(2) Adding Talk

To add talk powder to a finished GP chest at a rate of approximately 0.5 percent of pulp.

(3) Adding Anionic Surfactant

To add anionic surfactant corresponding to 0.1 percent solid of pulp.

(4) Adding Alum

To add alum to machine headbox to maintain the PH value at 4.5. (This method is applied in Japan.)

3.2 Measures to Reduce GP Shives

3.2.1 Shive Level at the Aksu Mill

Aksu mill	: 60
Balikesir	: 16
Imported (Canada)	: 16
Imported (Norway)	: 14
Imported (France)	: 10
Japan	: 2

3.2.2 Examined Measures against Shives

(1) Measures by facility improvement

- Replacement of screens
- Stabilization of screen reject treatment capacity
- Replacement of tail screens
- Employment of centri-cleaner

(2) Operational measures

- Controlling grinding power (fixing load fluctuation)

- Controlling grinder stone (standardization of stone grain, cleaning of stone surface)
- Controlling temperature within the process (keeping temperature of cycling white water at 70 ^{o}C)

3.3 Product Handling

Many problems in the product handling method were identified during our mill investigation, while users complain about product defects due to wrong handling which causes troubles in printing.

3.3.1 Cause of Defective Products

The following are the major causes of defective products.

A. Distortion of lifter: cause of marred roll
B. Rolling rolls: cause of mars by objects on the floor
C. Loading on truck: mars caused by clamp which is used for loading on truck
D. Unloading: dropping impact cause core crush

3.3.2 Product Handling Method in Japan

There are no users' complaints of in such a nature in Japan. Handling method and instructions for damage prevention practiced at leading Japanese paper mill is introduced (omitted).

3.4 Energy Saving

A large amount of exhausted heat is generated on a low level at a pulp and paper mill. It is important to examine how to recover the exhausted heat so that the required steam may be and that the consumption of fuel may be reduced.

Recycling of white water and heat recovery of paper drying process can be effective measures for energy saving.

Besides, recycling of white water is also favorable to reduce the volume of waste water to be treated.

Various rationalization plans that will be implemented in this renovation project have energy-saving effects directly or indirectly, as well as improvement of paper quality. The followings are the major subjects of energy saving considered in this study.

3.4.1 Recycling of the Heat Exchanger's Thermal Waste Water into Process Water

Currently, a large quantity of the heat exchanger's thermal waste water is drained using a once-through system in paper machine and utility facilities. When the renovation project is implemented, the amounts of the drained water in those facilities are estimated to be as follows.

	Case 1	Case 2
Paper Machine	400 m^3/H	608 m^3/H
Utility	109 m^3/H	109 m^3/H
Total	509 m^3/H	717 m^3/H
Heat Recovered (Kcal/H)	10,180 x 10	14,140 x 10

Further, this recycling of hot water contributes to decreases in waste water discharge and raw water consumption.

3.4.2 Stoppage of Blowing Steam for Heating the Grinder Shower Water (GP)

Grinder shower water which used to be heated by steam blow is replaced by high temperature white water from the paper machine section. This will make possible reduction of the steam by 0.8 T/BDT of GP.

3.4.3 Intermittent Operation of Pulpers

A broke pulper (150 kw x 1) will be newly installed downstairs, and then the regularly operated pulpers located under the calendars (220 kw x 2) will be operated intermittently.

As a result of this modification, 172 KW H/H of electric power can be saved on average.

3.4.4 Sealed Dryer Hood

The existing hood and waste heat recovery system have deteriorated, and they does not perform their role of heat recovery. The hood and waste heat recovery device will be replaced with new ones, then recovered heat will be used for heating of air inside the hood.

3.4.5 Replacement of Motor for Pulp Dust Collector

The AC motors for the fan pump will be replaced with DC motors. Energy savings expected therefrom are as follows.

Case 1 : 330 KW H/H
Case 2 : 150 KW H/H

3.4.6 Rise in BKP Dissolving Pulp Temperature

The temperature of BKP dissolving pulp which is currently 31°C will be increased to 50 - 55°C by change in white water flow. This will cause the temperature increase of stock by 5°C, and it will improve drying effect.

4. Environmental Protection

4.1 Saving Resources and Preserving Forests

Although the rate of demand for pulp wood to total wood demand in Turkey is low (i.e. 4.5%), certain effects of saving resources can be expected by implementation of this renovation project, as follows.

4.1.1 Resource Saving by DIP Unit

By introducing DIP, approximately 30,000 tons of newsprint can be produced annually without using logs. This amount of paper corresponds to about 90,000 m^3 per annum of logs.

4.1.2 Resource Saving by Reducing Basis Weight

After the renovation, basis weight of the products is planned to be reduced from the present 49 g/m^2 to 45 g/m^2.

This will save approximately 8% of the material, and such saving can be converted into saved log volume as follows.

Case 1 : 11,200 m^3/year
Case 2 : 16,700 m^3/year

4.2 Water Pollution Control

Presently, at Aksu mill, the waste water is discharged into the adjacent Aksu River without performing water treatment. The amount of the discharged water is 850 m^3 per hour on average. The quality of the waste water is not so good, as shown below.

S.S. : 690 ppm
COD : 700 ppm
BOD : 270 ppm

After realization of the water treatment system presently planned at Aksu mill (860 m^3/H), treated water is expected to clear the quality requirements set by the Turkish Government.

On the other hand, the renovation project will bring about two factors to increase the waste water discharge load: increased production of paper and newly installed DIP facilities. Thus, in the renovation plan, the reduction and circulatory recycling of water will be carried out more boldly, and a comprehensive waste water treatment system exclusively for the DIP waste water. Because the DIP waste water contains a considerable amount of BOD substance unlike the waste water from the existing process, a two-step waste water treatment system that combines physical separation and biochemical treatment will be employed for the DIP waste water, and then treated water therefrom will be clean enough to waste to Aksu River.

After the renovation, therefore, the total volume of pollutants discharged with waste water will be far smaller then the present level.

4.3 Industrial Waste Treatment

After the renovation, in addition to the existing waste, a large amount of sedimented wastes will be generated by water treatment system for general mill waste water and DIP waste water treatment system. Such wastes will be incinerated together with bark and solid waste from DIP unit. The ashes from the incinerator will be used for land filling.

4.4 Prevention of Air Pollution

After the renovation, sources of air pollutants emission are the boiler and incinerator. Currently, bunker C (fuel oil) with 2.78% sulfur content (acceptance limit: 4% max.)

is used for the power boiler. It is estimated that 47,000 Nm^3/Hr (damp) combustion gas with approximately 1,600 ppm of SO_2 concentration is now exhausted at present 46.6 T/Hr boiler load (height of stack is 25m).

In this region, there are no environmental regulations imposed on combustion gas emissions. There appears to be no special problem in this region.

When the renovation is implemented, the process incorporating energy saving measures will be employed. For this reason, fuel consumption and pollutant emissions will stay almost at the same level as it is now, though the production of paper will increase.

As for the newly installed waste incinerator, it will be provided with a device to eliminate dust and soot. Therefore no problems is expected thereof.

	Existing	Case 1	Case 2
Fuel Consumption in Boiler	4.01 T/H	4.01 T/H	4.07 T/H

4.5 Noise Abatement

The main sources of noises at Aksu mill are presumably the drum barker, impact sound of logs and exhaustion of the paper machine's dryer hood.

