

GOVERNMENT OF BANGLADESH
MINISTRY OF ENVIRONMENT AND FORESTS

FINANCIAL ANALYSIS

FORESTRY MASTER PLAN



ASIAN DEVELOPMENT BANK (TA NO. 1355-BAN)

UNDP/FAO BGD/88/025

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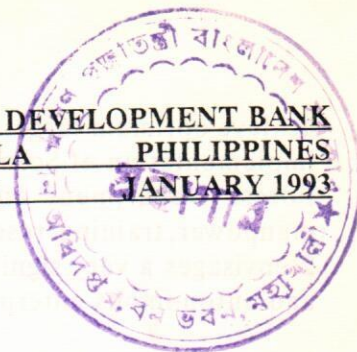
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FINANCIAL ANALYSIS

SUMMARY

General - Forestry development as envisaged in the Master Plan Programmes parallels the overall and sector-specific national goals, objectives, policies, and development efforts. The Government of Bangladesh is strongly committed to overcome the serious problems prevailing in the forestry sector. This commitment was emphasized in the policy pronouncement and the objectives outlined in the Fourth Five Year Plan. These objectives are: (1) rehabilitation or reforestation of denuded and degraded national forest; (2) bringing all possible vacant public and private lands under tree cover; (3) meeting basic needs of all forest products by integrating trees with farming and traditional land use; (4) improving the general environment for supporting agricultural and other biological production; (5) creation of employment opportunities for the landless poor, marginal farmers and women; (6) conservation of the country's ecology and biodiversity and (7) adoption of different wood conservation techniques.

It is expected that these objectives will expand the tree cover area of the country, increase supply of forest products to meet the deficit and growing demand and also improve the overall environmental condition of the country. Attaining these sectoral planning objectives requires programmes which: (1) upgrade the management and exploitation of existing hill forest; (2) improve the management and expand the areas of the coastal mangrove forest; (3) increase the production of biomass fuels by supporting homestead plantings and establishing people-oriented plantations on public lands; (4) establish large scale industrial plantations on degraded state forest lands; and (5) enhance the capacity of the Forest Department in the efficient management and protection of the forest areas.

Responding to these Government forestry sector objectives, the Master Plan design focuses on:

- Promoting the efficient and judicial use of natural resources.
- Ensuring the sustainable productive capacity of natural resources.
- Expanding implementation of community-based natural resources management and conservation.
- Achieving a more equitable sharing of the benefits derived from the development and utilization of resources.
- Increasing the sector's contribution to the national efforts directed towards poverty alleviation and enhanced welfare of small farmers and landless workers.
- Maintaining and improving the ecological balance.

The plan presumes the following basic policies in forestry development and husbandry:

- Forest renewal and rehabilitation is the immediate and foremost concern in the sector, not only for restoring environmental stability, but also for ensuring a stable resource base for people's use and the wood industry.
- Conservation of the remaining forest resources requires much more attention.
- Community-based forest management is a basic strategy for promoting a more equitable distribution of benefits from the forests.
- Revitalization and development of the wood and other forest-based industries is undertaken based on their revenue, foreign exchange, employment and sustainable potential.

Estimated Costs - Two development options are proposed under the Master Plan. Scenario 1 represents a modest level of investment and Scenario 2 is based on a high level of investment to

achieve optimum targets set under different programme components. The assumption is that the implementation of Scenario 1 is undertaken by the existing institutional setup of the Bangladesh Forest Department and substantial strengthening is proposed in terms of infrastructure, manpower, training, research, monitoring and other support services. On the other hand, Scenario 2 envisages a very significant restructuring of the forestry sector and creates a new department and autonomous enterprises.

The costs of the different Master Plan programmes for each five-year period in the 20-year plan are separately estimated for Scenario 1 and 2. The five major programmes and their subprogrammes and main components vary by their nature and costing principle. However, the basic costing method in all programmes has been the unit cost approach. Each programme has its own set of quantitative targets, activities, and corresponding implementation schedule as presented in the subteam reports. To the extent possible, appropriate units costs are identified and applied for costing of these programmes and their components. Since the Master Plan presents a macro level plan, the costs of each programme is indicative, specific projects and investment packages need more detailed costing.

Scenario 1 - Estimated Scenario 1 cost is Tk 54.4 billion (US\$ 1.5 billion), including physical contingencies of Tk 2.3 billion (US\$ 60 million) which is about four percent of the base cost. Foreign exchange costs amount to Tk 16.9 billion (US\$ 435 million) or about 31 percent of total plan cost. Approximately 76 percent of the cost covers the investment items and their corresponding contingencies, while recurrent costs take up the remaining 24 percent.

Scenario 2 - Total plan costs under Scenario 2 over the 20-year period is Tk 131.0 billion (US\$ 3.4 billion) of which physical contingencies represent about four percent of the base cost or Tk 5.2 billion (US\$ 135 million). Foreign exchange component amounts to Tk 42.4 billion (US\$ 1.1 billion) representing about 32 percent of the plan cost. Of the total cost, about 71 percent covers investment items and the rest, 29 percent, accounts for recurrent costs which mainly include incremental staff salaries and operation and maintenance of facilities, equipment and vehicles.

Financing Plan - Suggested financing for the 20-year Master Plan is proposed for sharing between the Government of Bangladesh, donors and the private sector, as follows under both Scenarios:

Government Financing - In Scenario 1 the overall government financing of the total plan cost is 35 percent or US\$ 492 million. At a programme level, the range varies between three percent and 62 percent of the total financing. The financing will mainly cover the taxes and duties component, land acquisition, and the major portion of the incremental recurrent costs in terms of staff salaries and operation and maintenance of facilities.

Proposed Government financing of Scenario 2 is US\$ 92 million representing about three percent of the total plan costs. This amount will be required to support the Forest Department activities responsible to oversee the development activities in the sector through regulatory measures.

Donor Financing - Under Scenario 1, anticipated donor financing is US\$ 885 million, about 63 percent of the total Plan costs coming from different donor agencies supporting this development option. In Scenario 2, total external financial assistance remains almost the same relatively, but in absolute terms, external financial requirements are substantial to support implementation of this development option. About US\$ 2.2 billions is expected from the external sources, representing about 64 percent of the total cost.

Private Sector Financing - The private sector is assumed to participate actively in Master Plan implementation and funding. The bulk of private financing occurs in participatory forestry, wood-based energy and wood-based industries. These programmes cover 81% of all private

financing and are carried mainly by the participants and industrial companies. Private sector financing also includes small-scale operations in wood and non wood forest industries as well as non governmental organizations. In people-oriented forestry, the individual forest occupants' labour input is included under private financial resources.

Anticipated Benefits - Substantial forest product production, employment, social and economic and environmental benefits are expected in the following ways:

Production Benefits - By the end of the plan period, sawlog production from both forest production and participatory forestry increases substantially under both development options. Incremental production under Scenario 1 is 2.7 million m³/A (valued at Tk 12.3 billion or US\$ 317 million) at the plantation gate. Under Scenario 2, sawlog production is 5.9 m³/A (valued at Tk 26.5 billion or US\$ 680 million). Based on the plantation program, peak incremental production occurs at year 35 under Scenario 1 and year 30 under Scenario 2. The estimated value of this incremental production is Tk 365.9 billion (US\$ 9.4 billion) and Tk 473.2 billion (US\$ 12.2 billion) under Scenario 1 and 2, respectively. These estimates use financial prices expressed in 1993 constant values. The value of the incremental production of other products, consisting of pulpwood, poles and fuelwood over the same period is estimated at Tk 219 billion (US\$ 5 billion) under Scenario 1 and Tk 338 billion (US\$ 9 billion) under Scenario 2.

Employment Generation - On-farm employment opportunities increase by about 0.86 million person years under Scenario 1 and 1.3 million person years under Scenario 2 over the 20-year period. The development and maintenance of the physical facilities for the plan will generate about 1.18 person years and about 3.32 million person years of additional employment under Scenario 1 and 2, respectively. Increased labour absorption reflects the reduction of the present high level of unemployment and underemployment of family labour, particularly on the smaller farms and landless families. Further employment opportunities occur due to increased demand for logging, transportation, processing and marketing services.

Poverty Alleviation - Implementing the Master Plan contributes positively towards the Government's efforts to alleviate poverty in the rural areas. Plan implementation of the Master Plan would lead to a better quality of life for the rural people which will result from increased availability of fuelwood for cooking, more timber for shelter, increased security from natural disaster because of a better soil cover and better amenities from protected areas.

The overall increase in the demand for labour for plantation development in state forests is estimated at 0.56 and 0.67 million person years under Scenario 1 and 2 respectively over the plan period. This increase in the additional employment opportunities can employ 192,000 families living around the forest areas, especially landless and small farmers. The average increase in wage income for each of these families is estimated at Taka 15,000/A.

Participatory programmes generate additional employment amounting to about 0.28 million person years under Scenario 1 and about 0.65 million under Scenario 2. Increased employment opportunities will generate wage income for the participating families equal to Tk 15,000/A, supplementing their farm incomes. In addition to the increased wage income, participants benefit from the fruit and other forest products produced.

Women's Welfare - Master Plan programmes involve women in the implementation of the nursery, agroforestry, woodlot plantation and strip plantation activities in the participatory programme, contributing substantially to family income. As well, increased fuelwood production will reduce the time spent collecting fuel and allow them to undertake other economic activities to gain income. This additional income improves the living conditions of themselves and their children.

Environmental Impact - The forest resources of Bangladesh are depleting very rapidly to supply the needs of the increasing population for fuelwood, timber, fodder, and other forest products, as well as land for food production and settlements. The overall strategy of the Master Plan is to improve the management of the forestry resources of the country and to better balance population needs, production systems, and sustainable resource levels. Its action programmes will have substantial, positive impact on the environment. They will restore degraded areas, control exploitation of the natural forest, and bring all forests under more productive management. Other programmes will promote soil and water conservation, protect wildlife, extend national parks and maintain plant and animal genetic resources for the benefit of future generations.

Plantation Models - Several plantation development technical models incorporate different rotations, species and growth rates. Appropriate silvicultural prescriptions including spacing, level of physical inputs, maintenance and thinning program apply for each model. Based on these technical parameters, financial analysis assesses financial attractiveness. The analyses confirm that most models are financially viable and attractive. However, the financial profitability varies greatly. Strikingly, the short rotation (fuelwood or pulpwood) models show a low rate of return as does long rotation slow growing timber species. Careful selection of locations, project alternatives, market opportunities, and feasible cost levels in each specific project is worthy of extra planning effort. Selected models serve to formulate programmes and targets for both the forest production and participatory forestry components.

Master Plan Economic and Financial Results - The two main programmes - forest production and participatory - were analyzed separately from the combined Master Plan, for both development options. These analyses compare the incremental costs and benefits associated with Scenarios 1 and 2 to the costs and benefits of the Status Quo situation. The analyses take into account the felling and plantation program and the associated growth targets. The reader's attention is drawn to the fact that Scenario 2 income estimates exclude direct income flows coming from the environmental programmes, and that Scenario 1 costs exclude the cost of the benefit sharing arrangements required to achieve the physical programme and growth targets.

Economic internal rates of return show 17 percent and 24 percent for Scenarios 1 and 2, respectively, revealing that both are economically viable. Economic returns under both scenarios are higher because many of the forest resources are already in place creating benefits from the sunk costs of existing plantations.

Indicated internal rates of return on a financial basis are 14 and 20 percent, respectively, for Scenarios 1 and 2.

Sensitivity analysis also indicates that both development options are viable, but show more sensitivity to increased costs than to reduced benefits. The major risk assessed is failure to protect the existing and newly established forest resource. Transparent benefit sharing formulae and effective extension are the principal means to manage this risk.

FINANCIAL ANALYSIS

INTRODUCTION

General

Asian Development Bank (ADB*), United Nations Development Programme (UNDP) and the Government of Bangladesh (GOB) are supporting the preparation of a long term plan to preserve and develop the nation's forest resources. The purpose of the plan is to provide a framework to help optimize the forest resource contribution to stabilizing the environment and to social and economic development.

This report analyzes the financial and economic effects of the recommended development programmes. Amongst the effects analyzed are: investment requirements, suggested financing, budgetary implications; economic, social and environmental impacts; as well as distributional aspects, and economic and financial returns. The report provides background documentation to the Economic and Marketing Subteam report (FMP, 1992a).

INVESTMENT PROGRAMME

Two development options have been proposed under the Master Plan. Scenario 1 represents a modest level of investment and Scenario 2 is based on a high level of investment to achieve optimum targets set under different programme components. It has been assumed that the implementation of the Scenario 1 will be undertaken by the existing institutional set up of the BFD and substantial strengthening of the Bangladesh Forest Department (BFD) has been proposed in terms of infrastructure, manpower, training, research, monitoring and other support services. On the other hand, for the implementation of Scenario 2 a very significant restructuring of the BFD and also creation of a new department and autonomous bodies have been envisaged.

Estimated Cost of the Master Plan

The costs of the different Master Plan programmes for each five-year period in the 20-year plan have been estimated separately for Scenario 1 and 2 excepting two cases. All items of expenditure have been included in the investment programmes. In the case of forest-based industries, the operating costs required to run the industries are excluded. Scenario 1 estimates exclude the costs of any benefit sharing required to obtain forecast yields and local involvement. A physical contingency of ten percent on civil works and five percent on other items applies. In consideration of the long planning period, price contingencies are not included.

Since the Master Plan presents a macro level plan, the costs of each programme and programme component should be considered as indicative. For specific projects and investment packages a more detailed costing procedure is needed.

The five major programmes and their subprogrammes and main components vary by their nature and costing principle. However, the basic costing method in all programmes has been the unit cost approach. Each programme has its own set of quantitative targets, activities, and corresponding implementation schedule as presented in the subteam reports. To the extent possible, appropriate units cost have been identified and applied for costing of these programmes and their components.

* For this and other terms or abbreviations, see Appendix 1

In most cases, the unit costs are the same or are based on present standards or experiences of BFD or specific projects. In other cases, the unit costs are based on model calculations, which to some extent are sensitive to assumptions made, or to comparisons with similar other activities. Sometimes the unit costs are deliberately not bound to any detailed model procedure but meant to represent the cost level justified to achieve the proposed targets, thereby offering the planner flexibility to adopt an alternative set of options. All estimates are in early 1993 constant prices. An exchange rate of Tk 38.9 to a US Dollar has been used.

Scenario 1

On the basis of the above assumptions, the Master Plan cost has been estimated at Tk 54.4 billion (US\$ 1.5 billion) including physical contingencies of Tk 2.3 billion (US\$ 60.0 million) which is about four percent of the base cost. Foreign exchange costs amount to Tk 16.9 billion (US\$ 434.8 million) or about 31 percent of total plan cost. About 76 percent of the cost covers the investment items and their corresponding contingencies while recurrent costs take up the remaining 24 percent. Infrastructure development accounts for about three percent of the total outlay, procurement of furniture, equipment and vehicles will require about 12 percent, human resources development in terms of both overseas and local training will take about 12 percent; research and development represents about five percent and consulting services constitute about one percent of the total costs. The plantation development accounts for about 28 percent and the commissioning of forest-based industries will require about 24 percent of the total outlay. The incremental staff requirement has been estimated based on the physical target set under plantation development and accounts for about five percent of the plan outlay. The summary of the total plan cost by major programmes under Scenario 1 is given in Table 1 and details are provided in Appendix 3. Details of the costs by category of expenditure is presented in Table 2.

