has been decided that exported part of the output /15.000 t/ will be valued at a selling price of US$ 350 per ton, whereas domestically sold part of the output will be valued at US$ 400 per ton.

After these changes had been introduced the financial viability of the project improved but still remained unsatisfactory. The break-even net selling price for a normal year of operation is now US$ 420 per ton which is still well above the maximum f.o.b. price of US$ 350 per ton.

Calculations made in the cash-flow table demonstrate that cumulated net cash flow for the whole life period of the project is negative and amounts to more than 39 millions of US$. In addition if external financing in the form of foreign equity is envisaged /up to 49% of total assets/, the dividend payments of 5% of the capital would push the break-even net selling price even higher up to US$ 450 per ton.

Bearing in mind these results one cannot make a positive assessment of the Version "1". Therefore some other possibilities have to be seeked for.

One of these possibilites is to lower the investment cost by purchasing a second-hand equipment. The relevant information has been gathered and an additional run of calculations has been carried out under assumption that the project would use a second-hand paper machine which is the most expensive single component of the cost of equipment. On the basis of available quotations the cost of the paper machine has been estimated at ca. 9,5 millions US$ instead of ca. 15 millions for a new one. However, this change produced only slight improvement of profitability measures, yielding break-even net-selling price at US$ 410 per ton which is still above the expected market price. Therefore this version which might be called Version "1A" is also to be rejected.

All relevant results are given in the following schedules. Obviously there was no need for using more sophisticated measures

e.g. discounting, since cash-flows produced by the project are negative, therefore both NPV and IRR are negative too.

Schedules 1.1. - 1.7. follow.

SCHEDULE 1.1. VERSION "1"

Initial Investment Cost /US$ '000/ *

Item	Investment Category	Local	Foreign	Total
I	FIXED INVESTMENT			
	1.1.Site Preparation and Development	420	80	500
	1.2.Buildings,Structures and Civil Works 1/	7.200	800	8,000
	1.3.Enigneering and Design	4.500	400	4,900
	1.4.Production Machinery and Equipment 2/	4.300	28.000	32.300
	1.5.Auxiliary and Service Equipment 2/	480	2.670	3.150
	1.6.Insurance and Freight	3.000	-	3.000
	1.7.Plant Installation	1.200	5.950	7.150
II	PRE-PRODUCTION CAPITAL EXPENSES	900	600	1.500
III	WORKING CAPITAL /FULL CAPACITY/	1.000	4.000	5.000
IV	TOTAL INVESTMENT COST	23.000	42.500	65.500
V	PROVISION FOR CONTINGENCIES /ca. 4% of I + II/	900	1.600	2.500
VI	TOTAL FINANCE REQUIRED	23.900	44.100	68.000

* - After foreign exchange rate has been increased from 0.88P/US$ to 1P/US$ and cheaper sources of purchase have been taken into account

1/ - Does not include housing for workers

2/ - See a separate list of the equipment /attached/

SCHEDULE 1.2. VERSION "1"

Factory Overhead Cost /US$ ´000/

1. WAGES AND SALARIES AND INDIRECT MANPOWER	
- local personnel 15 persons á US$ 4.435	66.00
- foreign personnel 8 persons á US$ 35.000	288.00
2. TOTAL WAGE TAX /25% OF WAGE BILL -LOCAL/	248.00
3. TRAVEL COSTS	110.00
4. GENERAL REPAIR AND MAINTENANCE	200.00
5. EFFLUENT AND WASTE DISPOSAL	20.00
6. AUXILIARY AND OFFICE SUPPLIES	60.00
7. COMMUNICATIONS	60.00
8. RENTS /LAND/	50.00
9. INSURANCE	300.00
10. COST OF FUEL /10.000 US$/	10.00
T O T A L :	1,402.00

Pre-production Capital Expenses /in US$ ´000/

1. PRE-INVESTMENT STUDIES	
2. LEGAL AND REGISTRATION FEES	
3. PREPARATORY RESEARCH AND INVESTIGATIONS	
4. RELOCATION OF LABOUR FORCE	
5. TRAINING OF LABOUR FORCE	
6. PROMOTION, DISTRIBUTION, MARKETING	
7. START-UP COSTS	
8. INTEREST DURING CONSTRUCTION /if any/	
T O T A L :	1.500.00

SCHEDULE 1.3. VERSION "1"

Working Capital Requirements /in US$ '000/

/for 90% Capacity = 54.000 tons/

	ITEM	Minimum Coverage Period in Days	Coefficient of Turn-Over	Amount Required	
				Total	of it Foreign
1.	Accounts Receivable[1/]	30	12	1455	/25%/361
2.	Inventories of Raw Matls				
	2.1.Bagasse[2/]	180	2	459	-
	2.2.Caustic Soda	90	4	266	266
	2.3.Hydrogen Peroxide	90	4	182	182
	2.4.Clay /Kaolin/	90	4	198	198
	2.5.Kraft Woodpulp	90	4	424	424
	2.6.Mechanical Woodpulp	90	4	533	533
	2.7.Other Imported /capitalist/	90	4	284	284
	2.8.Other Imported /socialist/	90	4	36	36
	2.9.Other Local Matls.	45	8	43	-
3.	Work-in-Progress[3/]	1	360	47	/75%/ 35
4.	Finished Products[4/]	10	36	470	/25%/117
5.	Spare Parts	360	1	1476	1476
6.	Cash-in-Hand[5/]	15	24	194	-
7.	Accounts Payable[6/]	30	12	1067	-

TOTAL FINANCE REQUIRED = 6067 - 1067 = 5000 of it foreign 3912

1/ - Operating Cost
2/ - Seasonal Supply /November - May only/
3/ - At Factory Cost
4/ - At Factory Cost
5/ - At Operating Cost Minus Raw Materials and Utilities
6/ - Raw Materials Plus Utilities

I T E M	1990 20 %	1991 50 %	1992 65 %	1993 80 %	1994 90 %	....	2000	2001	
1. Imported Raw Materials	1537	4270	5551	6832	7686				
2. Local Raw Materials	253	703	914	1124	1265				
3. Direct Manpower	461	692	738	923	923				
4. Utilities	855	2139	2781	3423	3851				
5. Repair and Maintenance	900	1800	1800	1800	1800				
6. Factory Overheads	1050	1400	1400	1400	1400				
TOTAL FACTORY COSTS	5056	11004	13184	15502	16925	....	....	...	
7. Sales and Distribution Cost									
7.1.Transportation Cost /4.82 US$/t/	48	145	188	231	260	....	....	...	
7.2.Sales Cost /5.00 US$/t/	50	150	195	240	270				
OPERATING COST	5154	11299	13567	15973	17455	....	17455	17455	....
8. Depreciation /4% of 13.400 + 10% of 47.100/	2623	5246	5246	5246	5246	....	5171	5096	....
PRODUCTION COST	7777	16545	18813	21219	22701	....	22626	22551	....
- break-even net selling price f.o.b.	778	551	482	442	420			418	
- break-even price incl. 5% devidends on 30 millions foreign equity					448			445	

SCHEDULE 1.4.

VERSION "1"

Production Cost Schedule

SCHEDULE 1.5. VERSION "1"

Raw Materials and Utilities

Annual Requirement at 54.000 t Plant Capacity

	COUNTRY	QUANTITY TONS	UNIT PRICE AT PLANT SITE - US$	TOTAL COST
I. IMPORTED MATERIALS				
1. Caustic Soda /98%/	soc.	3568	297.98	1,063.193
2. Hydrogen Peroxide	soc.	1634	445.82	728.470
3. Magnesium Sulfate	soc.	42	78.00	3.276
4. Clay /75 - 80% Br/	soc.	5082	155.69	791.217
5. Sulphur /95%/	soc.	1150	108.00	124.200
6. Colorant	cap.	16	13,805.48	220.888
7. Retention Aid Agent	cap.	108	2,005.48	216.592
8. Semibleached Woodpulp	cap.	3844	441.00	1,695.204
9. Mechanical Woodpulp	cap.	5766	369.52	2,130.652
10. Discs for Pulp Refiners /set/	cap.	80	5256.85	420.548
11. Discs for Paper Refiners /set/	cap.	3	1506.85	4.520
12. Disc Rings	cap.	24	631.85	15.165
13. Stainless Metallic Wire	soc.	8	1875.00	15.000
14. Synthetic Wires	cap.	6	30,000.00	180.000
15. Felts	cap.	51	-	76.705
T O T A L Imported Materials				7,685.630
II. LOCAL MATERIALS				
1. Depithed Bagasse /60% fibre, 50% humidity/		120.000	7.65	918.000
2. Sodium Silicate /40-42°Bé/		1.867	94.82	177.029
3. Alumina /17% Al_2O_3/		1.620	104.82	169.808
TOTAL Local Materials				1,264.837
III. UTILITIES				
1. Electric Energy /kWh/		110.7 10^6	0.02	1,214.000
2 Steam		156.506	8.80	1,377.253
3. Water /m^3/		6.5 10^6	0.04	260.000
TOTAL UTILITIES				3,851.253

SCHEDULE 1.6. VERSION "1"

Cost of Equipment and Buildings

	LOCAL	FOREIGN	TOTAL
1. PRODUCTION EQUIPMENT			32.300
1.1.Plant Machinery	2.800	25.300	28.100
1.2.Instrumentation and Controls	200	800	1.000
1.3.Pipes, Valves, Connections	1.300	1.900	3.200
2. AUXILIARY EQUIPMENT			2.340
2.1.Ventillation and Air Conditioning System	-	325	325
2.2.Laboratories	-	200	200
2.3.Transport Equipment	-	515	515
2.4.Electric and Light System	-	650	650
2.5.Workshops	150	500	650
3. SERVICE EQUIPMENT			810
3.1.Communications Facilities	-	100	100
3.2.Office Equipment	130	195	325
3.3.Canteen	40	-	40
3.4.Packaging Machine	-	20	20
3.5.Fire Protection System	160	165	325
4. PLANT INSTALLATION			7.150
4.1.Technical Assistance	-	325	325
4.2.Plant Installation	1.000	5.500	6.500
4.3.Painting / Insulation	200	125	325
5. CIVIL WORKS			12.900
5.1.Engineering and Design	4.500	400	4.900
5.2.Buildings and Structures	7.200	800	8.000
6. SITE PREPARATION AND DEVELOPMENT	420	80	500
T O T A L :	18.100	37.900	56.000

SCHEDULE 1.7. VERSION "1"

CASH FLOW TABLE /IN US$

	1987	1988	1989	1990 20 %	1991 50 %	1992 65 %	1993 80 %	1994 90 %
I. CASH INFLOWS								
1. Sales Revenues - Domestic 1/	-	-	-	4.600	9.000	11.700	14.400	15.600
2. Sales Revenues - Exports 2/	-	-	-	-	2.625	3.412	4.200	5.250
II. CASH OUTFLOWS								
1. Investment Cost								
1.1. Fixed Investment	500	8.000	46.100	4.400	-	-	-	-
1.2. Pre-production Expenses	300	400	400	400	-	-	-	-
1.3. Working Capital	-	-	-	1.000	1.800	800	900	500
2. Operating Cost	-	-	-	5.154	11.299	13.567	15.973	17.455
2.1. Factory Cost								
2.2. Sales and Distribution Cost								
III. NET CASH FLOW /I-II/	/800/	/8.400/	/46.500/	/6.954/	/1.474/	745	1.727	2.895
IV. CUMULATED NET CASH-FLOW								
V. DISCOUNTED NET CASH-FLOW								
/at 10%/ - NEGATIVE IRR < 0								

1/ - At Selling Price US$ 400 per ton

2/ - At Selling Price US$ 350 per ton

'000/ FOR NEWSPRINT PROJECT, CAPACITY 54.000 TONS

1995 90 %	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
15.600 5.250	15.600 5.250	15.600 5.250	15.600 5.250	15.600 5.250	15.600 5.250	15.600 5.250	15.600 5.250	15.600 5.250	15.600 5.250	15.600 5.250	15.600 5.250
-	-	-	-	-	42.600	-	-	-	-	-	/19.466/
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	/5.000/
17.455	17.455	17.455	17.455	17.455	17.455	17.455	17.455	17.455	17.455	17.455	17.455
3.395	3.395	3.395	3.395	3.395	/39.205/	3.395	3.395	3.395	3.395	3.395	27.861 /36.155/

1.4. Version "2".

Version "2" refers to the project with the capacity increased from 54.000 t to 110.000 t of newsprint annually. The data on the cost of equipment and machinery have been provided by ICIDCA remaining data have been estimated by the UNIDO consultants. The results obtained indicate a notable improvement of the financial viability of the project. The break-even net selling price dropped down to US$ 368 per ton /pre-tax, pre-interest/ and for the first time a positive net cash-flow has been obtained. However, internal rate of return albeit positive, is very low /2.3%/ and obviously does not match the market interest rate. The cash-flow table has been computed assuming that 80.000 t of newsprint is sold on the domestic market at the price of US$ 400 per ton whereas 30.000 t /ca. 27% of the total output/ is exported at f.o.b. price of US$ 350 per ton.

In spite of the fact that rough estimates had to be made about particular cost items within this version, the obtained results seem to be compatible with general yardsticks established for paper and pulp industry. According to available sources the doubling of the capacity from 55.000 to 110.000 tons should normally allow to diminish a unit production cost by 18%. In our case the actual difference in cost between Version "1" and "2" is ca. 13%, indicating that perhaps some possibilities of cutting down operating costs still exist.

At the request of ICIDCA officials a second run of calculations has been done with higher selling price for domestic market of US$ 450 per ton and for exports of US$ 400 per ton. In this case IRR grows up slightly to ca. 3.0% which is still not a very impressive figure.

COMFAR programme has been used to compute results. Printouts of schedules follow.

Total initial investment costs in us $ '000

Year	1987.1	1987.2-88.1	1988.2	1989.1	1989.2
Fixed investment costs					
Land, site preparation, development	650.00	0.00	0.00	0.00	0.00
Buildings and civil works	6500.00	2300.00	1300.00	600.00	559.00
Auxiliary and service facilities	0.00	0.00	1000.00	2400.00	1072.00
Incorporated fixed assets	0.00	0.00	6050.00	6550.00	1100.00
Plant machinery and equipment	0.00	0.00	21480.00	21480.00	0.00
Total fixed investment costs	7150.00	2300.00	29830.00	31030.00	2731.00
Pre-production capital expenditures	500.00	500.00	400.00	400.00	500.00
Net working capital	0.00	0.00	0.00	0.00	1800.00
Total initial investment costs	7650.00	2800.00	30230.00	31430.00	5031.00
Of it foreign, in %	10.92	17.86	85.94	88.39	69.79

COMFAR 1.1 - Computing center of MFERT, Beijing

Total investment costs, production phase in us $ '000

Year	1990	1991	1992	1993	1994
Fixed investment costs					
Land, site preparation, development	0.00	0.00	0.00	0.00	0.00
Buildings and civil works	0.00	0.00	0.00	0.00	0.00
Auxiliary and service facilities	0.00	0.00	0.00	0.00	0.00
Incorporated fixed assets	0.00	0.00	0.00	0.00	0.00
Plant, machinery and equipment	0.00	0.00	0.00	0.00	0.00
Total fixed investment costs	0.00	0.00	0.00	0.00	0.00
Preproduction capitals expenditures.	0.00	0.00	0.00	0.00	0.00
Working capital	3338.62	4937.62	2174.19	1987.79	646.60
Total current investment costs	3338.62	4937.62	2174.19	1987.79	646.60
Of it foreign, %	125.62	80.14	79.87	62.24	75.92

COMFAR 1.1 - Computing center of MFERT, Beijing

Total investment costs, production phase in us $ '000

Year	1995-98	1999
Fixed investment costs		
Land, site preparation, development	0.00	0.00
Buildings and civil works	0.00	0.00
Auxiliary and service facilities	0.00	4490.00
Incorporated fixed assets	0.00	13699.00
Plant, machinery and equipment	0.00	42960.00
Total fixed investment costs	0.00	61149.00
Preproduction capitals expenditures.	0.00	0.00
Working capital	0.00	0.00
Total current investment costs	0.00	61149.00
Of it foreign, %	0.00	89.60

bagasse newsprint plant --- 1985-04-18

Total production costs in us $ '000

Year	1990	1991	1992	1993	1994-99
% of nom. capacity (single product).	18.18	55.45	71.82	89.09	100.00
Raw material 1	1242.10	3450.10	4685.10	5520.10	6210.10
Other raw materials	2404.00	6680.00	9684.00	10688.00	12024.00
Utilities	667.00	1853.00	2409.00	2964.00	3335.00
Energy	902.00	2506.00	3257.00	4009.00	4510.00
Labour, direct	599.00	900.00	959.00	1200.00	1200.00
Repair, maintenance	700.00	1400.00	1400.00	1400.00	1400.00
Spares	700.00	1400.00	1400.00	1400.00	1400.00
Factory overheads	784.00	1046.00	1046.00	1046.00	1046.00
Factory costs	7998.10	19235.11	23640.11	28227.11	31125.11
Administrative overheads	490.00	654.00	654.00	654.00	654.00
Indir. costs, sales and distribution	140.00	427.00	553.00	686.00	770.00
Direct costs, sales and distribution	0.00	0.00	0.00	0.00	0.00
Depreciation	6961.56	6961.56	6961.56	6961.56	6961.56
Financial costs	0.00	0.00	0.00	0.00	0.00
Total production costs	15589.66	27277.66	31808.66	36528.66	39510.66
Costs per unit (single product)	0.78	0.45	0.40	0.37	0.36
Of it foreign, %	65.05	62.06	61.59	60.93	60.83
Of it variable,%	0.00	0.00	0.00	0.00	0.00
Total labour	1089.00	1554.00	1613.00	1854.00	1854.00

Total production costs in us $ '000

Year	2000- 4
% of nom. capacity (single product).	100.00
Raw material 1	6210.10
Other raw materials	12024.00
Utilities	3335.00
Energy	4510.00
Labour, direct	1200.00
Repair, maintenance	1400.00
Spares	1400.00
Factory overheads	1046.00
Factory costs	31125.11
Administrative overheads	654.00
Indir. costs, sales and distribution	770.00
Direct costs, sales and distribution	0.00
Depreciation	6683.26
Financial costs	0.00
Total production costs	39232.37
Costs per unit (single product)	0.36
Of it foreign, %	60.98
Of it variable,%	0.00
Total labour	1854.00

Net working capital in us $ '000

Year			1990	1991	1992	1993	1994
Coverage	adc	cota					
Current assets &							
Accounts receivable	30	12.0	719.01	1693.01	2070.59	2463.93	2712.43
Inventory and materials	83	4.4	3989.25	7768.29	9772.33	11597.25	12146.91
Energy	1	360.0	2.51	6.96	9.35	11.14	12.53
Spares	360	1.0	700.00	1400.00	1400.00	1400.00	1400.00
Work in progress	1	360.0	22.22	53.43	65.67	78.41	86.46
Finished products	10	36.0	235.78	552.48	674.84	802.25	882.75
Cash in hand	15	24.0	136.38	225.00	227.46	237.50	237.50
Total current assets			5805.13	11679.17	14220.43	16590.47	17478.57
Current liabilities and							
Accounts payable	30	12.0	666.51	1602.93	1970.01	2352.26	2593.76
Net working capital			6938.62	11876.24	14050.42	16038.21	16684.81
Increase in working capital			5138.62	4937.62	2174.18	1987.79	646.60
Net working capital, local			1256.53	2237.01	2674.73	3425.24	3580.95
Net working capital, foreign			5682.10	9639.23	11375.70	12612.98	13103.86

Note: adc = minimum days of coverage ; cota = coefficient of turnover .

bagasse newsprint plant --- 1985-04-18

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Net working capital in us $ '000

Year			1995-2004
Coverage	adc	cota	
Current assets &			
Accounts receivable	30	12.0	2712.43
Inventory and materials	83	4.4	12146.91
Energy	1	360.0	12.53
Spares	360	1.0	1400.00
Work in progress	1	360.0	86.46
Finished products	10	36.0	882.75
Cash in hand	15	24.0	237.50
Total current assets			17478.57
Current liabilities and			
Accounts payable	30	12.0	2593.76
Net working capital			16684.81
Increase in working capital			0.00
Net working capital, local			3580.95
Net working capital, foreign			13103.86

Note: adc = minimum days of coverage ; cota = coefficient of turnover .

bagasse newsprint plant --- 1985-04-18

Source of finance, construction in us $ '000

Year	1987.1	1987.2-88.1	1988.2	1989.1	1989.2
Equity, ordinary ..	7650.00	2800.00	30230.00	31430.00	5031.00
Equity, preference.	0.00	0.00	0.00	0.00	0.00
Subsidies, grants .	0.00	0.00	0.00	0.00	0.00
Loan A, foreign .	0.00	0.00	0.00	0.00	0.00
Loan B, foreign..	0.00	0.00	0.00	0.00	0.00
Loan C, foreign .	0.00	0.00	0.00	0.00	0.00
Loan A, local....	0.00	0.00	0.00	0.00	0.00
Loan B, local....	0.00	0.00	0.00	0.00	0.00
Loan C, local....	0.00	0.00	0.00	0.00	0.00
Total loan	0.00	0.00	0.00	0.00	0.00
Current liabilities	0.00	0.00	0.00	0.00	0.00
Bank overdraft	0.00	0.00	0.00	0.00	0.00
Total funds	7650.00	2800.00	30230.00	31430.00	5031.00

Source of finance, production in us $ '000

Year	1990	1991	1992	1993	1994
Equity, ordinary ..	0.00	0.00	0.00	0.00	0.00
Equity, preference.	0.00	0.00	0.00	0.00	0.00
Subsidies, grants .	0.00	0.00	0.00	0.00	0.00
Loan A, foreign .	0.00	0.00	0.00	0.00	0.00
Loan B, foreign..	0.00	0.00	0.00	0.00	0.00
Loan C, foreign .	0.00	0.00	0.00	0.00	0.00
Loan A, local....	0.00	0.00	0.00	0.00	0.00
Loan B, local....	0.00	0.00	0.00	0.00	0.00
Loan C, local....	0.00	0.00	0.00	0.00	0.00
Total loan	0.00	0.00	0.00	0.00	0.00
Current liabilities	666.51	936.42	367.08	382.25	241.50
Bank overdraft	4766.73	-1446.27	-3320.45	0.00	0.00
Total funds	5433.24	-509.86	-2953.37	382.25	241.50