After the renovation, since the dryer hood will be replaced with muffling measures, the environment in terms of noise abatement will be much improved.

V. TOTAL PROJECT COSTS AND FINANCING

Each base cost was first calculated in relevant currency and then was converted to US dollars at the official exchange rate as of the end of February 1990. The following official exchange rates were used.

US$1=TL2,417.6
US$1=¥148.8

1. Total Capital Requirement

As descriptions of the costs related to the equipment, materials and construction work are given in IV, other costs are described below.

1.1 Taxes

Under the Turkish tax system now in force, the following four taxes should be taken into consideration in calculating the total project costs.

1.1.1 Corporate Tax

It is assumed that the local contractors are subject to the corporate tax, and 5 percent of the contract amount is appropriated for payment of the corporate tax. As the corporate tax rate (including funds) is 49.22 percent, it is assumed that approximately 10 percent of the said contract amount is deemed profits subject to the corporate tax.

1.1.2 Personal Income Tax

The personal income tax is levied on incomes of not only the local contractors' employees but also the foreigners dispatched to Turkey by the general contractor for supervision of the construction work and the equipment

installation work. It is assumed that incomes of foreigners who stay in Turkey for more than 12 months are subject to the personal income tax.

The foreigners who are to be dispatched to Turkey by the consultant and the general contractor for management of the construction work and assistance on operation of the plant and who are expected to stay in the country for more than 12 months running are:

Case 1

The general contractor's project engineer	18 months

Case 2

The general contractors' project engineer	23 months
The operation advisors	48 months
Total	71 months

1.1.3 Import Duties, etc.

In light of the investment incentives currently implemented in Turkey, it is assumed that excepting the fund payments, this project is exempt from import duties.

It is also assumed that 10 percent of the CIF prices of the imported items of equipment will be included in the total project costs as the fund payment cost.

1.2 Project Management

1.2.1 Technical Adviser

A foreign consultant will be hired for preparation of ITB, examination and evaluation of the tender documents and management of the plant construction work. The cost for this arrangement is estimated as follows.

Phase 1 (preparation of ITB through contracting)		30 M-M
Phase 2 (contracting through completion of construction work)	Case 1	20 M-M
	Case 2	27 M-M

1.2.2 Operation Advisors

This is the cost for the operation advisors after the start of commercial operation of the plant. This cost could have been included in the plant operation costs. As this cost, in combination with other investment costs, is often eligible for a long-term loan, it is included in the project management costs.

The number of the operation advisors and the period of their stay in Turkey were estimated as follows in consideration of the planned capacity utilization rate after the start of operation of the plant.

	No. of operation advisors	Period(months)	Total
Case 1	2	3	6 M-M
Case 2	2	24	48 M-M

The cost of the technical advisor's stay in Turkey was included in the owner's service, and the costs related to employment of the advisor was included in the general overheads.

1.3 Costs for Preparing for Start of Operation

1.3.1 Training

This is the cost required for training the plant's employees in the introduction of new technologies at the

vendor's factory. As it is assumed that two employees will be sent to the vendor's factory for a one-month, on-the-job training in the techniques of computer control. US$20,000 was appropriated for their travel and other expenses, and was included in the foreign currency category.

1.3.2 Trial Run Costs

In the two alternatives, a half-month trial run period and a one-month trial run period are incorporated in their respective schedules. The utility costs (electricity and heavy oil) and those of consumables were divided into the foreign currency and domestic currency categories.

1.4 Contingency

1.4.1 Physical Contingency

The physical contingency is to cover unforeseen supplies and services caused by possible changes in the conceptual design, the estimating conditions and the method of implementation of the construction work. The percentage distribution of the physical contingency is as shown below.

Equipment	5%
Removal and installation of equipment	10%
Construction/civil engineering	15%
Others	5%

1.4.2 Price Contingency

The price contingency is to cover possible rises in prices due to inflation during a period from the time of calculation of the base project cost (the end of February 1990) to the time of their accruement.

The annual inflation rates are estimated at 4.5 percent for the foreign currency category and 3.0 percent for the domestic currency category, both in US dollar terms.

1.5 Interest during Construction

Eighty five (85) percent of the total project costs will be covered by long-term loans. The interest rate will be 4 percent (Case A) or 10 percent (Case B) per annum, as follows.

Case 1A output: 100,000T/Y; interest rate on long-term loans: 4% p.a.

Case 1B output: 100,000T/Y; interest rate on long-term loans: 10% p.a.

Case 2A output: 130,000T/Y; interest rate on long-term loans: 4% p.a.

Case 2B output: 130,000T/Y; interest rate on long-term loans: 10% p.a.

Interest will be charged on loans from the time of borrowing through the time of start of commercial operation of the plant. The total interest charged on loans during the above period is the interest during construction.

1.6 Additional Working Capital

The additional working capital is to cover the variable costs excepting the electricity charges and the costs of consumables for the first one month after the start of operation. The costs of imported pulp and waste paper are included in the foreign currency category, and all the other variable costs in the domestic currency category, both as part of the investment costs.

1.7 Total Costs Required

Shown below are the total costs required, which were calculated taking into account the above-mentioned factors.

Case 1A	US$ 94,986,000
Case 1B	US$ 99,600,000
Case 2A	US$171,338,000
Case 2B	US$181,838,000

Tables V-1 to V-4 show breakdown of the total cost required for Cases 1A, 1B, 2A, and 2B.

Table V-1 TOTAL INVESTMENT COSTS (CASE-1A 100,000 T/Y)

[USD 1,000]

	FOREIGN CURRENCY	LOCAL CURRENCY	TOTAL
1. Site Preparation & Development	0	0	0
2. Plant Direct Cost	38,867	9,441	48,308
(a) Plant Equipment & Materials	35,778	2,000	37,778
(1) Wood Handling Section	0	6	6
(2) GWP Section	4,382	242	4,624
(3) DIP Section	5,544	303	5,847
(4) Stock Preparation	590	50	640
(5) Paper Machine	21,467	1,198	22,665
(6) Finishing Section	2,192	65	2,257
(7) Utility Facilities	0	38	38
(8) Auxiliary Facilities	1,603	98	1,701
(b) Spare Parts	3,089	0	3,089
(c) Dismounting Works	0	317	317
(d) Erection & Installation Works	0	4,037	4,037
(e) Civil & Building Works	0	3,087	3,087
3. Ocean Freight & Insurance	2,661	373	3,034
4. Local Handling & Inland Transportation	0	307	307
5. Construction Equipment	0	1,406	1,406
6 Indirect Field Expenses	212	887	1,099
7. General Contractor's Services	7,203	828	8,031
8. Tax & Funds	0	4,839	4,839
9. Project Management	1,260	185	1,445
(a) Owner's Services	0	123	123
(b) Technical Advisor	750	0	750
(c) Operation Advisor	90	0	90
(d) General Overheads	420	62	482
10. Pre-operation Expenses	49	230	279
(a) Training	20	0	20
(b) Test Run Expenditures	29	230	259
Total Project Cost (1990 Prices)	50,252	18,496	68,748
11. Physical Contingency	2,515	1,477	3,992
12. Price Contingency	12,512	3,059	15,571
13. Interest During Construction	2,918	0	2,918
14. Additional Working Capital	2,480	1,276	3,756
Total Project Cost (1995 Prices)	70,678	24,308	94,986