Table 1 - Summary of Plan Cost, Scenario 1

Programme	Tk Billion			US Million			% of Base Costs	% of FEC
	Foreign	Local	Total	Foreign	Local	Total		
Landuse, Soil Conservation and Environment	0.3	1.2	1.5	6.9	31.3	38.2	2.73	1.65
Forest Management and Production	1.2	10.6	11.8	29.6	273.4	303.0	21.71	7.11
Participatory Forestry	2.5	4.2	6.7	65.3	107.3	172.6	12.37	15.67
Wood-based Energy	0.0	0.6	0.6	0.3	15.5	15.8	1.13	0.07
Non Wood Forest Products	-	-	-	0.0	0.0	0.0	0.00	0.00
Wood-based Forest Industries	9.9	6.3	16.1	254.1	160.9	415.0	29.73	60.98
Institutional Strengthening	2.4	15.2	17.6	60.5	391.0	451.4	32.34	14.51
Base Costs	16.2	38.1	54.3	416.6	979.3	1,396.0	100.00	100.00
Physical Contingencies	0.7	1.7	2.4	18.2	44.7	63.0		
Total Programme Cost	16.9	39.8	56.8	434.8	1,024.1	1,458.9		

Table 2 - Plan Cost by Categories of Expenditure, Scenario 1

Programme/Components	Tk Billion			US Million			% of Base Costs	% of FEC
	Foreign	Local	Total	Foreign	Local	Total		
Physical Infrastructure								
Land Acquisition	0.0	0.1	0.1	0.0	2.6	2.6	0.2	0.0
Detail Engineering & Supervision	0.0	0.1	0.1	0.0	1.4	1.4	0.1	0.0
Civil Works	0.1	0.8	0.9	2.3	20.5	22.8	1.6	0.5
Construction of Roads	0.2	0.5	0.7	5.3	13.6	18.9	1.4	1.3
Subtotal	0.3	1.5	1.8	7.6	38.0	45.6	3.3	1.8
Furniture, Equipment and Vehicles								
Furniture	0.0	0.0	0.0	0.0	0.4	0.4	0.0	0.0
Equipment	1.9	0.5	2.4	48.4	12.1	60.5	4.3	11.6
Vehicles	0.3	0.5	0.8	7.2	12.8	20.0	1.4	1.7
Extraction Equipment	1.7	1.5	3.2	43.5	38.6	82.2	5.9	10.5
Subtotal	3.9	2.5	6.3	99.1	64.0	163.1	11.7	23.8
Human Resources Development								
Overseas Training for BFD Staff	0.5	0.1	0.6	14.1	1.6	15.6	1.1	3.4
Local Training to BFD Staff	0.0	0.1	0.1	0.0	3.4	3.4	0.2	0.0
Local Training to Beneficiaries	0.0	0.6	0.6	0.0	15.2	15.2	1.1	0.0
Seminar and Workshops	0.0	0.1	0.1	0.0	1.5	1.5	0.1	0.0
Subtotal	0.5	0.8	1.4	14.1	21.7	35.7	2.6	3.4
Research, Development and Studies								
Research and Development	1.2	1.0	2.2	31.9	25.5	57.3	4.1	7.6
Monitoring and Evaluation	0.0	0.3	0.3	1.0	6.5	7.5	0.5	0.2
Subtotal	1.3	1.2	2.5	32.9	31.9	64.8	4.6	7.9
Consulting Services								
International	0.4	0.0	0.4	10.0	1.1	11.2	0.8	2.4
Local	0.0	0.3	0.3	0.0	7.3	7.3	0.5	0.0
Subtotal	0.4	0.3	0.7	10.0	8.4	18.5	1.3	2.4
Plantation Development/ Fabrication of Energy Saving Equipment							21.7	7.1
Forest Production	1.2	10.6	11.8	29.6	273.4	303.0	4.0	1.5
Participatory Forestry	0.2	1.9	2.2	6.1	50.0	56.2	0.0	0.0
Non Wood Forest Products	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0
Wood-based Energy	0.0	0.4	0.4	0.0	9.6	9.6	26.4	8.6
Subtotal	1.4	13.0	14.3	35.8	333.0	368.8		
Forest-based Industries								
Saw Mills	2.4	0.9	3.3	62.6	23.2	85.8	6.1	15.0
News Print/ Pulp Industries	3.0	1.8	4.8	76.6	45.9	122.5	8.8	18.4
Printing and Writing Paper Industries	2.6	1.5	4.1	66.0	39.6	105.6	7.6	15.8
Subtotal	8.0	4.2	12.2	205.2	108.7	313.9	22.5	49.3
Recurrent Costs								
Existing Staff Salaries	0.0	9.3	9.3	0.0	237.9	237.9	17.0	0.0
Incremental Staff Salaries	0.0	4.9	4.9	0.0	126.1	126.1	9.0	0.0
Operation and maintenance of facilities	0.0	0.0	0.0	0.2	0.9	1.2	0.1	0.1
Operation & mainten.of Equip.& Vehicles	0.2	0.2	0.5	6.2	6.2	12.5	0.9	1.5
Office Supplies and Consumables	0.2	0.1	0.3	5.5	2.3	7.8	0.6	1.3
Subtotal	0.5	14.5	15.0	12.0	373.6	385.5	27.6	2.9
Base Costs	16.2	38.1	54.3	416.6	979.3	1,396.0	100.0	100.0
Physical Contingencies	0.7	1.7	2.4	18.2	44.7	63.0		
Total Project Cost	16.9	39.8	56.8	434.8	1,024.1	1,458.9		

Scenario 2

Estimated total plan costs under Scenario 2 over the 20-year period are Tk 131.0 billion (US\$ 3.4 billion) of which physical contingencies represents about four percent of the base cost Tk 5.2 billion (US\$ 134.8 million). Foreign exchange component is Tk 42.4 billion (US\$ 1.1 billion) representing about 32 percent of the plan cost. Of the total cost about 71 percent covers investments items and the rest, 29 percent, accounts for recurrent costs which mainly include incremental staff salaries and operation and maintenance of facilities, equipment and vehicles. By categories of expenditure, civil works will require about five percent, procurement of furniture, vehicles and equipment about 12 percent, human resources development about three percent, forest production support about 21 percent and wood-based forest industries about 32 percent of the total plan cost. Summary of the total plan cost is presented in Table 3. Details of the programme costs by categories of expenditure is given in Table 4. More detailed cost estimates for each programme by components over the 20-year period are in Appendix 3.

Table 3 - Summary of Plan Cost, Scenario 2

Programme	Tk Billion			US\$ Million			% of Base Costs	% of FEC
	Foreign	Local	Total	Foreign	Local	Total		
Landuse, Soil Conservation and Environment	0.8	3.7	4.5	20.9	94.0	114.8	3.57	1.99
Forest Management and Production	1.7	15.8	17.5	44.0	406.5	450.5	13.99	4.19
Participatory Forestry	5.1	11.0	16.1	130.1	283.5	413.5	12.84	12.39
Wood-based Energy	0.1	1.1	1.2	3.3	28.2	31.5	0.98	0.32
Non Wood Forest Products	0.2	0.8	1.0	4.2	21.6	25.8	0.80	0.40
Wood-based Forest Industries	28.2	17.2	45.4	725.1	441.9	1,167.0	36.25	69.07
Institutional Strengthening	4.8	34.8	39.5	122.2	894.0	1,016.3	31.57	11.64
Base Costs	40.8	84.4	125.2	1,049.8	2,169.7	3,219.5	100.00	100.00
Physical Contingencies	1.6	3.6	5.2	41.1	93.0	134.1		
Total Programme Cost	42.4	88.0	130.5	1,090.8	2,262.7	3,353.6		

Table 4 - Plan Cost by Categories of Expenditure, Scenario 2

Programme/ Components	Tk Billion			US Million			% of Base Costs	% of FEC
	Foreign	Local	Total	Foreign	Local	Total		
Physical Infrastructure								
Land Acquisition	0.0	0.7	0.7	0.0	18.9	18.9	0.6	0.0
Detail Engineering & Supervision	0.0	0.2	0.2	0.0	4.4	4.4	0.1	0.0
Civil Works	0.4	2.5	2.9	10.6	63.3	73.9	2.3	1.0
Construction of Roads	0.6	1.6	2.2	15.9	40.9	56.8	1.8	1.5
Subtotal	1.0	5.0	6.0	26.5	127.5	154.0	4.8	2.5
Furniture, Equipment and Vehicles								
Furniture	0.0	0.9	0.9	0.0	22.6	22.6	0.7	0.0
Equipment	0.7	0.7	1.4	16.9	19.1	36.0	1.1	1.6
Vehicles	3.0	0.3	3.3	77.4	8.6	86.0	2.7	7.4
Extraction Equipment	3.2	1.5	4.6	81.0	37.6	118.6	3.7	7.7
Subtotal	6.8	3.4	10.2	175.3	87.9	263.2	8.2	16.7
New Legislation	0.0	0.3	0.3	0.0	8.7	8.7	0.3	0.0
Subtotal	0.0	0.3	0.3	0.0	8.7	8.7	0.3	0.0
Human Resources Development								
Overseas Training for BFD Staff	0.8	0.1	0.8	19.4	2.2	21.6	0.7	1.9
Local Training to BFD Staff	0.0	0.2	0.2	0.0	4.4	4.4	0.1	0.0
Local Training to Beneficiaries	0.0	2.0	2.1	0.0	52.7	52.7	1.6	0.0
Seminar and Workshops	0.0	0.1	0.1	0.0	2.0	2.0	0.1	0.0
Subtotal	0.8	2.4	3.1	19.4	61.2	80.6	2.5	1.9
Research, Development and Studies								
Research and Development	1.3	1.0	2.3	33.9	25.9	59.8	1.9	3.2
Monitoring and Evaluation	0.1	0.8	0.9	3.2	19.8	23.0	0.7	0.3
Subtotal	1.4	1.8	3.2	37.1	45.8	82.9	2.6	3.5
Consulting Services								
International	0.9	0.1	1.0	24.1	2.7	26.8	0.8	2.3
Local	0.0	0.3	0.3	0.0	8.9	8.9	0.3	0.0
Subtotal	0.9	0.5	1.4	24.1	11.6	35.8	1.1	2.3
Plantation Development/ Fabrication of Energy Saving Equipment								
Forest Production	1.7	15.8	17.5	44.0	406.5	450.5	14.0	4.2
Participatory Forestry	0.8	6.9	7.7	21.4	177.4	198.8	6.2	2.0
Non Wood Forest Products	0.0	0.4	0.4	0.0	9.1	9.1	0.3	0.0
Wood-based Energy	0.1	0.6	0.7	2.3	15.1	17.4	0.5	0.2
Subtotal	2.6	23.7	26.3	67.6	608.1	675.8	21.0	6.4
Forest-based Industries								
Saw Mills	6.0	2.2	8.2	153.1	56.6	209.7	6.5	14.6
News Print/ Pulp Industries	4.4	2.6	7.0	112.6	67.5	180.1	5.6	10.7
Printing and Writing Paper Industries	4.5	2.7	7.3	116.7	70.0	186.6	5.8	11.1
Wrapping and Packaging Industries	3.6	2.2	5.8	93.0	55.8	148.8	4.6	8.9
Specialities Industries	7.6	4.6	12.2	195.8	117.4	313.2	9.7	18.7
Subtotal	26.1	14.3	40.4	671.2	367.3	1,038.4	32.3	63.9
Recurrent Costs								
Existing Staff Salaries	0.0	1.2	1.2	0.0	29.8	29.8	0.9	0.0
Incremental Staff Salaries	0.0	31.1	31.1	0.0	799.3	799.3	24.8	0.0
Operation & maintenance of facilities	0.1	0.1	0.2	1.6	3.2	4.7	0.1	0.1
Operation and mainten. of Equip. & Vehicles	0.5	0.5	1.1	13.8	13.8	27.5	0.9	1.3
Office Supplies and Consumables	0.5	0.2	0.7	13.2	5.7	18.8	0.6	1.3
Subtotal	1.1	33.1	34.2	28.5	851.6	880.1	27.3	2.7
Base Costs	40.8	84.4	125.2	1,049.8	2,169.7	3,219.5	100.0	100.0
Physical Contingencies	1.6	3.6	5.2	41.1	93.0	134.1		
Total Project Cost	42.4	88.0	130.5	1,090.8	2,262.7	3,353.6		

Phasing of Programme Costs

The programme cost has been prepared for each five year period based on the physical targets. The investment requirement is estimated to grow, level off, and then start decreasing over the 20-year plan. The trend agrees with the notion that as development takes place triggered by additional investments, less and less further investment is required. On the other hand, recurrent expenditures, which are estimated to support maintenance and operations of plantations and facilities, increase as greater and greater impacts of the investments come about. Under Scenario 1 about 23 percent of the total plan outlay will be required in the first five years. The peak investment will take place in the second five years which is about 37 percent of the total estimated cost and then it will go down to 18 percent and 20 percent in the subsequent two five-year periods. Under Scenario 2 the trend is slightly different. The investment requirements are 17 percent, 31 percent, 24 percent and 27 percent of the total plan outlay respectively for each of the five year periods. Phasing of the plan costs by programme and development scenario are presented in Tables 5 and 6.

Table 5 - Phasing of Programme Costs, Scenario 1 (Tk Billion)

Programme	Year 1-5 1993/97	6-10 1998/02	11-15 2003/07	16-20 2008/12	Total Costs		
					Local	Foreign	Total
Landuse, Soil Conservation and Environment	0.7	0.4	0.2	0.2	1.2	0.3	1.5
Forest Management and Production	2.7	2.7	2.9	3.2	10.6	1.2	11.8
Participatory Forestry	1.4	3.0	1.0	1.5	4.2	2.5	6.7
Wood-based Energy	0.2	0.2	0.1	0.1	0.6	0.0	0.6
Non Wood Forest Products	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wood-based Forest Industries	3.3	9.7	1.3	1.2	6.3	9.9	16.1
Institutional Strengthening	3.6	3.8	4.7	5.5	15.2	2.4	17.6
Base Costs	11.8	19.6	10.3	11.8	38.1	16.2	54.3
Physical Contingencies	0.6	0.9	0.5	0.5	1.7	0.7	2.4
Total Programme Cost	12.4	20.4	10.8	12.3	39.8	16.9	56.8
Percentage	22	36	19	22	70	30	100

Main Features of the Investment Programmes

From the point of view of total cost the three major programmes are forest production and management, wood-based industries, and participatory forestry under both the scenarios. The plantation forest programme will require on average Tk 589 million under Scenario 1 and Tk 876 under Scenario 2 annually during the 20-year period. In addition some minor plantation components like enrichment plantation, coastal afforestation etc are also included in the programme. Plantation costs are calculated on a full cost basis including not only establishment costs but also maintenance and thinning costs to be required to meet the requirements of the silvicultural prescriptions proposed for each plantation module.

Table 6 - Phasing of Programme Costs, Scenario 2 (Tk Billion)

Programme	Year 1-5 1993/97	6 - 10 1998/02	11 - 15 2003/07	16 - 20 2008/12	Total Costs		
					Local	Foreign	Total
Landuse, Soil Conservation and Environment	1.7	1.0	0.7	1.0	3.7	0.8	4.5
Forest Management and Production	4.2	4.3	4.3	4.4	15.8	1.7	17.5
Participatory Forestry	3.3	6.1	2.9	4.4	11.0	5.1	16.1
Wood-based Energy	0.3	0.3	0.3	0.3	1.1	0.1	1.2
Non Wood Forest Products	0.4	0.2	0.2	0.2	0.8	0.2	1.0
Wood-based Forest Industries	2.8	17.4	11.8	12.3	17.2	28.2	45.4
Institutional Strengthening	8.7	9.7	10.0	11.2	34.8	4.8	39.5
Base Costs	21.4	39.0	30.2	33.7	84.4	40.8	125.2
Physical Contingencies	0.9	1.5	1.3	1.5	3.6	1.6	5.2
Total Programme Costs	22.3	40.4	31.5	35.2	88.0	42.4	130.5
Percentage	17	31	24	27	67	33	100

The annual quantitative targets set forth under both the scenarios are at about the same level. Differences are mainly on the qualitative side, leading to higher MAI. The difference in MAI targeted to be achieved under both the scenarios is quite significant and is detailed in Forest Production (FMP 1992b) and Forest Management (FMP 1992d) reports. To support the plantation programme, a substantial amount of money will be required in institutional strengthening to achieve these targets. These will include development of physical facilities, equipment, furniture, vehicles, staff training, research studies, monitoring and consultants services.

Intensive plantation development and intensified silvicultural practices provide significant sustained growth possibilities for wood-based industries in the first two five-year periods under Scenario 1 and in the last three five-year periods under Scenario 2. In the near future, however, the raw material supply shift to secondary forests requires large-scale retailing in the wood-based industry and improvements in logging as represented by the investment needs. The present very low investment (in sawmilling and logging equipment) will grow more than 10 times during the programme years. While quite large, this programme differs from others as the investments required is anticipated to be carried mainly by the private sector.

Participatory forestry as a programme is one of the cornerstone programmes of the Master Plan, and is considered to result in major improvements in forest management. Although it means a significant institutional change, its direct cost requirements are quite modest as seen in programme cost. However, participatory approach of forestry development in the socioeconomic context of Bangladesh relies heavily on the massive participation of the people and therefore, will depend decisively on very intensive and large scale training and extension programmes. In costing the programme due attention has been given to education, training, and extension and partly also to NGOs involvement in the forestry development. Attention is drawn to the fact that Scenario 1 requires substantial public involvement to achieve both the forecast growth and physical targets set. The cost of benefit sharing required to obtain the participation and support of resident population affected by the programme is not reflected in the estimates.

Many other programmes are also directly or indirectly supporting participatory forestry and relying on the management opportunities developed within it. From the costing point of view, community-based forest management represents the extreme case where the vital supporting components are located in other programmes. This has also been reflected in GOB policy consideration to create a new Department to deal separately with the community-based forestry development.

Financing Plan

A suggested financing plan by programme cost components and sources has been prepared. A summary of the plan is presented in Table 5. It is anticipated that GOB will strive to make a balanced and sustainable allocation of resources among the various development sectors and the programmes and subprogrammes of the plan. To meet the physical targets set forth in the Master Plan, GOB's expenditure for the forestry sector will have to increase substantially. But at the same time it is also expected that the interest of the bilateral and multilateral donors will support the development of the forestry sector of Bangladesh.