Cashflow tables, construction in us $ '000

Year	1987.1	1987.2	1988.1	1988.2	1989.1	1989.2
Total cash inflow	7650.00	2800.00	2800.00	30230.00	31430.00	5031.00
Financial resources	7650.00	2800.00	2800.00	30230.00	31430.00	5031.00
Sales, net of tax	0.00	0.00	0.00	0.00	0.00	0.00
Total cash outflow	7650.00	2800.00	2800.00	30230.00	31430.00	5031.00
Total assets	7650.00	2800.00	2800.00	30230.00	31430.00	5031.00
Operating costs	0.00	0.00	0.00	0.00	0.00	0.00
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)	0.00	0.00	0.00	0.00	0.00	0.00
Cumulated cash balance	0.00	0.00	0.00	0.00	0.00	0.00
Inflow, local	6815.00	2300.00	2300.00	4250.00	3650.00	1520.00
Outflow, local	6815.00	2300.00	2300.00	4250.00	3650.00	1520.00
Surplus (deficit)	0.00	0.00	0.00	0.00	0.00	0.00
Inflow, foreign	835.00	500.00	500.00	25980.00	27780.00	3511.00
Outflow, foreign	835.00	500.00	500.00	25980.00	27780.00	3511.00
Surplus (deficit)	0.00	0.00	0.00	0.00	0.00	0.00
Net cashflow	-7650.00	-2800.00	-2800.00	-30230.00	-31430.00	-5031.00
Cumulated net cashflow	-7650.00	-10450.00	-13250.00	-43480.00	-74910.00	-79941.00

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Cashflow tables, production in us $ '000

Year	1990	1991	1992	1993	1994	1995
Total cash inflow	14433.24	27636.42	34962.08	43282.25	48241.50	48000.00
Financial resources	5433.24	936.42	387.08	382.25	241.50	0.00
Sales, net of tax	9000.00	26700.00	34575.00	42900.00	48000.00	48000.00
Total cash outflow	14433.24	27636.41	30708.83	31937.15	35984.00	35095.91
Total assets	5805.13	5874.03	2541.27	2370.04	888.10	0.00
Operating costs	8628.11	20316.11	24847.11	29567.11	32549.11	32549.11
Cost of finance	0.00	0.00	0.00	0.00	0.00	0.00
Repayment	0.00	1446.27	3320.45	0.00	0.00	0.00
Corporate tax	0.00	0.00	0.00	0.00	2546.80	2546.80
Dividends paid	0.00	0.00	0.00	0.00	0.00	0.00
Surplus (deficit)	-0.00	0.00	4233.25	11345.10	12257.50	12904.09
Cumulated cash balance	-0.00	0.00	4233.25	15578.36	27835.85	40739.95
Inflow, local	14082.72	21087.08	26924.67	33464.67	36096.58	36000.00
Outflow, local	5406.49	11860.81	14822.80	13882.14	16973.06	16720.77
Surplus (deficit)	8676.23	9226.27	12101.86	19582.52	19123.52	19279.23
Inflow, foreign	350.51	6549.33	8037.42	9817.58	12144.92	12000.00
Outflow, foreign	9026.75	15775.60	15886.03	18055.00	19010.94	18375.14
Surplus (deficit)	-8676.24	-9226.27	-7848.61	-8237.42	-6866.02	-6375.14
Net cashflow	-5433.24	509.86	7136.62	10962.85	12015.99	12904.09
Cumulated net cashflow	-85374.23	-84864.38	-77677.75	-66714.90	-54698.91	-41794.81

bagasse newsprint plant --- 1985-04-18

Cashflow tables, production in us $ '000

Year	1996	1997	1998	1999	2000	2001
Total cash inflow	48000.00	48000.00	48000.00	48000.00	48000.00	48000.00
Financial resources	0.00	0.00	0.00	0.00	0.00	0.00
Sales, net of tax	48000.00	48000.00	48000.00	48000.00	48000.00	48000.00
Total cash outflow	35095.91	35095.91	35095.91	96244.91	35179.40	35179.40
Total assets	0.00	0.00	0.00	61149.00	0.00	0.00
Operating costs	32549.11	32549.11	32549.11	32549.11	32549.11	32549.11
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	2546.80	2546.80	2546.80	2546.80	2630.29	2630.29
Dividends paid	0.00	0.00	0.00	0.00	0.00	0.00
Surplus (deficit)	12904.09	12904.09	12904.09	-48244.91	12820.60	12820.60
Cumulated cash balance	53644.04	66548.13	79452.23	31207.32	44027.92	56848.52
Inflow, local	36000.00	36000.00	36000.00	36000.00	36000.00	36000.00
Outflow, local	16720.77	16720.77	16720.77	23078.77	16804.26	16804.26
Surplus (deficit)	19279.23	19279.23	19279.23	12921.23	19195.74	19195.74
Inflow, foreign	12000.00	12000.00	12000.00	12000.00	12000.00	12000.00
Outflow, foreign	18375.14	18375.14	18375.14	73166.14	18375.14	18375.14
Surplus (deficit)	-6375.14	-6375.14	-6375.14	-61166.14	-6375.14	-6375.14
Net cashflow	12904.09	12904.09	12904.09	-48244.91	12820.60	12820.60
Cumulated net cashflow	-29890.72	-15986.63	-3082.54	-51327.45	-38506.84	-25686.24

Cashflow tables, production in us $ '000

Year	2002	2003	2004
Total cash inflow	48000.00	48000.00	48000.00
Financial resources	0.00	0.00	0.00
Sales, net of tax	48000.00	48000.00	48000.00
Total cash outflow	35179.40	35179.40	35179.40
Total assets	0.00	0.00	0.00
Operating costs	32549.11	32549.11	32549.11
Cost of finance	0.00	0.00	0.00
Repayment	0.00	0.00	0.00
Corporate tax	2630.29	2630.29	2630.29
Dividends paid	0.00	0.00	0.00
Surplus (deficit)	12820.60	12820.60	12820.60
Cumulated cash balance	69669.13	82489.73	95310.33
Inflow, local	36000.00	36000.00	36000.00
Outflow, local	16804.26	16804.26	16804.26
Surplus (deficit)	19195.74	19195.74	19195.74
Inflow, foreign	12000.00	12000.00	12000.00
Outflow, foreign	18375.14	18375.14	18375.14
Surplus (deficit)	-6375.14	-6375.14	-6375.14
Net cashflow	12820.60	12820.60	12820.60
Cumulated net cashflow	-12865.64	-45.04	12775.56

Cashflow Discounting:

a) Return on Equity:
Net present value -47016.57 at 10.00 %
Internal Rate of Return (IRRE) .. -1.47 %

b) Internal Rate of Return without outside financing:
Net present value -31913.00 at 10.00 %
Internal Rate of Return (IRR) .. 3.02 %

c) Future Value of cash outflow during construction:
Total cash outflow .. 79941.00
Future Value 87769.39 at 10.00 %

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Net income statement in us $ '000

Year	1990	1991	1992	1993	1994
Total sales, incl. sales tax	9000.00	26700.00	34575.00	42900.00	48000.00
Less: variable costs, incl. sales tax.	0.00	0.00	0.00	0.00	0.00
Variable margin	9000.00	26700.00	34575.00	42900.00	48000.00
As % of total sales	100.00	100.00	100.00	100.00	100.00
Non-variable costs, incl. depreciation	15589.66	27277.66	31808.66	36528.66	39510.66
Operational margin	-6589.66	-577.66	2766.34	6371.34	8489.34
As % of total sales	-73.22	-2.16	8.00	14.85	17.69
Cost of finance	0.00	0.00	0.00	0.00	0.00
Gross profit	-6589.66	-577.66	2766.34	6371.34	8489.34
Allowances	0.00	0.00	0.00	0.00	0.00
Taxable profit	-6589.66	-577.66	2766.34	6371.34	8489.34
Tax	0.00	0.00	0.00	0.00	2546.80
Net profit	-6589.66	-577.66	2766.34	6371.34	5942.54
Dividends paid	0.00	0.00	0.00	0.00	0.00
Undistributed profit	-6589.66	-577.66	2766.34	6371.34	5942.54
Accumulated undistributed profit	-6589.66	-7167.33	-4400.99	1970.34	7912.88
Gross profit, % of total sales	-73.22	-2.16	8.00	14.85	17.69
Net profit, % of total sales	-73.22	-2.16	8.00	14.85	12.38
ROE Net profit, % of equity	-8.24	-0.72	3.46	7.97	7.43
ROI Net profit+interest, % of equity	-7.69	-0.63	2.94	6.60	6.10

bagasse newsprint plant --- 1985-04-18

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Net income statement in us $ '000

Year	1995	1996	1997	1998	1999
Total sales, incl. sales tax	48000.00	48000.00	48000.00	48000.00	48000.00
Less: variable costs, incl. sales tax.	0.00	0.00	0.00	0.00	0.00
Variable margin	48000.00	48000.00	48000.00	48000.00	48000.00
As % of total sales	100.00	100.00	100.00	100.00	100.00
Non-variable costs, incl. depreciation	39510.66	39510.66	39510.66	39510.66	39510.66
Operational margin	8489.34	8489.34	8489.34	8489.34	8489.34
As % of total sales	17.69	17.69	17.69	17.69	17.69
Cost of finance	0.00	0.00	0.00	0.00	0.00
Gross profit	8489.34	8489.34	8489.34	8489.34	8489.34
Allowances	0.00	0.00	0.00	0.00	0.00
Taxable profit	8489.34	8489.34	8489.34	8489.34	8489.34
Tax	2546.80	2546.80	2546.80	2546.80	2546.80
Net profit	5942.54	5942.54	5942.54	5942.54	5942.54
Dividends paid	0.00	0.00	0.00	0.00	0.00
Undistributed profit	5942.54	5942.54	5942.54	5942.54	5942.54
Accumulated undistributed profit	13855.42	19797.95	25740.48	31683.02	37625.55
Gross profit, % of total sales	17.69	17.69	17.69	17.69	17.69
Net profit, % of total sales	12.38	12.38	12.38	12.38	12.38
ROE Net profit, % of equity	7.43	7.43	7.43	7.43	7.43
ROI Net profit+interest, % of equity	6.10	6.10	6.10	6.10	3.75

bagasse newsprint plant --- 1985-06-18

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COMFAR 1.1 - Computing center of MFERT, Beijing

Net income statement in us $ '000

Year	2000	2001	2002	2003	2004
Total sales, incl. sales tax	48000.00	48000.00	48000.00	48000.00	48000.00
Less: variable costs, incl. sales tax.	0.00	0.00	0.00	0.00	0.00
Variable margin	48000.00	48000.00	48000.00	48000.00	48000.00
As % of total sales	100.00	100.00	100.00	100.00	100.00
Non-variable costs, incl. depreciation	39232.36	39232.36	39232.36	39232.36	39232.37
Operational margin	8767.64	8767.64	8767.64	8767.64	8767.63
As % of total sales	18.27	18.27	18.27	18.27	18.27
Cost of finance	0.00	0.00	0.00	0.00	0.00
Gross profit	8767.64	8767.64	8767.64	8767.64	8767.63
Allowances	0.00	0.00	0.00	0.00	0.00
Taxable profit	8767.64	8767.64	8767.64	8767.64	8767.63
Tax	2630.29	2630.29	2630.29	2630.29	2630.29
Net profit	6137.35	6137.35	6137.35	6137.35	6137.34
Dividends paid	0.00	0.00	0.00	0.00	0.00
Undistributed profit	6137.35	6137.35	6137.35	6137.35	6137.34
Accumulated undistributed profit	43762.90	49900.24	56037.59	62174.93	68312.27
Gross profit, % of total sales	18.27	18.27	18.27	18.27	18.27
Net profit, % of total sales	12.79	12.79	12.79	12.79	12.79
ROE Net profit, % of equity	7.68	7.68	7.68	7.68	7.68
ROI Net profit+interest, % of equity	3.87	3.87	3.87	3.87	3.87

bagasse newsprint plant --- 1985-04-18

COMFAR 1.1 - Computing center of MFERT, Beijing

Projected balance sheets, construction in us $ '000

Year	1987.1	1987.2	1988.1	1988.2	1989.1
Total assets	7650.00	10450.00	13250.00	43480.00	74910.00
Fixed assets, net of depreciation	0.00	7650.00	10450.00	13250.00	43480.00
Construction in progress	7650.00	2800.00	2800.00	30230.00	31430.00
Current assets	0.00	0.00	0.00	0.00	0.00
Cash, bank	0.00	0.00	0.00	0.00	0.00
Cash surplus, finance available	0.00	0.00	0.00	0.00	0.00
Total liabilities	7650.00	10450.00	13250.00	43480.00	74910.00
Equity capital	7650.00	10450.00	13250.00	43480.00	74910.00
Reserves, retained profit	0.00	0.00	0.00	0.00	0.00
Profit,(loss)	0.00	0.00	0.00	0.00	0.00
Long and medium term debt	0.00	0.00	0.00	0.00	0.00
Current liabilities	0.00	0.00	0.00	0.00	0.00
Bank overdraft, finance required.	0.00	0.00	0.00	0.00	0.00
Total debt	0.00	0.00	0.00	0.00	0.00
Equity, % of liabilities	100.00	100.00	100.00	100.00	100.00

COMFAR 1.1 - Computing center of MFERT, Beijing

Projected balance sheets, construction in us $ '000

Year	1989.2
Total assets	79941.00
Fixed assets, net of depreciation	74910.00
Construction in progress	3231.00
Current assets	1800.00
Cash, bank	0.00
Cash surplus, finance available	0.00
Total liabilities	79941.00
Equity capital	79941.00
Reserves, retained profit	0.00
Profit,(loss)	0.00
Long and medium term debt	0.00
Current liabilities	0.00
Bank overdraft, finance required.	0.00
Total debt	0.00
Equity, % of liabilities	100.00

bagasse newsprint plant --- 1985-04-18

COMFAR 1.1 - Computing center of MFERT, Beijing

Projected balance sheet, production in us $ '000

Year	1990	1991	1992	1993	1994
Total assets	78784.57	77697.05	77510.02	84263.60	90447.63
Fixed assets, net of depreciation	71179.44	64217.88	57256.32	50294.76	43333.20
Construction in progress	0.00	0.00	0.00	0.00	0.00
Current assets	7468.76	13254.17	15792.98	18152.97	19041.07
Cash, bank	136.38	225.00	227.46	237.50	237.50
Cash surplus, finance available	0.00	0.00	4233.26	15578.37	27835.86
Total liabilities	78784.57	77697.05	77510.02	84263.60	90447.63
Equity capital	79941.00	79941.00	79941.00	79941.00	79941.00
Reserves, retained profit	0.00	-6589.66	-7167.33	-6400.99	1970.34
Profit,(loss)	-6589.66	-577.66	2766.34	6371.34	5942.54
Long and medium term debt	0.00	0.00	0.00	0.00	0.00
Current liabilities	666.51	1602.93	1970.01	2352.26	2593.76
Bank overdraft, finance required.	4766.73	3320.45	0.00	0.00	0.00
Total debt	5433.24	4923.38	1970.01	2352.26	2593.76
Equity, % of liabilities	101.47	102.89	103.14	94.87	88.38

bagasse newsprint plant --- 1985-04-18

COMFAR 1.1 - Computing center of MFERT, Beijing

Projected balance sheet, production in us $ '000

Year	1995	1996	1997	1998	1999
Total assets	96390.18	102332.70	108275.20	114217.80	120160.30
Fixed assets, net of depreciation	36371.64	29410.09	22448.53	15486.97	8525.41
Construction in progress	0.00	0.00	0.00	0.00	61149.00
Current assets	19041.07	19041.07	19041.07	19041.07	19041.07
Cash, bank	237.50	237.50	237.50	237.50	237.50
Cash surplus, finance available	40739.96	53644.05	66548.14	79452.23	31207.33
Total liabilities	96390.18	102332.70	108275.20	114217.80	120160.30
Equity capital	79941.00	79941.00	79941.00	79941.00	79941.00
Reserves, retained profit	7912.88	13855.42	19797.95	25740.48	31683.02
Profit,(loss)	5942.54	5942.54	5942.54	5942.54	5942.54
Long and medium term debt	0.00	0.00	0.00	0.00	0.00
Current liabilities	2593.76	2593.76	2593.76	2593.76	2593.76
Bank overdraft, finance required.	0.00	0.00	0.00	0.00	0.00
Total debt	2593.76	2593.76	2593.76	2593.76	2593.76
Equity, % of liabilities	82.93	78.12	73.83	69.99	66.53

bagasse newsprint plant --- 1985-04-18

中国经贸部 COMFAR 1.1 UNIDO ©

COMFAR 1.1 - Computing center of MFERT, Beijing ---

Projected balance sheet, production in us $ '000

Year	2000	2001	2002	2003	2004
Total assets	126297.70	132435.00	138572.40	144709.70	150847.00
Fixed assets, net of depreciation	62991.15	56307.89	49624.63	42941.38	36258.11
Construction in progress	0.00	0.00	0.00	0.00	0.00
Current assets	19041.07	19041.07	19041.07	19041.07	19041.07
Cash, bank	237.50	237.50	237.50	237.50	237.50
Cash surplus, finance available	44027.94	56848.54	69669.16	82489.76	95310.36
Total liabilities	126297.70	132435.00	138572.40	144709.70	150847.00
Equity capital	79941.00	79941.00	79941.00	79941.00	79941.00
Reserves, retained profit	37625.55	43762.90	49900.24	56037.59	62174.93
Profit,(loss)	6137.35	6137.35	6137.35	6137.35	6137.34
Long and medium term debt	0.00	0.00	0.00	0.00	0.00
Current liabilities	2593.76	2593.76	2593.76	2593.76	2593.76
Bank overdraft, finance required.	0.00	0.00	0.00	0.00	0.00
Total debt	2593.76	2593.76	2593.76	2593.76	2593.76
Equity, % of liabilities	63.30	60.36	57.69	55.24	52.99

bagasse newsprint plant --- 1985-04-18

1.5. Version "3".

For Version "3" it has been agreed to assume that the output would be split into two products -- bagasse newsprint /of 36.000 t p.a./ and bagasse based light weight coating paper /LWC/ - ca. 22.914 t. The total plant capacity remains the same as in Version "1", i.e. 54.000 tons of paper p.a. However, since LWC paper requires more chemical components its total weight is higher by ca. 27.3% than the weight of paper base used for its manufacturing. It means that 18.000 tons of paper base remaining after covering the newsprint production requirements will be sufficient to yield ca. 22.914 tons of LWC.

The net selling price for LWC has been assumed at US$ 600 per ton /see Chapter II/ whereas the price for newsprint remains US$ 400 per ton. Total output of LWC is to be exported and total output of newsprint is to be sold at domestic market. According to information provided by ICIDCA officials the extension of the product-mix would require purchasing of additional machinery and equipment of ca. 4 millions US$. Additional cost for civil works, pre-production expenses and working capital has been assumed at ca. 1 million US$. Operating costs are also supposed to increase to allow for increased use of some inputs /especially clay, latex, storch and utilities/. Relevant data for investment cost and production cost are given below.

Under given assumptions the project yields some positive net cash flow although the overall profitability is rather low. IRR is estimated at 6.19%. NPV at 10% is negative /a deficit of over 23 millions US$/. Since newsprint production seems to be less beneficial /as one can judge from previous versions/, the overall profitability of this version is likely to depend on the propor-

tions of LWC and newsprint in the product-mix. For example, if the share of newsprint in the total output is limited to 27.000 t p.a. and the share of LWC is increased to 34.371 t p.a. at full capacity, the internal rate of return grows up to 8.34%. The net present value of the project at 10% discount rate remains still negative /a deficit of more than 14 millions/. However, it should be kept in mind that these results must be taken as very rough estimates since the whole Version "3" has been examined on the basis of very tentative and sketchy data concerning cost level and structure. To make the analysis more reliable, a much deeper study of Version"3" is necessary.

Schedules 3.1 - 3.8. follow.

SCHEDULE 3.1. VERSION "3"

Total Initial Investment Cost /in US$ ´000/

I. FIXED INVESTMENT	= 63.800	
1.1. Site Preparation and Development		500
1.2. Building Structures and Civil Works		8.100
1.3. Engineering and Design		5.000
1.4. Machinery and Equipment		42.950
1.5. Plant Installation		7.250
II. PRE-PRODUCTION CAPITAL EXPENSES		1.700
III. WORKING CAPITAL /FULL CAPACITY/		5.600
IV. TOTAL INVESTMENT COST		71.100
V. PROVISION FOR CONTINGENCIES /ca. 4% of I + II/		2.900
VI. TOTAL FINANCE REQUIRED		74.000

SCHEDULE 3.2. VERSION "3"

Working Capital Requirements

Full Capacity /36.000 t + 22.914 t/

I T E M	Minimum Coverage Period in Days	Coefficient of Turnover	Amount Required Total	of it Foreign
1. ACCOUNTS RECEIVABLE	30	12	1597	
2. INVENTORIES OF RAW MTLS.				
2.1. Bagasse	180	2	459	
2.2. Caustic Soda	90	4	266	
2.3. Clay	90	4	351	
2.4. Hydrogen Peroxide	90	4	182	
2.5. Kraft Woodpulp	90	4	424	
2.6. Mechanical Woodpulp	90	4	533	
2.7. Latex	90	4	113	
2.8. Other Imported /Cap./	90	4	362	
2.9. Other Imported /Soc./	90	4	36	
2.10.Other Local Materials	45	8	43	
3. WORK-IN-PROGRESS	1	360	52	
4. FINISHED PRODUCTS	10	36	516	
5. SPARE PARTS	360	1	1653	
6. CASH-IN-HAND	15	24	203	
7. ACCOUNTS PAYABLE	30	12	-1190	
TOTAL FINANCE REQUIRED :	6790 - 1190 = 5600			

SCHEDULE 3.3. VERSION "3"

Newsprint 36.000 t + LWC Paper 22.914 t

A. ADDITIONAL COSTS /FULL CAPACITY IN US$/

1. RAW MATERIALS				
Clay	3924 t	á	155,69	610.928
Latex	378 t	á	1200,0	453.600
Starch	558 t	á	300,0	167.400
Auxiliary	486 t	á	3000.0	145.800
2. UTILITIES				
Water	4914 m^3	á	904.0	197
Steam	9000 t	á	8.80	79.200
Eelctricity	1350000 kWh	á	0.02	27.000
3. MANPOWER	8 men	á	2728	21.824
4. DEPRECIATION	10% of 4.000.000			400.000

B. SALES PROGRAMME / IN TONS /

	1990	1991	1992	1993	1994*
NEWSPRINT	10000	20000	26000	32000	36000
LWC PAPER	-	12730	16549	20368	22914

* - Full Capacity

SCHEDULE 3.4.