Table V-2 TOTAL INVESTMENT COSTS (CASE-1B 100,000 T/Y)

[USD 1,000]

	FOREIGN CURRENCY	LOCAL CURRENCY	TOTAL
1. Site Preparation & Development	0	0	0
2. Plant Direct Cost	38,867	9,441	48,308
(a) Plant Equipment & Materials	35,778	2,000	37,778
(1) Wood Handling Section	0	6	6
(2) GWP Section	4,382	242	4,624
(3) DIP Section	5,544	303	5,847
(4) Stock Preparation	590	50	640
(5) Paper Machine	21,467	1,198	22,665
(6) Finishing Section	2,192	65	2,257
(7) Utility Facilities	0	38	38
(8) Auxiliary Facilities	1,603	98	1,701
(b) Spare Parts	3,089	0	3,089
(c) Dismounting Works	0	317	317
(d) Erection & Installation Works	0	4,037	4,037
(e) Civil & Building Works	0	3,087	3,087
3. Ocean Freight & Insurance	2,661	373	3,034
4. Local Handling & Inland Transportation	0	307	307
5. Construction Equipment	0	1,406	1,406
6 Indirect Field Expenses	212	887	1,099
7. General Contractor's Services	7,203	828	8,031
8. Tax & Funds	0	4,839	4,839
9. Project Management	1,260	185	1,445
(a) Owner's Services	0	123	123
(b) Technical Advisor	750	0	750
(c) Operation Advisor	90	0	90
(d) General Overheads	420	62	482
10. Pre-operation Expenses	49	230	279
(a) Training	20	0	20
(b) Test Run Expenditures	29	230	259
Total Project Cost (1990 Prices)	50,252	18,496	68,748
11. Physical Contingency	2,515	1,477	3,992
12. Price Contingency	12,512	3,059	15,571
13. Interest During Construction	7,533	0	7,533
14. Additional Working Capital	2,480	1,276	3,756
Total Project Cost (1995 Prices)	75,292	24,308	99,600

Table V-3 TOTAL INVESTMENT COSTS (CASE-2A 130,000 T/Y)

[USD 1,000]

		FOREIGN CURRENCY	LOCAL CURRENCY	TOTAL
1.	Site Preparation & Development	0	0	0
2.	Plant Direct Cost	70,893	14,250	85,143
	(a) Plant Equipment & Materials	62,526	3,328	65,854
	(1) Wood Handling Section	0	6	6
	(2) GWP Section	5,999	298	6,297
	(3) DIP Section	5,544	303	5,847
	(4) Stock Preparation	1,440	85	1,525
	(5) Paper Machine	45,438	2,391	47,829
	(6) Finishing Section	2,502	72	2,574
	(7) Utility Facilities	0	75	75
	(8) Auxiliary Facilities	1,603	98	1,701
	(b) Spare Parts	8,367	0	8,367
	(c) Dismounting Works	0	837	837
	(d) Erection & Installation Works	0	6,290	6,290
	(e) Civil & Building Works	0	3,795	3,795
3.	Ocean Freight & Insurance	5,263	742	6,005
4.	Local Handling & Inland Transportation	0	610	610
5.	Construction Equipment	0	2,289	2,289
6	Indirect Field Expenses	376	1,302	1,678
7.	General Contractor's Services	13,347	1,679	15,026
8.	Tax & Funds	0	8,797	8,797
9.	Project Management	2,363	347	2,710
	(a) Owner's Services	0	231	231
	(b) Technical Advisor	855	0	855
	(c) Operation Advisor	720	0	720
	(d) General Overheads	788	116	904
10.	Pre-operation Expenses	101	574	675
	(a) Training	20	0	20
	(b) Test Run Expenditures	81	574	655
	Total Project Cost (1990 Prices)	92,343	30,590	122,933
11.	Physical Contingency	4,620	2,302	6,922
12.	Price Contingency	24,681	5,392	30,072
13.	Interest During Construction	6,550	0	6,550
14.	Additional Working Capital	3,405	1,456	4,861
	Total Project Cost (1996 Prices)	131,598	39,740	171,338

Table V-4 TOTAL INVESTMENT COSTS (CASE-2B 130,000 T/Y)

[USD 1,000]

	FOREIGN CURRENCY	LOCAL CURRENCY	TOTAL
1. Site Preparation & Development	0	0	0
2. Plant Direct Cost	70,893	14,250	85,143
(a) Plant Equipment & Materials	62,526	3,328	65,854
(1) Wood Handling Section	0	6	6
(2) GWP Section	5,999	298	6,297
(3) DIP Section	5,544	303	5,847
(4) Stock Preparation	1,440	85	1,525
(5) Paper Machine	45,438	2,391	47,829
(6) Finishing Section	2,502	72	2,574
(7) Utility Facilities	0	75	75
(8) Auxiliary Facilities	1,603	98	1,701
(b) Spare Parts	8,367	0	8,367
(c) Dismounting Works	0	837	837
(d) Erection & Installation Works	0	6,290	6,290
(e) Civil & Building Works	0	3,795	3,795
3. Ocean Freight & Insurance	5,263	742	6,005
4. Local Handling & Inland Transportation	0	610	610
5. Construction Equipment	0	2,289	2,289
6 Indirect Field Expenses	376	1,302	1,678
7. General Contractor's Services	13,347	1,679	15,026
8. Tax & Funds	0	8,797	8,797
9. Project Management	2,363	347	2,710
(a) Owner's Services	0	231	231
(b) Technical Advisor	855	0	855
(c) Operation Advisor	720	0	720
(d) General Overheads	788	116	904
10. Pre-operation Expenses	101	574	675
(a) Training	20	0	20
(b) Test Run Expenditures	81	574	655
Total Project Cost (1990 Prices)	92,343	30,590	122,933
11. Physical Contingency	4,620	2,302	6,922
12. Price Contingency	24,681	5,392	30,072
13. Interest During Construction	17,050	0	17,050
14. Additional Working Capital	3,405	1,456	4,861
Total Project Cost (1996 Prices)	142,098	39,740	181,838

2. Financing Plan

Although at this writing no decision has been made on the source of funds or concrete terms of loan, the following financing plan for this project has been tentatively assumed.

2.1 Capital Increase

In this study, it is assumed that 15 percent of this total amount of investment in this project (the total project costs) will be covered by capital increase so that this project may be eligible for the investment incentives.

2.2 Long-term Loans

It is assumed that 85 percent of the total amount of investment in this project will be covered by long-term loans.

Although the source of long-term loans is undecided, a soft loan arrangement with foreign public financial institutions and a commercial loan arrangement with private financial institutions are assumed here.

In this study, the following two sets of terms of loan are assumed.

Case A:

Interest rate:	4 percent per annum
Repayment term:	25 years, including a grace period of seven years
Method of repayment:	Principal repayment in annual equal installments

Case B:

Interest rate:	10 percent per annum
Repayment term:	10 years after a grace period(construction period)
Method of repayment:	Principal repayment in annual equal installments

VI. FINANCIAL ANALYSIS

1. Preconditions for Financial Analysis

1.1 Method of Financial Analysis

As in a project to construct a new facility, the investment effect of a facility renovation project is analyzed on the basis of the internal rate of return (IRR) and the net present value (NPV). Unlike in a project to construct a new facility, however, in a renovation project, the incremental cost and benefit in a case with a renovation project ("With" Case) is compared with that in a case without a renovation project ("Without" Case). In other words, the value of IRR found as a result of the comparison in terms of the incremental cost and benefit between Case 1 and the case without a renovation project indicates the investment effect of Case 1.