1. Allocation Procedure and Principles

An assessment has been made on the distribution of costs by main sources - GOB, the external donors, the private sector and beneficiaries for each module of subprogramme and programme components and also by development options. Principles adopted for the preparation of the financing plan are described below:

- On equipment and material cost, all imported inputs are generally assumed to be financed by foreign sources. Imported items mainly involve foreign currency. Local currency components are mostly taxes and duties, presumed borne by the Government. A major exception could be wood-based industry investments where imported equipment is high and has been assumed to be undertaken by private sector, but considering hard currency constraints, the entire foreign exchange requirements are open for donor financing. In many of the agriculture and other development sector projects external donors have financed this sort of private sector undertaking as a gesture to support the foreign exchange requirements of the country. All local currency costs are financed through private sector.
- Other principles concerning foreign funding are the nature and type of the programme component. The foreign proportion of the cost has been proposed where:
 - a. The programme does not have major immediate materialized benefits as in many support programmes) or the benefits are mainly environmental.
 - b. The programme is basically quite long term in nature (eg forest plantations programmes).
 - c. The programme has been designed to serve the immediate interest of the international and local community (eg. biodiversity programmes built-in within the environmental programme).
 - d. The programme is considered to promote social equity (like participatory forestry).
 - e. Financing of the component is very vital to the overall success of the plan (such as training, research, education, monitoring, consultants services and overall forest plantation development components).

- It is assumed Government funding covers generally the appropriate administrative costs including incremental staff salary and wages of the programme components. The operation and maintenance cost of physical facilities, especially the local currency cost is financed by GOB. Also the programme components which are expected to increase government revenue from the forestry sector are usually assumed to cover those materials and other costs which are considered to be within the reach of Government's funding capacity.
- Participation of the private sector (including forest occupants and NGOs) always assumes private sector or beneficiary investment, expenditure or labour input

The financing plan is also indicative and needs considering in more detail when planning and packaging specific projects or investment modules.

2. General Plan

For the whole Master Plan programme costs (total costs during 20 years), the proposed financing plans under both the development scenarios are presented in Tables 7 and 8. More detailed presentations by subprogrammes and components are in Appendix 3 and 4.

Table 7 - Summary of Financing Plan by Sources, Scenario 1

Source	US Million	Percentage
GOB	416.5	30
Donors	885.0	63
Private	96.5	07
Total	1,398.0	100

Proposed GOB Financing

1. Scenario 1

The overall government financing of the total plan cost is estimated to be 35 percent or US\$ 492 millions under Scenario 1. At a programme level the range varies between three percent and 62 percent of the total financing. The financing will mainly cover the taxes and duties component, land acquisition, and major portion of the incremental recurrent costs in terms of staff salaries and operation and maintenance of facilities. The lowest in the range concerns wood-based industries which has been assumed to be financed through the private sector and the highest, institutional strengthening. This component is mainly to support the plantation development programme of the plan and will cover development of physical facilities, procurement of vehicles, equipment, staff training, research and development, consultants services and the associated recurrent costs. At a subprogramme and major component level the variation is much higher (Appendix 3). The largest financial resources from the government are expected to be allocated to the plantation forest programmes followed by the participatory forestry, and wood-based industries. It can be noted that the Master Plan programmes will considerably improve the government's possibilities to finance forestry and forest environment sectors. In the short run this is possible by increasing the stumpage prices of forest products. In the long term it will be a result of increased timber production and other forest-based activities with related industrial development which would generate not only increased stumpage income but other taxable incomes as well.

Table 8 - Summary of Financing Plan by Sources, Scenario 2

Source	US Million	Percentage
GOB	91.8	03
Donors	2,159.9	64
Private	1,116.6	33
Total	3,368.3	100

2. Scenario 2

Under Scenario 2 the GOB financing trend is expected to change drastically because many of the programme components will be undertaken by the proposed enterprises. This shift in the trend will allow GOB a greater flexibility in allocating its resources more and more to social development sectors. The GOB financing under Scenario 2 has been proposed at US 92 millions representing about three percent of the total plan costs. This amount will be required to support the BFD activities responsible to oversee the development activities in the sector through regulatory measures.

Proposed Donor Financing

External donors assistance in the implementation of the Master Plan is seen to be vital. Most, if not all, of the Master Plan programmes are characterized by strong social dimension and equity concerns, high environmental and conservation contents, and a firm thrust in urgent transition to sustainable development and utilization of the forest land base for economic products. These are among the major factors supporting a prominent foreign assistance in financing the Master Plan programmes.

The other reasons for proposing external financial support is that many of the programme benefits may be shared, to some extent at least, by the international community at large. This is especially related to the global concern on the protection of the remaining tropical rain forest and maintaining biodiversity options.

The third major reason for proposing foreign financing is simply because of limited local financing capacity. Due to the increasing budgetary constraints of the country and the immediate subsistence needs of the majority of the increasing population (a major cause of unsustainable development), the financing of the programme emphasizing sustainability and medium-to long-term benefits would simply not be feasible without large foreign financial support.

1. Scenario 1

In the financing plan it has been anticipated that about US 885.0 million or about 63 percent of the total Plan costs would come from different donor agencies to support the development option of Scenario 1 for the entire 20 years.

Two key programmes, plantation forest and participatory forestry, make up about 44 percent of all foreign financing. The other programme, institutional strengthening accounts for about 12 percent of the proposed external financing. It may be noted that forest plantation development, agroforestry and other participatory oriented plantations designed to promote small-scale sustainable forestry development actually comprise a large financial share in these programmes. Proportional foreign funding is relatively low for the wood-based industries compared to other programmes, but due to the large investment needs in the latter half of the plan, financial requirements are still considerable. At programme level, high proportional shares of foreign

financing is assumed for limited protected areas and biodiversity forest protection, as well as soil conservation and all other environmentally supportive programmes. A detailed financing presentation is found in Appendix 3.

2. Scenario 2

Total external financial assistance under Scenario 2 remains almost the same as Scenario 1 if it is considered in terms of percentage. But in absolute terms, the external financial requirement is expected to be substantial to support implementation of this development option. About US 2.2 billions is expected to be shared by the external sources which represent about 64 percent of the total cost. Forest plantation and participatory forestry account for about 33 percent of all foreign financing. The other programme, wood-based industries makes up about 50 percent. Proportional foreign funding is relatively high for the wood-based industries compared to other programmes under the scenario due to substantial increase in the production of pulpwood which will come from short rotation plantation leading to the large investment needs in the latter half of the plan.

Investments in new machinery in the wood-based industries is imperative both due to the changing volume, size and quality of logs available in the future and to the old and worn out equipment presently prevailing in the industry. At programme level, high proportional shares of foreign financing is assumed for Protected Areas and Biodiversity Forest Protection, as well as Soil Conservation and all other environmentally supportive programmes. Institutional restructuring to support the high input-high yield programme will require a substantial support amounting to US 106 million, about 12 percent of the total external financing envisaged. A detailed presentation of the proposed financing plan is given in Appendix 4.

Projected Private Sector Financing

The private sector is assumed to participate actively in Master Plan implementation and funding, although the bulk of private financing occurs in participatory forestry, wood-based energy and wood-based industries. These programmes cover 81% of all private financing and are carried mainly by the participants and industrial companies. Private sector financing also includes small-scale operations in wood and non-wood forest industries as well as NGOs. In people-oriented forestry, individual forest occupants' labour input is included under private financial sources.

Current Forestry Sector Financing Status

In the government expenditure, forestry related activities are mainly included in the budget of the Department of Forest, and are part of agriculture under economic services in the sectoral classification of the national budget. During the FY 1992 the BFD's budget covered about 15 percent of all expenditures of the agricultural sector and only about one percent total national expenditure which is less than forestry's proportional share of three percent in the 1992 gross domestic product. This status clearly demonstrates the under financing of the sector

The assessment of the impact of the GOB's incremental share in the financing of the Master Plan cost on the resource allocations of the government, considers current financing status in the forestry sector by five year plans and annual development plans (ADP). The total actual allocations made under the First Five Year Plan plus the Two Year Plans was Tk 800 millions, which increased to Tk 1.8 billion under the Second Five Year Plan, Tk 3.9 billion under the Third Five Year Plan and further increased to Tk 8.5 billion during the current Plan. Although the actual allocations have shown an increasing trend they never exceeded more than two percent of any of the total Plan outlays. In terms of annual budgetary allocation, this trend is particularly clear in the annual development programmes.

Since fiscal 1980-81, the share of the forestry sector budget shows an erratic and uneven trend. However, over the same period ADP allocation has increased at an annual compound rate of about 23 percent. Despite this nominal increase, the allocation for the sector, as a percentage, has remain unchanged at about 1.5 percent of the corresponding total plan outlay. The revenue budget for the sector has shown some steady increase over the last five years (Tk 120 million in 1986/87, Tk 128 million in 1987/88, Tk 189 million in 1990/91 and Tk 205 million in 1991/92) but as a percentage of the total outlay it has followed the same trend.

Master Plan Budgetary Implications

1. Scenario 1

GOB contribution to implement the development option will constitute: (1) cost of land acquisition, (2) taxes and duties on imported items and (3) a part of the incremental recurrent cost. It is anticipated that during the first five years of the Master Plan GOB would have to contribute an amount of Tk 3.0 billion. This amount represents about 36 percent of the forestry sector allocation and about 7 percent of the total outlay under the Fourth Five Year Plan (1990-95). This means that the during the next five year plan allocation to forestry sector has to be increased by at least five percent to meet the financial requirements.

2. Scenario 2

As envisaged, many of the programmes under Scenario 2 are undertaken on an enterprises basis, so the implementation of the development option will need much lower level of financing from the Government. Based on the tentative financing plan, it is estimated that during the first five year implementation, government financial requirements would be about Tk 610 million to cover the incremental recurrent cost, land acquisition and taxes and duties. This amount represents about seven percent of the forestry sector allocation and only 1.4 percent of the total outlay under the Fourth Five Year Plan. This low financial requirement to implement the development options will release pressure on the government financial resources.

ECONOMIC, SOCIAL AND ENVIRONMENTAL IMPACTS

General

Forestry development as envisaged in the Master Plan Programs should be in accordance with the overall and sector-specific national goals, objectives, policies, and development efforts. GOB is strongly committed to overcome the serious problems prevailing in the forestry sector. This commitment has been emphasized in the policy pronouncement and the objectives outlined in the Fourth Five Year Plan. These objectives are: (1) rehabilitation or reforestation of denuded and degraded national forest; (2) bringing all possible vacant public and private lands under tree cover; (3) meeting people's basic needs of all forest products by integrating trees with farming and traditional land use; (4) improving the general environment for supporting agricultural and other biological production; (5) creation of employment opportunities for the landless poor, marginal farmers and women; (6) conservation of the country's ecology and biodiversity and (7) adoption of different wood conservation techniques.

It is expected that these objectives will expand the tree cover of the country, increase supply of forest products to meet the deficit and growing demand and also improve the overall environmental condition of the country. Attaining these sectoral planning goals requires programmes which: (1) upgrade the management and exploitation of existing hill forest; (2) upgrade the management and expand the areas of the coastal mangrove forest; (3) increase the production of biomass fuels by supporting homestead plantings and establishing people-oriented

plantations on public lands; (4) establishing large scale industrial plantations on degraded state forest lands; and (5) enhancing the capacity of BFD in efficient forest management and protection.

To respond to these objectives of the Government for the forestry sector, the Master Plan has been designed to:

- Promote the efficient and judicious use of natural resources.
- Ensure the sustainable productive capacity of natural resources.
- Expand the implementation of community-based natural resources management and conservation.
- Achieve a more equitable sharing of the benefits derived from the development and utilization of resources.
- Increase the sector's contribution through the national efforts directed towards poverty alleviation and enhanced welfare of small farmers and landless workers.
- Maintain and improve the ecological balance.

The plan defines the following basic policies in forestry development and conservation:

- Forest renewal and rehabilitation is an immediate and foremost concern in the sector, not only for restoring environmental stability, but also for ensuring a stable resource base for the wood industry.
- Conservation of the remaining forest resources to receive more attention.
- Community-based forest management is the basic strategy for promoting a more equitable distribution of benefits from the forests.
- Revitalize and develop the wood and other forest-based industries in view of their potential as a source of revenue, foreign exchange and employment.

An assessment of Master Plan subprogrammes and components clearly shows they support and do not conflict with the basic development goals. There is room for differences in interpretation but the Master Plan programmes support strongly the achievement of the prioritized national goals.

Plan Impact and Financial Viability

Two development scenarios were subjected to detailed analyses. Scenario 1 consists of five main programs and Scenario 2 composed of six major programmes; and both have a series of subprogrammes. All programs are planned to efficiently accomplish the goals of social equity and progress, environmental improvement, sustained development, and economic efficiency. Only those programs which include productive investment components and direct input-output relationship with economically measurable output are tested against their financial viability. Financial viability is determined here for two major programs and the associated subprogrammes and components forest production.

1. Roundwood Production

Present production of different forest products is low. Growth rates (MAI) for all rotations and forest types are low because of inefficient management, use of low inputs, indigenous variety, lack of protective measures, illegal encroachment and uncontrolled felling. The net MAI for long rotation hill forest is estimated at 2.5 m³/ha which is the lowest in the region. Net MAI of the medium and short rotation (industrial) plantations is also equally low. This low trend in the forest production is likely to continue without any major development initiatives.

With the intervention of the Master Plan, production is expected to increase substantially due to increase growth for all rotations and types of forest. This increase became possible due to better management, protection, use of better variety of seedlings, intensive silvicultural practices, and protection from illegal felling. The main forest products from felling and plantation development proposed under the plan would be sawlogs, pulpwood, poles and fuelwood. Mean annual increment and yields over the 20-year plan period have been calculated based a variety of plantation models developed by the forest production and management subteam (FMP 1992b).

Status Quo - The supply of different forest products have been estimated to come from the present growing stock and the regular plantation program of the BFD with out Master Plan intervention is summarized in Table 9. Total roundwood production is 2013 reach 10.8 million m³.

Table 9 - Status Quo Roundwood (000 m³/ A)

Products	1998	2008	2013
Sawlog	1,364	1,589	1,829
Pulpwood	344	500	518
Poles	153	215	296
Fuelwood	6,494	7,212	8,208
Total	8,355	9,516	10,851

Scenario 1 - Production of different forest products under Scenario 1 by the end of the plan period is 14.3 m³, summarized in Table 10.

Table 10 - Scenario 1 Roundwood (000 m³/ A)

Products	1998	2008	2013
Sawlog	1,393	1,739	2,739
Pulpwood	393	648	655
Poles	179	483	830
Fuelwood	6,242	8,554	10,054
Total	8,550	11,424	14,278

Scenario 1 production comes from continued natural forest extraction, felling old plantations on forest land, public strip plantations, and village and unclassed forests. Details of the felling and plantation program by each five-year period, rotation and type of forest are given in the Forest Production (FMP 1992b) and Participatory Forestry (FMP 1992c) reports.

Table 11 - Scenario 2 Roundwood Production (000 m³/ A)

Products	1998	2008	2013
Sawlog	1,528	2,018	5,884
Pulpwood	403	1,370	1,640
Poles	175	2,053	3,054
Fuelwood	6,666	10,958	15,072
Total	8,802	16,399	25,650

Scenario 2 - Different plantation model growth is expected to increase substantially triggered by high level of investments in terms of more efficient management, silvicultural operations, improved variety of seedlings, and high level of inputs. People living around the plantation area will be directly involved for protection. MAI for long rotation (30 years) plantation has been assumed at 20 m³ per ha. For medium rotation (20 years) and short rotation (10 years) the assumed MAI are 30 m³ and 45 m³/ha. These growth estimates are considered to be attainable with the proposed level of management practices. Based on these rate and plantation programmes the supply of different forest products should reach 25.6 million m³ in 2013, Table 11 summarize the estimate.

Production of these forest products will come from limited clear felling and replanting of hill forest felling and replanting old plantation, new plantation in the degraded and denuded state forest, unclassified forest lands, homestead forestry, agroforestry, strip plantation and cultivated field plantations. Plantation program by type of forest is in the Forest Production (FMP 1992b) and Participatory Forestry reports (FMP 1992c).

2. Marketing

Since Bangladesh is deficit in all forest products and is estimated to continue in future due to increased demand, the incremental production forecast is not likely to pose any marketing problem.

Sawlogs demand indicates that even with a very high level of production, there will be great a difference between demand and supply of sawlogs and the gap will continue. All the sawmills of the country are operated well below the designed capacity. Therefore the incremental production of sawlogs will be absorbed by the mills for marketing without any difficulty.

Pulpwood supply is in surplus because of lower capacity utilization of the existing paper and pulp mills. With the establishment of new paper and pulp mills due to increased demands, the incremental production will be absorbed by these mills.

Posts and poles are widely used in house construction and in agriculture. The Rural Electrification Board also provides a sizable market together with anchor poles and sleepers for railways. The present production of poles is insufficient to meet these requirements. However, with the increased production, the supply of poles is estimated to exceed demand. After meeting the basic requirements of these buyers, the surplus can be used for other purposes such as pulpwood or improved housing. A possibility is to develop international markets as there is a external demand for pulpwood internationally.

Peeler logs would be primarily used by match factories and for tea chests. The present production of tea chest is not sufficient to satisfy the requirements of the tea industries.

Fuelwood is in chronic shortage of supply in Bangladesh. This shortage is also one of the reasons for the fast depletion of the forest resources of the country. Attempts made to increase the production of fuelwood meet with limited success. Therefore the incremental fuelwood supply would be absorbed with little difficulty.

3. Prices

Forest products from state forests are marketed by BFD in two ways. Sawlogs are sold either at the plantation gate or at the Divisional Office stockyard through open auction. Market forces play an important role in fixing the prices of sawlog. The Forest Department Corporation also uses a large quantity of timber at a fixed price within their concessions. BFD also makes direct allocations of industrial raw materials to pulpmills on a royalty basis. Most prices of forest

products agreed between the public sector and the BFD are well below market prices. Forests products from private lands are marketed through the private traders and small-scale sawmillers, market forces largely determine the prices. Price of forest products vary between products and across regions.