VERSION "3"

Production Cost Schedule /in US$ ´000/ - Low Capacity

I T E M	1990	1991	1992	1993	1994			2000	2001	ect.
1. RAW MATERIALS - IMPORTED	1813	5036	6546	8057	9064					
2. RAW MATERIALS - LOCAL	253	703	914	1124	1265					
3. MANPOWER /DIRECT/	473	709	756	945	945					
4. UTILITIES	791	2198	2858	3517	3957					
5. REPAIR AND MAINTENANCE	950	1900	1900	1900	1900					
6. FACTORY OVERHEADS	1087	1450	1450	1450	1450					
TOTAL FACTORY COST	5367	11996	14424	16993	18581			18581	18581	
7. SALES AND DISTRIBUTION										
7.1. Transportation Cost	48	158	205	253	284					
7.2. Sales Cost /5 US$/t/	50	164	213	262	295					
OPERATING COST	5465	12318	14842	17508	19160			19160	19160	
8. DEPRECIATION 4% of 13600 + 10% of 51900	2867	5734	5734	5734	5734			5649	5564	
TOTAL PRODUCTION COST	8332	18052	20576	23242	24894			24809	24724	ect.
9. TOTAL PRODUCTION COST /product-mix: 50% newsprint, 50% LWC /					25741					

SCHEDULE 3.5. VERSION "3" CASH FLOW TABLE FOR /36.000 T

	1987	1988	1989	1990	1991	1992	1993	1994
I. CASH INFLOWS								
1.1. Sales Revenue /Newsprint/[1/]	-	-	-	4.000	8.000	10.400	12,800	14.400
1.2. Sales Revenue /LWC/[2/]	-	-	-	-	7.638	9.929	12.221	13.748
II. CASH OUTFLOWS								
2.1. Fixed Investment	500	8.100	50.100	5.100	-	-	-	-
2.2. Pre-production Expenses	400	500	400	500	-	-	-	-
2.3. Working Capital	-	-	-	1.200	1.900	900	1.000	600
2.4. Operating Cost	-	-	-	5.465	12.318	14.842	17.508	19.160
III.NET CASH FLOW /I-II/	/900/	/8.600/	/50.500/	/8.265/	1.420	4.587	6.513	8.388
IV. CUMULATED NET CASH-FLOW								
NPV at 70% = -23411 < 0								
IRR = 6,19%								

1/ - Selling price 400 US$

2/ - Selling price 600 US$

NEWSPRINT + 22.914 T LWC PAPER/, IN US$ '000

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
14.400	14.400	14.400	14.400	14.400	14.400	14.400	14.400	14.400	14.000	14.400	14.400
13.748	13.748	13.748	13.748	13.748	13.748	13.748	13.748	13.748	13.748	13.748	13.748
-	-	-	-	-	50.200	-	-	-	-	-	/22.194/
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	/5.600/
19.160	19.160	19.160	19.160	19.160	19.160	19.160	19.160	19.160	19.160	19.160	19.160
8.988	8.988	8.988	8.988	8.988	/41.212/	8.988	8.988	8.988	8.988	8.988	/36.782/
											+38.093

SCHEDULE 3.6. VERSION "3"

Newsprint 27.000 t + LWC Paper 34.371 t

A. ADDITIONAL COSTS /FULL CAPACITY IN US$ ´000/

1. Raw Materials	2066,6	689
2. Utilities	159,6	53
3. Manpower 10 men á 2728 US$	27,3	5
4. Depreciation 10% of 6.000.000	600,0	100

B. SALES PROGRAMME /IN T AND US$ ´000/

NEWSPRINT	1990	1991	1992	1993	1994
TONNES	10.000	15.000	19.500	24.000	27.000
VALUE	4.000	6.000	7.800	9.600	10.800
LWC PAPER					
TONNES	-	19.095	24.823	30.552	34.371
VALUE	-	11.457	14.894	18.331	20.623
Σ VALUE		17.457	22.694	27.931	31.423

SCHEDULE 3.7.

VERSION "3"

Newsprint + LWC 50/50

	1990	1991	1992	1993	1994			2000	2001
1. RAW MATERIALS									
- imported	1813	5418	7044	8669	9753				
- local	253	703	914	1124	1265				
2. UTILITIES	791	2228	2896	3564	4010				
3. MANPOWER	473	713	760	950	950				
4. REPAIR AND MAINTENANCE	970	1940	1940	1940	1940				
5. FACTORY OVERHEADS	1110	1480	1480	1480	1480				
FACTORY COST	5410	12428	15034	17727	19398				
5. SALES AND DISTRIBUTION									
a. Transportation	48	164	214	263	296				
b. Sales Cost	50	170	222	273	307				
OPERATING COST	5508	12816	15470	18263	20001			20001	20001
7. DEPRECIATION	2917	5834	5834	5834	5834			5749	5664
4% of 13600 + 10% of 52900									
TOTAL PRODUCTION COST	8425	18650	21304	24097	25835			25750	25665

SCHEDULE 3.8. VERSION "3" CASH-FLOW TABLE: 27.000T NEWSPRINT

	1987	1988	1989	1990	1991	1992	1993	1994
I. CASH INFLOWS								
1. Sales Revenues - Newsprint	-	-	-	4.000	6.000	7.800	9.600	10.800
2. Sales Revenues - LWC	-	-	-	-	11.457	14.894	18.331	20.623
II. CASH OUTFLOWS								
1. Investment								
1.1. Fixed Investment	500	8.100	51.100	5.100	-	-	-	-
1.2. Pre-production Expenses	400	500	400	500	-	-	-	-
1.3. Working Capital	-	-	-	1.200	1.900	1.000	1.000	600
2. Operating Cost	-	-	-	5.508	12.816	15.470	18.263	20.001
III. NET CASH FLOW /I - II/	/900/	/8.600/	/51.500/	/8.308/	2.741	6.225	8.668	10.822
IV. CUMULATED NET CASH-FLOW								
NPV at 10% = - 14.567 < 0								
IRR = 8.34%								

34.371 T LWC PAPER, /IN US$ '000/

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800
20.623	20.623	20.623	20.623	20.623	20.623	20.623	20.623	20.623	20.623	20.623	20.623
-	-	-	-	-	51.200	-	-	-	-	-	/22.544/
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	/5.700/
20.001	20.001	20.001	20.001	20.001	20.001	20.001	20.001	20.001	20.001	20.001	20.001
11.422	11.422	11.422	11.422	/39.778/	11.422	11.422	11.422	11.422	11.422	11.422	39.666
											73.255

1.6. Financial Plan.

Theoretically several options of financial plan including some form of foreign participation can be envisaged to be applied for the project. The original idea advanced by the Cuban authorities was to establish a "joint-venture" project with the share of foreign equity up to 49% of total capital on the basis of new public law regulations allowing for the creation of mixed-capital enterprises within Cuban economy. The remaining 51% /or more/ at the capital would be provided by the Cuban government through the Ministry of Sugar Industry.

This form of financing though quite attractive for local partners requires comparatively high profitability ratios for the project in order to encourage foreign investors to participate in the venture in the form of direct investment.

However, obtained results of financial evaluation point out very clearly that Versions "0" and "1" and to a lesser extent Version "2" have no or little chance to meet these standards and it would be unlikely to find foreign co-sponsors for the project.

It seems that in this case a foreign debt - local equity financing pattern would be more realistic. If one rejects Version "0" and "1" as entirely unsatisfactory, any loan financing for the Version "2" has to take into consideration very low levels of profitability indicators and high vulnerability of the project with respect to selling price. Debt service obligations push the required net selling price even higher. Below are given break-even selling prices for several most typical modes of financing /schedule 3.9/. As it can be seen in case of loan financing higher cost of capital can by offset by lower depreciation rates, which

This is because lower depreciation rates mean longer period of recovering the invested capital and therefore foreign investors always insist to shorten the depreciation period.

For Vesion "2" which is probably the only one which can be further examined three modes of financing have been discussed and are given below. It is clear that the project should be financed partly by a "soft" foreign loan with interest charges not exceeding 4-5% p.a. and partly by government contribution in the form of equity. Commercial loan even if granted by foreign banking institution would have to be guaranteed by the Cuban government and would inevitably create a liquidity problem for the company due to high debt service burdens.

It is therefore recommended to apply for a "soft" loan in a country where the main production equipment is purchased from and the financing can be obtained through a government export promoting agency. It might be possible also to get very favourable financial conditions for the purchase of a second-hand equipment. There are several industrialized countries which would be willing and able to finance the contract among them Sweden, Finland, Canada and also some COMECON countries.

A financial plan has been presented below for Version "2" assuming Debt/Equity ratio ≃ 2 and 10% interest charges /Schedule 3.10 /.

in turn are rather impossible to maintain if a "joint-venture" form was proposed.

SCHEDULE 3.9 VERSION "2"

Modes of Financing

MODES OF FINANCING	Unit Cost of Production /incl.interest + depreciation/. Full capacity	Minimum Required Selling Price /incl. debt service/* Full capacity
1. Government Contribution Only	a. 368 b. 341	368 341
2. Government Contribution plus foreign loan: D/E = 50/50, interest 10%	a. 394 b. 367	425 408
3. Government Contribution plus loan D/E = 50/50 interest 5%	a. 381 b. 354	409 382
4. Government Contribution plus loan D/E = 67/33 interest 10%	a. 399 b. 372	440 413
5. Government Contribution plus foreign equity: 51/49%, dividends 5%	a. 388 b. -	388 -

a/ - Depreciation: 4% of 18.050 + 10% of 63.950 = 7.117

b/ - Depreciation: 5% of 82.000 : 4.100

*/ - No profit.

SCHEDULE 3.10

VERSION "2"

D/E ≃ 2.0

Financial Plan: Foreign Loan + Local Equity

/in US$ 1.000/

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
1. Government Contribution /local equity/ of 31.000	1350	12700	2250	7500	-	-	-	-	-	-
2. Long term foreign loan[1/] of 54.000	-	-	54000	-	-	-	-	-	-	-
3. Short term foreign loan[2/] of 6.000	-	-	-	6000	-	-	-	-	-	-
4. Interest during Pre-production	-	-	5400	5400	-	-	-	-	-	-
a. long term	-	-	-	600	-	-	-	-	-	-
b. short term	-	-	-	-	-	-	-	-	-	-
5. Amount to be repaid /2 + 4/ at the end of period a.	-	-	58400	65940	65940	65940	-	-	-	-
b.	-	-	-	6600	4950	3300	1850	-	-	-
6. Repayments of Principals a. Long term loan	-	-	-	-	-	-	-	10990	10990	10990
b. Short term loan	-	-	-	-	1650	1650	1650	1650	-	-
7. Interest payments /per ton/	-	-	-	-	119	90	71	61	50	40
a. Long term loan	-	-	-	-	6594	6594	6594	6594	5495	4396
b. Short term loan	-	-	-	-	660	495	330	165	-	-
8. Total investment payments	-	-	-	-	7254	7089	6924	6759	5495	4396
9. Unit production cost	-	-	-	-	567	497	450	429	418	408

1/ and 2/ - see a separate note

Financial Plan - Additional Information VERSION "2"

1. Project is to be financed partly by local equity /government contribution/ of 31 million US$ and partly by foreign loans - long term loan of 54 million US$ and short term credit of 6 million US$. Therefore the debt/equity ratio is 1.94.

2. Long term loan for the purchase of the machinery and equipment is disbursed 1.01. 1989,with interest rate of 10% /including commission/ and repaid in 6 equal annual installments with 4 years grace period, i.e. repayment of principals starts in 1994. Interest capitalized over 1989-1990 and is to be paid annually starting in 1991.

3. Short term credit to finance partly working capital and partly other investment cost - is to be repaid in 4 equal annual installments starting in the second year of operation, i.e. 1991. Interest at 10%.

C H A P T E R IV

NATIONAL COST-BENEFIT ANALYSIS

/Economic Analysis/

This part of the study should give us an idea of the project's contribution to the national economy as a whole. Thus, in this Chapter a macro-perspective is a decisive and dominant point of view for the evaluation of the project under consideration.

After studying the information supplied by the ICIDCA team the UNIDO Value Added Approach has been selected as the method to carry out the national cost-benefit analysis. High grade of integrity of this approach with the financial analysis and complexity of the method as well as its openess to any non-routine aspect of the discussed problem were considered to be important merits for the economic evaluation. The following stages of economic analysis have been undertaken creating the basis of consequent paragraphs of this Chapter:

1. Analysis of Recent Tendencies in Cuban Economy.
2. Discussion and Estimates of the National Parameters for Cuba.
   2.1. Social Rate of Discount.
   2.2. Adjusted Rate of Foreign Exchange.
3. Integrated Value Added Analysis and Discussion of the Possible Impact of the Project on the Balance of Payments of the Country.

1. Cuban Economy - Recent Tendencies.

Cuba has a socialist, centrally planned economy, is a member of the Council for Mutual Economic Assistance /CMEA/. Following the 1959 revolution Cuba adopted the new political and economic system and succeeded in accelerating its economic development as well as reaching important social targets /liquidation of illiteracy, promoting medical care for the whole society, etc/.[1/]

National accounting system in Cuba employs two basic measures of growth: gross material product /GMP/ and gross social product /GSP/. The latter is the most commonly used measure and includes the value of all goods and productive services generated in the country within the course of a year. It does not include the value of services such as: finance, housing, public health, education, public administration and defence, which according to Cuban methodology are classified as consumption. It does, however, include transportation, communication and trade sectors, which in turn are not included in GMP category.

Economic growth calculated in terms of GSP and its structural distribution is shown in Table I/1. The figures demonstrate that between the years 1975 and 1983 GSP grew by 75% with considerably slower growth in the early eighties compared with the seventies.

1/ - For details look: Kuba - opyt obszczestwiennowo razwitija. Moskwa 1979; accelarated public investment efforts after the revolution are described by C. Brundenius: Development Strategies and Basic Needs in Revolutionery Cuba, in Brundenius, C., Lindahl, M. /eds/, 1982.

TABLE I/1

Dynamics of the Gross Social Product in Cuba by Sectors

/1975 - 1983/ /1975 = 100/

	1979	1980	1982	1983	1983/1982
INDUSTRY	117.7	120.5	149.9	158.2	105.6
CONSTRUCTION	125.5	125.5	144.1	159.6	110.7
AGRICULTURE	122.9	128.1	212.9	215.6	101.3
TRANSPORT	121.8	141.6	160.2	166.7	104.1
COMMUNICATION	172.2	194.1	246.2	260.9	106.0
COMMERCE	122.3	121.7	177.0	194.2	190.7
OTHERS	248.8	283.0	391.2	441.3	112.8
GROSS SOCIAL PRODUCT	120.8	124.3	164.5	175.0	106.4

Source: Own calculations on the basis of : Cuba en cifras. Comité Estatal de Estadísticas. La Habana 1983.

Growth of the majority of sectors during the period under consideration has been generally in line with overall economic change. Thus, the diversification of the economy has remained rather slow, with no single sector significantly altering its contribution to GSP up to the end of the seventies /safe for the communication/.

In general, the industry has been diminishing its share in GSP. It decreased by 9.6% between 1975 and 1983, still accounting for more than 40% of the social product. However, within the sector, light industry continued to grow faster than the heavy one.

Among the sectors with slower growth than the overall economy were also construction and transport. Their shares in GSP have thus decreased slightly. The most considerable increase of the share took place in such sectors as: communication /still accounting for less than 1% of GSP/, agriculture and commerce, in case of the last two sectors the main change taking place in the eighties /compare Table I/2/.

TABLE I/2

Structure of the Gross Social Product in Cuba 1975 - 1983

/ In current prices, at factor cost/ /%/

	1975	1980	1982	1983
INDUSTRY	47.8	46.4	43.6	43.2
CONSTRUCTION	8.9	9.0	7.8	8.1
AGRICULTURE	11.9	12.1	15.1	14.4
TRANSPORT	7.2	8.2	6.9	6.8
COMMUNICATION	0.5	0.8	0.9	0.8
COMMERCE	23.5	23.0	25.3	26.1
OTHERS	0.2	0.5	0.4	0.6
TOTAL	100.0	100.0	100.0	100.0

Source: As in Table I/1

Construction and housing have been identified as a major bottleneck of socio-economic development of the country. In recent years, however, this sector has been boosted by the construction of hotels and by the modernization and expansion works in some principal ports /Habana, Cienfuegos, Mariel, Matanzas/.

In the years to come the main thrust of this sector is supposed to be in infrastructure development and social services /hospitals and schools/.

The contribution of agriculture to GSP increased in the period 1975-1983 by 21%. Irrigation, increased use of fertilizers and substantial mechanisation have enabled the total acreage planted to sugar and other crops to be more than doubled since 1975. State farms account for more than 80% of arable land but government policy is now to provide incentives for small private farmers and to encourage them to form production cooperatives. Since 1980 farmers have been allowed to sell their surplus production on the free market /Mercado Libre Campesino/ once they had met their targets in the planned economy, which has stimulated output.

Agricultural production, however, has been affected recently by bad weather conditions and insect pests. The main losses were in sugar and tobacco. Despite it, sugar still accounts for much of the growth in the agricultural sector.

Fishing and fish processing which make a significant contribution to Cuban exports, particularly as overseas sales are entirely to market economies, suffered from decreasing catches, partly due to the establishment by many countries of 200-miles limits.

In spite of its declining share in GSP the most significant changes took place within the industry sector. With the efforts for restructuring the economy it has been given a high priority and about 42% of Cuba's budget[1/] has been recently allocated in industrial investment. Main streams of industrial activity are concentrated in sugar processing, metal industry, oil refining and the production of fertilizers, textiles, cement and foodstuffs.

1/ - Economic Survey of Latin America and the Caribbean 1982, Vol. I. UN, Santiago, Chile 1984, p. 268

The manufacture of raw materials and investment goods based on domestic resources is also gaining in importance. Projects under way in this area are primarily aimed at import substitution but are also to some extent seeking to create new export capacities /e.g. cement production/. The steel production is set for expansion with financial and technical aid from the Soviet Union. The energy sector is heavily dependant on imports of crude oil and oil derivatives, primarily shipped from the U.S.S.R. However, offshore oil exploration, carried out with Mexican and Soviet assistance has resulted in the rise of production.

Despite the efforts to diversify the national economic structure, sugar is still central to income generation /about 9% of GSP/ even within the industrial sector. This high dependency on sugar, which has long been the major agricultural crop among quite a wide variety of tropical crops in Cuba, makes the overall economic performance being heavily influenced by the results of each harvest. Moreover, with sugar accounting for large part of export earnings, in the short run, international sugar prices and the level of its production to a large extent dictate the pace of GSP growth. Low international sugar prices in recent years have thus had a depresive effect on the Cuban economy. Of course this was not the only factor that caused the decline of growth rate in the recent decade. The deterioration of terms of trade in the '80-ies was also due to higher priced imports and not only to low prices of major export commodities. Among the external factors the overall world recession has had a general depressive impact on Cuba's national economy, too. Simultaneously, the economy suffered through the considerable increase of the financial service of its foreign debt.

Foreign trade is important to Cuban economy accounting for about 35% of national product /export and import separately/. According to official Cuban data imports regularly exceeds exports,

i.e. foreign trade deficit is a structural feature of the economy.[1/]

Foreign trade has been expanding rapidly in recent years[2/] although there has been rather limited commodity diversification of exports which remains almost totally composed of agricultural and mining products. Slightly more significant diversification of export commodity structure in the last decade took place within the exports to market economies. The number of items exported has augmented considerably, including as well semi-manufactured goods. On the imports side, oil, capital and transport equipment and mechanical engineering products dominate.

1/ - Compare Vos R., The Role of the State and Participatory Planning, in: PLanning for Basic Needs in Latin America, Institute of Social Studies, The Haque, 1985, p. 13.

2/ - E. Sarvera: Cuba Seeks to Expand its Trade with the West, Journal of Commerce, 25.06.1984.

TABLE 1/3

Cuban Foreign Trade, 1970 - 1983 /Millions of Cuban Pesos, Current Prices/

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
TOTAL EXPORTS	1050	861	771	1153	2237	2952	2692	2918	3440	3493	3967	4210	4940	5531
Soviet Union	529	304	224	477	811	1662	1638	2066	2496	2418	2253	2414	3297	4761
Rest of Socialist Countries	248	261	197	268	472	341	452	377	420	513	534	767	883	
Rest of the World	273	296	350	408	954	949	602	475	524	562	1180	1029	760	770
TOTAL IMPORTS	1311	1387	1190	1463	2226	3113	3180	3462	3574	3687	4545	5158	5537	6224
Soviet Union	691	731	714	811	1025	1250	1490	1858	2328	2524	2829	3223	3756	5403
Rest of Socialist Countries	226	239	200	224	328	437	374	482	521	534	711	952	1153	
Rest of the World	394	417	276	428	873	1456	1316	1122	725	629	1006	983	628	821
OVERALL BALANCE	-261	-526	-419	-310	11	-161	-488	-544	-134	-194	-578	-948	-597	-693
Soviet Union	-162	-427	-490	-334	-214	412	148	208	168	-106	-576	-809	-459	-642
Rest of Socialist Countries	22	22	-3	44	144	-66	78	-105	-101	-21	-177	-185	-279	
Rest of the World	-121	-121	74	-20	81	-507	-714	-647	-201	-67	174	46	132	-51

Sources: Economic Survey of Latin America, UN, Santiago de Chile 1982 on the basis of data from Anuarios Estadisticos de Cuba, National Bank of Cuba;
Economic Survey of Latin America and the Caribbean, 1982, Vol. I, UN, Santiago, Chile, 1984.