The figures to be included in the financial statements and the internal rate of return will be calculated on the basis of the constant prices for 1996, which will include price escalation up to the time of start of commercial operation of the plant in Case 2 (1996). (Case 2 has the longest period of construction work.)

Case 1A (output: 100,000T/Y; interest rate on long-term loans: 4 percent)
Case 1B (output: 100,000T/Y; interest rate on long-term loans: 10 percent)
Case 2A (output: 130,000T/Y; interest rate on long-term loans: 4 percent)
Case 2B (output: 130,000T/Y; long-term interest rate on long-term loans: 10 percent)

1.2 Relevant Currencies and Exchange Rates

The official exchange rates for the Turkish Lira and the Japanese yen against the US dollar as of the end of February 1990 will be used for conversion purposes.

US$1.00=TL2,417.6
US$1.00=¥148.8

1.3 Escalation Rate

The rate of price escalation to result from inflation during a period from February 1990, when an investigation was made of the estimated total project costs and the estimated purchase prices of raw material, to 1996, when commercial operation of the plant will be started in Case 2, is estimated.

1.3.1 Foreign Currency-Denominated Prices

The escalation rate for the foreign currency-denominated prices is estimated on the basis of the rate of depreciation of the US dollar and the rate of increase in the US dollar-denominated prices (MUV) of goods exported to developing countries from five advanced countries (France, West Germany, Japan, the United Kingdom and the United States). Shown in the following table are the World Bank's projections for the rates of increase for the US GNP deflator and MUV for 1990 to 1996. The average annual rate of devaluation of the US dollar for 1990 to 1996 is projected at 5.0 percent, and the rate of increase in MUV for the same period at 4.4 percent. OECF's projections for the inflation rates in the member countries also indicate that, in the United States, the inflation rate has been on the rise over the past few years.

	US GNP Deflator	MUV
1990	5.30	11.45 %
1991	4.70	1.43
1992	5.20	2.68
1993	5.40	7.45
1994	5.00	5.05
1995	4.90	5.18
1996	4.80	4.41

Based on these data, the average annual inflation rate for the foreign currency (US dollar)-denominated prices is estimated at 4.5 percent, and this figure will be used in the financial and economic analyses.

1.3.2 Domestic Currency (Turkish Lira)-Denominated Prices

The average annual rate of change in he exchange rate for the Turkish Lira against the US dollar for the past 10 years has been almost the same as that for the consumer price index for the same period. However, it fell far below the inflation rate in 1989. In this study, the increase rate in US dollar terms of the domestic currency-denominated prices are estimated at 3 percent on the assumption that the decline in the exchange rate for the Turkish Lira against the US dollar will come closer to the value obtained by subtracting the value of devaluation of the US dollar from the value of the rate of the domestic inflation rate.

1.4 Investment Incentives

The following assumption, which is based on the study team's consultations with SPO during its on-site investigation and SPO's "Foreign Investment Regulation and Application Forms" as amended in November 1989, is to be reflected in the financial analysis.

1.4.1 Import Duties

By obtaining an incentive certificate, this project will be exempted from import duties on imported equipment. As mentioned earlier, however, no preferential treatment is given to this project concerning the funds.

1.4.2 Investment Allowances

This is an incentive measure in which a project obtaining an incentive certificate is exempted from the corporate tax until a certain portion of the amount of investment is recovered as operating profit.

In the financial analysis, two years from 1996 to 1997 is to be considered a period during which this project will be exempt from the corporate tax in Case 1, and in Case 2 the five-year period from 1996 to 2000 is to be considered such a period, for purposes of convenience in calculation.

1.4.3 Resource Allocation Support Premium

This is a system in which an investment project obtaining an incentive certificate can receive a support premium from the Resource Allocation Support Fund established within the Central Bank of Turkey against payment of a certain percentage of the amount of investment out of owned capital. In this project, the percentage is set at 15 percent, and this amount is entered in the financial statements as part of non-operating income. At the time of calculation of IRR, this amount is included in operating profit.

1.5 Equipment's Useful Life

The equipment's useful life is set at 15 years after the start of operation. Since this project is scheduled to start operation in October 1995 in Case 1, or in May 1996 in Case 2, the equipment's useful life should end in 2010 in either case.

1.6 Production Plan

The mill's output in the case without a renovation project is estimated at 74,700 tons/year (300 working days/year) on the basis of data on its daily output as of February 1990.

In the cases with a renovation project, the mill's output is estimated as follows taking into consideration the possible suspension of operations during the construction work and the problems involved in techniques of operating the plant.

- Case 1

1994	74,700T/Y	
1995	41,180T/Y	74,700/12x3 (before renovation)+100,000/12x3x0.9 (after renovation)
1996-	100,000T/Y	100,000x1.0

- Case 2

1994	74,700T/Y	
1995	12,450T/Y	74,700/12x2 (before renovation)
1996	69,330T/Y	130,000/12x8x0.8 (after renovation)
1997	117,000T/Y	130,000x0.9
1998	123,000T/Y	130,000x0.95
1990-	130,000T/Y	130,000x1.0

1.7 Sales and Inventory Schedule Plan

1.7.1 Sales and Inventory Management Plan

In 1989, Aksu mill had two months' output (or one-sixth of the annual output for the year), on average, in stock. This was partly because the mill was still affected by the increase in imports of newsprint due to the strike in 1988. More important, however, was the fact that the country's major newspapers, which had begun to use imported newsprint superior in quality to home-produced newsprint, were still dependent on foreign supplies of newsprint even after the strike was brought to an end. In the case without a renovation project, product quality is unlikely to improve, while the inventory level will exceed last year's level to some extent. It would be too optimistic to expect that it will return to the level before the occurrence of the strike. Accordingly, the inventory level in the W/O case is set at 1.5 months' output.

The inventory levels in the cases with a renovation project are set as follows in consideration of the planned operating rate after the start of commercial operation.

- Case 1

1994	1.5 months (before renovation)
1995	no inventory
1996 -	0.5 month

- Case 2

1994	1.5 months (before renovation)
1995	no inventory
1996 -	0.5 month

1.7.2 Selling Prices

As mentioned earlier, at present, SEKA's selling prices of newsprint (ex-factory prices) are set 10 percent lower than the landed prices of imported newsprint. In some cases, the prices so set are further discounted by US$5.00 to US$10.00 (US$8.00 on average). The selling prices in the case without a renovation are estimated on the assumption that this pricing policy will be continued.

In setting the selling prices after renovation in the cases with a renovation, two problems, namely, improvement in product quality and lighter weight of newsprint, must be taken into consideration. As mentioned in "Renovation Implementation Plan" (Designing Conditions), the planned new product will be of the same quality as imported newsprint and the basis weight for the new product will be reduced from 48.8g/m^2 to 45g/m^2.