The stumpage prices of different forest products determined for revenue projections are given in Table 12. In the table data, long rotation species composition assumed is at 25% garjan and chapalish, 15% dhakijam and mahogany, 25% teak, 25% jarul and kadam and 10% for other species. Fuelwood price is based on value of mixed species. The price used for poles is the stumpage value of poles. Price of sawlogs represent the average price of Class A and B logs for long rotation plantations.

Table 1 - Prices of Different Forest Products

Product	Tk/ m ³
Sawlogs	
Long Rotation	4,500
Medium Rotation	3,500
Poles	1,240
Fuelwood	400

4. Production Benefits

At the end of the plan period, sawlog production from both the forest production and participatory forestry is expected to increase substantially under both the development options. Incremental production under Scenario 1 is estimated to be 2.7 million m³/A (valued at Tk 12.3 billion or US\$ 317 million) in 1993 constant prices at the plantation gate. Under Scenario 2, the projected production of sawlogs is 5.9 m³/A (valued at Tk 26.5 billion or US\$ 680 million). Based on the plantation program, peak incremental production takes place in year 35 under Scenario 1 and year 30 under Scenario 2. The value of this incremental production is Tk 365.9 billion or US\$ 9.4 billion, and Tk 473.2 billion or US\$ 12.2 billion under Scenario 1 and 2, respectively. These values presume intensive plantation development mainly on the degraded, denuded and low density forest areas. The estimates are calculated using the above financial prices expressed in 1993 constant values. The value of the incremental production of other products, consisting of pulpwood, poles and fuelwood over the same period is estimated at Tk 219 billion or US\$ 5 billion under Scenario 1 and Tk 338 billion or US\$ 9 billion under Scenario 2.

5. Employment Generation

The incremental employment opportunities due to the project will come mainly from (a) construction activities; (b) operation and maintenance of the project facilities; and (c) plantation development both under forest production and participatory forestry. These employment opportunities will come mainly due to higher labour requirements for planting, maintenance and improved silvicultural practices. It is estimated that on-farm employment opportunities will increase by about 0.86 million person years under Scenario 1 and 1.3 million person years under Scenario 2 over the 20-year plan period. The development and maintenance of the physical facilities for the plan will generate about 1.18 person years and about 3.32 million person years of additional employment under Scenario 1 and 2, respectively. The increase in labour absorption will be reflected in the reduction of the present high level of unemployment and under-employment of family labour, particularly on the smaller farms and landless families. Further employment opportunities will be generated by the plan due to increased demand for logging, transportation, processing and marketing services.

6. Poverty Alleviation

About 70 percent of the households in rural Bangladesh are living below the poverty line. The effect of the Master Plan on the income of these rural poor is expected to be substantial, particularly as the demand for labour would significantly increase for construction of facilities and plantation establishment, maintenance and thinning. The overall increase in the demand for labour for plantation development in state forests is estimated at 0.56 million person years and 0.67 million person years under Scenario 1 and 2 respectively over the 20-year Plan period. This increase in the additional employment opportunities will be shared among 192,180 families living around the forest areas, especially from the landless and small farmers. The average increase in wage income for each of these families is estimated at Taka 15,000/ A.

The participatory program of the Master Plan will generate an additional employment to the participants in the amount of about 0.28 million person years of additional employment under Scenario 1 and about 0.65 million under Scenario 2. This increase in the employment opportunities will generate wage income for the participating families by an amount of Tk 15,000/ A to supplement their farm incomes from annual crops. In addition to the increased wage income the participants are expected to benefit from the fruit and other forest products planted under the program. For details see the Participatory Forestry Report (FMP 1992c). The implementation of the Master Plan will contribute positively towards the Government's efforts to alleviate poverty in the rural areas. Implementation of the Master Plan would lead to a better quality of life for the rural people which will result from increased availability of fuelwood for cooking, more timber for shelter, increased security from natural disaster because of a better soil cover and better amenities from protected areas.

7. Women's Welfare

Women in Bangladesh play a major role in the economy of their households. They have to spend a disproportionately large amount of time fetching fuel. The FFYP recognizes that women have an important role in the forest development programme, principally through raising nurseries and homestead plantation development. The Master Plan has been designed to involve women actively in the implementation of the Participatory component. Women members of the family will be actively involved in the agroforestry, woodlot plantation and strip plantation components of the participatory forestry program which will contribute substantially to the family income.

Increased production of fuelwood will reduce the time they have to spend collecting fuel and would allow them to undertake other economic activities to supplement their family income. This additional income will help in improving the living conditions of the family members. In Bangladesh, there are large numbers of female-headed households, with their own peculiar social and economic problems. Involvement of women in practical ways consonant with social attitudes will help to minimize the current mutual mistrust between villagers and the BFD. This, in turn, will help to minimize the encroachment problems due largely to enormous population pressures, which remains the most serious constraint on forest resource management

Environmental Impact

The forest resources of Bangladesh are rapidly depleting to supply the needs of the increasing population for fuelwood, timber, fodder, and other forest products, as well as land for food production and settlements. The overall strategy of the Master Plan is to improve the management of the forestry resources of the country, helping to bring the population needs, the production systems, and the environment into a sustainable balance. The programs will have a substantial positive impact on the environment. Forest cover will be restored on degraded areas. Exploitation of the natural forests will be controlled, and these forests brought under management. Soil conservation will be promoted. The network of national parks and wildlife reserves will be

protected and maintained, plant and animal genetic conservation will be promoted. The people will be made more aware of the necessity of sustaining a balance between their needs for forest products and the ability of the ecosystem to supply these needs.

Due to non availability of data it is not possible to estimate the Environmental-Economic Internal Rate of Return to serve as a quantitative indicator of the environmental impacts of the Master Plan program components. However, it is anticipated that the Plan will have substantial positive impacts on soil productivity. The negative impacts of soil erosion on other productive sectors like irrigated agriculture, fisheries, and power supply may increased. For example, highly mechanized intensive short rotation plantation will increase soil erosion due to heavy equipment and regular removal of vegetation cover, unless protective extractive and forest management practices are adopted and implemented.

Generally, reduction of soil erosion is not an easy task. The bulk of soil erosion comes from sources other than forestry related activities, especially from areas under jhum agriculture, largescale ranching, river erosion, and from poor road construction practices and other infrastructures. There is always a natural erosion rate. It is impossible to levy "total ban" on all economic activities, participatory in a subsistence economy. The issue is how to direct operations, leave fragile areas untouched, protect existing protective vegetation, reduce off-site effects of on-going operations, while including preventive measures and placing sensible restriction on planned activities.

Soil erosion and hydrological deterioration not only have negative off-site impacts to agricultural, industrial, and infrastructure activities, but it also, by definition, reduces the nutrients available for plants, as well as the moisture retention capacity of the soil. This results in a reduction of the productivity of the land where erosion occurs. These economic costs are called the on-site costs. A more visible sign of critical nature of the problem is the vastness of the degraded Unclassified State Forest areas. A large area of the forest lands of the country, lies under low value or degraded vegetation like brushlands and coronal grasses, or has almost no vegetative cover at all. At best, this area supports low productivity agriculture, extensive animal grazing or lies fallow. There are no official estimates on how much this area of "extensive land use" is producing per hectare, and how much it contributes to gross domestic product. The programs of Master Plan can increase the productivity of this presently lightly used land. Integrated social forestry, community-based forest management, range management, assisted natural regeneration, plantation forests, and forest protection will each cover parts of the area of extensive land used and develop them towards intensified uses.

In short, implementation of the Master Plan will have a strongly positive impact on the environment by restoring forest cover on degraded areas. Controlled exploitation of the natural forests will bring them under efficient and more productive management. Soil and water conservation will be promoted. The network of national parks and wildlife reserves protect and maintain existing plant and animal resources and promote genetic conservation. The people will be made more aware of the necessity of sustaining a balance between their needs for forest products and the ability of the ecosystem to supply these needs.

DISTRIBUTIONAL IMPACTS

Resources

Legal access to resources and development for the people living near and relying on the forests is not only a question of social justice but also of economic efficiency. It is well known that only secure tenure can guarantee long term investments and intensification of efforts.

Development as envisaged under the Master Plan will mean fundamental reform in forest land allocation. Community-based forest management, integrated social forestry, and forest land management, when implemented in full, will equalize the present tenure structure to the advantage of people and communities living on forest lands. At the same time, it maintains the forest resource base and supports sustainable wood supply for both people and industry and provides long-term forest products supply security needed for new investments.

Benefits of Wood Production

Increased wood production is one of the major material benefits due to the program. It will improve the sustainability and retailing prospects for the industry dependent on wood raw materials. Industrial development in turn will provide benefits directly and indirectly to the different sectors and subsectors of society. However, the focus of the benefits of the natural forest management, forest plantation, and community-based forest management programs will be limited only to the primary sector and primary beneficiaries, excluding industrial development benefits.

The total value of wood production from natural forests and plantations at mill gate prices will increase from present Tk 18.0 billion to Tk 34.5 billion under Scenario 1 and to Tk 74.1 billion in 2013. How the total incremental "stumpage value" (economic rent) will in practice be allocated among specific forest beneficiaries, like the BFD and local communities, in each case, is a distributional policy. Labour's actual share will depend on the labour intensity of the technology used.

Other material inputs from the forest, especially non wood-based forest products are a source of similarly increased production and value distribution flows. Due to the labour-intensive technology, labour's income from collecting, planting, and processing of these products will have a larger relative share than in the case of wood production.

Environmental Benefits

The biodiversity benefits are multidimensional and the potential direct beneficiaries are, in the first place, future generations, forest gatherers, cultural minorities, traders, and processing firms, either local or foreign. Indirect beneficiaries of maintaining biodiversity option, are society and the citizenry as a whole.

In the case of other major environment benefits, particularly that of reducing the off-site costs of soil erosion and hydrological deterioration, one can be more specific in identifying those who will benefit. In the estimation of the Master Plan, the reduction of off-site costs will be reduced annually by a substantial amount in 2013.

Programme Costs as Benefits

The Master Plan is a long-term program and most of the investments will mature beyond 5-10 years after investments are placed, and in many cases much later. However, the most immediate impacts of the program come from the direct implementation of the program components. What is considered a cost for the program is income to those employed, contracted, or who sell material inputs needed in a program.

It is estimated that about 21 percent of the costs of the Master Plan will benefit small farmers in the plantation development program components which implemented inside the farms and lots. Plan implementation require technical, professional, and administrative skills which account for 24 percent of all costs. Other costs are materials, equipment, machinery costs, human resources development, research, monitoring and consulting services of which about 40 percent is of local origin and 40 percent foreign.

FINANCIAL AND ECONOMIC RESULTS

Plantation Models

Several technical plantation development models reflect a range of appropriate rotations, species and MAI. Appropriate silvicultural prescriptions including spacing, level of physical inputs, maintenance and thinning programmes have also been proposed separately for each of the models. Based on these technical parameters, financial analysis has been undertaken for each of the models to assess financial attractiveness of the model on a per hectare basis. In estimating benefits, all products including fuelwood, poles and sawlogs has been taken into account. Prices of all inputs and outputs are financial prices at plantation gate and has been expressed in late 1992 values. Details of all technical assumptions are included in the Forest Production (FMP 1992b) and Economics and Marketing (FMP 1992a) subteam reports, Appendix 5 has the analytical details which Table 13 summarizes. Appendix 6 describes in detail the basic assumptions included in the analysis.

Table 12 - Plantation Model Financial Analysis

Rotation	Species	MAI m ³ / A	Development Cost Tk/ ha	Benefit Tk/ ha	FIRR	NPV @ 12% Tk/ ha
45	Teak (Stump)	2.5	13,050	437,985	13	2,442
45	Teak (Polybags)	2.5	16,685	360,585	10	-4,579
40	Teak	8.4	25,000	819,728	22	30,057
30	Teak	25	33,400	1,159,140	29	81,510
30	Garjan	25	38,190	1,159,140	24	84,845
20	Teak	12.5	23,625	379,770	26	56,086
20	Teak	30	31,600	731,810	24	81,467
20	Sal	12.5	33,140	278,910	17	10,930
10	Various ^a	15	17,050	51,000	14	3,790
10	Various ^a	20	35,200	74,400	19	8,700
10	Various ^a	45	32,115	153,000	28	27,828

^aGamar, Melocanna, or pine

The analyses confirm that all the plantation models are financially viable and attractive. However, the financial profitability of the analyzed models varies over a large range. Strikingly, the short rotation (fuelwood) plantation model shows a lower rate of return. These plantations have been supported in the past because they reduce the pressure on the natural forest.

The low profitability of fuelwood plantations also demonstrates the wide range of financial profitability of plantation forests, a fact that is valid for the whole program as well. Careful selection of locations, project alternatives, market opportunities, and feasible cost levels in each specific project is worthy of extra planning effort. These fuelwood models are adopted in formulating programs and targets for forest production and participatory forestry.

Master Plan

Financial and economic analyses were undertaken for the forest production and participatory forestry components separately and the Master Plan as a whole under both the development options. These analyses have been done by comparing the incremental costs and benefits associated with the program component (Scenario 1 and 2) with the costs and benefits of the "without" (Status Quo) programme situation. The analyses take into account the felling and plantation program and the associated growth targets. All values are in 1993 constant prices. For financial analysis, financial price of inputs and outputs are used. The economic analysis was border prices, with international prices converted at the exchange rate of 1 US\$ = Tk 38.9.

Because of prevailing unemployment and underemployment in Bangladesh, the daily market value of unskilled labour (Tk-50) has been adjusted by a factor of 0.75 to reflect its opportunity cost.

Economic prices of different forest products under the plan are based on farmgate or plantation-gate prices derived on the basis of prevailing market prices and adjusted by conversion factors. Use of market (financial prices) prices as a basis for subsequent derivation is considered justified in view of the competitive market for poles and timber in Bangladesh. These outputs are not also traded internationally, and therefore, valuing them in terms of imported resources would seem to be inappropriate. Of the output subcategories, only fuelwood is considered to be a close substitute for an import like kerosene. Kerosene, however, is used minimally in rural Bangladesh. Thus, even allowing for a future fall in its real price, the true degree of substitutability among fuels in Bangladesh is yet to be established. Considering this, the market price of fuelwood has been considered as a basis for economic prices of fuelwood in the analysis. Other traded goods and services get valued at their CIF imports or FOB export prices as appropriate. Non-traded goods and services are adjusted by a shadow cost factor of 0.80. All cost items directly related to forest development have been included in the cashflow. Details of the assumptions and analysis are in Appendix 5, Table 14 summarizes the results. Appendix 6 gives complete details of the basic and assumptions the analysis.

Table 13 - Summary of Financial and Economic Analysis - Scenario 1

Item	Rate of Return %		Net Present Value ^a Tk Million	
	Economic	Financial	Financial	Economic
Programme				
Forest Production	14	16	38	1,538
Participatory	17	19	489	1,897
Master Plan	14	17	2,054	2,890
Switching Value ^a				
Costs	+2	+7	na	na
Benefits	-7	-46	na	na

^a Discount rate 12%

The analysis reveals that both the scenarios are economically viable. The EIRR under both the development options are higher because many of the forest resources are already in place and benefit of those have been accounted for without taking into consideration the sunk costs associated existing plantations. Under Scenario 1, the EIRR is inflated because the cost of forest protection from benefit sharing is not reflected in the costing of plantation development. Experience shows that without specific protective measures, actual forest production goes down substantially, this severely affects the rate of return.

In context, Scenario 2 benefit exclude benefit sharing costs, as well the Scenario excludes potential increase from environmental development programme.

Table 14 - Summary of Financial and Economic Analysis, Scenario 2

Item	Rate of Return %		Net Present Value* Tk Million	
	Economic	Financcail	Financial	Economic
Programme				
Forest Production	19	24	11,896	13,297
Participatory	32	29	28,043	26,897
Master Plan	20	27	12,054	62,936
Switching Value *				
Costs	+10	+30	na	na
Benefits	-25	-75	na	na

* Discount rate 12%

The EIRR under Scenario 2 is much higher because of the high MAI assumed and this also explains the incremental net benefit that will accrue at a much later years date from long rotation plantations.

Sensitivity Analysis

Sensitivity analysis carried out assesses the financial and economic viability of both the development options under various assumptions and adverse changes in key factors affecting costs and benefits using switching values. The results indicate that both the development options remain viable even under a variety of adverse changes in costs and benefits. However, in all the cases, results are more sensitive to cost increases than accrual of benefits. It should be noted here that cost estimates are indicative and, in some cases, are on the higher side to allow flexibility during preparation of more detailed and specific program packages.

Risks

For the plantation development protection of forest cover is the major risk anticipated. Theft, illegal grazing, fire and inadequate forest management practices are the major causes of rapid depletion of Bangladesh forest resources. The Plan provides for the establishment of long, medium and short rotation plantations over a period of 20 years. Location of short rotation fuelwood plantations is adjacent to populated areas. However, the Plan envisages large scale peoples participation in the establishment and maintenance of new plantations. The benefit sharing arrangements or monetary incentives to the participants can minimise the risk. In the past, plantations have failed for many reasons. These problems are now better recognized and routine forest management practices are being progressively introduced to counter them. It is therefore expected that these matters should not constitute a major risk, provided that BFD organization and management are enhanced as proposed.