Sugar cane production which dominates the Cuban economy provides also the majority of its export earnings. Cuba has long been the world's biggest raw sugar exporter and plans to retain this position throughout the eighties.

TABLE I/4

Commodity Structure of Cuban Exports /%/

	1978	1979	1980	1981
SUGAR	85.9	84.7	82.7	78.4
NICKEL	4.5	4.4	4.6	7.4
TOBACCO	2.0	1.7	0.9	1.3
COFFEE,TEA,COCOA	0.6	0.6	0.6	0.7
FISHERY PRODUCTS	2.5	2.8	2.3	2.3
PETROLEUM PRODUCTS	0.8	1.5	1.8	0.4
OTHERS	3.1	4.2	4.7	5.6
RE-EXPORTS	0.5	0.1	2.4	3.9
TOTAL	100.0	100.0	100.0	100.0

Source: Own calculations on the basis of the data of the National Bank of Cuba

The dominating position of one commodity item in the export structure makes the country highly dependent on the evolution of the world market situation. When the world sugar prices were rising steadily in the early seventies, Cuba increased the share of its imports coming from non-centrally planned economies. Then with the unfavourable change on world sugar market, Cuba has been forced to adjust its development goals to new, less positive conditions.

TABLE I/5

Commodity Structure of Cuban Imports /%/

	1978	1979	1980	1981
FOODSTUFFS	17.6	17.0	17.1	16.9
RAW MATERIALS /EXCL. FOOD/	4.2	4.2	4.3	4.2
MANUFACTURES	16.5	17.5	16.3	16.6
FUELS AND LUBRICANTS	17.7	20.6	20.5	22.4
CHEMICALS	6.1	6.5	6.6	6.5
MACHINERY AND TRANSPORT EQUIPMENT	34.4	34.1	35.2	33.4
TOTAL INCLUDING OTHERS	100.0	100.0	100.0	100.0

Source : Own calculation on the basis of the data of the National Bank of Cuba

Cuba´s major partners are the CMEA countries. Trade ties with these countries have been intensified in recent years, so that this area accounts now for some 85% of total foreign trade turnover of Cuba compared with 56% in 1975. Most of trade is thus handled on a clearing basis at relatively stable prices and many Cuban export prices well above those ruling in international markets.

TABLE I/6

Unit Values and Terms of Trade of Cuban Foreign Trade /1979 = 100/

	1977	1978	1979	1980	1981	1982[a/]
UNIT EXPORT VALUE						
Soviet Union	321.7	454.6	446.9	563.9	550.0	542.0
Market Economies	205.2	195.9	226.7	407.2	314.0	232.0
UNIT IMPORT VALUE						
Soviet Union	184.3	195.9	202.4	217.1	210.0	225.4
Market Economies	150.8	166.9	200.2	226.4	210.1	183.4
TERMS OF TRADE /GOODS/						
Soviet Union	201.7	232.1	220.8	259.7	261.9	240.5
Market Economies	136.1	117.4	113.2	179.9	149.5	126.5

a/ - Preliminary figures estimated by ECLA

Source: Economic Survey of Latin America and the Caribbean, 1982, Vol. I. UN, Santiago, Chile, 1984

Despite its close integration with the CMEA countries Western export markets continue to be important to Cuba as foreign currency earnings are indispensable to finance essential imports of chemical products, high technology capital goods, pharmaceuticals and a number of spare parts. Acute shortage of hard currency is the result of a number of factors, including low world sugar prices, high international interest rates and the drying up of Western credits. Thus the world sugar price slump forces to reduce Cuba's imports from the West. It should be acknowledged that close links with the

Soviet Union have softened the impact of the current world recession on Cuban economy.

Chief trading partners among the Western industrialized countries are: Canada, Japan, Spain, the Netherlands, the United Kingdom and the Federal Republic of Germany. Japan, Canada and Iraq play the leading role among the non-Comecon sugar importers.

TABLE I/7

Geographical Pattern of Cuban Sugar Exports /%/

COUNTRY	1977	1979	1980	1981	1982
U.S.S.R.	54.4	52.9	44.0	45.3	57.2
CHINA	7.4	6.7	8.3	8.1	11.7
JAPAN	7.3	4.1	4.3	5.0	3.8
BULGARIA	2.6	3.0	3.8	3.5	3.6
GDR	2.8	3.1	3.4	3.6	2.8
ALGERIA	2.4	2.8	3.3	3.6	2.7
EGYPT	1.8	1.5	2.2	2.3	2.5
CANADA	3.9	4.3	4.3	5.3	2.1
MEXICO	0	0	6.5	2.0	1.8
IRAQ	2.6	3.4	4.5	2.5	1.7
TOTAL INCL. OTHERS	100.0	100.0	100.0	100.0	100.0

Source: Own calculations on the basis of data of Lloyds Bank Group Economic Report, 1983

2. National Parameters.

2.1. Social Rate of Discount

Social Rate of Discount /SRD/ provides a link between costs and benefits occuring in different periods. Social Rate of Discount is the discount rate at which society as a whole is ready to accept lower weights assigned to future benefits and costs as compared with those of the current year.

In our case the SRD has been calculated by an iterative process taking into consideration the following elements of the reasoning:

a. analysis of prevailing market interest rates on leading capital markets,
b. analysis of the level of development of the country and expected growth rate of the national economy,
c. analysis of the financial position of the country,
d. analysis of the situation on the domestic market with special attention to the rate of inflation,
e. analysis of the overall situation on international markets, as well as domestic and world political and economic stability.

While estimating Social Rate of Discount the prevailing interest rates on the most important international capital markets should be used as the starting point and the reference level for any further adjustments.

The actual long-term interest rates vary from market to market and from country to country depending on inflation rates, currency stability, international capital movements, trade balances, etc. Typical reference levels for the "Commercial Prime Lending"

are[1/]:

- low : Japan /5.5%/,
- medium : Switzerland, West Germany, the Netherlands /7.5% - 8% - 8.5%/,
- high: USA, Canada /10.5% - 11.5%/.

Eurodolar rate in London /LIBOR/ is ranging from 9.8% to 10.4%.

In the next step, information concerning international market interest rates should be adjusted by a set of premium coefficients /negative or positive/ in order to take into account specific features of the analyzed economy or prospects of the world economy.

Here the formula was used:

$$SRD = r_m + /P_i \times r_m/$$

where: r_m stands for the market interest rate and P_i for a premium; $P_i > 0$ positive premium, $P_i < 0$ a negative one.

Arguments for applying premium coefficients increasing the level of SRD above the prevailing market interest rate /$P_i > 0$/:

a. Financial position of the country.

Cuba has been recently facing a difficult situation in the foreign trade, especially with its convertible currency partners[2/] and is a net borrower of capital. In early eighties Cuba was largely influenced by the world recession and radical decline of the sugar /from 16.88 cents per pound in 1981 to the level of ca.8.5 cents in 1982-1984 and below 4 cents in 1985[3/]

1/ - All information here dated 9-15 March 1985, data provided by Chase Manhattan, Banque de Commerce /Belgium/, Nederlands Crediebebank, Deutsche Bank and others.

2/ - See: Journal of Commerce from 25.06.1984

3/ - Compare : Movimiento del Mercado Azucarero, Raporte, 14/1985

and nickel prices. Terms of trade both with market economies and Comecon countries have been showing recently declining tendency.

At present Cuba has to face an increasing burden of the financial service of the foreign debt. According to international sources[1/] Cuba's foreign debt in convertible currency amounted in 1982 to 2683 mn US$ and in 1983 /both governments and private banks/ to ca. 3500 mn US$.

Since 1982 Cuba has been renegotiating the terms of its hard currency debt covering government guaranteed credits and commercial bank loans. Terms of rescheduling were agreed in March 1983 and in July 1984.

b. The Overall Situation on International Markets and the Prospects of the World Economy.

In the last decade world economy has been subject to deep structural transformations as a result of numerous shock phenomena and long run processes /weak dynamism of growth, energy crisis, rocketing inflation, monetary-financial crisis, deep and long-lasting recessions, neo-protectionism, structural changes in irdustry, international trade and technology, terms of trade evolution , etc/.

Adjustment processes prevailing in different countries and regions change to a large extent their position in the world economy. They reflect diversified adjustment capacities of individual economies and regions. The effectiveness of these adjustment movements is a decisive factor in shaping the future position of individual national economies in the interdependent world.

1/ - Compare e.g. The Economist Intelligence Unit, Annual Supplement 1984.

The group of countries which are net borrowers of capital and have serious difficulties in servicing their foreign debt is constantly growing. The gap between consumption level of highly industrialized, richest countries and economic possibilities of developing countries are facing serious trouble in their balance of payments. All this may lead to serious liquidity problems for private banks and even some countries. In long- and medium-run the situation is complicated and difficult to be predicted. Capital is already a scarce factor on many markets and a rising tendency of international market interest rates, after some fluctuations in the short-run, may be a prevailing tendency for medium- and long-run.

Arguments for applying premium coefficients <u>decreasing</u> the level of SRD below the prevailing market interest rate /$P_i < 0$/:

a. The Level of Development and the Expected Rate of Growth of the National Economy.

Cuba has a socialist centrally planned economy characterized by a relatively high level of development in Latin America terms. National Income /GSP/ was estimated in 1981 at the level of 22.2 bn pesos[1/] /2.289 pesos per capita/. World Bank estimate for 1979 was GNP = 13.920 mn US$ /1420 US$ per head/. After the Revolution Cuba managed to increase considerably its rate of growth. Average annual rate of growth in the period 1979 - 1983 was estimated by Juceplan /Central Planning Commission/ at 5.5% /GSP/. According to the same source Cuban GSP grew in 1983 by 5.2% and preliminary figure for 1984 showed a rate of growth of about 4.5%.

1/ - By Comité Estatal de Estadísticas, Cuba, Official exchange rate is 1 US$ = 0.8996 pesos.

The main objectives of the new 5-year plan /1986 - 1990/ and a long-term strategy resulting from this concept are being discussed at present in Cuba.

The III Cuban Communist Party Congress to be held in a few months will formulate the main guidelines for the future development. It is to be expected that the development under the new system of planning and management /started 1978 - "cálculo económico"/ aiming at decentralisation and efficiency will be continued.

All in all, we may assume that Cuba, though a considerable progress has been done, is at the stage where the pressure of social needs is still high, and moderatelly extended investment programmes are necessary.

b. Rate of Inflation on Domestic Market

Cuba is definitely a low-inflation country. Price inflation in Cuba may be regarded as a very low one; however, it is difficult to submit the exact figures. No price indices are published by the Comité Estatál de Estadísticas, but the present 5-year plan /1981-1985/ has envisaged a reorganization of the structure of wages and prices. In essence, many prices were to be increased to take closer account of production costs and reduce the proportion of subsidies. The price reforms announced in December 1981 proposed price increases in the range of 11-30 per cent. However, on certain items /e.g. medicines/ prices were due to fall, and overall, the planned price increases were planned to be less than wage increases .
In March 1983 consumer price increases of about 10% overall were announced in order to reduce state subsidies by about 170 mn pesos.

It should be noted, however, that in case of a centrally planned economy, largely state owned, with rigid state price policy and rationing system on producer and consumer markets there may be an inflationary pressure not reflected through the price movements. The rationing system, supplier market situation and the existence of different kinds of unofficial markets are usually the indications of the non-price inflation.

c. Domestic and World Political Stability

Cuba is considered to be /even by Western sources/ a very stable country in political terms.
There are many regions of relative instability in the world, but this is not affecting Cuba directly. There are no indications to adjust /increase/ rate of discount for that factor.

d. Adjustments in Favour of Strategic Industries and Backward Regions

Self-sufficiency in production of newsprint is considered to be at present as a strategic development objective by many developing countries in the world. It is usually not the highest priority, but is valued as an important target and leads even to over-production in some regions /see corresponding remarks in Chapter II/.

The plant is proposed to be built next to the Brazil Sugar Mill in Camaguey province. From the available information one can assume that this investment would be very much in line with the already existing plans to industrialize this rather agriculture-oriented region.

TYPE OF FINANCING

a. Foreign Financing

The disbursed debt in convertible currency, which for the years 1979 - 1981 stayed at the equivalent of approximately 3.2 billion pesos fell in 1982 by about 400 million pesos. This was obtained mainly through the reduction of the debt with financial institutions /largely short-run deposits/. Simultaneously, the service of debt rose.

The relative figures point out the worsening of the financial situation in convertible currency - in 1982 the total servicing amounted to nearly 65% of the export value and was five times as high as disbursements.

The total debt is actual y much larger if we include the debts accumulated with the socialist countries. Here an agreement, renegotiated on highly concessional terms, is now in power.

TABLE II/1

Indicators of External Indebtedness of Cuba[a/] /mln of Cuban pesos/

	1979	1980	1981	1982
TOTAL DISBURSED DEBT	3267	3227	3170	2683[b/]
BILATERAL OFFICIAL DEBT	1280	1384	1294	1231[b/]
MULTILATERAL OFFICIAL DEBT	-	8	15	17[b/]
SUPPLIERS	33	27	33	28[b/]
FINANCIAL INSTITUTIONS	1953	1837	1826	1405[b/]
Medium-term bilateral loans and loans from consortiums	659	563	505	443[b/]
Short-term deposits	1269	1238	1282	907[b/]
Credits for current imports	25	36	39	55[b/]
OTHER CREDITS	2	1	1	1[b/]
DISBURSEMENTS[c/]	...	114	224	204
SERVICE[d/]	403	417	619	1036
INTEREST PAID	176	263	338	345
AMORTIZATION PAYMENTS ON LONG-TERM DEBTS	101	96	142	96
AMORTIZATION PAYMENTS ON SHORT-TERM DEBTS	126	58	139	595
RATIOS:				
TOTAL DISBURSED DEBT /GLOBAL SOCIAL PRODUCT/	19.3	18.3	14.0	9.9
TOTAL DEBT SERVICE /EXPORTS/ OF GOODS AND SERVICES[e/]	45.3	28.7	35.9	64.7
TOTAL DEBT SERVICE /DISBURSEMENTS/	...	365.8	276.3	507.8
TOTAL DEBT SERVICE /GLOBAL SOCIAL PRODUCT	2.4	2.4	2.8	4.5

a/ - Includes commitments in freely convertible currency falling due one year or more after the date of issue.
b/ - Preliminary figures /August/
c/ - Estimated on the basis of the difference between the total disbursed debt plus total amortization payments made during the year.
d/ - Relates to service payments included in the balance of payments.
e/ - Owing to lack of broken-down information, exports of goods and services include factor services, except for interest payments on the debt.

Source: Economic Survey of Latin Amercia and the Caribbean, 1982, Vol. I, UN, Santiago, Chile, 1984.

Government guaranteed credits represent an important element in Cuba's external financing - about 80% of its bilateral debt between 1979 and 1981 and 30% of its total debt between 1979 and 1983. The bulk of these official credits are trade credits for the purchase of goods on convertible currency markets with government guarantees. Most important credits of this kind come from France, Canada, Japan, the United Kingdom, Sweden, West Germany, Mexico and Argentina.

Financing of development projects by multilateral institutions has been of little significance, so far. Suppliers' credits have also been negligible.

Cuba has made, however, considerable use of eurocurrency markets - ca. 60% of total debt contracted in 1979 and 49% in 1982[1/]. These loans represent some 65 - 70% of Cuba's short-term debt.

TABLE II/2

Structure of the External Debt of Cuba in Convertible Currency /US$ mln/*/ , August 1982

1. BILATERAL:	
1.1. Bilateral loans on commercial terms	7.4%
1.2. Development assistance	1.0%
1.3. Guaranteed export credits	37.4%
2. FINANCIAL INSTITUTIONS:	
2.1. Bank loans and deposits /medium-, long-, and short-term/	50.3%
2.2. Import finance	2.0%
3. OTHER	1.9%

*/ - According to Lloyds Bank Group Economic Report, 1983, own calculations.

1/ - The Economist Intelligence Unit, Annual Supplement, 1984

d. Domestic Sources of Financing

Since 1978 in Cuba interest has been payable on credits, ranging from 4 to 12%, and since 1983 interest is paid on personal savings accounts. A rate of 2% is the most popular one; deposits over 5.000 pesos are collecting 0.5%. Paralelly, a direct financing from the state budget /donations, grants/ is being an important channel of financing.

CONCLUSIONS:

On the basis of available information we may try to make a rough estimation in order to calculate the average market interest rate as the reference level for the SRD. Let us assume a simplified distribution of borrowed funds over different sources which represents characteristic tendencies for Cuban economy in the recent years:

TABLE II/3

TYPE OF FINANCING	Average Interest Rate	Approximate %
1. Internal savings	6%	51%
2. Eurocurrency market, commercial loans	11%	10%
3. Multilateral institutions	3%	5%
4. Government Guaranteed Credits	6%	34%

The average market rate can be estimated as simple weighted average:

$$r_m = 6 \times 0.51 + 11 \times 0.1 + 3 \times 0.05 + 6 \times 0.34 = 6.35\%$$

Thinking of Cuba in terms of a net borrower country and emphasizing the importance of balancing its foreign payments we have to apply an increasing premium on market interest rate:

$SRD = r_m + /P_i \times r_m/$, where $P_i > 0$.

However, taking into consideration development necessities of Cuba and other considerations mentioned earlier in this paragraph we cannot go too high with the suggested rate of discount.

It seems to be reasonable to accept a positive premium ranging from +25% to +40%; thus, our discount rate will fall into the interval /7.95 ÷ 8.89/

$$7.95 < SRD < 8.89$$

For practical reasons SRD = 8% has been applied to further calculations.

2.2. Adjusted Rate of Foreign Exchange /ARFE/

The experts' team was facing considerable difficulties while trying to estimate the Adjusted Rate of Foreign Exchange for Cuba. Availability of adequate information should be mentioned here as a problem. Cuba does not publish information concerning subsidies, foreign trade and balance of payments in a form which could enable precise calculation of ARFE.

That is why, despite all the efforts made by the team, results presented here can be treated only as a reasonable approximation of these coefficients.

The Method - General Remarks

a. The approach has been chosen to take into consideration a set of particular calculations and observations aiming at estimating the real exchange rate between Cuban peso and foreign currency, different from the relatively stable in the long-run official exchange rate.

b. The analysis of Cuban foreign trade and especially of the situation in the balance of payments brought us to the conclusion that the distinction between ARFE for convertible currency and non-convertible currency is unavoidable. Accordingly two different ARFE´s have been applied to further calculations under Integrated Value Added Analysis.

c. In order to estimate the ARFE´s the following research instruments have been used:
   - analysis of the current account /1978-1984/ of the Cuban balance of payments, with special attention paid to its structure,
   - estimation of the Deficit/Receipts Ratio,
   - analysis of the capital account of the Cuban balance of payments,
   - comparative analysis of international statistic figures and information published by the Cuban Comité Estatal Estadísticas on national income of Cuba,
   - comparison of the official exchange rate with other exchange rates existing in Cuban economy /in the tourist industry, unofficial excnange rates/.

Results of the Study

The newest available data on Cuban foreign trade show the still dominating share of goods exchange with other CMEA countries in transferable roubles /ca. 75% - compare Table I/3/. This proportion has been a characteristic feature of Cuban foreign trade for a long time. In this part Cuban exports and imports are subject to multilateral medium-term coordination under CMEA and the structure is decided in a detailed way by yearly trade protocols between parties involved usually on bilateral basis.

While studying the results of Cuban foreign trade and its balance /compare Table I/3/ we have to be aware of the leading and dominating role played by intra-CMEA trade in this case.

On the other hand, Cuban imports from convertible currency countries are subject to central /administrative/ direct type regulation. They are reflecting first of all estimation of payment possibilities in convertible currency made by central economic authorities /Juceplan, Ministry of Foreign Trade, etc./.

In order to analyze Cuban balance of payments and further estimate the Adjusted Rate of Foreign Exchange /ARFE/ the formula for Deficit/Receipts Ratio was used:

$$ARFE = ORFE \left/ 1 + \frac{M - B}{B} \right.$$

where:

ORFE - official rate of foreign exchange,

M - current payments /including, when possible, invisible payments/ expressed in domestic currency,

B - visible /and invisible/ receipts expressed in domestic currency.

TABLE II/4

Import/Export Ratio

YEARS	$\frac{M}{B}$ 1/
1970	1.25
1971	1.61
1972	1.54
1973	1.27
1974	1.00
1975	1.05
1976	1.18
1977	1.19
1978	1.04
1979	1.06
1980	1.07
1981	1.21
1982	1.12
1983	1.13

1/ - M - imports, B - exports

Source: Own calculation on the basis of data from Table I/3

Average coefficient $\frac{M^1}{B^1}$ computed on the basis of the data provided by Table I/3 is showing a relative domination of imports in the period 1970 - 1983 by 19%.

$$\frac{M^1}{B^1} = 1.19$$

Further analysis of the current account of the Cuban balance of payments /compare Table II/5/ - convertible currency part - brought us to the similar results, though available data cover the period 1978 - 1984. Convertible currency imports and other payments under current account show a relative excess over receipts of 8% on the average.

$$\frac{M^2}{B^2} = 1.08$$

TABLE II/5

Current Account of the Balance of Payments of Cuba /1978 - 1984/, Convertible Currency

/Millions of Cuban Pesos/

	1978	1979	1980	1981	1982	1983	1984
PAYMENTS /B/	757.8	913.4	1516.1	1788.6	1668.6	1477.8	1603.4*
RECEIPTS /M/	1272.8	1045.2	1532.6	1700.1	1352.0	1449.8	1572.8
BALANCE	-515.0	-131.8	-16.5	+88.5	+316.6	+28.0	+30.6
$\frac{M^2}{B^2}$	1.68	1.14	1.01	0.95	0.81	0.98	0.98

*/ - Preliminary

Source: Own computation on the basis of data by the National Bank of Cuba

However, these results need a considerable reservation before further application for the purposes of ARFE.