As for the possible effects of the reduction in weight, the present unit price per ton on the international market is inversely proportional to the basis weight. In this study, therefore, the selling prices of newsprint with a basis weight of 45g/m^2 are calculated on the basis of the international price (CIF Istanbul) projections (on a 48.8g/m^2 basis) mentioned in Chapter II.

In the case of home-made newsprint of the same quality as imported newsprint, it is reasonable to assume that its selling prices will be higher by five to ten percent than the landed prices of imported newsprint, given importation-related commercial charges and reduction in interest on inventory. In this study, however, the selling prices are set at the same level as the landed prices.

1.8 Elements of Variable Costs

Table VI-1 shows the units of output and the unit prices in 1990 for elements of the variable costs such as raw materials, services, chemicals and consumables. The financial analysis will be carried out on the assumption that the prices of imported goods like pulp will rise at an average annual rate of 4.5 percent and the prices of locally procured goods at an average annual rate of 3 percent, which is based on the escalation rates set earlier in this report. Described below are the main elements of the variable costs.

1.8.1 Pulpwood

In Turkey, a nationwide uniform price is set for pulpwood by the Forestry Agency, regardless of the place of felling and the type of pulpwood. As the transportation cost is defrayed by the mill, the distance from the source of supply of pulpwood to the mill directly affects the material cost at the mill.

However, looking over the weighted average distance from wood since to the mill during the part 3 years i.e. 287 km (1987), 299 km (1988) and 315 km (1989), there is not substantial charge in the distance though slight increasing tendency is identified. Therefore, current delivered cost including tracking charge is assumed applicable to the study.

Table VI-1 MATERIAL / UTILITIES UNIT CONSUMPTION

	W/O CASE (74,700 T/Y)		CASE-1 (100,000 T/Y)		CASE-2 (130,000 T/Y)	
Wood	2.37	CUM/P.Ton	1.44	CUM/P.Ton	1.50	CUM/P.Ton
Kraft Pulp	0.22	T/P.Ton	0.21	T/P.Ton	0.26	T/P.Ton
Waste Paper	0.00	T/P.Ton	0.37	T/P.Ton	0.28	T/P.Ton
Power (TEK)	1,398	KWH/P.Ton	1,247	KWH/P.Ton	1,350	KWH/P.Ton
Fuel Oil	0.415	T/P.Ton	0.301	T/P.Ton	0.253	T/P.Ton

P.Ton : Product Ton

1.8.2 Kraft Pulp

At Aksu mill, home-produced kraft pulp supplied from Dalaman mill has been used together with kraft pulp imported from the United States and other countries. There is a wide price differential between the two types of kraft pulp. According to the data obtained from SEKA, the price of imported kraft pulp is two to three times higher than that of the Dalaman mill's kraft pulp. However, priority is given to imported kraft pulp at Aksu mill, mainly from the standpoint of quality. In 1989, no home-made kraft pulp was purchased at the mill. So the price of imported kraft pulp will be used in the financial analysis on the assumption that this trend will continue.

1.8.3 Chemicals

Chemicals can be divided broadly into the following four categories.

a. Chemicals for use in the paper making process
b. Chemicals for use in GP bleaching
c. Chemicals for use in the DIP process
d. Chemicals for use in treatment of waste water (or solid waste)

(1) Chemicals for Use in the paper making process

In principle, there is no difference in types of chemicals used and consumption per product ton between the case without a renovation project and those with a renovation project.

In Case 2, however, talc will be required for the treatment of the pitch of pine mixed with pulpwood.

(2) Chemicals for use in GP bleaching

Chemicals for use in bleaching at the newly constructed GP plant are as shown below.

	Case 1	Case 2
NaOH	476T/Y	514T/Y
Na_2SiO_3	952T/Y	963T/Y
H_2O_2	714T/Y	835T/Y
DTPA	10T/Y	13T/Y
H_2SO_4	762T/Y	1028T/Y

(3) Chemicals for Use in the DIP Process

The quantities of the chemicals used for 33,000BDT/year of waste paper are as follows.

NaOH	470T/Y
Na_2SiO_1	933T/Y
H_2O_2	311T/y
De-inking agent	12T/Y

The costs per ton of these chemicals were calculated on the basis of their present unit prices.

(4) Chemicals for Use in Treatment of Waste Water (or Solid Waste)

The waste treatment equipment which is to go into operation in 1993 and the equipment to treat waste water from the DIP plant after the start of commercial operation will require alum as treating chemical.

1.8.4 Electricity

Aksu mill is generating electric power with a steam turbine power generator installed within it to cover part of its demand for electric power, while purchasing electricity from TEK.

As the cost of the electricity generated with its own power generator is included in the cost of heavy oil, only the cost of purchase of electricity from TEK, namely the basic charge and the power consumption rates were included in the cost of electricity.

1.9 Elements of Fixed Costs

1.9.1 Personnel Expenses and Related Expenses

Aksu mill presently has a personnel of 808. The present personnel should be maintained even while the mill's operations are stopped because of the construction work under this project. After renovation, it will be possible to operate the plant with the present personnel. Thus it is assumed that this project will require no increase in the number of staff, except for the personnel in charge of the waste treatment equipment.

The personnel expenses in the cases with a renovation project and the W/O case were calculated based on the data received from Aksu mill.

It should be noted that 10 percent of the personnel expenses will be appropriated for employees' welfare and 20 percent for general administration.

1.9.2 Maintenance/Repair Cost

It is expected that the plant maintenance/repair cost will increase from year to year as the equipment becomes more and more worn-out. In the case without a renovation project, it is assumed that output of 74,700 tons/year will be maintained. In this case, however, it will be necessary to carry out a major repair work every five or ten years.

Generally, the plant maintenance/repair cost (which includes the cost of the above-mentioned major repair work) can be expressed as a ratio to the cost for purchase of equipment. If the ratio of the maintenance/repair cost to the cost for purchase of equipment (excluding price increases due to inflation) for the first year of operation is estimated at about 3 percent, and that 30 years after the start of operation at about 7 percent, the estimated average annual increase rate for the maintenance/repair cost for the period is 3 percent.

It is assumed, therefore, on the basis of the average annual maintenance/repair cost of US$1,167,000 for 1985-89, that the maintenance/repair cost will increase at an average annual rate of 3 percent from 1990 on. However, the average annual increase rate until 1996 will be 6 percent since a 3 percent escalation rate is added every year until 1996.

In the cases with a renovation project, 3 percent of the cost for purchase of equipment (CIF prices) will be appropriated every year for maintenance and repair of the new equipment during the 15-year period. For maintenance and repair of the existing equipment, 15 percent (Case 1) or 5 percent (Case 2) of the maintenance/repair cost in the case without a renovation project will be appropriated.

1.9.3 Depreciation and Amortization

A schedule for depreciation of the mill's existing equipment and the waste water treatment equipment to be constructed from 1990 and 1992 was worked out in accordance with the legal provisions in Turkey and on the basis of the book value as of the end of 1989.

It is assumed that the new equipment will also be in accordance with the legal provisions in Turkey. Intangible fixed property is to be amortized over a five-year period in a straight line method, with no residual value left after completion of the amortization.

1.9.4 Taxes/Public Charges and Insurance

It is assumed that 1.0 percent of the book value of the fixed assets will be set aside for payment of the real estate tax and insurance premiums on the mill's equipment.