One of the major risk to the success of the participatory forestry is the failure of the local communities to respond as fully as expected. This risk is more related to its social and institutional aspects than to physical, silvicultural or price related variables. In particular, the danger of inadequate participation by local communities in the program is guarded against through attractive benefit-sharing arrangements. The emphasis the program places on training and motivational activities through NGOs further reduces the risk.

Economic Rental Valuation

1. Sawlog Stumpage

Production of sawlogs from state forest resources is partly carried out by BFIDC within their concessions. BFD also makes direct allocations of pulpwood to BCIC enterprises. Prices of wood products are fixed by BFD in agreement with BFIDC and BCIC which are well below the market prices. A substantial undervaluation of the forest products in Bangladesh in the form of low royalty, forest charges and other forest fees has been among the major causes of forest depletion. Given that a forest performs both protective and productive functions, optimal management of forests would require that those who log the forest should pay a price for the forest products which takes into account the full cost of conversion, including the economic value of lost forest products and the loss of the protective value of the forest to the environment. Charges to both BFIDC and BCIC do not consider the full opportunity cost of forest use and conversion, indicating a weakness in the price mechanism, which sound forest management policies should seek to offset.

It has been suggested many times during the recent past to transfer from administratively determined low forest charges to timber pricing systems which adequately reflect the real value of forest products. Government policy should clearly support this transfer in order that forest management and development decision fully reflect economic decisions.

2. Stumpage Pricing System Goals

The basic purpose of a stumpage pricing system is to attach a price for logs harvested which:

- a. Adequately represents the true market value of logs of different species and wood products made from them.
- b. Captures a fair and reasonable public share of economic rent of timber harvested to facilitate public funding for forest resource rehabilitation and development programmes.
- c. Covers in every situation at least the cost of reforestation and possible environmental off-site costs of logging (otherwise, the public carries the erosion and regeneration costs).
- d. Encourages rational and economic raw material use and sustainable development of forest resources.
- e. Adequately takes account of the varying logging and transport costs.
- f. Allows sound development of forest industries with investment level balanced to modern technology and supporting the manufacture of high value-added products.

These goals may conflict sometimes and trade-offs between them became necessary.

3. Recommended Rent

Economic rent for timber is the value left after subtracting the minimum amount required to harvest and transport it to the market (including a reasonable profit for a extraction or timber operator). Thus, economic rent corresponds to the stumpage value of timber obtained from the market price of timber less the costs of reasonable efficient logging and transport plus a reasonable margin for profit and risks. In principle, resource owners, like the government, can capture the whole economic rent without affecting the market prices of timber, because economic rent, if captured by the timber contractor (or other party) represents an "extra unearned" or windfall profit over and above the normal "earned" profit in logging.

The Resources Economics report (FMP 1992a) includes modified calculation of the economic rent values for pulpwood and bamboo. This report estimates economic rent of the principal product, sawlogs prices ex-mill. The four calculations details in Appendix 5 model the economic rent according to the quality grade of sawlogs and corresponding timber grade prices (low, medium,

high). Calculation give economic rents (stumpage value for timber) of Tk 8,400, Tk 7,200, Tk 4,200 and Tk 4,800 per m³. If the assumed quality distribution of the logs in the preceding order is 30 percent (low quality sawlogs), 40 percent (medium) and 30 percent (15 percent high quality sawlogs and 15% high quality peeler logs), the average economic rent is Tk 6,870/m³. This amount represents 50% of the financial value of sawlogs at the mill. This values is the highest average stumpage value assuming 30 percent profit in sawmilling on variable and fixed cost and 20 percent profit on extraction operational and overhead costs. Attention is drawn to the fact that these assumed milling and logging profit margins are quite high, and are only be justified by a fair degree of risk.

4. Policy Implications

The economic rent calculations present the highest stumpage value attained from timber resources under the defined assumptions concerning normal profits in processing and in logging. Realistic variable fixed costs for both milling and logging reflect current cost levels. Normally, under a stumpage system these calculations get appraised for different products, mill sizes, geographical locations, wood supply conditions, and market assumptions throughout the country.

The broad calculations confirm indisputably the earlier studies and discussions that the government can substantially raise the timber stumpage prices. But by how much is a policy and distributional issue. There is no single answer to this question. As stated above, there are many purposes in proper pricing of standing timber and some of the goals may and will conflict. The basic principles should be that price paid should reflect an appropriate economic rent based on the value of logs at the millgate (or product value); an assessed price which in all cases, covers the necessary regeneration and environmental on-site and off-site environmental costs.

It is suggested to set the stumpage price initially at 20 percent against the present rate of 12.5 percent of market price (or millgate price) of timber harvested. The above calculations and reference show that this amount is defensible and will not make a transition too difficult for the industry. The most accurate basis for stumpage price determination is to charge the economic rent, not a percentage of the market value of logs although the latter is easier to implement.

Wood-Based Industry Assessment

1. General

Wood-based industries in Bangladesh comprise two types of wood users, the pulp and paper and the mechanical or solidwood products industry. Both categories breakdown further in to other classes: the first into pulp, paper and allied products; and the second into a host of other products, including secondary products and joinery materials like doors, textile bobbins, and large numbers of other minor products with sawnwood as their base material.

Most pulp and paper industry enterprises in Bangladesh are owned and operated by Bangladesh Chemical Industry Corporation. Their enterprises include the karnafuli Paper mill, Sylhet Pulp and Paper Mill, Khulna Newsprint Mill, North Bengal Paper Mill. These enterprises are characterized by large capital investments and a high level of enterprised is required for operations and maintenance. Private industry is limited to small papermills producing most products and converted products other than newsprint.

Many of the solidwood processing industries are owned and operated by Bangladesh Forest Development Corporation. There companies include Chittagong Particleboard and Veneer Plant, Chittagong Furniture Factory, Chittagong Cabinet Manufacturing Plant, Chittagong Board Mill, Chittagong Door Factory, Chittagong Treatment Plant, Chittagong Timber Seasoning Plant, Chittagong Sawmill, Sangu Valley Plywood Plant, Dhaka Cabinet Manufacturing Plant, Eastern Woodworks Dhaka, Kaptai Wood Processing Complex, Khulna Wood Treatment Plant and Khulna

Cabinet Manufacturing Plant. BCIC's interests in solidwood are the Khulna Hardboard Mill and Ujala Match Works.

There are about 4,800 sawmills in the country, of which 2,500 are in urban locations and 2,300 in rural areas. Most of the private mills are ill-equipped and unable to take advantage of normal conservation and lumber recovery techniques. Private sector plants dominate the panel board industry using both wood and agricultural residues for raw materials. Overall, the private solidwood industry is weakly developed.

2. Financial Analysis

The Wood Processing specialist report assessed all the major wood-based industries. This assessment included both financial and technical performances. Financial analysis is based on the data furnished by each enterprise for the last ten years. That specialist report gives detailed analyses for each enterprise compared to the summaries reported here.

BFIDC operates eleven solidwood processing companies. Table summarizes the profit (loss) position of all these companies by three different periods:

- Pre cutting moratorium.
- Post cutting moratorium.
- 10-year periods 1981/82 to 1990/91.

10-year financial performance shows a combined total profit of \$ 481,600. In the seven years before the imposition of the cutting moratorium, BFIDC showed a profit of \$ 1.68 million. Since the moratorium, the Corporation suffered losses totaling \$1.2 million in three years.

Table 15 - BFIDC Consolidated 10-Year Profit (Loss) Summary

Mill/ Plant	Profit (Loss) US		
	Pre ^a Moratorium	Post ^b Moratorium	10-year ^c Total
Chittagong Particleboard/ Veneer	(1,106,181)	(835,122)	(1,941,303)
Chittagong Furniture	(62,784)	(213,844)	(276,628)
Chittagong Cabinet	(26,718)	(92,848)	(119,566)
Chittagong Flush Door	(851,367)	(91,111)	(942,478)
Chittagong Wood Treatment	956,833	(224,777)	732,056
Sangu Valley Plywood	345,773	101,864	447,637
Dhaka Cabinet	(16,807)	(40,639)	(57,446)
Eastern Woodworks	50,932	(41,813)	9,119
Kaptai Lumber Processing	902,375	67,893	970,268
Khulna Wood Treatment	1,395,453	172,312	1,567,765
Khulna Cabinet	93,512	(1,354)	92,158
Total	1,681,021	(1,199,439)	481,582

^a 1981/82-1987/88

^b 1988/89-1990/91

^c 1981/82-1990/91

BFIDC's operations breakdown into four distinct product groups as follows:

- Particleboard includes the particleboard and veneer plant in Chittagong.
- Seasoning and treatment, three facilities, one at each of Khulna, Kaptai and Chittagong. These are the only production units which demand expertise not found in the private sector.

- Plywood, one plant located at Dohazari.
- Furniture, cabinetry and doors, includes six plants, three located in Chittagong, two in Dhaka, and one in Khulna.

Table 16 presents the 10-year financial results according to product categories, split to show the effects of the cutting moratorium. Sangu Valley Plywood and the three seasoning and wood treatment plants are the only operation showing a cumulative and periodic profit position in the 10-year period ending in 1990/91. In contrast, the particleboard and tertiary processing enterprises (furniture, cabinetry and doors) show losses consistently.

Table 16 - Profit (Loss) of BFIDC Enterprises According to Product

Product Group	Plants	Profit (Loss) US		
		Pre-Moratorium	Post Moratorium	10-Year
Particleboard	1	(1,106,181)	(835,122)	(1,941,303)
Seasoning/ Treatment	3	3,254,661	15,428	3,270,089
Plywood	1	345,773	101,864	447,637
Furniture, Cabinest. Doors	6	(813,232)	(481,609)	(1,294,841)
Total	11	1,681,021	(1,199,439)	481,582

BCIC owns and operates two solidwood product companies - Khulna Hardboard Mill and Ujala Matchworks. Performance of both industries is not affected by the cutting moratorium. Ujala shows an accumulated 10-year loss of US \$ 1.47 million, while Khulna Hardboard has a very modest \$0.32 million profit.

Table 17 - Financial Condition of BCIC Enterprises

Mill	Profit/ Loss (US)
Karnafuli	1,052,363
Sylhet	(4,058,748)
Khulna	(10,819,923)
North Bengal	(21,085,568)
Total	(34,911,876)

Technically, the pulp and paper companies keep their plant and equipment in reasonably good mechanical condition but operating below capacity. Financial performances gives a very gloomy picture for the accumulated financial loss of US \$34.9 million. Only Karnafuli is in the black with a small profit US \$ 1.0 million, all others incurred a net loss.

3. Economic Appraisal

It is estimated that about 47 percent more raw material than required is wasted in the conversion of sawlogs to meet current sawnwood demands. About 2.16 million m³, of sawlogs is normally required to meet the present annual sawnwood demand of 1.2 million m³. The equivalent log volume necessary with present sawing techniques and equipment is 3.17 million m³/A. This a simple waste of the country's scarce natural resource which would amount to 1.1 m³ annually. This

loss is due entirely to two factors: The use of out-dated and in appropriate technology; and the use of in appropriate conversion techniques.

The potential loss to the country's economy due to the continuing use of inappropriate technology and practices is staggering. If Bangladesh had sufficient resources to provide the volume needed, the estimated value of the wasted raw materials is US\$ 165 million annually in 1993 market prices. For each of the approximately 4,800 Sawmills in Bangladesh, this amount translates to about US 36,000 annually.

The unfavourable financial performance incurred results from a myriad of factors. The major ones identified as contributors are:

- Inappropriate technology.
- Raw material shortage and irregular supply..
- Extent of Forest Department control on raw materials.
- Inability to access external assistance and technology.
- Shortage of skilled labour.
- High level of import duties.
- Under capitalization.
- Wornout equipment.

Public sector corporations, in addition to the above constraints also face conditions of:

- Over employment.
- Fixed cost labour.
- High employee fringe benefit cost.
- Militant labour force; and
- Government controlled prices.
- Revolving management.
- High input costs.

4. Plantation Incentives

One of the major constraints facing to-day by the wood based industries is the shortage of raw materials supply. It is perceived by many, that if all industrial raw materials remain under the direct control of the FD, the situation of many of the wood based industries will not be improved. As an example, BFIDC seasoning and treatment plants sit idle while there is a strong demand for transmission poles, anchor logs and crossarms. The reason cited is that the FD has delayed its silvicultural activities with respect to thinning programmes. Meanwhile, poles are being imported.

Further, vast areas of denuded forest and felled plantations alike, remain undeveloped while major industrial users of forest products desperately seek alternate sources to meet their raw material need. If this situation continues, the future of the wood based industries will be at stake which warrants to seek alternative and sustainable sources of forest products development. It is therefore, imperative that those major enterprises such as pulp and paper mills should be granted long term tenure for land for the establishment of plantation of an area appropriate to meet their raw materials requirement. This action will clearly provide an incentive to the enterprises.

Such plantation development under the management of individual enterprises will also ease the demand for timber from FD lands as well as village forest. Certain species can be grown which would serve the needs of specific end-uses, thus leaving more valuable FD and village forest species for products of higher value. In addition, the entrepreneur who wishes to invest in a forest-based industry will have a better opportunity to secure financing for the enterprise if a secure source of raw material supply can be shown.

Plantation development by the enterprise will also provide price incentives in the form of reduced cost of raw materials. The financial analysis of short rotation pulpwood species plantation model

suggests that pulpwood cost/m³ would be around Tk 60. If another Tk 150-200 is added for harvesting and transportation, the cost of pulpwood at millgate would still be less than proposed royalty rates. This reduction in the price of raw materials in combination with sustained supply will have a tremendous positive impact on the cash flow of the enterprises and also on the economy as a whole.

The possibilities of having control over raw material supplies at affordable prices is incentive enough for legitimate business to plan and develop productive investments. Bangladesh will however likely face having to build up suitable plantation resources before any genuine investor will grasp the opportunity. Existing companies given secure tenure on raw land should raise their own plantations, but government will have to warrant controlled prices on mature plantation wood.

5. Policy Recommendations

Implementation of the following recommendations (FMP 1992f) is necessary to bring about the changes needed for the growth of the forest industry and to permit the industry to make a positive contribution to the country's economy.

- Create secure raw material supplies by granting conditional long term tenurial rights to enterprise making large investments, either the an autonomous enterprise system, or as independent producers or government corporations.
- Give responsibility for ensuring sustained industrial raw material supplies to the consuming industries holding long term tenure. These groups, ie. pulp and paper mills must be held accountable and responsible for establishing intensively managed fast growing pulpwood plantation on areas appropriate to their needs.
- Reduce raw material losses in the sawmilling industry by new and efficient sawmills which utilize the resource more efficiently, thereby supporting sustainable resource development.
- Finally, it is suggested that an autonomous enterprise system, operated legitimately and in a proper businesslike manner, is the best means by which the wood processing industry in Bangladesh can grow, provide continuing employment, and make a positive contribution to the national economy.

Separate policy recommendations relate to government owned corporations only, the following apply, in addition to the above recommendations:

- Adopt standardized product sizes, make Bangladesh Standards Institute, in co-operation with manufacturers, builders, architects, and major end-users establish and implement efficient wood product standards clearly designed to conserve wood.
- Eliminate wasteful raw material measurement systems, compel the forestry sector to follow government order which placed Bangladesh under the metric system of measurement in 1982.
- Introduce log and sawnwood grading rules, have Bangladesh Standards Institution prepare, publish and enforce quality rules applicable to the timbers of Bangladesh.
- Accelerate practical research and development of lesser-known species, have the Bangladesh Forest Research Institute continue their research into all properties of the lesser-known and traditionally unused species.
- Embark upon a public education programme to encourage consumer acceptance of wood seasoning and preservative treatment. Back the programme up with a differential value-added tax structure that gives price incentive to use seasoned and preserved wood products.