Available data /information needed for any supplementary coefficients like e.g. subsidy/tax ratio could not be collected/

give us little information about relative importance and scarcity of foreign exchange, especially convertible currency.

The problem of Cuban indebtedness was already discussed in the previous paragraph. Cuban imports from market economies declined rapidly in 1982 by ca. 34.5%, the year when Cuba faced a considerable deficit of 531 mln pesos in the balance of payments in convertible money. Though Cuba imports from market economies are growing since then, but at a declining rate of growth /1983 = = 19.3%; 1984 = 10.2%, planned for 1985 is 8%/. They tend to be constrained by the country shortage of convertible currency.

Recent development in Cuban imports from market economies are in line with the agreements reached while rescheduling Cuban external debt, too. These terms[1/] included holding hard currency imports down /to 700 mn US$ in 1984/ with the debt servicing to hard currency income ratio at 25%.

Having analyzed the situation in Cuban foreign trade and balance of payments, as well as basic principles of functioning of the Cuban system of planning and management in the foreign trade sphere, it was decided /as mentioned in the introduction/ to split up all the calculations done under the economic analysis of the project into 3 different parts:

A - LOCAL PAYMENTS/RECEIPTS,
B - CONVERTIBLE CURRENCY PAYMENTS/RECEIPTS,
C - NON-CONVERTIBLE CURRENCY PAYMENTS/RECEIPTS.

Furthermore, it has been decided to apply the conversion factor /$\frac{M}{B}$ = ca. 0.1/ resulting from the analysis of the Cuban current account of the balance of payments only to part C /that is payments/receipts in non-convertible currency/ of the

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1/ - According to The Economist Intelligence Unit, Annual Supplement, 1984.

economic analysis. Here we arrived at the following results:

$$ARFE^{NC} = ORFE^{NC} \quad /1 + 0.1/$$

$$ARFE^{NC} = 1.11^{Peso/Rb} \times 1.1$$

$$ARFE^{NC} = 1.221^{Peso/Rb}.$$

where:

$ARFE^{NC}$ -- adjusted rate of foreign exchange against non-convertible currency /transferable rouble/

$ORFE^{NC}$ -- official rate of exchange between peso and transferable roubles.

The limiting factor, however, for the Cuban national development is the shortage of convertible currency, in the first instance.

Here an effort has been done to develop measures showing more sharply the realitive importance and scarcity of this type of financial means. Computation of the conversion factor adjusting relatively stable official exchange rate has been done upon own estimations of different price and value relations. Unfortunately, neither results of Cuban research in this field, nor any official calculation made by Cuban authorities or public institutions were available for the experts. That is why the results obtained should be taken with a sort of reservation. The experts are aware of possible shortcomings of their analysis. Much more sophisticated and extensive study would be probably needed for this purpose. It was not possible because of obvious technical reasons and despite all the efforts done, presented results may serve

only as a rough approximation of the real relations between domestic and convertible currencies.

The following information was taken into consideration in order to calculate a conversion factor adjusting the official exchange rate for the purpose of this study:

a. comparison of data concerning Cuban foreign trade turn-over in hard currency made by Cuban trade partners[1/] in US$ with official Cuban foreign trade statistics in domestic currency[2/] - are showing in the period 1978 - 1980 an average ratio between peso and US$ /in Cuban exports/ of 1.29 /that is 1 US$ = 1.29 peso/ with an increasing tendency to 1.46.

b. comparison of national income estimates made by international organizations and those supplied by the Cuban State Committee of statistics show a ratio of about 1.40. 1979 World Bank estimate of GNP at current prices in Cuba was US$ 13.920 mln /1420 US$ per head/; Cuban GSP in 1979 according to national statistics was estimated at the level of 16,897.6 mn pesos /1,724 pesos per head /. Taking a positive adjustment to the latter figure for non-material services of ca. 15%, we arrive at the ratio 1.40[3/].

c. comparison of official exchange rate with other exchange rates functioning on the Cuban market. Non-official market exchange rate shows a very high demand pressure on foreign exchange for consumption purposes. It is ranging from 4 to 5 pesos for US$ and includes premium for high risk connected with transactions which are not allowed by Cuban law. This rate is, as usually, subject to seasonal fluctuations, reaching the level of 6 pesos and more for 1 US$ when demand is growing. These exchange rates should be taken into consideration with great reservation.

1/ - Compare ABECOR country report.
2/ - Source: The National Bank of Cuba.
3/ - Anuario Estadístico de Cuba 1980, Comité Estatal de Estadísticas, Habana.

They are showing, however, approximately marginal propensities to purchase a unit of foreign convertible currency. Much higher than the official exchange rate are the rates used for pricing consumer goods in the so-called "Internal Exports" - that is shops /"Tiendas Intur"/ selling goods /mainly for tourists/ against hard currency - in many cases 1 US$ is an equivalent of goods priced at the home market at more than 3 pesos.

The same holds true in case of consumer goods imported from market economies, ranging from transistor radios from Japan to olive oil from Spain. Comparison of their domestic prices with those of the international markets are showing outcome exchange rates similar to those at the unofficial market or in some cases /luxury goods/, even higher.

Taking all these aspects of the problem into consideration it was decided finally to use at least the convertion factor of 2 for the purpose of further calculation connected with the Integrated Value Added Analysis. This gives us:

$$ARFE^C = ORFE^C \times 2$$

where:

$ORFE^C$ = 0.8996 P/US$ as for 1st November 1984.

$ARFE^C$ = 0.8996 x 2, 1.7992 P/US$

This means practically a considerable devaluation of domestic currency for the purpose of economic evaluation. However, the importance of Cuban foreign trade and a difficult situation in the Cuban balance of payments seem to justify largely increased importance and weight assigned to potential convertible currency earnings on one hand and expenditures for imports, on the other.

The evaluation done from the point of view of national economy should expose /especially in the present situation of the Cuban economy/ the real dimension of foreign trade success /increased exports/ and real cost of imported inputs.

It should expose the problem of responsibility of particular economic unit of being capable not only to spend scarce foreign exchange on attractive imports, but also of being capable of repaying these outflows to the national economy, bringing some hard currency profits, if possible.

3. Integrated Value Added Analysis, Possible Impact of the Project on the Balance of Payments.

Consequently to the classification introduced in the financial evaluation /Chapter III/ - three main versions of the project have been identified and examined under the economic evaluation.

Moreover, an effort has been done to synchronize whenever possible this part of the study with the financial evaluation: to use similar assumptions, information background, classifications, etc.

According to this, costs and benefits resulting from the project for the national economy have been confronted for three different cases. The comments presented here concern the following versions of the project:

VERSION 1 -- assuming plant capacity up to 54.000 t of newsprint,

VERSION 2 -- with plant capacity up to 110.000 t of newsprint,

VERSION 3 -- assuming revised output of the project: a product mix consisting of newsprint and LWC paper.

Marketing evaluation presented earlier in this study played a crucial role in estimating direct benefits from the exportable output of the project. Information concerning cost side of the project, as well as import and internal prices for newsprint in Cuba was provided by the ICIDCA experts in a written form /Appendix 1/ and in numerous oral comments and answers to the questions asked by the UNIDO team. Main international and Cuban sources relating the newsprint project to the economic situation in Cuba or economic developments outside this country have been given in the footnotes of this and previous paragraphs.

Obviously, results obtained here are dependant on both: objective facts and author's conclusions drawn in other paragraphs. Within this, conclusions concerning Adjusted Rate of Foreign Exchange from paragraph 2.2. seems to be of peculiar importance. As usually, there is a certain chain of partial assumptions and conclusions bringing us to the final opinion. If we change assumptions or draw different conclusions we may arrive at a different final opinion. However, any such change has to be fully justified at early stages of the analysis.

VERSION 1 - CAPACITY 54.000 T OF NEWSPRINT

1. Presentation of structures /besides levels/ of major financial inflows and outflows generated by the project and concerning different types of currencies - was considered to be one of the most important objectives of this part of the study. Consequently these inflows and outflows are presented here under three different groups:
   a. inflows and outflows from/to convertible currency area;
   b. inflows and outflows from/to non-convertible currency area;
   c. inflows and outflows from/to local market.

2. In order to estimate adjusted prices for the main input and output items two different Adjusted Rates of Foreign Exchange /ARFE/ have been used in line with the main idea and conclusions from paragraph 2.2. in this Chapter:

   $ARFE^{C}$ /concerning convertible currency/ = 1,7992 Cuban peso/US$

   $ARFE^{NC}$ /concerning non-convertible currency/ = 1.221 Cuban peso/Rbl

3. Distribution of output. Consumption of newsprint planned by the Central Planning Commission in Cuba was used as the main reference level for the construction of balances presenting distribution of the project's output - Table III/1. Planned levels of

Distribution of Newsprint. Import vs. bagasse Newsprint Plant /54.000 t/ Alternatives

TABLE III/1

Y E A R	PLANNED CONSUMPTION /T/	IMPORT BASED ALTERNATIVE /No Bagasse Newsprint Plant/		OWN PRODUCTION WITH IMPORT - Bagasse Newsprint Plant of 54.000 t				
		Maximum Imports - NC /T/	Residual Imports - C /T/	Capacity of the Plant /T/	Production for Domestic Market /T/	Exports - C - /T/	IMPORTS /T/ NC	C
1985	43.200	41.000	2.200	-	-	-	41.000	2.200
1986	45.900	42.000	3.900	-	-	-	42.000	3.900
1987	46.400	43.000	3.400	-	-	-	43.000	3.400
1988	52.200	45.000	7.200	-	-	-	45.000	7.200
1989	55.800	47.000	8.800	-	-	-	47.000	8.800
1990	59.800	49.000	10.800	10.000	10.000	-	49.000	800
1991	62.500	51.000	11.500	30.000	22.500	7.500	40.000	-
1992	65.500	53.000	12.500	39.000	29.250	9.750	36.250	-
1993	68.500	55.000	13.500	48.000	36.000	12.000	32.500	-
1994	72.000	57.000	15.000	54.000	39.000	15.000	33.000	-
1995	75.000	59.000	16.000	54.000	39.000	15.000	36.000	-
1996	78.500	61.000	17.500	54.000	39.000	15.000	39.500	-
1997	82.000	63.000	19.000	54.000	39.000	15.000	43.000	-
1998	85.500	65.000	20.500	54.000	39.000	15.000	46.500	-
1999	90.000	67.000	23.000	54.000	39.000	15.000	51.000	-
2000	95.000	69.000	26.000	54.000	39.000	15.000	56.000	-
2001	95.000	69.000	26.000	54.000	39.000	15.000	56.000	-
2002	95.000	69.000	26.000	54.000	39.000	15.000	56.000	-
2003	95.000	69.000	26.000	54.000	39.000	15.000	56.000	-
2004	95.000	69.000	26.000	54.000	39.000	15.000	56.000	-
2005	95.000	69.000	26.000	54.000	39.000	15.000	56.000	-
2006	95.000	69.000	26.000	54.000	39.000	15.000	56.000	-

consumption[1/] are indicated in the second column of this Table.

Important set of further pre-assumptions concerning struture of future distribution of the project's output was based upon observation of the present situation in the newsprint imports to Cuba and on the opinions expressed by the ICIDCA experts.

Traditionally, in the period after Revolution, Cuba was almost exclusively supplied with newsprint by the Soviet Union. In 1984 for the first time Cuba imported in addition to 40.000 t of newsprint from the usual source also 1.000 t of newsprint from Sweden. According to the information by ICIDCA, despite Cuban intentions to buy more newsprint from the Soviet Union - the 1984 level of 40.000 t seems to be a kind of a relatively rigid limit for the newsprint purchases on this market for the time being.

Thus limited export possibilities of the Soviet Union and other non-convertible currency /NC/ countries in the field of newsprint were assumed for the future. In this situation supplementary purchases of newsprint from hard currency countries might occur unavoidable in view of growing demand pressure on the Cuban market. However, these supplementary purchases in convertible currency have been treated in the balances as ultimate residual amounts - a difference between planned consumption on one side and future export possibilities of the NC countries /plus eventually own production for the home market/ on the other.

Information on future imports of newsprint from NC countries was not available. Generally these figures are difficult to predict. Within CMEA countries they are always subject to complex bilateral /in some cases multilateral/ negotiations.

1/ - Information supplied by ICIDCA

Yet a slow increase /up to 1987 by 1.000 t a year, later by 2.000 t from year to year/ of newsprint imports from NC countries was considered a more realistic variant rather than a long term freeze of these imports at the 1984 level.

Detailed figures concerning planned consumption of newsprint were available only up to the year 1990, later - only preliminary figures for 1995 and 2000. For calculation purposes an increase roughly by ca. 5% was assumed in the period 1991 - 95 and ca. 4.5% in the period 1996 - 2000.

There were no estimates available concerning consumption in the periods later than the year 2000. In order to avoid unrealistic speculations on this subject and in view of high figures planned for the year 2000[1/] - it was decided to maintain this level and structures for the next 6-year period.

Comparison of the consumption of newsprint trends in Cuba with possible alternatives of output distribution in the case of 54.000 t plant has brought some interpretation problems stemming from inconsistency of the main idea of this version of the project with officially projected vision of the newsprint consumption.

The size of the plant assumed in this version /being the only planned newsprint plant in Cuba - according to the available information/ does not enable meeting own consumption requirements. Planned consumption levels are always higher than production capacities of the plant. The difference is: 1991 = 32.500t; 1995 = 21.000 t; 2000 = 41.000 t. In this situation imports of newsprint are unavoidable.

The differences mentioned above may even be higher, if we take into consideration one of the key pre-assumptions introduced by the Cuban experts concerning strong export priority for a considerable part /10.000-15.000 t a year/[2/] of the project's output.

1/ - A ca. 230% increase compared with the present level; look for additional comments on this subject in marketing part of the study /Chapter II/

2/ - Mentioned also on page 1 in Appendix 1

In view of that a preliminary assumption made by the UNIDO team of directing 50% of newsprint exports to NC countries had to be abandoned. Simultaneous imports of newsprint from the Soviet Union and exports from Cuba to any other NC country does not seem to be likely.

Finally, it has been assumed to allow in the analysis for exports to convertible currency countries only[1/], being justified by bringing hard currency gains, which could counterbalance hard currency expenditures connected with imported machinery and current material inputs.
At the assumed rates of growth of newsprint consumption and imports of newsprint from the Soviet Union the 54.000 t capacity version enables cancelling hard currency imports of newsprint after the year 1990. Imports from NC countries are increasing in the period 1985 - 1990 up to the level of 49.000 t, then, after a period of lower imports, they start to grow once more in 1994 and reach the level of 57.000 t in 2000.

All in all, Version 1 does not mean a radical change from the present situation and what is called "Import Based Alternative" in the analysis. In a long term perspective amounts of imported newsprint can be reduced but remain the main basis for home consumption of this commodity /from 2000 on imports amount to ca. 170% of home market supplies from own production/.

Successful implementation of this version, like in "Import Based Alternative" largely depends on import possibilities from non-convertible currency countries, first of all from the Soviet Union. More severe constrains on these imports than assumed here may lead to the necessity of reducing convertible currency exports or even may require hard currency imports. This can only worsen the convertible currency balance of the project.

4. Value of the output. As mentioned earlier the value of the exports to convertible currency markets was estimated on the

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1/ - With all the reservations expressed in the marketing part of this sutdy /Chapter II/

basis of the prices justified in the marketing part of this study that is 350 US$/t of newsprint.

Domestically marketed newsprint has been treated as import substitution, substituting in the first instance residual ammounts of hard currency imports calculated in the output distribution balances. Excess domestic supplies over this level have been treated as a substitution for non-convertible currency imports in respective quantities. /e.g. 39.000 t of domestically marketed newsprint in 1994 are substituting 15.000 t alternatively imported newsprint against convertible currency and 24.000 t non-convertible currency imports/.

Table III/2 contains full specification of newsprint prices used in this part of the study.

5. Value of inputs. In line with the main idea introduced in the economic evaluation, value of material inputs /both investments, as well as current material inputs/ are divided into the following three groups:

   - imported from convertible currency markets,
   - imported from non-convertible currency markets,
   - domestically procured.

   Only the value of infrastructural services is given as an aggregate. This is justified by the fact, that expenditures in local currency are clearly dominating in this item.

TABLE III/2

Newsprint Prices Used in the

Integrated Value Added Analysis

DOMESTIC MARKET PRICE	EXPORT PRICE /FOB/		IMPORT SUBSTITUTION		ARFE	Prices Used In the IVAA
	TO "C"	TO "NC"	FROM "C"	FROM "NC"		
400 P/t					1.0	400P/t
	350$/t				1.7992	630P/t
		300 Rbl/t			1.221	366P/t
			326P/t= /FOB/ 1/			
			= 370$/t= /FOB/			
			= 420$/t /CIF/		1.7992	756P/t
				379P/t /CIF/ 2/=		
				= 341Rbl/t	1.221	416.5P/t

1/ - Price actually paid in 1984 /imports from Sweden/;

2/ - Price actually paid in 1984 /imports from the Soviet Union/;

P = CUBAN PESO

Main raw material , the sugar cane bagasse, in quantities used for this production process, can be qualified - according to the information by ICIDCA - as pure surplus bagasse of practically no use for the economy at present and in the nearest future. For this reason its cost is estimated here at minimum, preferential prices supplied by ICIDCA and not treated as e.g. an imported fuel substitute for power generation /some quantities of bagasse are used for this purpose/.

Total initial investment cost of adjusted prices according to $ARFE^{NC}$ and $ARFE^{C}$ and divided into three above mentioned categories of goods are presented in Table III/3. The same computation procedure has been applied to working capital requirements /Table III/4/ and current material inputs /Table III/5/.

All required values in local currency had to be computed from dollar values given in Appendix 1. The latter had to be converted into pesos using the old exchange rate 1 US$ = 0.88 peso, which had been used while preparing this information material.

However, in the second phase of collecting information, new prices /from latest quotations/ for fixed investment and special preferential prices for utilities were given, all calculated at the rate used recently in Cuba for these types of calculations[1/] - 1 US$ = 1 Cuban peso. Conversion of these values into domestic currency has been adjusted accordingly.

A drawback which the authors are fully aware of is that at this stage of the study indirect cost as well as indirect benefits cannot be incorporated into the analysis. Lack of adequate information was the main reason for that.

1/ - Information by ICIDCA experts.

TABLE III/C

Total Initial Investment Cost[1/]

/At Adjusted Prices According to ARFE[C] and ARFE[NC]/

/in '000 peso/

	LOCAL	FOREIGN		TOTAL
		C	NC	
I. FIXED INVESTMENT				
1.1. Site Preparation and Development	420	-	98	518
1.2. Buildings, Structures and Civil Works	7.200	-	977	8.177
1.3. Engineering and Design	4.500	-	488	4.988
1.4. Production Machinery and Equip.	-	58.114	-	58.114
1.5. Auxiliary and Service Equipment	480	-	3.260	3.740
1.6. Insurance and Freight	3.000	-	-	3.000
1.7. Plant Installation	1.200	7.782	1.984	10.966
II. PRE-PRODUCTION CAPITAL EXPENSES	900	720	244	1.864
III. WORKING CAPITAL /at full capacity/	1.084	5.262	1.209	7.417
IV. TOTAL INVESTMENT COST	18.784	71.878	8.260	98.922

1/ - After cheaper sources of purchase have been taken into consideration

TABLE III/4 VERSION 1

Capacity 54.000 T

Working Capital Requirements /in '000 pesos/

ITEM	Minimum Covergae Period in Days	Coef. of Turnover	Amount Required L	C	NC
1. Accounts Receivable[1/]	30	12	1091	654	-
2. Inventories of Raw Mtls.					
2.1. Bagasse[2/]	180	2	459	-	-
2.2. Caustic Soda	90	4	-	-	325
2.3. Hydrogen Peroxide	90	4	-	-	222
2.4. Clay /Kaolin/	90	4	-	-	242
2.5. Kraft Woodpulp	90	4	-	763	-
2.6. Mechanical Woodpulp	90	4	-	959	-
2.7. Other Imported - Convertible	90	4	-	511	-
2.8. Other Imported - Non-Convertible	90	4	-	-	44
2.9. Other Local Matls.	90	4	43	-	-
3. Work in Progress[3/]	1	360	12	41	15
4. Finished Products[4/]	10	36	352	211	-
5. Spare Parts	360	1	-	2123	361
6. Cash in Hand	15	24	194	-	-
7. Accounts Payable	30	12	-/1067/	-	-
TOTAL FINANCE REQUIRED :			1084	5262	1209

1/ - See operating cost; foreign = 25% of total amount before shadow pricing
2/ - Seasonal supply /November-May only/
3/ - At factory cost; foreign = 75% of total amount before shadow pricing
4/ - At factory cost; foreign = 25% of total amount before shadow pricing

TABLE III/5

Current Material Inputs /at Adjusted Prices, according to ARFC^{C}, ARFE^{NC}/

/in '000 pesos/

MATERIALS	ANNUAL REQUIREMENTS - ADJUSTED VALUE AT FULL CAPACITY 54.000 T
A. Convertible Currency Imports	
1. Colorant	397.422
2. Retention Aid Agent	389.692
3. Semibleached Kraft Woodpulp	3,466.294
4. Mechanical Woodpulp	4,356.124
5. Synthetic Wire	323.856
6. Felts	138.008
T O T A L	9,071.396
B. Non-Convertible Currency Imports	
1. Caustic Soda	1,168.291
2. Hydrogen Peroxide	704.430
3. Magnesium Sulphate	3.600
4. Kaolin /Clay/	869.436
5. Sulphur	137.427
6. Stainless Wire	14.505

Both ICIDCA experts as well as UNIDO team, identified only a a limited scope of indirect positive influence of this project on other branches. Precise estimation was not possible on the basis of available information at this stage.