1.9.5 Selling Expenses

The selling expenses are direct expenses for selling and promotion, and it is assumed that they will account for 1.0 percent of the gross sales.

1.10 Inventory Management Plan for Raw Materials

In light of the past records of the mill's inventory control, the mill's future inventory level for raw materials is set at one month's stock of all elements of the variable costs, excepting electric power and consumables.

The following are proposed measures to cope with the suspension of operations during the construction work.

- To reduce the ratio of inventory holdings to production to zero during a month immediately before the suspension of operations.
- To secure one month's stock of raw materials before operations are resumed. The costs required for this arrangement are included in the total project costs as part of the additional working capital.

1.11 Current Assets and Current Liabilities

Neither accounts receivable nor accounts payable are considered in this study as at present sales of products and purchases of raw materials are settled mainly in cash. The amount of cash at hand is set at a half-month proportion of the cash factory cost.

1.12 Short-Term Loans

Shortfalls of funds while the mill is in operation are to be covered by short-term loans. In the financial analysis, the interest rate on such loans is assumed at 7 percent.

2. Financial Analysis

2.1 Present Condition of Assets

As this study is to investigate the profitability of a project to renovate the plant which is currently in operation, it is necessary to carry out projections on a continual basis with the present condition of the plant's assets as the starting point.

The figures in Aksu mill's balance sheet in US dollar terms as of the end of 1989 were converted into US dollars, and then the financial projections for 1990 and beyond were carried out on the basis of the above-mentioned preconditions and on the assumption that the current state of assets will remain as it is.

2.2 Financial Analysis

2.2.1 Financial Internal Rate of Return

The financial internal rates of return (FIRR) for Cases 1A to 2B are as shown below.

FIRR (based on 1996 constant prices)

	Before tax	After tax
Case 1A	16.84%	13.02%
Case 1B	16.84%	13.42%
Case 2A	5.54%	4.69%
Case 2B	5.54%	5.51%

It is concluded that the implementation of Case-1 is fairly feasible under soft loans though FIRR of 16.84% may not be acceptable for commercial loans.

The IRR for Case 2 is lower than that for Case 1 for the following two reasons.

a. In Case 2, the proposed period of suspension of operations is 14 months, while in Case 1, it is 6 months.

b. It is in 1999, or four years after the start of operation, that the capacity utilization rate will reach 100 percent.

2.2.2 Sensitivity Analysis

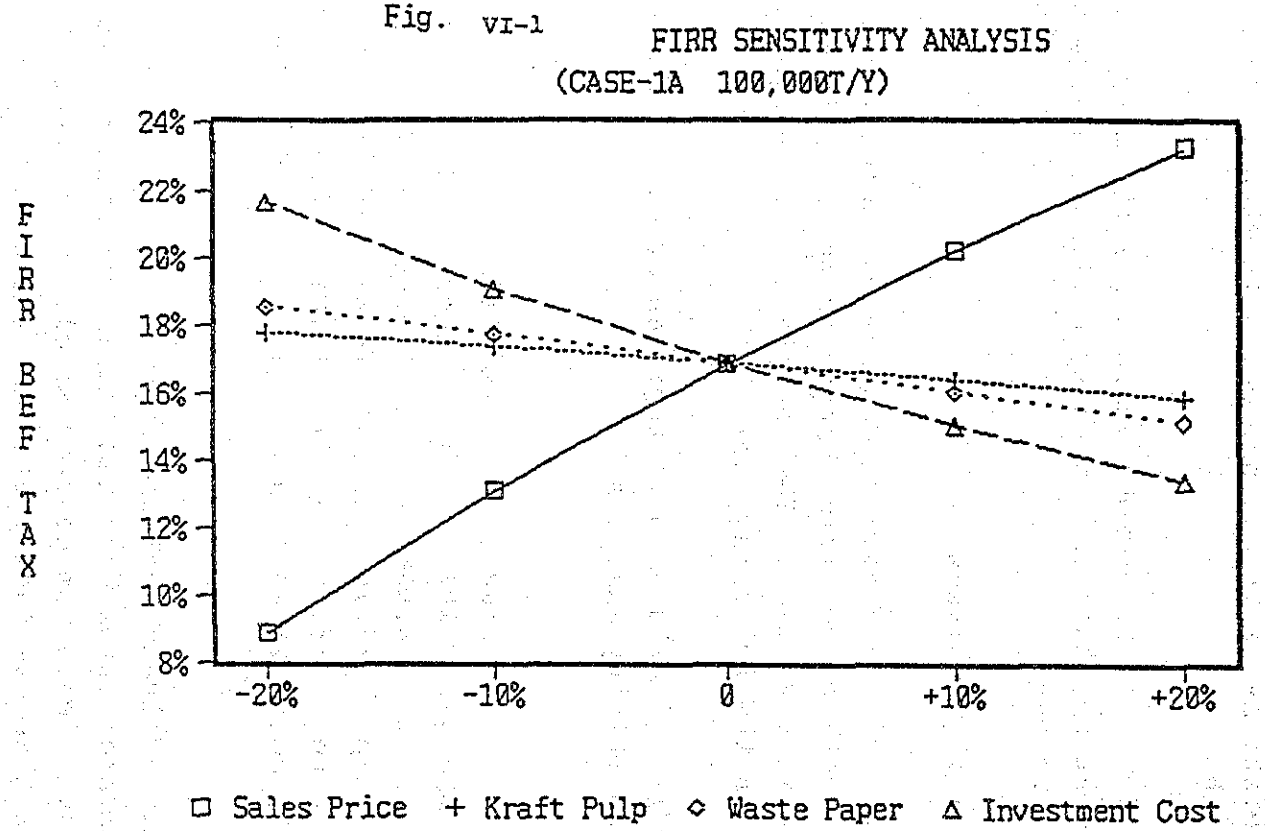
A sensitivity analysis of Case 1A was conducted to examine the effects of possible changes in the main items of the financial statement. The results of the analysis are as shown in the following table.

Fig. VI-1 gives a graphic representation of the results of the sensitivity analysis.

	FIRR before Tax (Case 1A)				
Items changed	-20%	-10%	Base	10%	20%
Sales price	8.86%	13.11%	16.84%	20.22%	23.32%
Kraft pulp	17.75	17.30	16.84	16.37	15.88
Waste paper	18.49	17.67	16.84	16.01	15.16
Invest. cost	21.65	19.02	16.84	15.00	13.41

In this analysis, calculation was made on the basis of the incremental investment and the incremental profit in the W/O case. When the cost of an element becomes 10 percent higher than originally planned, the same element in the W/O case is also made 10 percent higher than originally planned.

Fig. VI-1


FIRR SENSITIVITY ANALYSIS
(CASE-1A 100,000T/Y)
FIRR BEF TAX
24%
22%
20%
18%
16%
14%
12%
10%
8%
-20%
-10%
0
+10%
+20%
□ Sales Price
+ Kraft Pulp
◇ Waste Paper
△ Investment Cost

Although the FIRR is greatly affected by changes in the selling prices and the amounts of investment funds, it is less sensitive to changes in the prices of kraft pulp and waste paper.

VII. ECONOMIC AND SOCIAL ANALYSIS

1. Economic Prices

The economic analysis is aimed at evaluating the national benefits which is calculated by replacing the financial value(market prices) of the resources (labor, capital, raw materials) to be invested in this project with their economic prices.