APPENDIX 1
ABBREVIATIONS, TERMS AND CONVERSION FACTORS



APPENDIX
ABBREVIATIONS, TERMS AND CONVERSION FACTORS

FINANCIAL ANALYSIS

APPENDIX 1

ABBREVIATION, TERMS AND CONVERSION FACTORS

LIST OF ABBREVIATIONS AND LOCAL TERMS

ADB	- Asian Development Bank
AF	- Acquired Forest
BARC	- Bangladesh Agricultural Research Council
BASIC	- A Software Program
BCIC	- Bangladesh Chemical Industries Corporation
BCSIR	- Bangladesh Council for Scientific and Industrial Research
BSCIC	- Bangladesh Small and Cottage Industries Corporation
CAI	- Current annual increment
CF	- Cost and Freight
Char	- Land formation on river bank on sea coast
CHT	- Chittagong Hill Tracts
CIF	- Cost, Insurance and Freight
cm	- Centimetre
DBH	- Diameter Breast Height
EIRR	- Economic Internal Rate of Return
FAO	- Food and Agriculture Organization of the United Nations
FD	- Forest Department
FEC	- Foreign Exchange Component
FIDC	- Forest Industries Development Corporation
FIRR	- Financial Internal Rate of Return
FMP	- Forestry Master Plan
FOB	- Freight on Board
FRI	- Forest Research Institute
FY	- Financial Year
FFYP	- Fourth Five Year Plan
gm	- Gram
GOB	- Government of Bangladesh
ha	- Hectare
IFCU	- Institute of Forestry, Chittagong University
Jhum	- Shifting Cultivation
kg	- Kilogram
Khas Forest	- Forest Land Owned by Revenue Department of Government
Khetland	- Private Land
km	- Kilometre
km ²	- Square kilometre
KNM	- Khulna Newsprint Mill
KPM	- Karnafuli Paper Mill
m	- Metre
m ²	- Square Metre
m ³	- Cubic Metre
m ³ /ha/ A	- Cubic metre per hectare per year
MAI	- Mean annual increment
mm	- Millimetre
MOEF	- Ministry of Environment and Forest
MT	- Metric Tonne
MUV	- Manufacturing Unit Value
NGO	- Non Government Organization
No.	- Number
NPV	- Net Present Value
OCC	- Opportunity Cost of Capital
ODA	- Overseas Development Agency
PF	- Protected Forest
PY	- Planning Year
REB	- Rural Electrification Board
RF	- Reserved Forest
SCF	- Standard Conversion Factor
Tk	- Taka
UNDP	- United Nations Development Program
VF	- Vested Forest
WAPDA	- Water and Power Development Authority
WHD	- 4 Wheel Drive

APPENDIX 2
TERMS OF REFERENCE

APPENDIX 1
TERMS OF REFERENCE

FINANCIAL ANALYSIS

APPENDIX 2
TERMS OF REFERENCE

Investment (Financial) Analysis

- i. Assess in financial terms the viability of private plantations and private nurseries;
- ii. Assist other sub-teams in the financial assessment of alternative land use allocations (e.g. forest land for rubber production or for fodder production, etc.);
- iii. Carry out a financial assessment of wood-based industry including the paper and pulp sector. Recommend policy reforms to increase their efficiency. Assess the feasibility of providing incentives to these industries for plantation development; and
- iv. Assist other sub-teams in the preparation and analysis of investment proposals.

PROJECT NUMBER: 100-100000000-0000
HONOLULU MASTER PLAN
HAWAIIAN ISLANDS
DATE: 10/1/1991

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APPENDIX 1

TERMS OF REFERENCE

Investment Feasibility Analysis

1. Areas to be studied include the following:

1. Areas to be studied include the following:
2. Areas to be studied include the following:
3. Areas to be studied include the following:

2. Areas to be studied include the following:

1. Areas to be studied include the following:
2. Areas to be studied include the following:
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3. Areas to be studied include the following:

1. Areas to be studied include the following:
2. Areas to be studied include the following:
3. Areas to be studied include the following:

APPENDIX 3
INVESTMENT PROGRAMME AND COSTS, SCENARIO 1

APPENDIX 3
INVESTMENT PROGRAMME AND COSTS SCENARIO 1

FINANCIAL ANALYSIS

APPENDIX 3
INVESTMENT PROGRAMME AND COSTS, SCENARIO 1

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1. SUMMARY OF PROGRAMME COSTS BY CATEGORY OF EXPENDITURE

Table 1 - Summary of Programme Costs by Category of Expenditure

Programme Components	Million Taka			Million U \$			% of Base Costs	% of FEC
	Foreign	Local	Total	Foreign	Local	Total		
A. PHYSICAL INFRASTRUCTURE								
1. Land Acquisition		100.0	100.0		2.6	2.6	0.2	
2. Detail Engineering and Supervision		53.1	53.1		1.4	1.4	0.1	
3. Civil Works	88.5	796.7	885.3	2.3	20.5	22.8	1.6	0.5
4. Construction of Roads	206.1	530.0	736.1	5.3	13.6	18.9	1.4	1.3
Subtotal	294.6	1,479.8	1,774.5	7.6	38.0	45.6	3.3	1.8
B. FURNITURE, EQUIPMENT AND VEHICLES								
1. Furniture		16.3	16.3		0.4	0.4	0.0	
2. Equipments	1,882.6	470.6	2,353.2	48.4	12.1	60.5	4.3	11.6
3. Vehicles	279.3	498.7	778.1	7.2	12.8	20.0	1.4	1.7
4. Extraction Equipments	1,694.1	1,502.3	3,196.4	43.5	38.6	82.2	5.9	10.5
Subtotal	3,856.0	2,488.0	6,344.0	99.1	64.0	163.1	11.7	23.8
C. HUMAN RESOURCES DEVELOPMENT								
1. Overseas Training for BFD Staff	546.8	60.8	607.5	14.1	1.6	15.6	1.1	3.4
2. Local Training to BFD Staff		131.8	131.8		3.4	3.4	0.2	
3. Local Training to Beneficiaries		592.4	592.4		15.2	15.2	1.1	
4. Seminar and Workshops		58.0	58.0		1.5	1.5	0.1	
Subtotal	546.8	843.0	1,389.7	14.1	21.7	35.7	2.6	3.4
D. RESEARCH, DEVELOPMENT AND STUDIES								
1. Research and Development	1,239.6	990.3	2,230.0	31.9	25.5	57.3	4.1	7.6
2. Monitoring and Evaluation	40.0	252.5	292.5	1.0	6.5	7.5	0.5	0.2
Subtotal	1,279.6	1,242.8	2,522.5	32.9	31.9	64.8	4.6	7.9
E. CONSULTING SERVICES								
1. International	390.7	43.4	434.1	10.0	1.1	11.2	0.8	2.4
2. Local		285.0	285.0		7.3	7.3	0.5	
Subtotal	390.7	328.4	719.1	10.0	8.4	18.5	1.3	2.4
F. PLANTATION DEVELOPMENT/FABRICATION OF ENERGY SAVING EQUIPMENTS								
1. Forest Production	1,152.8	10,633.8	11,786.6	29.6	273.4	303.0	21.7	7.1
2. Participatory Forestry	238.0	1,946.3	2,184.3	6.1	50.0	56.2	4.0	1.5
3. Non Wood Forest Products								
4. Wood-Based Energy		375.0	375.0		9.6	9.6	0.7	
Subtotal	1,390.8	12,955.1	14,345.9	35.8	333.0	368.8	26.4	8.6
G. FOREST-BASED INDUSTRIES								
1. Sawmilling	2,436.5	901.2	3,337.6	62.6	23.2	85.8	6.1	15.0
2. Newsprint	2,979.1	1,786.5	4,765.6	76.6	45.9	122.5	8.8	18.4
3. Printing and Writing Paper	2,567.9	1,540.0	4,107.8	66.0	39.6	105.6	7.6	15.8
Subtotal	7,983.4	4,227.7	12,211.1	205.2	108.7	313.9	22.5	49.3
H. RECURRENT COSTS								
1. Existing Staff Salaries		9,254.3	9,254.3		237.9	237.9	17.0	
2. Incremental Staff Salaries		4,906.4	4,906.4		126.1	126.1	9.0	
3. Operation and Maintenance of Facilities	9.2	36.8	46.0	0.2	0.9	1.2	0.1	0.1
4. Vehicle/ Equipment Operation/ Maintenance	243.0	243.0	486.0	6.2	6.2	12.5	0.9	1.5
5. Office Supplies and Consumables	212.8	91.2	304.0	5.5	2.3	7.8	0.6	1.3
Subtotal	465.0	14,531.7	14,996.7	12.0	373.6	385.5	27.6	2.9
BASE COSTS	16,207.0	38,096.5	54,303.5	416.6	979.3	1,396.0	100.0	100.0
Physical Contingencies*	708.4	1,740.6	2,449.0	18.2	44.7	63.0		
TOTAL PROJECT COST	16,915.4	39,837.1	56,752.5	434.8	1,024.1	1,458.9		

* Ten percent on civil works and five percent on other items.

2. LANDUSE, CONSERVATION AND ENVIRONMENTAL MANAGEMENT

Table 2 - Summary of Programme Costs

Programme Components	Million Taka			Million U \$			% of Base Costs	% of FEC
	Foreign	Local	Total	Foreign	Local	Total		
A. PHYSICAL INFRASTRUCTURE								
1. Land Acquisition		5.0	5.0		0.1	0.1	0.3	
2. Detail Engineering and Supervision		18.1	18.1		0.5	0.5	1.2	
3. Civil Works	30.2	271.8	302.0	0.8	7.0	7.8	20.4	11.3
Subtotal	30.2	294.9	325.1	0.8	7.6	8.4	21.9	11.3
B. FURNITURE, EQUIPMENT AND VEHICLES								
1. Furniture		16.3	16.3		0.4	0.4	1.1	
2. Equipments	12.6	3.2	15.8	0.3	0.1	0.4	1.1	4.7
3. Vehicles	38.4	9.6	48.0	1.0	0.2	1.2	3.2	14.4
Subtotal	51.0	29.1	80.1	1.3	0.7	2.1	5.4	19.1
C. HUMAN RESOURCES DEVELOPMENT								
1. Overseas Training	16.2	1.8	18.0	0.4	0.0	0.5	1.2	6.1
2. Short Courses (Overseas)	20.3	2.3	22.5	0.5	0.1	0.6	1.5	7.6
3. Training of Trainers		3.0	3.0		0.1	0.1	0.2	
4. Training of Local Government Officials		2.0	2.0		0.1	0.1	0.1	
5. Training of Villagers		80.0	80.0		2.1	2.1	5.4	
6. Workshop and Seminars		6.0	6.0		0.2	0.2	0.4	
Subtotal	36.5	95.1	131.5	0.9	2.4	3.4	8.9	13.6
D. RESEARCH, DEVELOPMENT AND STUDIES								
1. Inventory and Surveys		8.8	8.8		0.2	0.2		
2. Research and Development Studies		28.0	28.0		0.7	0.7	1.9	
3. Monitoring and Evaluation		32.5	32.5		0.8	0.8	2.2	
Subtotal		69.3	69.3		1.8	1.8	4.7	
E. CONSULTING SERVICES								
1. International	119.4	13.3	132.6	3.1	0.3	3.4	8.9	44.7
2. Local		225.6	225.6		5.8	5.8	15.2	
Subtotal	119.4	238.9	358.3	3.1	6.1	9.2	24.1	44.7
F. RECURRENT COSTS								
1. Existing Staff Salaries		137.6	137.6		3.5	3.5	9.3	
2. Incremental Staff Salaries		325.8	325.8		8.4	8.4	22.0	
3. Operation and Maintenance of Facilities	1.2	4.8	6.0	0.0	0.1	0.2	0.4	0.4
4. Vehicle/ Equipment Operation/ Maintenance	15.0	15.0	30.0	0.4	0.4	0.8	2.0	5.6
5. Office Supplies and Consumables	14.0	6.0	20.0	0.4	0.2	0.5	1.3	5.2
Subtotal	30.2	489.2	519.4	0.8	12.6	13.4	35.0	11.3
BASE COSTS	267.3	1,216.4	1,483.7	6.9	31.3	38.1	100.0	100.0
Physical Contingencies	14.9	75.6	90.4	0.4	1.9	2.3		
TOTAL PROGRAMME COST	282.1	1,291.9	1,574.1	7.3	33.2	40.5		

Table 3 - Proposed Financing Plan, Million U \$

Project Components	Total Programme Cost			GOB Financing			Donors Financing			Beneficiaries Financing		
	Foreign	Local	Total	Foreign	Local	Total	Foreign	Local	Total	Foreign	Local	Total
A. PHYSICAL INFRASTRUCTURE												
1. Land Acquisition		0.1	0.1		0.1	0.1						
2. Detail Engineering and Supervision		0.5	0.5					0.5	0.5			
3. Civil Works	0.8	7.0	7.8		0.8	0.8	0.8	6.2	7.0			
Subtotal	0.8	7.6	8.4		0.9	0.9	0.8	6.7	7.5			
B. FURNITURE, EQUIPMENT AND VEHICLES												
1. Furniture		0.4	0.4					0.4	0.4			
2. Equipments	0.3	0.1	0.4		0.1	0.1	0.3		0.3			
3. Vehicles	1.0	0.2	1.2		0.2	0.2	1.0		1.0			
Subtotal	1.3	0.7	2.1		0.3	0.3	1.3	0.4	1.7			
C. HUMAN RESOURCES DEVELOPMENT												
1. Overseas Training	0.4	0.0	0.5				0.4	0.0	0.5			
2. Short Courses (Overseas)	0.5	0.1	0.6				0.5	0.1	0.6			
3. Training of Trainers		0.1	0.1					0.1	0.1			
4. Training of Local Government Officials		0.1	0.1					0.1	0.1			
5. Training of Villagers		2.1	2.1					2.1	2.1			
6. Workshop and Seminars		0.2	0.2					0.2	0.2			
Subtotal	0.9	2.4	3.4				0.9	2.4	3.4			
D. RESEARCH, DEVELOPMENT AND STUDIES												
1. Inventory and Surveys		0.2	0.2					0.2	0.2			
2. Research and Development Studies		0.7	0.7					0.7	0.7			
3. Monitoring and Evaluation		0.8	0.8					0.8	0.8			
Subtotal		1.8	1.8					1.8	1.8			
E. CONSULTING SERVICES												
1. International	3.1	0.3	3.4				3.1	0.3	3.4			
2. Local		5.8	5.8					5.8	5.8			
Subtotal	3.1	6.1	9.2				3.1	6.1	9.2			
F. RECURRENT COSTS												
1. Existing Staff Salaries		3.5	3.5		3.5	3.5						
2. Incremental Staff Salaries		8.4	8.4		8.4	8.4						
3. Operation and Maintenance of Facilities	0.0	0.1	0.2		0.1	0.1	0.0		0.0			
4. Vehicle/ Equipment Operation/ Maintenance	0.4	0.4	0.8		0.4	0.4	0.4		0.4			
5. Office Supplies and Consumables	0.4	0.2	0.5		0.2	0.2	0.4		0.4			
Subtotal	0.8	12.6	13.4		12.6	12.6	0.8		0.8			
BASE COSTS	6.9	31.3	38.1		13.8	13.8	6.9	17.5	24.3			
Physical Contingencies	0.4	1.9	2.3		1.0	1.0	0.4	1.0	1.3			
TOTAL PROGRAMME COSTS	7.3	33.2	40.5		14.8	14.8	7.3	18.4	25.7			
PERCENTAGE	17.9	82.1	100.0		44.6	36.6	100.0	55.4	63.4			

Table 4 - Phasing of Programme Costs, Million Taka

Programme Components	PY				Total Costs		
	Year 1 - 5 FY 1993/97	6 - 10 1998/02	11 - 15 2003/07	16 - 20 2008/12	Local	Foreign	Total
A. PHYSICAL INFRASTRUCTURE							
1. Land Acquisition	5.0				5.0		5.0
2. Detail Engineering and Supervision	14.7	3.4			18.1		18.1
3. Civil Works	245.3	56.7			271.8	30.2	302.0
Subtotal	265.0	60.1			294.9	30.2	325.1
B. FURNITURE, EQUIPMENT AND VEHICLES							
1. Furniture	8.4	5.2	1.2	1.5	16.3		16.3
2. Equipments	10.4			5.4	3.2	12.6	15.8
3. Vehicles	20.1	0.6	12.0	15.3	9.6	38.4	48.0
Subtotal	38.9	5.8	13.2	22.2	29.1	51.0	80.1
C. HUMAN RESOURCES DEVELOPMENT							
1. Overseas Training	12.0	6.0			1.8	16.2	18.0
2. Short Courses (Overseas)	13.5	4.5	4.5		2.3	20.3	22.5
3. Training of Trainers	1.0	1.0	1.0		3.0		3.0
4. Training of Local Government Officials	0.5	0.5	0.5	0.5	2.0		2.0
5. Training of Villagers	20.0	20.0	20.0	20.0	80.0		80.0
6. Workshop and Seminars	3.0	1.5	1.5		6.0		6.0
Subtotal	50.0	33.5	27.5	20.5	95.1	36.5	131.5
D. RESEARCH, DEVELOPMENT AND STUDIES							
1. Inventory and Surveys	8.8				8.8		8.8
2. Research and Development Studies	12.0	8.0	8.0		28.0		28.0
3. Monitoring and Evaluation	10.0	10.0	7.5	5.0	32.5		32.5
Subtotal	30.8	18.0	15.5	5.0	69.3		69.3
E. CONSULTING SERVICES							
1. International	90.4	42.2			13.3	119.4	132.6
2. Local	155.6	70.0			225.6		225.6
Subtotal	246.0	112.2			238.9	119.4	358.3
F. RECURRENT COSTS							
1. Existing Staff Salaries	27.6	31.7	36.4	41.9	137.6		137.6
2. Incremental Staff Salaries	39.9	79.9	95.8	110.2	325.8		325.8
3. Operation and Maintenance of Facilities	1.5	1.5	1.5	1.5	4.8	1.2	6.0
4. Vehicle/ Equipment Operation/ Maintenance	7.5	7.5	7.5	7.5	15.0	15.0	30.0
5. Office Supplies and Consumables	5.0	5.0	5.0	5.0	6.0	14.0	20.0
Subtotal	81.5	125.6	146.2	166.1	489.2	30.2	519.4
BASE COSTS	712.2	355.2	202.4	213.8	1,216.4	267.3	1,483.7
Physical Contingencies	48.9	20.8	10.1	10.7	75.6	14.9	90.4
TOTAL PROGRAMME COST	761.1	376.0	212.5	224.5	1,291.9	282.1	1,574.1