Indirect cost for the national economy /carried according to ICIDCA experts either by other ministries or directly the state budget/ were relatively easier to identify among others: some infrastructural investments in the region, transportation cost of the labour force, cost of education, training and medical care. Being aware of such additional burden to the national economy, we were reluctant to include them in this study on the basis of very limited information and vague idea of law share in the total investment cost.

It was only agreed that the eventual indirect cost side of the project is likely to exceed potential indirect benefit side. Any further investigation in this matter would probably influence the undertaken efficiency calculus in the negative way.

The Integrated Value Added Analysis has been carried out /Table III/6/ for the period of 20 years /1987-2006/. The results obtained are clearly negative.

Even with a very favourable assumption that the only repatriated payments are salaries of the foreign personnel of the plant - cummulated Net National Value Added /NNVA/ is in the red figures until the year 2004. In cummulative terms the project starts to generate positive stream of NNVA only in two last periods being examined after 18 years of functioning. Net Present Value at the level of SRD /8%/ is negative: -28.722,389 Cuban pesos.

From the point of view of the national economy this version of the project is not acceptable and should be rejected. Its im-

pact on the national economy has to be described as clearly negative.

Implementation of this variant could unfavourably influence Cuban balance of payments because of serious disproportions between convertible currency cost of equipment and current material inputs on one hand and possible hard currency earnings from the project on the other.

Highly promising,at the beginning, potential advantages of the project like excess, cheap bagasse as basic raw material and relatively low cost of labour force cannot, according to this analysis, offset technically justified but high hard currency cost of the investments and current material inputs.
Sales revenue from exports is limited both by low capacity of the plant and unfavourable conditions on international news - print markets.

After these immanent limitations of the project have been identified and a general negative opinion on this version formulated - two further alternative concepts of bagasse newsprint production have been examined: Version 2 /higher capacity/ and Version 3 /different product-mix/.

TABLE III/6

$ARFE^{C}$ = 1,7992 P/US$

$ARFE^{NC}$ = 1,221 P/Rbl

VERSION "1"

Capacity 54.000 t

INTEGRATED VALUE

	1987	1988	1989	1990	1991	1992	1993	1994
I. VALUE OF OUTPUT								
1. Direct Sales Revenue	-	-	-	-	-	-	-	-
1.1. Exports[1/] - Convertible	-	-	-	-	4.725	6.143	7.560	9.450
1.2. Exports - Non-Convertible	-	-	-	-	-	-	-	-
1.3. Domestically Marketed	-	-	-	7.560	13.276	16.426	19.577	21.336
Σ /I/	-	-	-	7.560	18.001	22.569	27.137	30.786
II. VALUE OF MATERIAL INPUTS								
1. Direct Material Inputs								
1.1. Investments								
1.1.1. Imported - Convertible	100	33.198	33.675	1.709	1.373	778	735	310
1.1.2. Imported - Non-Convertible	731	3.111	3.317	107	448	234	220	93
1.1.3. Domestically Procured	4.370	6.490	6.911	295	354	156	146	62
1.2. Current Material Inputs								
1.2.1. Imported - Convertible	-	-	-	2.016[1/]	5.039	6.551	8.063	9.071
1.2.2. Imported - Non-Convertible	-	-	-	644[1/]	1.610	2.093	2.576	2.898
1.2.3. Domestically Procured	-	-	-	281[1/]	703	914	1.124	1.265
1.2.4. Infrastructural Services	-	-	-	2 2.149	4.555	5.285	6.015	6.502
Σ /II/	5.201	42.799	43.903	7.201	14.082	16.011	18.879	20.201
III. NET DOMESTIC VALUE ADDED	/5.201/	/42.799/	/43.903/	359	3.919	6.558	8.258	10.585
IV. REPATRIATED PAYMENTS								
1. Repatriated Salaries	-	-	-	256[2/]	342	342	342	342
V. NET NATIONAL VALUE ADDED	/5.201/	/42.799/	/43.903/	103	3.577	6.216	7.916	10.243
Cummulated NNVA	-	/48.000/	/91.903/	/91.800/	/88.223/	/82.007/	/74.091/	/63.848/
VI. NPV AT 8%								

1/ - Assumed requirement for 1990 is 20/90 of full capacity /54.000 t/ requirement; later /1991-93/ - proportional to the output

2/ - 75% of salaries in convertible currency in 1990, later 100%

ADDED ANALYSIS /IN '000 CUBAN PESOS/

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
-	-	-	-	-	-	-	-	-	-	-	-
9.450	9.450	9.450	9.450	9.450	9.450	9.450	9.450	9.450	9.450	9.450	9.450
-	-	-	-	-	-	-	-	-	-	-	-
21.676	22.185	22.694	23.203	24.052	25.071	25.071	25.071	25.071	25.071	25.071	25.071
31.126	31.635	32.144	32.653	33.502	34.521	34.521	34.521	34.521	34.521	34.521	34.521
-	-	-	-	65.896	-	-	-	-	-	-	/25.031/
-	-	-	-	5.244	-	-	-	-	-	-	/3.282/
-	-	-	-	4.680	-	-	-	-	-	-	/6.366/
9.071	9.071	9.071	9.071	9.071	9.071	9.071	9.071	9.071	9.071	9.071	9.071
2.898	2.898	2.898	2.898	2.898	2.898	2.898	2.898	2.898	2.898	2.898	2.898
1.265	1.265	1.265	1.265	1.265	1.265	1.265	1.265	1.265	1.265	1.265	1.265
6.502	6.502	6.502	6.502	6.502	6.502	6.502	6.502	6.502	6.502	6.502	6.502
19.736	19.736	19.736	19.736	19.736	19.736	19.736	19.736	19.736	19.736	19.736	/14.934/
11.390	11.899	12.408	12.917	/62.054/	14.785	14.785	14.785	14.785	14.785	14.785	49.464
342	342	342	342	342	342	342	342	342	342	342	342
11.048	11.557	12.066	12.575	/62.396/	14.443	14.443	14.443	14.443	14.443	14.443	48.984
/52.800/	/41.243/	/29.177/	/16.602/	/78.998/	/64.555/	/50.112/	/35.669/	/21.226/	/6.783/	/7.660/	/56.644/
											/28.733/

VERSION 2 - CAPACITY 110.000 T OF NEWSPRINT.

The method applied to analyze this version of the project was generally kept unchanged. The same SRD, Adjusted Rates of Foreign Exchange and division of inflows into three categories were maintained.

First differences with the previous version emerged while comparing assumed distribution of output at new, higher levels, with the figures describing planned consumption of newsprint in Cuba /Table III/7/.

It has become obvious, that now, a qualitative change, on the contrary to Version 1, is possible. Under higher capacity of the plant, imports from "NC" countries are necessary only until 1991 and from "C" countries until 1989. Increased capacity of the plant enables meeting the domestic newsprint consumption requirements and to leave certain ammounts of the commodity for export purposes. So, this version may be considered as a real non-import alternative to the present situation.

In the period 1993 - 1996 amounts produced exceed planned consumption levels allowing for either higher domestic consumption or larger exports. The latter is, of course, subject to existing demand on foreign markets[1/]. Starting with 1997 growing planned newsprint consumption levels at home market are adversely affecting export possibilities to "NC" countries. After the year 2000 only exports to "C" countries are possible; they remain however at the stable level of 15.000 t.

Similarly to the previous version an Integrated Value Added Analysis has been carried out for the period of 20 years /1987 - 2006/. The results are presented in Table III/8.

1/ - Compare our comments in the marketing part of this study

TABLE III/7

Distribution of Newsprint.

Import vs. Bagasse Newsprint Plant /110.000 t/ Alternatives

IMPORT BASED ALTERNATIVE - No Bagasse Newsprint Plant				BAGASSE NEWSPRINT PLANT OF 110.000 T					
YEAR	PLANNED CONSUMPTION	MAXIMUM IMPORTS "NC"	RESIDUAL IMPORTS "C"	CAPACITY	FOR DOMESTIC MARKET	EXPORTS "NC"	EXPORTS "C"	IMPORTS "NC"	IMPORTS "C"
1985	43.200	41.000	2.200	-	-	-	-	41.000	2.200
1986	45.900	42.000	3.900	-	-	-	-	42.000	3.900
1987	46.400	43.000	3.400	-	-	-	-	43.000	3.400
1988	52.200	45.000	7.200	-	-	-	-	45.000	7.200
1989	55.800	47.000	8.800	-	-	-	-	47.000	8.800
1990	59.800	49.000	10.800	20.000	20.000	-	-	39.800	-
1991	62.500	51.000	11.500	61.000	53.500	-	7.500	9.000	-
1992	65.500	53.000	12.500	79.000	65.500	3.750	9.750	-	-
1993	68.500	55.000	13.500	98.000	74.000	12.000	12.000	-	-
1994	72.000	57.000	15.000	110.000	80.000	15.000	15.000	-	-
1995	75.000	59.000	16.000	110.000	80.000	15.000	15.000	-	-
1996	78.500	61.000	17.500	110.000	80.000	15.000	15.000	-	-
1997	82.000	63.000	19.000	110.000	82.000	13.000	15.000	-	-
1998	85.500	65.000	20.500	110.000	85.500	9.500	15.000	-	-
1999	90.000	67.000	23.000	110.000	90.000	5.000	15.000	-	-
2000	95.000	69.000	26.000	110.000	95.000	-	15.000	-	-
2001	95.000	69.000	26.000	110.000	95.000	-	15.000	-	-
2002	95.000	69.000	26.000	110.000	95.000	-	15.000	-	-
2003	95.000	69.000	26.000	110.000	95.000	-	15.000	-	-
2004	95.000	69.000	26.000	110.000	95.000	-	15.000	-	-
2005	95.000	69.000	26.000	110.000	95.000	-	15.000	-	-
2006	95.000	69.000	26.000	110.000	95.000	-	15.000	-	-

VERSION "2"

Capacity = 110.000 t

Integrated Value Added Analysis

TABLE III/8

/In '000 Cuban pesos/

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
I.VALUE OF OUTPUT																				
1. Sales Revenue																				
1.1.Exports "C"	-	-	-	-	4.725	6.143	7.560	9.450	9.450	9.450	9.450	9.450	9.450	9.450	9.450	9.450	9.450	9.450	9.450	9.450
1.2.Exports "NC"	-	-	-	-	-	1.373	4.392	5.490	5.490	5.490	4.758	3.477	1.830	-	-	-	-	-	-	-
1.3.Domest	-	-	-	11.997	26.187	31.525	35.314	38.281	38.670	39.237	40.604	42.571	45.294	48.395	48.395	48.395	48.395	48.395	48.395	48.395
/Σ I/	-	-	-	11.997	30.912	39.041	47.266	53.221	53.610	54.177	54.812	55.498	56.574	57.845	57.845	57.845	57.845	57.845	57.845	57.845
II.VALUE OF MATL. INPUT																				
1. Invest																				
1.1. I "C"	448	39.095	50.121	2.123	2.575	1.668	1.086	643	-	-	-	-	87.742	-	-	-	-	-	-	/34.996/
1.2. I "NC"	2.187	2.137	4.726	601	728	473	308	182	-	-	-	-	6.580	-	-	-	-	-	-	/5.036/
1.3. I D	7.234	8.534	8.687	467	565	369	243	141	-	-	-	-	6.350	-	-	-	-	-	-	/9.044/
2. C.M.I.																				
2.1. I/C	-	-	-	4.107	10.264	13.344	16.424	18.478	18.478	18.478	18.478	18.478	18.478	18.478	18.478	18.478	18.478	18.478	18.478	18.478
2.2. I/NC	-	-	-	1.312	3.280	4.263	5.247	5.903	5.903	5.903	5.903	5.903	5.903	5.903	5.903	5.903	5.903	5.903	5.903	5.903
2.3. I/D	-	-	-	572	1.431	1.861	2.290	2.577	2.577	2.577	2.577	2.577	2.577	2.577	2.577	2.577	2.577	2.577	2.577	2.577
2.4. INF	-	-	-	4.473	9.673	11.330	13.007	14.111	14.111	14.111	14.111	14.111	14.111	14.111	14.111	14.111	14.111	14.111	14.111	14.111
/Σ II/	9.869	49.766	63.534	13.655	28.516	33.308	38.605	42.035	41.069	41.069	41.069	41.069	141.750	41.069	41.069	41.069	41.069	41.069	41.069	/8.007/
III.NUVA I - II	/9.869/	/49.766/	/63.534/	/1.658/	2.396	5.733	8.661	11.186	12.541	13.108	13.743	14.429	/85.176/	16.776	16.776	16.776	16.776	16.776	16.776	65.852
IV.REP. PAYM.																				
1.Salaries	-	-	-	256	342	342	342	342	342	342	342	342	342	342	342	342	342	342	342	342
V. NUVA III-IV	/9.869/	/49.766/ .926	/63.534/ .857	/1.914/ .794	2.054 .735	5.391 .681	8.319 .630	10.844 .589	12.199 .540	12.766 .500	13.401 .463	14.087 .429	/85.518/	16.434 .368	16.434 .340	16.434 .315	16.434 .292	16.434 .270	16.434 .250	65.510 .232
NPV AT 8%																				-58.554,177

Material Inputs.

Tables III/9 and III/10 are presenting new levels and structure of total investment cost. Assumptions on the increase of these costs were similar to the assumptions used in the financial part.

It has been assumed /still in line with financial evaluation/ that most of the expenses on current material inputs have to grow proportionally to the increased capacity.

One third of repair and maintenance costs was calculated as convertible currency expenditures. Sales and distribution cost was split up into cost in local currency /4 peso/t/ and convertible currency cost 3 US$/. Transportation cost was increased to 10 peso/t due to additional cost of bringing extra bagasse from more distant sugar mills /capacities of Brazil Sugar Mill in this respect were considered by ICIDCA as unsufficient/.

Value of Output.

The same as in the previous version import and export prices have been applied. Domestically marketed newsprint was treated as import substitute. Excess production, over the level of pre-planned consumption /and eventual imports/ was valued at internal market price of 400 pesos/t.

Assuming self sufficiency in newsprint production as an important consideration, we have to evaluate Version 2 as much more advantageous as Version 1. In absolute terms, however, the analysis is bringing still negative results.

Net Present Value /NPV/ of the Net National Value Added /NNVA/

TABLE III/9

VERSION "2"

Capacity = 110.000 T

$ARFE^{C}$ = 1.7992

$ARFE^{NC}$ = 1.221

Total Initial Investment Cost /in '000 pesos/

	LOCAL	FOREIGN		
		"C"	"NC"	TOTAL
I. FIXED INVESTMENT				
1.1. Site Preparation and Development	546	-	114	660
1.2. Buildings, Structures and Civil Works	9.810	-	1.198	11.008
1.3. Engineering and Design	5.969	-	584	6.553
1.4. Production Machinery and Equipment	-	77.294	-	77.294
1.5. Auxiliary and Service Equipment	648	-	4.182	4.830
1.6. Insurance and Freight	4.100	-	-	4.100
1.7. Plant Installation	1.611	10.448	2.398	14.457
II. PRE-PRODUCTION CAPITAL EXPENDITURES	1.680	1.344	410	3.434
III. WORKING CAPITAL /FULL CAPACITY/	1.912	8.673	2.455	13.040
IV. TOTAL INVESTMENT COST	26.276	97.759	11.341	135.376

TABLE III/10

VERSION "2"

Capacity 110.000 T

$ARFE^{C}$ = 1.7992

$ARFE^{NC}$ = 1.221

Working Capital Requirements

/in '000 pesos/

I T E M	MINIMUM COVERAGE PERIOD IN DAYS	COEFFICIENT OF TURNOVER	AMOUNT REQUIRED			
			"L"	"C"	"NC"	TOTAL
1. Accounts Receivable	30	12	2.085	625	382	3.092
2. Inventories of Raw Materials						
2.1. Bagasse	180	2	933	-	-	933
2.2. Caustic Soda	90	4	-	-	596	596
2.3. Hydrogen Peroxide	90	4	-	-	408	408
2.4. Clay /Kaolin/	90	4	-	-	443	443
2.5. Kraft Woodpulp	90	4	-	1.553	-	1.553
2.6. Mechanical Woodpulp	90	4	-	1.942	-	1.942
2.7. Other Imported - Convertible	90	4	-	1.042	-	1.042
2.8. Other Imported - Non-Convert.	90	4	-	80	-	80
2.9. Other Local	45	8	88	-	-	88
3. Work-In-Progress 1/	1	360	22	77	24	123
4. Finished Products 2/	10	36	654	196	120	970
5. Spare Parts	360	1	-	3.158	482	3.640
6. Cash-In-Hand	15	24	303	-	-	303
7. Accounts Payable	30	12	-2.173	-	-	-2.173
TOTAL FINANCE REQUIRED			1.912	8.673	2.455	13.040

1/ - Foreign = ca. 75% of total amount before shadow pricing /C/NC = 2:1/

2/ - Foreign = ca. 25% of total amount before shadow pricing /C/NC = 1:1/

has been estimated at the pre-determined Social Rate of Discount /SRD/ of 8%. Similarly to the previous case, minimum level of repatriated payments /repatriated salaries of the foreign personnel only/ has been taken into consideration.

Even under this assumption /no foreign loan - no cost of servicing it/ the obtained figure for NPV /at 8%/ is negative: -58.554,177 pesos. This means that in terms of Value Added /and under all previously justified assumptions/ the national economic profitability of the project is much below the cut-off discount rate, and the project in this shape should be rejected.

Under the national economic analysis a great attention /expressed by the relation of $ARFE^C$ to the Official Exchange Rate/ has been paid to the role of potential convertible currency inflows and necessary outflows resulting from the project. This attitude is fully justified by the situation in Cuban balance of payments, discussed in earlier paragraphs.

The analysis, stressing foreign currency aspects of the project, is pointing out negative consequences of project's implementation for the balance of payments.

This problem has been treated in a more detailed way while estimating the Net Foreign Exchange Effect /for convertible currency/ of the project, presented in Table III/11.

For the presentation purposes the most probable variant of financial pattern has been chosen, a combination of foreign loan and local equity /D/E = 1/.

VERSION "2"

TABLE III/11 — Foreign Loan + Local Equity — NET FOREIGN EXCHANGE

	1987	1988	1989	1990	1991	1992	1993	1994
I. FOREIGN EXCHANGE INFLOWS								
1. Foreign Loans in Cash	-	40.000[1/]	5.000[2/]	-	-	-	-	-
2. Goods on Credit	-	-	4.835[3/]	-	-	-	-	-
3. Exports	-	-	-	-	2.626	3.414	4.202	5.252
4. Salvage Value	-	-	-	-	-	-	-	-
II. FOREIGN EXCHANGE OUTLOWS								
1. Imports of Capital Goods - Equipment, Machinery	-	21.978	23.022	-	-	-	-	-
2. Imports of Raw Materials	-	-	-	2.283	5.705	7.417	9.027	10.270
3. Repayment of Suppliers Credit / with interest/	-	-	-	1.902	1.805	1.708	-	-
4. Repayment of Foreign Loans	-	-	-	1.375	1.375	1.375	7.425	6.050
5. Interest Payments on Foreign Loans	-	-	-	5.390	5.252	5.115	4.977	4.235
6. Repatriated Wages	-	-	-	143	190	190	190	190
7. Convertible Currency Part of Infrastructural Services	-	-	-	460	983	1,037	1.094	1.130
Σ II	-	21.978	23.022	11.553	15.310	16.842	22.713	21.875
III. NET FOREIGN EXCHANGE FLOW I - II	-	18.022	/13.187/	/11.553/	/12.684/	/13.428/	/18.511/	/16.623/
IV. IMPORT SUBSTITUTION EFFECT	-	-	-	4.536	4.830	5.250	5.670	6.300
V. NET FOREIGN EXCHANGE EFFECT	-	18.022	/13.187/	/7.017/	/7.854/	/8.178/	/12.841/	/10.323/
III + IV	-		.926	.857	.794	.735	.681	.630
VI. NPV AT 8%								

1/ - Long term loan disbursed 01.01.1988; interest rate = 10%; 8 installments; 4 years grace period; first installment to be paid in 1993
2/ - Short term loan disbursed 01.01.1989; interest rate 10%; 4 installments; first due in 1990.
3/ - Goods purchased on credit /from Government equity/; interest rate = 6%; 3 installments; fist due in 1990.
4/ - Goods purchased on credit /reinvestment/; interest rate = 6%; 6 installments; first due in 2000.

EFFECT /Convertible Currency/ - IN US$ '000

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	49.767 4/	-	-	-	-	-	-	-
5.252	5.252	5.252	5.252	5.252	5.252	5.252	5.252	5.252	5.252	5.252	5.252
-	-	-	-	-	-	-	-	-	-	-	19.451
-	-	-	-	-	-	-	-	-	-	-	-
10.270	10.270	10.270	10.270	10.270	10.270	10.270	10.270	10.270	10.270	10.270	10.270
-	-	-	-	-	11.054	10.566	10.079	9.591	9.103	8.615	-
6.050	6.050	6.050	6.050	6.050	6.050	-	-	-	-	-	-
3.630	3.025	2.420	1.815	1.210	605	-	-	-	-	-	-
190	190	190	190	190	190	190	190	190	190	190	190
1.130	1.130	1.130	1.130	1.130	1.130	1.130	1.130	1.130	1.130	1.130	1.130
21.270	20.665	20.060	19.455	18.850	29.299	22.156	21.669	21.181	20.693	20.205	11.590
/16.018/	/15.413/	/14.808/	/14.203/	+35.169	/24.047/	/16.904/	/16.417/	/15.929/	/15.441/	/14.953/	+13.113
6.720	7.350	7.980	8.610	9.660	10.920	10.920	10.920	10.920	10.920	10.920	10.920
/9.298/	/8.063/	/6.828/	/5.593/	+44.829	/13.127/	/5.984	/5.497/	/5.009/	/4.521/	/4.033/	+24.033
.583	.540	.500	.463	.429	.397	.368	.340	.315	.292	.270	.250
											-31.505,658

The analysis shows clearly outflowing streams of convertible currency which exceed inflowing ones, from 1989 until the end of the period being considered with two exceptions only /1999 and 2006/.