The economic prices were set as follows.

(1) As the taxes, tariffs and funds are revenues of Treasury, they are excluded from the total project costs as transfer items.

(2) Manufactured goods are generally considered trade goods. Therefore, the border prices of trade goods based on their international prices are regarded here as their economic prices.

(3) Labor Cost

The economic wages for unskilled workers in a country with a large unemployed population, namely the intrinsic value of labor force, can be considered lower than the actually paid wages.

Of the data received from Aksu mill, it was assumed that the economic wages and salaries of the plain workers account for 50 percent of the total, and the personal income taxes were excluded form the mill's total wages and salaries to obtain the economic prices for the personnel expenses.

2. Economic Analysis

2.1 Economic Internal Rate of Return

The following table shows the values of the economic internal rate of return (EIRR) (the values were calculated by using the economic prices) and the net present value (NPV), in which the opportunity cost of capital (OCC) in Turkey is used as the discount rate (12 percent), for Case 1 and Case 2.

	EIRR	NPV
	(unit : US$ 000)	
Case 1	13.91%	7,988
Case 2	0.36%	-75,230

While in Case 1 both EIRR and NPV are feasible enough, in Case 2 EIRR is 0.36 percent, which is lower than the value of OCC. Naturally, the value of NPV is less than zero in Case 2. From this, it may be given as a conclusion that Case 2 is economically hard to implement. From the standpoint of national economy, it is desirable that the fund should be utilized more effectively in the other project with a higher investment effect.

2.2 Sensitivity Analysis

The following table shows results of a sensitivity analysis of Case 1, which was carried out in the same way as in the sensitivity analysis conducted as part of the financial analysis.

The pattern of sensitivity of each variable element is almost the same as in the financial analysis.

EIRR(Case 1)

	-20%	-10%	0	10%	20%
Sales price	5.87%	10.17%	13.91%	17.27%	20.34%
Kraft pulp	14.99	14.46	13.91	13.35	12.76
Waste paper	15.64	14.78	13.91	13.03	12.13
Invest. cost	18.35	15.92	13.91	12.21	10.75

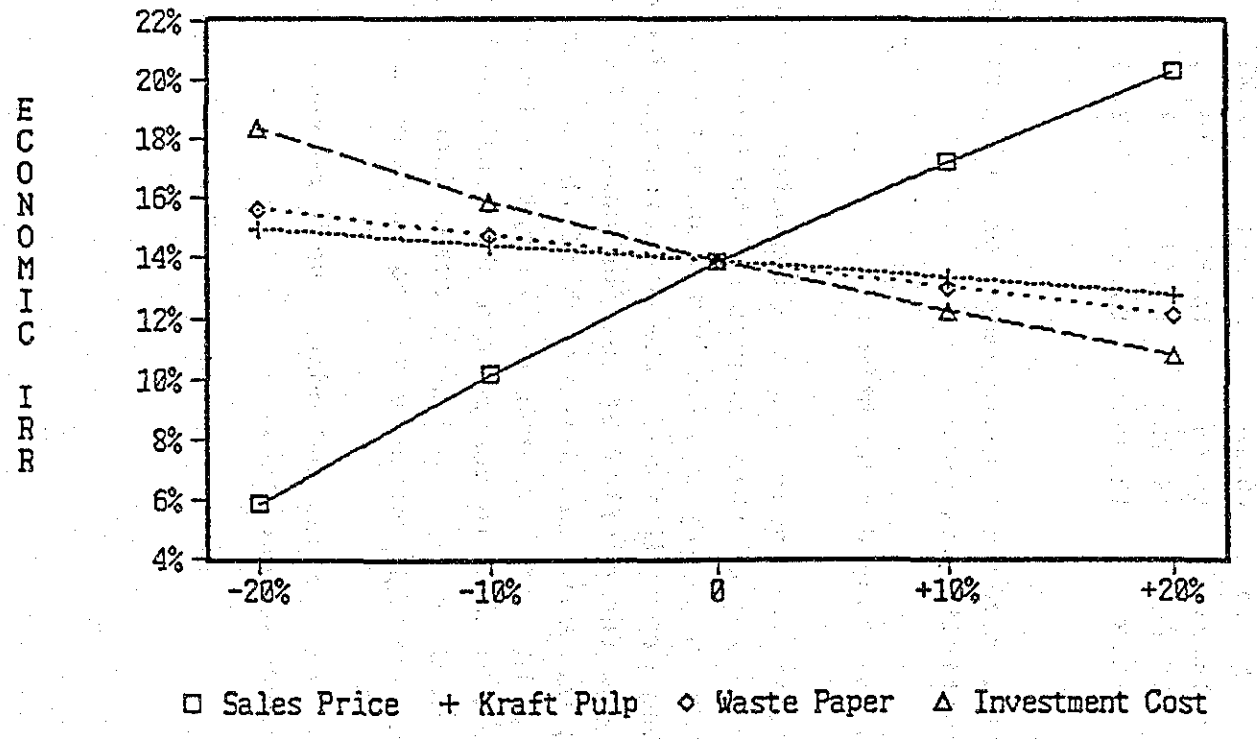
Fig. VII-1 gives a graphic representation of the results of the sensitivity analysis.

2.3 Foreign Currency Saving Effect

Calculation for evaluating the expected effects of the implementation of this project on the foreign currency situation in Turkey was conducted on the basis of the following preconditions. The differential between the inflow and the outflow of foreign currencies (i.e. net inflow) was calculated for each of the W/O case, Case 1A and Case 1B. The differential in net inflow between Case 1A and the W/O case is considered the gross foreign currency saving in Case 1A, and that between Case 1B and the W/O case the foreign currency saving in Case 1B.

a. All the prices and costs shall be those adopted in the financial analysis.

Fig. VII-1 EIRR SENSITIVITY ANALYSIS
(CASE-1 100,000T/Y)



b. In Turkey, domestic demand for newsprint exceeds the domestic newsprint production capacity, and this trend will remain unchanged after the implementation of this project. It is thus expected that the shortfall in output will be covered by imports as at present. For this reason, the planned increase in output through this project can be considered import substitution, or have an effect of inflow of foreign currencies. In Case 1A and Case 1B, the output differentials between these cases and the W/O case(74,700 tons/year) can constitute an inflow of foreign currencies in terms of CIF prices(including commercial charges which account for 3.5 percent of the total).

c. The following portions of the prices of raw materials are considered an outflow of foreign currencies.

Pulp	94%
Waster Paper	71%
Consumables	73%

d. Of the maintenance/repair costs, 60 percent is considered the cost of materials, and 80% there of imports. Accordingly, 48 percent of the total maintenance/repair costs is considered an outflow of foreign currencies.

As seen in Tables VII-1 and 2, Case 1 is judged to be highly feasible as result of examination of EIRR and NPV in this case. Case 1A, in particular, is expected to have a foreign currency saving effect, greatly contributing to the improvement in the foreign currency situation in the country, if it is implemented.