Table 5 - Cost Estimates - Civil Works, Furniture, Equipments and Vehicles

Items	Unit	Unit Cost (Taka '000)	Number of Units					Total	Total Costs (Million Taka)					FEC	T and D
			Year 1-5	6-10	11-15	16-20	21-25		Year 1-5	6-10	11-15	16-20	21-25		
A. PHYSICAL FACILITIES															
1. Land Acquisition		5,000.0	1					1	5.0					5.0	
2. Detail Engineering and Supervision I/	Ha	6.0							14.7	3.4				18.1	
Subtotal	Percent								19.7	3.4				23.1	
3. Civil Works															
- Department	m2	10.1	500					500	5.1					5.1	0.5
- Regional Offices	m2	8.6	2,500					2,500	21.5					21.5	2.2
- Existing National Parks(Protected Areas)	m2	5.4	8,000					8,000	43.2					43.2	4.3
- New Protected Areas	m2	5.4	30,000	10,000				40,000	162.0	54.0				216.0	21.6
- Field Rest House	m2	5.4	2,000					2,000	10.8					10.8	1.1
- Herbarium and Botanical Gardens	m2	5.4													
- Regional Nature Conservation Center	m2	5.4	500					1,000	2.7	2.7				5.4	0.5
- National and Regional Zoo	m2	5.4													
- Natural History Museum	m2	8.6													
Subtotal								54,000	245.3	56.7				302.0	30.2
B. FURNITURE															
- Department of Natural Resource Conservation	Lumpsum	300.0	1		1			2	0.3		0.3			0.6	
- Regional Offices	Lumpsum	150.0	6		6			12	0.9		0.9			1.8	
- Existing National Parks(Protected Areas)	Lumpsum	1,000.0	1					1	1.0					1.0	
- New Protected Areas	Lumpsum	1,000.0	5					10	5.0	5.0				10.0	
- Field Rest House	Lumpsum	50.0	10			30		44	0.5	0.2		1.5		2.2	
- Herbarium	Lumpsum														
- Regional Nature Conservation Center	Lumpsum	50.0	14					14	0.7					0.7	
- National Zoo	Lumpsum														
- Natural History Museum	Lumpsum														
Subtotal									8.4	5.2	1.2	1.5		16.3	
C. EQUIPMENTS															
- Division	Lumpsum	3,000.0	1					2	3.0					6.0	1.2
- Department of Environment	Lumpsum	10,000.0													
- Forest Department	Lumpsum		1					2							
- Regional Offices	Lumpsum	200.0	1					2	0.2					0.4	0.3
- Existing National Parks(Protected Areas)	Lumpsum	1,000.0	1					2	1.0					2.0	0.4
- New Protected Areas	Lumpsum	1,000.0	1					2	1.0					2.0	0.4
- Field Rest House	Lumpsum	20.0	10					20	0.2					0.4	0.3
- Herbarium	Lumpsum														
- Regional Nature Conservation Center	Lumpsum														
- National Zoo	Lumpsum														
- Natural History Museum	Lumpsum	5,000.0	1					1	5.0					5.0	1.0
Subtotal									10.4			5.4		15.8	12.6
D. VEHICLES															
- 4 WHD Jeep	No.	1,500.0	8			8		16	12.0		12.0			24.0	4.8
- Motor Cycle	No.	60.0	15			15		40	0.9	0.6				2.4	0.5
- Speed Boat	No.	1,200.0	6			12		18	7.2					21.6	4.3
- Coastal Research Vessel	No.														
- River Patrol Boat	No.	1,000.0	3			6		9	3.0					9.0	1.8
- Amphibious Aircraft	No.	2,000.0													
Subtotal									20.1	0.6	12.0	15.3		48.0	38.4

Table 6 - Cost Estimates - Human Resource Development, Research, Studies and Operation/Maintenance

Items	Unit Cost		Number of Units					Total Costs (Million Taka)						
	Unit (Taka '000)	Year 1 - 5	6 - 10	11 - 15	16 - 20	21 - 25	Total	Year 1 - 5	6 - 10	11 - 15	16 - 20	21 - 25	Total	FEC. T and D
A. TRAINING AND SEMINAR														
1. Overseas Training	No	1,200.0	10	5			15	12.0	6.0				18.0	16.2
2. Short Courses(Overseas)	No	450.0	30	10	10		50	13.5	4.5	4.5			22.5	20.3
3. Training of Trainers	No	20.0	50	50	50		150	1.0	1.0	1.0			3.0	
4. Training of Local Government Officials	No	10.0	50	50	50		200	0.5	0.5	0.5	0.5		2.0	
5. Training of Villagers	No	2.0	10,000	10,000	10,000		40,000	20.0	20.0	20.0	20.0		80.0	
6. Workshop and Seminars	No	150.0	20	10	10		40	3.0	1.5	1.5			6.0	
Subtotal								50.0	33.5	27.5	20.5		131.5	36.5
B. RESEARCH, DEVELOPMENT AND STUDIES														
1. Inventory and Surveys	Sum	800.0	11				11	8.8					8.8	
2. Research and Development Studies	Sum	800.0	15	10	10		35	12.0	8.0	8.0			28.0	
3. Monitoring and Evaluation	Sum	500.0	20	20	15	10	65	10.0	10.0	7.5	5.0		32.5	
Subtotal								30.8	18.0	15.5	5.0		69.3	
C. COMMUNITY BASED RESOURCE MANAGEMENT	Sum	1,167,000.0	0.4	0.2	0.2		1.0	466.8	233.4	233.4	233.4		1,167.0	
D. CONSULTING SERVICES														
1. International	mm	603.0	150	70			220	90.4	42.2				132.6	119.4
2. Local	mm	155.6	1,000	450			1,450	155.6	70.0				225.6	
Subtotal								246.0	112.2				358.3	119.4
E. RECURRENT COSTS														
1. Existing Staff Salaries	Sum	27,575.0	1	1.2	1.3	1.5	5	27.6	31.7	36.4	41.9		137.6	
2. Incremental Staff Salaries	Sum	39,928.7	1	2	2.4	2.8	8.2	39.9	79.9	95.8	110.2		325.8	
3. Operation and Maintenance of Facilities	Sum	1,500.0	1	1	1	1	4	1.5	1.5	1.5	1.5		6.0	1.2
4. Vehicle/Equipment Operation/Maintenance	Sum	7,500.0	1	1	1	1	4	7.5	7.5	7.5	7.5		30.0	15.0
5. Office Supplies and Consumables	Sum	5,000.0	1	1	1	1	4	5.0	5.0	5.0	5.0		20.0	14.0
Subtotal								81.5	125.6	146.2	166.1		519.4	30.2
														5.6

3. FOREST PRODUCTION AND MANAGEMENT

Table 7 - Summary of Plantation Costs

Programme Components	Million Taka			Million U S			% of Base Costs	% of FEC
	Foreign	Local	Total	Foreign	Local	Total		
A. LONG ROTATION								
1. Nursery	28.8	259.2	288.0	0.7	6.7	7.4		
2. Plantation Establishment	50.5	454.3	504.8	1.3	11.7	13.0	4.3	4.4
3. Plantation Maintenance	129.0	1,161.4	1,290.4	3.3	29.9	33.2	10.9	11.2
Subtotal	208.3	1,874.9	2,083.2	5.4	48.2	53.6	17.7	18.1
B. MEDIUM ROTATION								
1. Nursery	70.6	635.1	705.6	1.8	16.3	18.1	6.0	6.1
2. Plantation Establishment	127.3	1,145.3	1,272.5	3.3	29.4	32.7	10.8	11.0
3. Plantation Maintenance	299.8	2,698.3	2,998.1	7.7	69.4	77.1		
Subtotal	497.6	4,478.6	4,976.3	12.8	115.1	127.9	42.2	43.2
C. SHORT ROTATION								
1. Nursery	27.9	250.9	278.8	0.7	6.4	7.2	2.4	2.4
2. Plantation Establishment	39.0	351.0	390.0	1.0	9.0	10.0	3.3	3.4
3. Plantation Maintenance	51.9	466.9	518.8	1.3	12.0	13.3	4.4	4.5
Subtotal	118.8	1,068.8	1,187.5	3.1	27.5	30.5	10.1	10.3
D. ENRICHMENT PLANTATION								
1. Nursery	77.6	698.0	775.5	2.0	17.9	19.9	6.6	6.7
2. Plantation Establishment	51.7	723.8	775.5	1.3	18.6	19.9	6.6	4.5
3. Plantation Maintenance	116.2	1,046.0	1,162.2	3.0	26.9	29.9	9.9	10.1
Subtotal	245.5	2,467.7	2,713.2	6.3	63.4	69.7	23.0	21.3
E. COASTAL AFFORESTATION								
1. Nursery	9.5	85.5	95.0	0.2	2.2	2.4	0.8	0.8
2. Plantation Establishment	25.8	231.8	257.5	0.7	6.0	6.6	2.2	2.2
3. Plantation Maintenance	11.3	101.3	112.5	0.3	2.6	2.9	1.0	1.0
Subtotal	46.5	418.5	465.0	1.2	10.8	12.0	3.9	4.0
F. PARKS AND GAME SANCTUARIES								
1. Nursery	9.8	87.8	97.5	0.3	2.3	2.5	0.8	0.8
2. Plantation Establishment	8.1	73.1	81.3	0.2	1.9	2.1	0.7	0.7
3. Plantation Maintenance	18.3	164.4	182.7	0.5	4.2	4.7	1.5	1.6
Subtotal	36.1	325.3	361.4	0.9	8.4	9.3	3.1	3.1
BASE COSTS	1,152.8	10,633.8	11,786.6	29.6	273.4	303.0	100.0	100.0
Physical Contingencies	39.7	357.1	396.8	1.0	9.2	10.2		
TOTAL PROJECT COST	1,192.5	10,990.9	12,183.4	30.7	282.5	313.2		

Table 8 - Proposed Financing Plan, Million U \$

Project Components	Total Programme Cost			GOB Financing			Donors Financing			Beneficiaries Financing		
	Foreign	Local	Total	Foreign	Local	Total	Foreign	Local	Total	Foreign	Local	Total
A. LONG ROTATION												
1. Nursery	0.7	6.7	7.4		1.3	1.3	0.7	5.3	6.1			
2. Plantation Establishment	1.3	11.7	13.0		2.3	2.3	1.3	9.3	10.6			
3. Plantation Maintenance	3.3	29.9	33.2		6.0	6.0	3.3	23.9	27.2			
Subtotal	5.4	48.2	53.6		9.6	9.6	5.4	38.6	43.9			
B. MEDIUM ROTATION												
1. Nursery	1.8	16.3	18.1		3.3	3.3	1.8	13.1	14.9			
2. Plantation Establishment	3.3	29.4	32.7		5.9	5.9	3.3	23.6	26.8			
3. Plantation Maintenance	7.7	69.4	77.1		13.9	13.9	7.7	55.5	63.2			
Subtotal	12.8	115.1	127.9		23.0	23.0	12.8	92.1	104.9			
C. SHORT ROTATION												
1. Nursery	0.7	6.4	7.2		1.3	1.3	0.7	5.2	5.9			
2. Plantation Establishment	1.0	9.0	10.0		1.8	1.8	1.0	7.2	8.2			
3. Plantation Maintenance	1.3	12.0	13.3		2.4	2.4	1.3	9.6	10.9			
Subtotal	3.1	27.5	30.5		5.5	5.5	3.1	22.0	25.0			
D. ENRICHMENT PLANTATION												
1. Nursery	2.0	17.9	19.9		3.6	3.6	2.0	14.4	16.3			
2. Plantation Establishment	1.3	18.6	19.9		3.7	3.7	1.3	14.9	16.2			
3. Plantation Maintenance	3.0	26.9	29.9		5.4	5.4	3.0	21.5	24.5			
Subtotal	6.3	63.4	69.7		12.7	12.7	6.3	50.8	57.1			
E. COASTAL AFFORESTATION												
1. Nursery	0.2	2.2	2.4		0.4	0.4	0.2	1.8	2.0			
2. Plantation Establishment	0.7	6.0	6.6		1.2	1.2	0.7	4.8	5.4			
3. Plantation Maintenance	0.3	2.6	2.9		0.5	0.5	0.3	2.1	2.4			
Subtotal	1.2	10.8	12.0		2.2	2.2	1.2	8.6	9.8			
F. PARKS AND GAME SANCTUARIES												
1. Nursery	0.3	2.3	2.5		0.5	0.5	0.3	1.8	2.1			
2. Plantation Establishment	0.2	1.9	2.1		0.4	0.4	0.2	1.5	1.7			
3. Plantation Maintenance	0.5	4.2	4.7		0.8	0.8	0.5	3.4	3.9			
Subtotal	0.9	8.4	9.3		1.7	1.7	0.9	6.7	7.6			
BASE COSTS	29.6	273.4	303.0		54.7	54.7	29.6	218.7	248.3			
Physical Contingencies	1.0	9.2	10.2		1.8	1.8	1.0	7.3	8.4			
TOTAL PROJECT COST	30.7	282.5	313.2		56.5	56.5	30.7	226.0	256.7			
Percentage	9.8	90.2	100.0		20.0	18.0	100.0	80.0	82.0			

Table 9 - Phasing of Programme Costs, Million Taka

Programme Components	PY Year				Total Costs			
	1 - 5 FY	1993/97	6 - 10 1998/02	11 - 15 2003/07	16 - 20 2008/12	Local	Foreign	Total
A. LONG ROTATION								
1. Nursery		63.5	58.0	66.4	100.2	259.2	28.8	288.0
2. Plantation Establishment		111.4	100.4	115.2	177.9	454.3	50.5	504.8
3. Plantation Maintenance		285.0	254.1	291.8	459.5	1,161.4	129.0	1,290.4
Subtotal		459.8	412.4	473.3	737.7	1,874.9	208.3	2,083.2
B. MEDIUM ROTATION								
1. Nursery		176.4	176.4	176.4	176.4	635.1	70.6	705.6
2. Plantation Establishment		318.1	318.1	318.1	318.1	1,145.3	127.3	1,272.5
3. Plantation Maintenance		749.5	749.5	749.5	749.5	2,698.3	299.8	2,998.1
Subtotal		1,244.1	1,244.1	1,244.1	1,244.1	4,478.6	497.6	4,976.3
C. SHORT ROTATION								
1. Nursery		37.6	48.8	94.8	97.6	250.9	27.9	278.8
2. Plantation Establishment		52.7	68.3	132.6	136.5	351.0	39.0	390.0
3. Plantation Maintenance		70.0	90.8	176.4	181.6	466.9	51.9	518.8
Subtotal		160.3	207.8	403.8	415.6	1,068.8	118.8	1,187.5
D. ENRICHMENT PLANTATION								
1. Nursery		193.9	193.9	193.9	193.9	698.0	77.6	775.5
2. Plantation Establishment		129.3	129.3	129.3	129.3	723.8	51.7	775.5
3. Plantation Maintenance		290.6	290.6	290.6	290.6	1,046.0	116.2	1,162.2
Subtotal		613.7	613.7	613.7	613.7	2,467.7	245.5	2,713.2
E. COASTAL AFFORESTATION								
1. Nursery		23.8	23.8	23.8	23.8	85.5	9.5	95.0
2. Plantation Establishment		64.4	64.4	64.4	64.4	231.8	25.8	257.5
3. Plantation Maintenance		28.1	28.1	28.1	28.1	101.3	11.3	112.5
Subtotal		116.3	116.3	116.3	116.3	418.5	46.5	465.0
F. PARKS AND GAME SANCTUARIES								
1. Nursery		24.4	24.4	24.4	24.4	87.8	9.8	97.5
2. Plantation Establishment		20.3	20.3	20.3	20.3	73.1	8.1	81.3
3. Plantation Maintenance		45.7	45.7	45.7	45.7	164.4	18.3	182.7
Subtotal		90.4	90.4	90.4	90.4	325.3	36.1	361.4
BASE COSTS		2,684.5	2,684.6	2,941.4	3,217.6	10,633.8	1,152.8	11,786.6
Physical Contingencies		98.5	97.9	98.6	101.8	357.1	39.7	396.8
TOTAL PROJECT COST		2,782.9	2,782.5	3,040.1	3,319.4	10,990.9	1,192.5	12,183.4