The Import Substitution Effect computed for the convertible currency part of would-be imports of newsprint /according to previously presented distribution alternatives/ does not change the general negative balance of foreign currency. High investment cost to be carried in convertible currency and high cost of current material inputs cannot be offset by moderate hard currency export earnings from market economies. NPV of the Net Foreign Exchange Effect computed at the pre-determined level of SRD /8%/ gives a negative result of 31.505,658 US$.

All in all, these results are further speaking against implementation of the project. A project of this kind, despite merits mentioned before, but being a burden for the national balance of payments cannot be economically justified in the present situation of the Cuban foreign trade and unfavourable configuration on the international markets. That is why no positive recommendation can be given even for Version "2".

VERSION "3"

Difficult situation for newsprint on foreign markets described in the marketing part of this study was the main reason for formulating and examining possibilities of changing the production profile of the plant. More attractive output has been suggested in Version "3" with better prospects of selling on foreign markets, a product-mix consisting of LWC-paper and newsprint.

It is advised to take the results of the analysis presented below with considerable reservation because of many simplifying and tentative assumptions made for the purpose of this version. This part of the study should be considered as a first approach to this problem, a stage of a wider research at which some parts of basic information /e.g. marketing issues or cost structure/ are not available or only roughly estimated.

Basic assumptions and explanations to the Integrated Value Added Analysis:

a. The idea of a new product-mix has been applied to the smaller capacity version /54.000 t/ of the plant and that is why the project is mainly corresponding to Version "1" in this study.

b. In the examined case the output consists of newsprint and LWC-paper manufactured in proportion 2:1. All the newsprint produced is domestically marketed: LWC-paper is sold abroad against convertible currency.

c. A strong demand for LWC or international markets has been assumed. This is based mainly on the opinions and information collected by the ICIDCA experts and our ad-hoc expertise. LWC-paper

is considered to be an attractive commodity /at present/ and can be sold at a price not lower than 600 US$/t. This price has been used for calculation purposes.

These assumptions however, need a veryfying, deep marketing study and first of all a reliable demand forecast for LWC-paper. Many countries facing nowadays difficulties in selling their newsprint abroad may think the same way as we did and switch their production to more sophisticated grades of paper. This may result in the future in growing supplies of LWC-paper on international markets and unfavourable tendencies in prices for this commodity.

d. The process of coating is, by itself, additionally increasing the ultimate output of the plant. It has been calculated that out of 18.000 t /at full capacity/ bagasse based paper we can get after coating 22.914 t of LWC-paper, so the coefficient of weight-increase can be estimated at the level of 1.273.

e. According to the information by ICIDCA, this version requires additional equipment for coating purposes, worth 4.000.000 US$ /in convertible currency only/.
Additional quantities /compare Version "3" in the Financial Analysis/ of caolin and storch are to be bought in NC countries, some new items /latex, auxiliary materials/ have to be imported against convertible currency. New technology is increasing consumption of water, steam and electricity, respectively.

Preliminary results obtained on the basis of these assumptions and available information are positive and encouraging. Though this version is not solving the problem of self-sufficiency in newsprint production /compare the distribution of output presented in Table III/12 - necessary imports of newsprints are

exceedi`¸ domestic production by 64% in 2000/ but the Present Value of NNVA is positive.

Net National Value Added of this version of the project discounted at 8% /SRD/ shows a positive value of 39.191.700 Cuban pesos /Table III/13/.

TABLE III/12 Newsprint/LWC = 2/1

Distribution of Output. 54.000 t Bagasse

Newsprint and LWC-paper Plant

YEAR	PLANT CAPACITY	NEWSPRINT FOR DOMESTIC MARKET	LWC FOR EXPORT	IMPORTS OF NEWSPRINT	
				"NC"	"C"
1985	-	-	-		
1986	-	-	-		
1987	-	-	-		
1988	-	-	-		
1989	-	-	-		
1990	10.000	10.000	-	49.000	800
1991	30.000	20.000	12.730	42.500	-
1992	39.000	26.000	16.549	39.500	-
1993	48.000	32.000	20.368	36.500	-
1994	54.000	36.000	22.914	36.000	-
1995	54.000	36.000	22.914	39.000	-
1996	54.000	36.000	22.914	42.500	-
1997	54.000	36.000	22.914	46.000	-
1998	54.000	36.000	22.914	49.500	-
1999	54.000	36.000	22.914	54.000	-
2000	54.000	36.000	22.914	59.000	-
2001	54.000	36.000	22.914	59.000	-
2002	54.000	36.000	22.914	59.000	-
2003	54.000	36.000	22.914	59.000	-
2004	54.000	36.000	22.914	59.000	-
2005	54.000	36.000	22.914	59.000	-
2006	54.000	36.000	22.914	59.000	-

TABLE III/13

$ARFE^{C}$ = 1.7992
$ARFE^{NC}$ = 1.221

VERSION "3"
Capacity - 54.000 T

Integrated Value

	1987	1988	1989	1990	1991	1992	1993	1994
I. VALUE OF OUTPUT								
1. Sales Revenue.								
1.1. Exports - /LWC/ Convertible Currency	-	-	-	-	13.748	17.873	21.997	24.747
1.2. Exports - Non-Convertible	-	-	-	-	-	-	-	-
1.3. Domestically Marketed Newsprint	-	-	-	7.560	12.234	15.073	17.911	20.087
Σ I	-	-	-	7.560	25.982	32.946	39.908	44.834
II. VALUE OF MATERIAL INPUTS								
1. Investments	-	-	-	-	-	-	-	-
1.1. Imported - Convertible	100	36.796	37.380	1.856	1.856	928	928	463
1.2. Imported - Non-Convertible	731.	3.111	3.312	408	408	204	204	97
1.3. Domestically Procured	4.370	6.490	6.879	154	154	78	78	37
2. Current Material Inputs								
2.1. Import - Convertible	-	-	-	2.255	5.638	7.329	9.021	10.149
2.2. Imported - Non-Convertible	-	-	-	834	2.085	2.710	3.336	3.753
2.3. Domestically Procured	-	-	-	281	703	914	1.124	1.265
2.4. Infrastructural Services	-	-	-	2.173	4.641	5.398	6.153	6.658
Σ II	5.201	46.397	47.571	7.961	15.485	17.561	20.844	22.422
III. NET DOMESTIC VALUE ADDED	/5.201/	/46.397/	/47.571/	/401/	10.497	15.385	19.064	22.412
IV. REPATRIATED PAYMENTS								
4. Repatriated Salaries	-	-	-	256	342	342	342	342
V. NET NATIONAL VALUE ADDED	/5.201/	/46.397/	/47.571/	/657/	10.155	15.043	18.722	22.070
VI. NPV AT 8%								

Added Analysis /in '000 Cuban pesos/

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
24.747	24.747	24.747	24.747	24.747	24.747	24.747	24.747	24.747	24.747	24.747	24.747
-	-	-	-	-	-	-	-	-	-	-	-
20.426	20.935	21.445	21.954	22.803	23.821	23.821	23.821	23.821	23.821	23.821	23.821
45.173	45.682	46.192	46.701	47.550	48.568	48.568	48.568	48.568	48.568	48.568	48.568
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	73.093	-	-	-	-	-	-	/28.423/
-	-	-	-	5.244	-	-	-	-	-	-	/3.496/
-	-	-	-	4.680	-	-	-	-	-	-	/5.822/
10.149	10.149	10.149	10.149	10.149	10.149	10.149	10.149	10.149	10.149	10.149	10.149
3.753	3.753	3.753	3.753	3.753	3.753	3.753	3.753	3.753	3.753	3.753	3.753
1.265	1.265	1.265	1.265	1.265	1.265	1.265	1.265	1.265	1.265	1.265	1.265
6.658	6.658	6.658	6.658	6.658	6.658	6.658	6.658	6.658	6.658	6.658	6.658
21.825	21.825	21.825	21.825	104.842	21.825	21.825	21.825	21.825	21.825	21.825	/15.916/
23.348	23.857	24.367	24.876	/57.292/	26.743	26.743	26.743	26.743	26.743	26.743	64.484
342	342	342	342	342	342	342	342	342	342	342	342
23.006	23.515	24.025	24.534	/57.634/	26.401	26.401	26.401	26.401	26.401	26.401	64.142
											39.191.700

At this level of available information the results of the analysis cannot be more detailed and precise. They show clearly, however, objectives and directions of further supplementary studies which would be needed in order to investigate potential merits of this version.

Here two issues seam to be of utmost importance:

- under assumptions made the greater share of LWC-paper in the output, the more attractive results can be obtained. On the other hand, greater share of LWC means less own newsprint for domestic purposes and greater imports. A question arises: what are the ultimate possibilities of importing newsprint from NC countries for Cuba in long term and how important for the national economy is the self-sufficiency aspect of newsprint production ? Yet, in the extreme case the project could be exclusively oriented towards LWC-paper.

- consequences of increasing the capacity of the plant in Version 3 should be investigated. This requires competent information on changes in cost structure and wide marketing study.

One can imagine that this version could be the most attractive one by combining potential merits of Version 2 and Version 3. Precise answer requires a very careful investigation of many new aspects emerging in thus far reoriented project.

C H A P T E R V

CONCLUSIONS

1. Market and Demand Study

1.1. The world consumption of newsprint is growing increasingly slowly.

1.2. In the largest consumer countries of Latin America, recent and projected expansions of production capacity are creating a situation of self-sufficiency in newsprint.

1.3. Historically, newsprint prices have been stable at FOB US$ 400 per ton /in 1980 dollars/ from 1960 to 1980. In 1980 - 1984 FOB export prices for newsprint averaged ca. US$ 410 per ton in North America and ca. US$ 370 in other market areas. In early 1985, newsprint export prices collapsed to ca. US$ 300 per ton, a clearly unprofitable level for any producer. This was caused by a sluggish demand and rapid expansion of capacity in the early 80´s.

1.4. If excess capacity is retired or converted to other paper grades, and if demand growth will accelerate, real newsprint prices may in a few years regain the levels of 1980 - 1984.

1.5. Newsprint import and exports are stagnant and may decrease both in absolute and relative terms, because the traditional importers, especially those in the third world are becoming self-sufficient.

1.6. If Cuba starts producing newsprint for the export market it can hardly expect to sell for more than FOB US$ 350 per ton during the initial period of product adaptation and market penetration.

1.7. In the long run only large scale producers integrated to diversified paper groups with superior resource can survive the competition for newsprint markets.

1.8. Apart from the Cuban home market, where the demand exceeds present supply, other printing and writing papers have more attractive demand and price prospects than newsprint.

2. Financial Analysis

2.1. Production of newsprint does not seem to be a profitable industrial activity under the present market conditions. Versions "0", "1" and "2" are all either loss-producing or - in case of Version "2" - the rate of return is so small that practically lies within the range of computational error.

2.2. The reasons for low profitability seem to be due rather to the overall situation at the newsprint market nowadays, than the specific features of the project itself. The cost of production in the plant of 110.000 t p.a. /Version "2"/ is more or less equal to the average production cost in Canadian newsprint industry, as it is illustrated by the table below. However, the internal cost structure is distinctly different - in the Cuban technology the low cost of bagasse fibre and of manpower is being offset by quite substantial costs of other material inputs and also overheads.

Comparison of the Production Cost

in the Canadian Newsprint Industry and the Cuban Newsprint Project

at 110.000 t /Version "2"/ in US$

	CANADIAN INDUSTRY		CUBAN PROJECT
	1984	1985	
GROSS SELLING PRICE	496	492	-
DELIVERY COST ETC.	69	69	-
NET SELLING PRICE	427	423	-
Fibre	110	104	17
Other Materials	53	54	178
Energy	65	65	52 1/
Wages/Salaries	102	96	39 2/
Overheads/Depreciation	61	58	65
TOTAL PRODUCTION COST	390	377	367
PRE-TAX, PRE-INTEREST PROFIT PER TON	37	46	-

Source: Canadian Paper Analyst, December 1984, January, 1985.

1/ - Including transportation cost,

2/ - Including repair and maintenance cost,

3/ - Including sales cost.

2.3. Theoretically, the financing of the project may take various forms, the funds coming from foreign sources as loans or equity, to supplement the Cuban government contribution. However, rather awkward financial indicators for Version "0" and "1" make any foreign contribution practically impossible. Also Version "2" does not seem to be profitable enough to attract foreign investors to participate in the project as co-sponsors.

The most likely variant of financing would be therefore the combination of a foreign loan and a local equity with possibly favourable debt repayment conditions. Since it would be extremely difficult to find the funds for the project at international capital markets, thus a more realistic possibility seems to be a "self" loan from a credit line within a bilateral intergovernmental agree - ment. E.g. the country where the supplier of machinery and equipment is located could be willing to provide the necessary funds via its specialized export-promoting financial institutions.

2.4. It seems that the production of other grades of paper is more financially interesting than that of newsprint. Preliminary appraisal of Version "3" indicates that the production of LWC-paper can be profitable.
However, lack of sufficient information on the production of LWC has not allowed to carry out a more extensive study. It is advisable therefore, to examine in depth this possibility, trying to maintain a proper balance between the newsprint production, which is needed by domestic market and other grades of paper which strengthen the financial viability of the project.

2.5. It must be kept in mind that all results obtained within the framework of finanical analysis have been calculated on the basis of available information. In spite of the efforts undertaken to get as comprehensive information as possible, numerous ad hoc assumptions and rough estimates have had to be accepted during the calculations.

Therefore the degree of accuracy is necessarily quite low and the results should be seen as preliminary.

3. National Economic Evaluations

3.1. One of the most important merits of the project is the fact that it is capable of utilizing excess bagasse which is of no use for the national economy at present. The importance of this consideration may however decrease in time with larger amounts of bagasse being used in the future for alternative purposes, like e.g. power generation.

3.2. The next positive feature is its import substitution aspect. Production of newsprint may be treated as an important element in import substitution tendencies prevailing nowadays in Cuban economic policy. However, one has to be aware of the fact that the potential output of the plant would be a substitute for relatively cheap imports of newsprint from the USSR, in the first instance. Only beyond USSR export possibilities - it would be an import substitute for purchases from market economies.

3.3. Newsprint can be treated - and is actually treated in many countries - as a quasi strategic product for the national economy. Self-sufficiency in newsprint production may be

seen as an important national consideration. On the other hand national authorities have to be aware of high foreign currency cost and risks connected with the implementation of this project.

Moreover, self-sufficiency in newsprint supplies means for Cuba relatively less than for many other economies. Cuba's advantage is, that alternatively it is being supplied with newsprint by a very reliable partner like the USSR and under stable trade conditions.

3.4. The national economic analysis has been exposing the role for the national economy of potential convertible currency inflows and necessary outflows resulting from the project. The negative results obtained here point out foreign currency aspect of the production process. Unavoidably high investment cost in convertible currency and technically justified, but high, costs of current material inputs cannot be offset - under present unfavourable world market situation for all kinds of newsprint - by moderate hard currency export earnings.

3.5. Recent developments in the Cuban balance of payments fully justify a very cautious and careful approach to projects highly dependant on imported equipment, not yielding considerable export earnings. Being technically competitive, but not creating an attractive offer either for financial partner or foreign customer - these projects may produce a drain for foreign currency and create undue dependence on foreign creditors.

3.6. Value Added Analysis. Taking into consideration all inflows and outflows of currency, under adjusted prices ac-

cording to two different rates of foreign exchange /one for convertible currency, other - for non-convertible currency/, as well as their distribution in time - profitability of the project in terms of created value added for the national economy is much below pre-determined and justified Social Rate of Discount. The streams of discounted value added in first two versions are negative.

3.7. In terms of creating new employment opportunities the project may be seen as attractive for the region, but for the national economy it has rather limited importance, as the number of jobs created is not high and after all there is no unemployment problem in Cuba.

3.8. The project fits to regional development plans and may be stimulating for the publishing industry offering larger supplies than the import-based alterantive. Further positive aspect is the close integration with the Brazil Sugar Mill and plans to use common infrastructural facilities.

3.9. Implementation of the project may be regarded as a means to promote Cuban know-how and technique abroad.

3.10. Higher capacity of the plant is resulting positively on the national economic analysis. The same holds true to an improved product-mix, containing more other grades of paper, attractive from the point of view of exisitng demand on international markets.

---------- COMFAR 1.1 - UNIDO IO/FEAS, Vienna ---

Total initial investment costs in us $ '000

Year	1987.1	1987.2-88.1	1988.2	1989.1	1989.2
Fixed investment costs					
Land, site preparation, development	650.00	0.00	0.00	0.00	0.00
Buildings and civil works	6500.00	2300.00	1300.00	600.00	559.00
Auxiliary and service facilities	0.00	0.00	1000.00	2400.00	1072.00
Incorporated fixed assets	0.00	0.00	6050.00	6550.00	1100.00
Plant machinery and equipment	0.00	0.00	21480.00	21480.00	0.00
Total fixed investment costs	7150.00	2300.00	29830.00	31030.00	2731.00
Pre-production capital expenditures	500.00	500.00	400.00	400.00	500.00
Net working capital	0.00	0.00	0.00	0.00	1800.00
Total initial investment costs	7650.00	2800.00	30230.00	31430.00	5031.00
Of it foreign, in %	10.92	17.86	85.94	88.39	69.79

---------- COMFAR 1.1 - UNIDO IO/FEAS, Vienna ---

Total investment costs, production phase in us $ '000

Year	1990	1991	1992	1993	1994
Fixed investment costs					
Land, site preparation, development	0.00	0.00	0.00	0.00	0.00
Buildings and civil works	0.00	0.00	0.00	0.00	0.00
Auxiliary and service facilities	0.00	0.00	0.00	0.00	0.00
Incorporated fixed assets	0.00	0.00	0.00	0.00	0.00
Plant, machinery and equipment	0.00	0.00	0.00	0.00	0.00
Total fixed investment costs	0.00	0.00	0.00	0.00	0.00
Preproduction capitals expenditures.	0.00	0.00	0.00	0.00	0.00
Working capital	3338.62	4937.62	2174.19	1987.79	646.60
Total current investment costs	3338.62	4937.62	2174.19	1987.79	646.60
Of it foreign, %	125.62	80.14	79.87	62.24	75.92

bagasse newsprint plant --- 1985-04-18

---------- COMFAR 1.1 - UNIDO IO/FEAS, Vienna ---

Total investment costs, production phase in us $ '000

Year	1995-98	1999
Fixed investment costs		
Land, site preparation, development	0.00	0.00
Buildings and civil works	0.00	0.00
Auxiliary and service facilities	0.00	4490.00
Incorporated fixed assets	0.00	13699.00
Plant, machinery and equipment	0.00	42960.00
Total fixed investment costs	0.00	61149.00
Preproduction capitals expenditures.	0.00	0.00
Working capital	0.00	0.00
Total current investment costs	0.00	61149.00
Of it foreign, %	0.00	89.60

bagasse newsprint plant --- 1985-04-18

Total production costs in us $ '000

Year	1990	1991	1992	1993	1994-99
% of nom. capacity (single product).	18.18	55.45	71.82	89.09	100.00
Raw material 1	1242.10	3450.10	4485.10	5520.10	6210.10
Other raw materials	2404.00	6680.00	8684.00	10688.00	12024.00
Utilities	667.00	1853.00	2409.00	2964.00	3335.00
Energy	902.00	2506.00	3257.00	4009.00	4510.00
Labour, direct	599.00	900.00	959.00	1200.00	1200.00
Repair, maintenance	700.00	1400.00	1400.00	1400.00	1400.00
Spares	700.00	1400.00	1400.00	1400.00	1400.00
Factory overheads	784.00	1046.00	1046.00	1046.00	1046.00
Factory costs	7998.10	19235.11	23640.11	28227.11	31125.11
Administrative overheads	490.00	654.00	654.00	654.00	654.00
Indir. costs, sales and distribution	140.00	427.00	553.00	686.00	770.00
Direct costs, sales and distribution	0.00	0.00	0.00	0.00	0.00
Depreciation	6961.56	6961.56	6961.56	6961.56	6961.56
Financial costs	0.00	0.00	0.00	0.00	0.00
Total production costs	15589.66	27277.66	31808.66	36528.66	39510.66
Costs per unit (single product)	0.78	0.45	0.40	0.37	0.36
Of it foreign, %	65.05	62.06	61.59	60.93	60.83
Of it variable,%	0.00	0.00	0.00	0.00	0.00
Total labour	1089.00	1554.00	1613.00	1954.00	1854.00

Total production costs in us $ '000

Year	2000- 4
% of nom. capacity (single product).	100.00
Raw material 1	6210.10
Other raw materials	12024.00
Utilities	3335.00
Energy	4510.00
Labour, direct	1200.00
Repair, maintenance	1400.00
Spares	1400.00
Factory overheads	1046.00
Factory costs	31125.11
Administrative overheads	654.00
Indir. costs, sales and distribution	770.00
Direct costs, sales and distribution	0.00
Depreciation	6683.26
Financial costs	0.00
Total production costs	39232.37
Costs per unit (single product)	0.36
Of it foreign, %	60.98
Of it variable,%	0.00
Total labour	1854.00