Table VII-1 INCREMENTAL FOREIGN CURRENCY BALANCE (CASE-1A)

[USD 1,000]

	IMPORT SUBSTITUTION BY PRODUCTION INCREASE	FOREIGN LOAN	TOTAL IN-FLOW	ACC. IN-FLOW	FOREIGN PORTION OF INVESTMENT COST	REPAYMENT OF FOREIGN LOAN	INTEREST ON FOREIGN LOAN	MATERIAL IMPORT (a) KRATT PULP	(b) WASTE PAPER	COMSUMABLES	PARTS FOR MAINTENANCE	TOTAL OUT-FLOW	ACC. OUT-FLOW	NET IN-FLOW	ACC. NET IN-FLOW
			(1)									(2)		(1)-(2)	
Case-1A															
1993	0	799	799	799	825	0	0	0	0	0	0	825	825	-26	-26
1994	0	46,396	46,396	47,195	40,331	0	0	0	0	0	0	40,331	41,156	6,065	6,039
1995	-18,045	33,543	15,498	62,693	29,522	0	807	-8,913	1,110	-513	-277	21,736	62,892	-6,239	-200
1996	16,160	0	16,160	78,853	0	0	3,230	5,594	5,156	450	474	14,904	77,796	1,256	1,057
1997	19,377	0	19,377	98,230	0	0	3,230	5,594	5,156	450	453	14,883	92,679	4,494	5,551
1998	19,377	0	19,377	117,608	0	0	3,230	5,594	5,156	450	431	14,860	107,540	4,517	10,068
1999	19,377	0	19,377	136,985	0	0	3,230	5,594	5,156	450	408	14,838	122,378	4,539	14,607
2000	19,377	0	19,377	156,362	0	4,485	3,230	5,594	5,156	450	384	19,299	141,677	78	14,685
2001	19,377	0	19,377	175,739	0	4,485	3,050	5,594	5,156	450	360	19,095	160,773	282	14,967
2002	19,377	0	19,377	195,117	0	4,485	2,871	5,594	5,156	450	336	18,891	179,664	486	15,453
2003	19,377	0	19,377	214,494	0	4,485	2,691	5,594	5,156	450	310	18,686	198,350	691	16,144
2004	19,377	0	19,377	233,871	0	4,485	2,512	5,594	5,156	450	283	18,480	216,830	897	17,041
2005	19,377	0	19,377	253,248	0	4,485	2,332	5,594	5,156	450	256	18,273	235,103	1,105	18,146
2006	19,377	0	19,377	272,626	0	4,485	2,153	5,594	5,156	450	228	18,066	253,169	1,311	19,457
2007	19,377	0	19,377	292,003	0	4,485	1,974	5,594	5,156	450	199	17,858	271,027	1,519	20,976
2008	19,377	0	19,377	311,380	0	4,485	1,794	5,594	5,156	450	169	17,648	288,675	1,729	22,705
2009	19,377	0	19,377	330,758	0	4,485	1,615	5,594	5,156	450	139	17,439	306,114	1,938	24,643
2010	19,377	0	19,377	350,135	0	35,888	1,435	5,594	5,156	450	108	48,630	354,745	-29,253	-4,610
Total	269,397	80,738	350,135		70,678	80,738	39,384	75,000	78,450	6,232	4,263	354,745		-4,610	

Table VII-2 INCREMENTAL FOREIGN CURRENCY BALANCE (CASE-1B)

[USD 1,000]

	IMPORT SUBSTITUTION BY PRODUCTION INCREASE	FOREIGN LOAN	TOTAL IN-FLOW	ACC. IN-FLOW	FOREIGN PORTION OF INVESTMENT COST	REPAYMENT OF FOREIGN LOAN	INTEREST ON FOREIGN LOAN	MATERIAL IMPORT (a) KRAFT PULP	(b) WASTE PAPER	COMSUMABLES	PARTS FOR MAINTENANCE	TOTAL OUT-FLOW	ACC. OUT-FLOW	NET IN-FLOW	ACC. NET IN-FLOW
			(1)									(2)		(1)-(2)	
Case-1B															
1993	0	799	799	799	825	0	0	0	0	0	0	825	825	-26	-26
1994	0	46,396	46,396	47,195	40,331	0	0	0	0	0	0	40,331	41,156	6,065	6,039
1995	-18,045	37,466	19,421	66,616	34,137	2,117	2,117	-8,913	1,110	-513	-277	29,778	70,934	-10,358	-4,319
1996	16,160	0	16,160	82,776	0	8,466	8,254	5,594	5,156	450	474	28,394	99,328	-12,234	-16,552
1997	19,377	0	19,377	102,153	0	8,466	7,408	5,594	5,156	450	453	27,527	126,855	-8,150	-24,702
1998	19,377	0	19,377	121,531	0	8,466	6,561	5,594	5,156	450	431	26,657	153,513	-7,280	-31,982
1999	19,377	0	19,377	140,908	0	8,466	5,715	5,594	5,156	450	408	25,789	179,302	-6,412	-38,394
2000	19,377	0	19,377	160,285	0	8,466	4,868	5,594	5,156	450	384	24,918	204,220	-5,541	-43,935
2001	19,377	0	19,377	179,662	0	8,466	4,021	5,594	5,156	450	360	24,047	228,268	-4,670	-48,605
2002	19,377	0	19,377	199,040	0	8,466	3,175	5,594	5,156	450	336	23,176	251,444	-3,799	-52,404
2003	19,377	0	19,377	218,417	0	8,466	2,328	5,594	5,156	450	310	22,304	273,748	-2,927	-55,331
2004	19,377	0	19,377	237,794	0	8,466	1,482	5,594	5,156	450	283	21,431	295,179	-2,054	-57,385
2005	19,377	0	19,377	257,171	0	6,350	635	5,594	5,156	450	256	18,441	313,620	937	-56,448
2006	19,377	0	19,377	276,549	0	0	0	5,594	5,156	450	228	11,428	325,048	7,949	-48,499
2007	19,377	0	19,377	295,926	0	0	0	5,594	5,156	450	199	11,399	336,447	7,978	-40,521
2008	19,377	0	19,377	315,303	0	0	0	5,594	5,156	450	169	11,369	347,816	8,008	-32,513
2009	19,377	0	19,377	334,681	0	0	0	5,594	5,156	450	139	11,339	359,155	8,038	-24,475
2010	19,377	0	19,377	354,058	0	0	0	5,594	5,156	450	108	11,307	370,463	8,070	-16,405
Total	269,397	84,661	354,058		75,293	84,661	46,564	75,000	78,450	6,232	4,263	370,463		-16,405	

2.4 Other Economic Effects

As a result of the financial and economic analyses, it was concluded that Case 1A, which is an alternative aimed at raising the present output of 74,700 tons/year to 100,000 tons/year applying a soft loan arrangement, is highly feasible and is therefore a project desirable from the standpoint of national economy.

Of the economic effects of the implementation of this project, it is impossible to quantify the following.

a. Technology Transfer Effect

SEKA owns a total of 9 pulp and paper mills, including the Aksu mill. When the mill's newsprint output is increased and its paper-making and plant management/operation techniques are enhanced as a result of the implementation of this project at the mill, the project's effects will naturally be reflected in the way the other mills are operated and managed. Thus, the implementation of this project is expected to result in improvements in capacity utilization and reductions in manufacturing costs at SEKA's paper mills.

b. Resource Saving Effect

Recycling of waste paper is incorporated into this project from a resource saving point of view. The implementation of this project is expected to contribute to the increase in the waste paper collection rate in Turkey, which has not yet reached a satisfactory level, as well as to forest conservation in the country.