---------- COMFAR 1.1 - UNIDO IO/PEAS, Vienna ---

Net working capital in us $ '000

Year			1990	1991	1992	1993	1994
Coverage	mdc	coto					
Current assets &							
Accounts receivable	30	12.0	719.01	1693.01	2070.59	2463.93	2712.43
Inventory and materials	83	4.4	3989.25	7748.29	9772.83	11597.25	12146.91
Energy	1	360.0	2.51	6.96	9.05	11.14	12.53
Spares	360	1.0	700.00	1400.00	1400.00	1400.00	1400.00
Work in progress	1	360.0	22.22	53.43	65.67	78.41	86.46
Finished products	10	36.0	235.78	552.48	674.84	802.25	882.75
Cash in hand	15	24.0	136.38	225.00	227.46	237.50	237.50
Total current assets			5805.13	11679.17	14220.43	16590.47	17478.57
Current liabilities and							
Accounts payable	30	12.0	666.51	1602.93	1970.01	2352.26	2593.76
Net working capital			6938.62	11876.24	14050.42	16038.21	16684.81
Increase in working capital			5138.62	4937.62	2174.18	1987.79	646.60
Net working capital, local			1256.53	2237.01	2674.73	3425.24	3580.95
Net working capital, foreign			5682.10	9639.23	11375.70	12612.98	13103.86

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

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bagasse newsprint plant --- 1985-04-18

---------- COMFAR 1.1 - UNIDO IO/PEAS, Vienna ---

Net working capital in us $ '000

Year			1995-2004
Coverage	adc	coto	
Current assets &			
Accounts receivable . . .	30	12.0	2712.43
Inventory and materials .	83	4.4	12146.91
Energy	1	360.0	12.53
Spares	360	1.0	1400.00
Work in progress	1	360.0	86.46
Finished products . . .	10	36.0	882.75
Cash in hand	15	24.0	237.50
Total current assets			17478.57
Current liabilities and			
Accounts payable	30	12.0	2593.76
Net working capital			16684.81
Increase in working capital			0.00
Net working capital, local			3580.95
Net working capital, foreign			13103.86

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

bagasse newsprint plant --- 1985-04-18

Source of finance, construction in us $ '000

Year	1987.1	1987.2-88.1	1988.2	1989.1	1989.2
Equity, ordinary ..	7650.00	2800.00	30230.00	31430.00	5031.00
Equity, preference.	0.00	0.00	0.00	0.00	0.00
Subsidies, grants .	0.00	0.00	0.00	0.00	0.00
Loan A, foreign .	0.00	0.00	0.00	0.00	0.00
Loan B, foreign..	0.00	0.00	0.00	0.00	0.00
Loan C, foreign .	0.00	0.00	0.00	0.00	0.00
Loan A, local....	0.00	0.00	0.00	0.00	0.00
Loan B, local....	0.00	0.00	0.00	0.00	0.00
Loan C, local....	0.00	0.00	0.00	0.00	0.00
Total loan	0.00	0.00	0.00	0.00	0.00
Current liabilities	0.00	0.00	0.00	0.00	0.00
Bank overdraft	0.00	0.00	0.00	0.00	0.00
Total funds	7650.00	2800.00	30230.00	31430.00	5031.00

Year	1990	1991	1992	1993	1994	1995-98
Equity, ordinary ..	0.00	0.00	0.00	0.00	0.00	0.00
Equity, preference.	0.00	0.00	0.00	0.00	0.00	0.00
Subsidies, grants .	0.00	0.00	0.00	0.00	0.00	0.00
Loan A, foreign .	0.00	0.00	0.00	0.00	0.00	0.00
Loan B, foreign..	0.00	0.00	0.00	0.00	0.00	0.00
Loan C, foreign .	0.00	0.00	0.00	0.00	0.00	0.00
Loan A, local....	0.00	0.00	0.00	0.00	0.00	0.00
Loan B, local....	0.00	0.00	0.00	0.00	0.00	0.00
Loan C, local....	0.00	0.00	0.00	0.00	0.00	0.00
Total loan	0.00	0.00	0.00	0.00	0.00	0.00
Current liabilities	666.51	936.42	367.08	382.25	241.50	0.00
Bank overdraft	5766.73	1603.73	-3603.71	-3766.74	0.00	0.00
Total funds	6433.24	2540.14	-3236.63	-3384.49	241.50	0.00

Source of finance, production in us $ '000

Year	1999	2000
Equity, ordinary ..	0.00	0.00
Equity, preference.	0.00	0.00
Subsidies, grants .	0.00	0.00
Loan A, foreign .	0.00	0.00
Loan B, foreign..	0.00	0.00
Loan C, foreign .	0.00	0.00
Loan A, local....	0.00	0.00
Loan B, local....	0.00	0.00
Loan C, local....	0.00	0.00
Total loan	0.00	0.00
Current liabilities	0.00	0.00
Bank overdraft	4792.66	-4792.66
Total funds	4792.66	-4792.66

Year	1987.1	1987.2	1988.1	1988.2	1989.1	1989.2
Total cash inflow . .	7650.00	2800.00	2800.00	30230.00	31430.00	5031.00
Financial resources .	7650.00	2800.00	2800.00	30230.00	31430.00	5031.00
Sales, net of tax . .	0.00	0.00	0.00	0.00	0.00	0.00
Total cash outflow . .	7650.00	2800.00	2800.00	30230.00	31430.00	5031.00
Total assets	7650.00	2800.00	2800.00	30230.00	31430.00	5031.00
Operating costs . . .	0.00	0.00	0.00	0.00	0.00	0.00
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) .	0.00	0.00	0.00	0.00	0.00	0.00
Cumulated cash balance	0.00	0.00	0.00	0.00	0.00	0.00
Inflow, local	6815.00	2300.00	2300.00	4250.00	3650.00	1520.00
Outflow, local	6815.00	2300.00	2300.00	4250.00	3650.00	1520.00
Surplus (deficit) .	0.00	0.00	0.00	0.00	0.00	0.00
Inflow, foreign . . .	835.00	500.00	500.00	25980.00	27780.00	3511.00
Outflow, foreign . . .	835.00	500.00	500.00	25980.00	27780.00	3511.00
Surplus (deficit) .	0.00	0.00	0.00	0.00	0.00	0.00
Net cashflow	-7650.00	-2800.00	-2800.00	-30230.00	-31430.00	-5031.00
Cumulated net cashflow	-7650.00	-10450.00	-13250.00	-43480.00	-74910.00	-79941.00

Year	1990	1991	1992	1993	1994	1995
Total cash inflow . .	14433.24	26190.14	30992.08	38382.25	42741.50	42500.00
Financial resources .	6433.24	2540.14	367.08	382.25	241.50	0.00
Sales, net of tax . .	8000.00	23650.00	30625.00	38000.00	42500.00	42500.00
Total cash outflow . .	14433.24	26190.14	30992.09	35703.89	34334.00	33445.91
Total assets	5805.13	5874.03	2541.27	2370.04	888.10	0.00
Operating costs . . .	8628.11	20316.11	24847.11	29567.11	32549.11	32549.11
Cost of finance . . .	0.00	0.00	0.00	0.00	0.00	0.00
Repayment	0.00	0.00	3603.71	3766.74	0.00	0.00
Corporate tax . . .	0.00	0.00	0.00	0.00	896.80	896.80
Dividends paid . . .	0.00	0.00	0.00	0.00	0.00	0.00
Surplus (deficit) .	-0.00	0.00	-0.00	2678.36	8407.50	9054.09
Cumulated cash balance	-0.00	0.00	-0.00	2678.36	11085.85	20139.95
Inflow, local	14082.72	20390.81	23949.67	29764.67	32096.58	32000.00
Outflow, local	5406.49	10414.54	15106.06	17648.89	15323.06	15070.77
Surplus (deficit) .	8676.23	9976.27	8843.60	12115.78	16773.52	16929.23
Inflow, foreign . . .	350.51	5799.33	7042.42	8617.58	10644.92	10500.00
Outflow, foreign . . .	9026.75	15775.60	15886.03	18055.00	19010.94	18375.14
Surplus (deficit) .	-8676.24	-9976.27	-8843.61	-9437.42	-8366.02	-7875.14
Net cashflow	-6433.24	-2540.14	3236.62	6062.85	8165.99	9054.09
Cumulated net cashflow	-86374.23	-88914.38	-85677.75	-79614.90	-71448.91	-62394.81

bagasse newsprint plant --- 1985-04-18

IRR = 2.3 %

NPV at 5 % = -25260

Year	1996	1997	1998	1999	2000	2001
Total cash inflow . .	42500.00	42500.00	42500.00	47292.66	42500.00	42500.00
Financial resources .	0.00	0.00	0.00	4792.66	0.00	0.00
Sales, net of tax . .	42500.00	42500.00	42500.00	42500.00	42500.00	42500.00
Total cash outflow . .	33445.91	33445.91	33445.91	94594.91	38322.05	33529.40
Total assets	0.00	0.00	0.00	61149.00	0.00	0.00
Operating costs . . .	32549.11	32549.11	32549.11	32549.11	32549.11	32549.11
Cost of finance . . .	0.00	0.00	0.00	0.00	0.00	0.00
Repayment	0.00	0.00	0.00	0.00	4792.66	0.00
Corporate tax . . .	896.80	896.80	896.80	896.80	980.29	980.29
Dividends paid . . .	0.00	0.00	0.00	0.00	0.00	0.00
Surplus (deficit) .	9054.09	9054.09	9054.09	-47302.25	4177.95	8970.60
Cumulated cash balance	29194.04	38248.13	47302.23	-0.02	4177.92	13148.52
Inflow, local	32000.00	32000.00	32000.00	36792.66	32000.00	32000.00
Outflow, local	15070.77	15070.77	15070.77	21428.77	19946.92	15154.26
Surplus (deficit) .	16929.23	16929.23	16929.23	15363.89	12053.08	16845.74
Inflow, foreign . . .	10500.00	10500.00	10500.00	10500.00	10500.00	10500.00
Outflow, foreign . . .	18375.14	18375.14	18375.14	73166.14	18375.14	18375.14
Surplus (deficit) .	-7875.14	-7875.14	-7875.14	-62666.14	-7875.14	-7875.14
Net cashflow	9054.09	9054.09	9054.09	-52094.91	8970.60	8970.60
Cumulated net cashflow	-53340.72	-44286.63	-35 [illegible].53	-87327.44	-78356.84	-69386.23

Year	2002	2003	2004
Total cash inflow . .	42500.00	42500.00	42500.00
Financial resources .	0.00	0.00	0.00
Sales, net of tax . .	42500.00	42500.00	42500.00
Total cash outflow . .	33529.40	33529.40	33529.40
Total assets	0.00	0.00	0.00
Operating costs . . .	32549.11	32549.11	32549.11
Cost of finance . . .	0.00	0.00	0.00
Repayment	0.00	0.00	0.00
Corporate tax . . .	980.29	980.29	980.29
Dividends paid . . .	0.00	0.00	0.00
Surplus (deficit) .	8970.60	8970.60	8970.60
Cumulated cash balance	22119.13	31089.73	40060.33
Inflow, local	32000.00	32000.00	32000.00
Outflow, local	15154.26	15154.26	15154.26
Surplus (deficit) .	16845.74	16845.74	16845.74
Inflow, foreign . . .	10500.00	10500.00	10500.00
Outflow, foreign . . .	18375.14	18375.14	18375.14
Surplus (deficit) .	-7875.14	-7875.14	-7875.14
Net cashflow	8970.60	8970.60	8970.60
Cumulated net cashflow	-60415.63	-51445.03	-42474.43

a) Return on Equity:
Net present value 0.00 at 10.00 %
Internal Rate of Return (IRRE) .. 0.00 %

b) Internal Rate of Return without outside financing:
Net present value 0.00 at 10.00 %
Internal Rate of Return (IRR) .. 0.00 %

c) Future Value of cash outflow during construction:
Total cash outflow .. 79941.00
Future Value 87769.39 at 10.00 %

Year	1990	1991	1992	1993	1994
Total sales, incl. sales tax	8000.00	23650.00	30625.00	38000.00	42500.00
Less: variable costs, incl. sales tax.	0.00	0.00	0.00	0.00	0.00
Variable margin	8000.00	23650.00	30625.00	38000.00	42500.00
As % of total sales	100.00	100.00	100.00	100.00	100.00
Non-variable costs, incl. depreciation	15589.66	27277.66	31808.66	36528.66	39510.66
Operational margin	-7589.66	-3627.66	-1183.66	1471.34	2989.34
As % of total sales	-94.87	-15.34	-3.87	3.87	7.03
Cost of finance	0.00	0.00	0.00	0.00	0.00
Gross profit	-7589.66	-3627.66	-1183.66	1471.34	2989.34
Allowances	0.00	0.00	0.00	0.00	0.00
Taxable profit	-7589.66	-3627.66	-1183.66	1471.34	2989.34
Tax	0.00	0.00	0.00	0.00	896.80
Net profit	-7589.66	-3627.66	-1183.66	1471.34	2092.54
Dividends paid	0.00	0.00	0.00	0.00	0.00
Undistributed profit	-7589.66	-3627.66	-1183.66	1471.34	2092.54
Accumulated undistributed profit	-7589.66	-11217.33	-12400.99	-10929.66	-8837.12
Gross profit, % of total sales	-94.87	-15.34	-3.87	3.87	7.03
Net profit, % of total sales	-94.87	-15.34	-3.87	3.87	4.92
ROE Net profit, % of equity	-9.49	-4.54	-1.48	1.84	2.62
ROI Net profit+interest, % of equity	-8.85	-3.96	-1.26	1.52	2.15

bagasse newsprint plant --- 1985-04-18

Year	1995	1996	1997	1998	1999
Total sales, incl. sales tax	42500.00	42500.00	42500.00	42500.00	42500.00
Less: variable costs, incl. sales tax.	0.00	0.00	0.00	0.00	0.00
Variable margin	42500.00	42500.00	42500.00	42500.00	42500.00
As % of total sales	100.00	100.00	100.00	100.00	100.00
Non-variable costs, incl. depreciation	39510.66	39510.66	39510.66	39510.66	39510.66
Operational margin	2989.34	2989.34	2989.34	2989.34	2989.34
As % of total sales	7.03	7.03	7.03	7.03	7.03
Cost of finance	0.00	0.00	0.00	0.00	0.00
Gross profit	2989.34	2989.34	2989.34	2989.34	2989.34
Allowances	0.00	0.00	0.00	0.00	0.00
Taxable profit	2989.34	2989.34	2989.34	2989.34	2989.34
Tax	896.80	896.80	896.80	896.80	896.80
Net profit	2092.54	2092.54	2092.54	2092.54	2092.54
Dividends paid	0.00	0.00	0.00	0.00	0.00
Undistributed profit	2092.54	2092.54	2092.54	2092.54	2092.54
Accumulated undistributed profit	-6744.58	-4652.05	-2559.51	-466.98	1625.56
Gross profit, % of total sales	7.03	7.03	7.03	7.03	7.03
Net profit, % of total sales	4.92	4.92	4.92	4.92	4.92
ROE Net profit, % of equity	2.62	2.62	2.62	2.62	2.62
ROI Net profit+interest, % of equity	2.15	2.15	2.15	2.15	1.32

bagasse newsprint plant --- 1985-04-18

Year	2000	2001	2002	2003	2004
Total sales, incl. sales tax	42500.00	42500.00	42500.00	42500.00	42500.00
Less: variable costs, incl. sales tax.	0.00	0.00	0.00	0.00	0.00
Variable margin	42500.00	42500.00	42500.00	42500.00	42500.00
As % of total sales	100.00	100.00	100.00	100.00	100.00
Non-variable costs, incl. depreciation	39232.36	39232.36	39232.36	39232.36	39232.37
Operational margin	3267.64	3267.64	3267.64	3267.64	3267.63
As % of total sales	7.69	7.69	7.69	7.69	7.69
Cost of finance	0.00	0.00	0.00	0.00	0.00
Gross profit	3267.64	3267.64	3267.64	3267.64	3267.63
Allowances	0.00	0.00	0.00	0.00	0.00
Taxable profit	3267.64	3267.64	3267.64	3267.64	3267.63
Tax	980.29	980.29	980.29	980.29	980.29
Net profit	2287.35	2287.35	2287.35	2287.35	2287.34
Dividends paid	0.00	0.00	0.00	0.00	0.00
Undistributed profit	2287.35	2287.35	2287.35	2287.35	2287.34
Accumulated undistributed profit	3912.90	6200.25	8487.59	10774.94	13062.28
Gross profit, % of total sales	7.69	7.69	7.69	7.69	7.69
Net profit, % of total sales	5.38	5.38	5.38	5.38	5.38
ROE Net profit, % of equity	2.86	2.86	2.86	2.86	2.86
ROI Net profit+interest, % of equity	1.44	1.44	1.44	1.44	1.44

bagasse newsprint plant --- 1985-04-18

Year	1987.1	1987.2	1988.1	1988.2	1989.1
Total assets	7650.00	10450.00	13250.00	43480.00	74910.00
Fixed assets, net of depreciation	0.00	7650.00	10450.00	13250.00	43480.00
Construction in progress	7650.00	2800.00	2800.00	30230.00	31430.00
Current assets	0.00	0.00	0.00	0.00	0.00
Cash, bank	0.00	0.00	0.00	0.00	0.00
Cash surplus, finance available	0.00	0.00	0.00	0.00	0.00
Total liabilities	7650.00	10450.00	13250.00	43480.00	74910.00
Equity capital	7650.00	10450.00	13250.00	43480.00	74910.00
Reserves, retained profit	0.00	0.00	0.00	0.00	0.00
Profit,(loss)	0.00	0.00	0.00	0.00	0.00
Long and medium term debt	0.00	0.00	0.00	0.00	0.00
Current liabilities	0.00	0.00	0.00	0.00	0.00
Bank overdraft, finance required.	0.00	0.00	0.00	0.00	0.00
Total debt	0.00	0.00	0.00	0.00	0.00
Equity, % of liabilities	100.00	100.00	100.00	100.00	100.00

bagasse newsprint plant --- 1985-04-18

Projected balance sheets, construction in us $ '000

Year	1989.2
Total assets	79941.00
Fixed assets, net of depreciation	74910.00
Construction in progress	3231.00
Current assets	1800.00
Cash, bank	0.00
Cash surplus, finance available	0.00
Total liabilities	79941.00
Equity capital	79941.00
Reserves, retained profit	0.00
Profit,(loss)	0.00
Long and medium term debt	0.00
Current liabilities	0.00
Bank overdraft, finance required.	0.00
Total debt	0.00
Equity, % of liabilities	100.00

bagasse newsprint plant --- 1985-04-18

Year	1990	1991	1992	1993	1994
Total assets	78784.57	77697.05	73276.76	71363.60	73697.63
Fixed assets, net of depreciation	71179.44	64217.88	57256.32	50294.76	43333.20
Construction in progress	0.00	0.00	0.00	0.00	0.00
Current assets	7468.76	13254.17	15792.98	18152.97	19041.07
Cash, bank	136.38	225.00	227.46	237.50	237.50
Cash surplus, finance available	0.00	0.00	0.00	2678.37	11085.86
Total liabilities	78784.57	77697.05	73276.76	71363.60	73697.63
Equity capital	79941.00	79941.00	79941.00	79941.00	79941.00
Reserves, retained profit	0.00	-7589.66	-11217.33	-12400.99	-10929.66
Profit,(loss)	-7589.66	-3627.66	-1183.66	1471.34	2092.54
Long and medium term debt	0.00	0.00	0.00	0.00	0.00
Current liabilities	666.51	1602.93	1970.01	2352.26	2593.76
Bank overdraft, finance required.	5766.73	7370.45	3766.74	0.00	0.00
Total debt	6433.24	8973.38	5736.75	2352.26	2593.76
Equity, % of liabilities	101.47	102.89	109.09	112.02	108.47

bagasse newsprint plant --- 1985-04-18

Projected balance sheet, production in us $ '000

Year	1995	1996	1997	1998	1999
Total assets	75790.18	77882.71	79975.24	82067.77	88952.98
Fixed assets, net of depreciation	36371.64	29410.09	22448.53	15486.97	8525.41
Construction in progress	0.00	0.00	0.00	0.00	61149.00
Current assets	19041.07	19041.07	19041.07	19041.07	19041.07
Cash, bank	237.50	237.50	237.50	237.50	237.50
Cash surplus, finance available	20139.96	29194.05	38248.14	47302.23	0.00
Total liabilities	75790.18	77882.71	79975.24	82067.77	88952.98
Equity capital	79941.00	79941.00	79941.00	79941.00	79941.00
Reserves, retained profit	-8837.12	-6744.58	-4652.05	-2559.51	-466.98
Profit,(loss)	2092.54	2092.54	2092.54	2092.54	2092.54
Long and medium term debt	0.00	0.00	0.00	0.00	0.00
Current liabilities	2593.76	2593.76	2593.76	2593.76	2593.76
Bank overdraft, finance required.	0.00	0.00	0.00	0.00	4792.66
Total debt	2593.76	2593.76	2593.76	2593.76	7386.42
Equity, % of liabilities	105.48	102.64	99.96	97.41	89.87

Year	2000	2001	2002	2003	2004
Total assets	86447.66	88735.00	91022.35	93309.70	95597.04
Fixed assets, net of depreciation	62991.15	56307.89	49624.63	42941.38	36258.11
Construction in progress	0.00	0.00	0.00	0.00	0.00
Current assets	19041.07	19041.07	19041.07	19041.07	19041.07
Cash, bank	237.50	237.50	237.50	237.50	237.50
Cash surplus, finance available	4177.94	13148.54	22119.15	31089.75	40060.35
Total liabilities	86447.66	88735.00	91022.35	93309.70	95597.04
Equity capital	79941.00	79941.00	79941.00	79941.00	79941.00
Reserves, retained profit	1625.56	3912.90	6200.25	8487.59	10774.94
Profit,(loss)	2287.35	2287.35	2287.35	2287.35	2287.34
Long and medium term debt	0.00	0.00	0.00	0.00	0.00
Current liabilities	2593.76	2593.76	2593.76	2593.76	2593.76
Bank overdraft, finance required.	0.00	0.00	0.00	0.00	0.00
Total debt	2593.76	2593.76	2593.76	2593.76	2593.76
Equity, % of liabilities	92.47	90.09	87.83	85.67	83.62

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