Table 10 - Cost Estimate - Forest Plantation Development

Items	Unit	Unit Cost (Taka '000)	Number of Units					Total Costs (Million Taka)								
			Year 1 - 5	6 - 10	11 - 15	16 - 20	21 - 25	Total	Year 1 - 5	6 - 10	11 - 15	16 - 20	21 - 25	Total	FEC	T and D
A. LONG ROTATION																
1. Nursery																
- Stump	Ha	2.3	9,896	8,461	9,755	16,506	44,618	22.8	19.5	22.4	38.0	102.6	10.3			
- Polybags	Ha	5.6	7,299	6,904	7,885	11,169	33,257	40.7	38.5	44.0	62.3	185.4	18.5			
Subtotal			17,195	15,365	17,640	27,675	77,875	63.5	58.0	66.4	100.2	288.0	28.8			
2. Plantation Establishment																
- Stump	Ha	5.5	9,896	8,461	9,755	16,506	44,618	54.4	46.5	53.7	90.8	245.4	24.5			
- Polybags	Ha	7.8	7,299	6,904	7,885	11,169	33,257	56.9	53.9	61.5	87.1	259.4	25.9			
Subtotal								111.4	100.4	115.2	177.9	504.8	50.5			
3. Plantation Maintenance																
- Stump	Ha	17.2	9,896	8,461	9,755	16,506	44,618	170.2	145.5	167.8	283.9	767.4	76.7			
- Polybags	Ha	15.7	7,299	6,904	7,885	11,169	33,257	114.8	108.6	124.0	175.6	523.0	52.3			
Subtotal								285.0	254.1	291.8	459.5	1,290.4	129.0			
Total								459.8	412.4	473.3	737.7	2,083.2	208.3			
B. MEDIUM ROTATION																
1. Nursery																
- Stump	Ha	2.3	31,250	31,250	31,250	31,250	125,000	71.9	71.9	71.9	71.9	287.5	28.8			
- Polybags	Ha	5.6	18,750	18,750	18,750	18,750	75,000	104.5	104.5	104.5	104.5	418.1	41.8			
Subtotal			50,000	50,000	50,000	50,000	200,000	176.4	176.4	176.4	176.4	705.6	70.6			
2. Plantation Establishment																
- Stump	Ha	5.5	31,250	31,250	31,250	31,250	125,000	171.9	171.9	171.9	171.9	687.5	68.8			
- Polybags	Ha	7.8	18,750	18,750	18,750	18,750	75,000	146.3	146.3	146.3	146.3	585.0	58.5			
Subtotal								318.1	318.1	318.1	318.1	1,272.5	127.3			
3. Plantation Maintenance																
- Stump	Ha	15.8	31,250	31,250	31,250	31,250	125,000	494.5	494.5	494.5	494.5	1,978.1	197.8			
- Polybags	Ha	13.6	18,750	18,750	18,750	18,750	75,000	255.0	255.0	255.0	255.0	1,020.0	102.0			
Subtotal								749.5	749.5	749.5	749.5	2,998.1	299.8			
Total								1,244.1	1,244.1	1,244.1	1,244.1	4,976.3	497.6			
C. SHORT ROTATION																
1. Nursery																
- Stump	Ha															
- Polybags	Ha	5.6	6,750	8,750	17,000	17,500	50,000	37.6	48.8	94.8	97.6	278.8	27.9			
Subtotal			6,750	8,750	17,000	17,500	50,000	37.6	48.8	94.8	97.6	278.8	27.9			
2. Plantation Establishment																
- Stump	Ha															
- Polybags	Ha	7.8	6,750	8,750	17,000	17,500	50,000	52.7	68.3	132.6	136.5	390.0	39.0			
Subtotal								52.7	68.3	132.6	136.5	390.0	39.0			
3. Plantation Maintenance																
- Stump	Ha															
- Polybags	Ha	10.4	6,750	8,750	17,000	17,500	50,000	70.0	90.8	176.4	181.6	518.8	51.9			
Subtotal								70.0	90.8	176.4	181.6	518.8	51.9			
Total								160.3	207.8	403.8	415.6	1,187.5	118.8			

Table 10 - Cost Estimate - Forest Plantation Development (Cont'd.)

Items	Unit	Unit Cost (Taka '000)	Number of Units					Total	Total Costs (Million Taka)						
			Year 1 - 5	6 - 10	11 - 15	16 - 20	21 - 25		Year 1 - 5	6 - 10	11 - 15	16 - 20	21 - 25	Total	FEC
D. ENRICHMENT PLANTATION															
1. Nursery															
- Sal	Ha	11.3	10,340	10,340	10,340	10,340	41,360	116.3	116.3	116.3	116.3	465.3	46.5		
- Others	Ha	7.5	10,340	10,340	10,340	10,340	41,360	77.6	77.6	77.6	77.6	310.2	31.0		
Subtotal			20,680	20,680	20,680	20,680	82,720	193.9	193.9	193.9	193.9	775.5	77.6		
2. Plantation Establishment															
- Sal	Ha	6.3	10,340	10,340	10,340	10,340	41,360	64.6	64.6	64.6	64.6	258.5	25.9		
- Others	Ha	6.3	10,340	10,340	10,340	10,340	41,360	64.6	64.6	64.6	64.6	258.5	25.9		
Subtotal			129.3	129.3	129.3	129.3	517.0	129.3	129.3	129.3	129.3	517.0	51.7		
3. Plantation Maintenance															
- Sal	Ha	14.1	10,340	10,340	10,340	10,340	41,360	145.3	145.3	145.3	145.3	581.1	58.1		
- Others	Ha	14.1	10,340	10,340	10,340	10,340	41,360	145.3	145.3	145.3	145.3	581.1	58.1		
Subtotal			290.6	290.6	290.6	290.6	1,162.2	290.6	290.6	290.6	290.6	1,162.2	116.2		
Total			613.7	613.7	613.7	613.7	2,454.7	613.7	613.7	613.7	613.7	2,454.7	245.5		
E. COASTAL AFFORESTATION															
1. Nursery															
- Bed	Ha	1.9	12,500	12,500	12,500	12,500	50,000	23.8	23.8	23.8	23.8	95.0	9.5		
- Polybags	Ha														
Subtotal			12,500	12,500	12,500	12,500	50,000	23.8	23.8	23.8	23.8	95.0	9.5		
2. Plantation Establishment															
- Stump	Ha	5.2	12,500	12,500	12,500	12,500	50,000	64.4	64.4	64.4	64.4	257.5	25.8		
- Polybags	Ha														
Subtotal			12,500	12,500	12,500	12,500	50,000	64.4	64.4	64.4	64.4	257.5	25.8		
3. Plantation Maintenance															
- Stump	Ha	2.3	12,500	12,500	12,500	12,500	50,000	28.1	28.1	28.1	28.1	112.5	11.3		
- Polybags	Ha														
Subtotal			12,500	12,500	12,500	12,500	50,000	28.1	28.1	28.1	28.1	112.5	11.3		
Total			116.3	116.3	116.3	116.3	465.0	116.3	116.3	116.3	116.3	465.0	46.5		
F. PARKS AND GAME SANCTUARIES															
1. Nursery															
- Sal	Ha	11.3													
- Others	Ha	7.5	3,250	3,250	3,250	3,250	13,000	24.4	24.4	24.4	24.4	97.5	9.8		
Subtotal			3,250	3,250	3,250	3,250	13,000	24.4	24.4	24.4	24.4	97.5	9.8		
2. Plantation Establishment															
- Sal	Ha	6.3													
- Others	Ha	6.3	3,250	3,250	3,250	3,250	13,000	20.3	20.3	20.3	20.3	81.3	8.1		
Subtotal			3,250	3,250	3,250	3,250	13,000	20.3	20.3	20.3	20.3	81.3	8.1		
3. Plantation Maintenance															
- Sal	Ha	14.1													
- Others	Ha	14.1	3,250	3,250	3,250	3,250	13,000	45.7	45.7	45.7	45.7	182.7	18.3		
Subtotal			3,250	3,250	3,250	3,250	13,000	45.7	45.7	45.7	45.7	182.7	18.3		
Total			90.4	90.4	90.4	90.4	361.4	90.4	90.4	90.4	90.4	361.4	36.1		

4. PARTICIPATORY FORESTRY INSTITUTIONAL DEVELOPMENT

Table 11 - Summary of Programme Costs

Programme Components	Million Taka			Million U \$			% of Base Costs	% of FEC
	Foreign	Local	Total	Foreign	Local	Total		
A. PHYSICAL INFRASTRUCTURE								
1. Land Acquisition		45.0	45.0		1.2	1.2	1.0	
2. Detail Engineering and Supervision		19.0	19.0		0.5	0.5	0.4	
3. Civil Works	31.6	284.6	316.2	0.8	7.3	8.1	7.0	1.4
Subtotal	31.6	348.5	380.2	0.8	9.0	9.8	8.4	1.4
B. FURNITURE, EQUIPMENT AND VEHICLES								
1. Furniture		225.3	225.3		5.8	5.8	5.0	
2. Equipments	1,808.0	452.0	2,260.0	46.5	11.6	58.1	49.9	78.5
3. Vehicles	84.3	21.1	105.4	2.2	0.5	2.7	2.3	3.7
Subtotal	1,892.3	698.4	2,590.7	48.6	18.0	66.6	57.2	82.2
C. HUMAN RESOURCES DEVELOPMENT								
1. Overseas Training for BFD Staff	145.8	16.2	162.0	3.7	0.4	4.2	3.6	6.3
2. Local Training to BFD Staff		20.0	20.0		0.5	0.5	0.4	
3. Local Training to Beneficiaries		210.0	210.0		5.4	5.4	4.6	
Subtotal	145.8	246.2	392.0	3.7	6.3	10.1	8.7	6.3
D. MONITORING AND STUDIES								
1. On-going Monitoring		40.0	40.0		1.0	1.0	0.9	
2. Evaluation Studies		60.0	60.0		1.5	1.5	1.3	
Subtotal		100.0	100.0		2.6	2.6	2.2	
E. CONSULTING SERVICES								
1. International	108.5	12.1	120.6	2.8	0.3	3.1	2.7	4.7
2. Local		22.5	22.5		0.6	0.6	0.5	
Subtotal	108.5	34.6	143.1	2.8	0.9	3.7	3.2	4.7
F. RECURRENT COSTS								
1. Existing Staff Salaries		384.2	384.2		9.9	9.9	8.5	
2. Incremental Staff Salaries		285.6	285.6		7.3	7.3	6.3	
3. Operation and Maintenance of Facilities	8.0	32.0	40.0	0.2	0.8	1.0	0.9	0.3
4. Vehicle/ Equipment Operation/ Maintenance	88.0	88.0	176.0	2.3	2.3	4.5	3.9	3.8
5. Office Supplies and Consumables	28.0	12.0	40.0	0.7	0.3	1.0	0.9	1.2
Subtotal	124.0	801.8	925.8	3.2	20.6	23.8	20.4	5.4
BASE COSTS	2,302.3	2,229.5	4,531.8	59.2	57.3	116.5	100.0	100.0
Physical Contingencies	20.3	57.7	78.0	0.5	1.5	2.0		
TOTAL PROGRAMME COST	2,322.6	2,287.2	4,609.8	59.7	58.8	118.5		

Table 12 - Proposed Financing Plan, Million U \$

Project Components	Total Programme Cost			GOB Financing			Donors Financing			Beneficiaries Financing		
	Foreign	Local	Total	Foreign	Local	Total	Foreign	Local	Total	Foreign	Local	Total
A. PHYSICAL INFRASTRUCTURE												
1. Land Acquisition		1.2	1.2		1.2	1.2						
2. Detail Engineering and Supervision		0.5	0.5					0.5	0.5			
3. Civil Works	0.8	7.3	8.1				0.8	7.3	8.1			
Subtotal	0.8	9.0	9.8			1.2	1.2	0.8	7.8	8.6		
B. FURNITURE, EQUIPMENT AND VEHICLES												
1. Furniture		5.8	5.8					5.8	5.8			
2. Equipments	46.5	11.6	58.1		11.6	11.6	46.5		46.5			
3. Vehicles	2.2	0.5	2.7		0.5	0.5	2.2		2.2			
Subtotal	48.6	18.0	66.6		12.2	12.2	48.6	5.8	54.4			
C. HUMAN RESOURCES DEVELOPMENT												
1. Overseas Training for BFD Staff	3.7	0.4	4.2				3.7	0.4	4.2			
2. Local Training to BFD Staff		0.5	0.5					0.5	0.5			
3. Local Training to Beneficiaries		5.4	5.4					5.4	5.4			
Subtotal	3.7	6.3	10.1				3.7	6.3	10.1			
D. MONITORING AND STUDIES												
1. On-going Monitoring		1.0	1.0					1.0	1.0			
2. Evaluation Studies		1.5	1.5					1.5	1.5			
Subtotal		2.6	2.6					2.6	2.6			
E. CONSULTING SERVICES												
1. International	2.8	0.3	3.1				2.8	0.3	3.1			
2. Local		0.6	0.6					0.6	0.6			
Subtotal	2.8	0.9	3.7				2.8	0.9	3.7			
F. RECURRENT COSTS												
1. Existing Staff Salaries		9.9	9.9		9.9	9.9						
2. Incremental Staff Salaries		7.3	7.3		7.3	7.3						
3. Operation and Maintenance of Facilities	0.2	0.8	1.0		0.8	0.8	0.2		0.2			
4. Vehicle/ Equipment Operation/ Maintenance	2.3	2.3	4.5		2.3	2.3	2.3		2.3			
5. Office Supplies and Consumables	0.7	0.3	1.0		0.3	0.3	0.7		0.7			
Subtotal	3.2	20.6	23.8		20.6	20.6	3.2		3.2			
BASE COSTS	59.2	57.3	116.5		33.9	33.9	59.2	23.4	82.6			
Physical Contingencies	0.5	1.5	2.0		0.9	0.9	0.5	0.6	1.1			
TOTAL PROGRAMME COST	59.7	58.8	118.5		34.8	34.8	59.7	24.0	83.7			
PERCENTAGE	37.0	63.0	100.0		59.2	29.4	100.0	40.8	70.6			

Table 13 - Phasing of Programme Costs, Million Taka

Programme Components	PY Year				Total Costs			
	1 - 5 FY	1993/97	6 - 10 1998/02	11 - 15 2003/07	16 - 20 2008/12	Local	Foreign	Total
A. PHYSICAL INFRASTRUCTURE								
1. Land Acquisition		15.0	30.0			45.0		45.0
2. Detail Engineering and Supervision		5.5	13.5			19.0		19.0
3. Civil Works		91.7	224.5			284.6	31.6	316.2
Subtotal		112.2	267.9			348.5	31.6	380.2
B. FURNITURE, EQUIPMENT AND VEHICLES								
1. Furniture		55.0	170.0		0.3	225.3		225.3
2. Equipments		370.0	1,520.0		370.0	452.0	1,808.0	2,260.0
3. Vehicles		33.2	56.0		16.2	21.1	84.3	105.4
Subtotal		458.2	1,746.0		386.5	698.4	1,892.3	2,590.7
C. HUMAN RESOURCES DEVELOPMENT								
1. Overseas Training for BFD Staff		81.0	81.0			16.2	145.8	162.0
2. Local Training to BFD Staff		5.0	5.0	5.0	5.0	20.0		20.0
3. Local Training to Beneficiaries		30.0	60.0	60.0	60.0	210.0		210.0
Subtotal		116.0	146.0	65.0	65.0	246.2	145.8	392.0
D. MONITORING AND STUDIES								
1. On-going Monitoring		10.0	10.0	10.0	10.0	40.0		40.0
2. Evaluation Studies		15.0	15.0	15.0	15.0	60.0		60.0
Subtotal		25.0	25.0	25.0	25.0	100.0		100.0
E. CONSULTING SERVICES								
1. International		30.1	30.1	30.1	30.1	12.1	108.5	120.6
2. Local		5.0	5.0	6.3	6.3	22.5		22.5
Subtotal		35.1	35.1	36.4	36.4	34.6	108.5	143.1
F. RECURRENT COSTS								
1. Existing Staff Salaries		77.0	88.6	101.6	117.0	384.2		384.2
2. Incremental Staff Salaries		35.0	70.0	84.0	96.6	285.6		285.6
3. Operation and Maintenance of Facilities		10.0	10.0	10.0	10.0	32.0	8.0	40.0
4. Vehicle/ Equipment Operation/Maintenance		44.0	44.0	44.0	44.0	88.0	88.0	176.0
5. Office Supplies and Consumables		10.0	10.0	10.0	10.0	12.0	28.0	40.0
Subtotal		176.0	222.6	249.6	277.6	801.8	124.0	925.8
BASE COSTS		922.6	2,442.6	376.0	790.5	2,229.5	2,302.3	4,531.8
Physical Contingencies		17.6	21.4	18.8	20.2	57.7	20.3	78.0
TOTAL PROJECT COST		940.2	2,464.1	394.8	810.7	2,287.2	2,322.6	4,609.8

Table 14 - Cost Estimates - Civil Works, Furniture, Equipments and Vehicles

Items	Unit	Unit Cost (Taka '000)	Number of Units					Total	Total Costs (Million Taka)						
			Year 1-5	6-10	11-15	16-20	21-25		Year 1-5	6-10	11-15	16-20	21-25	Total	FEC
A. PHYSICAL FACILITIES															
1. Land Acquisition	Ha	5,000.0	3	6			9	15.0	30.0				45.0		
2. Detail Engineering and Supervision I/	Percent	6.0						5.5	13.5				19.0		
Subtotal								20.5	43.5				64.0		
3. Civil Works															
- Functional Building	m ²	8.5	1,050	2,500			3,550	8.9	21.3				30.2	3.0	3.0
- Residential	m ²	5.4	7,000	29,300			36,300	37.8	138.2				196.0	19.6	19.6
- Nursery	m ²	4.5	10,000	10,000			20,000	45.0	45.0				90.0	9.0	9.0
Subtotal								91.7	224.5				316.2	31.6	31.6
B. FURNITURE															
- Functional Building	Lumpsum	500.0	70	300			370.5	35.0	150.0				185.3		
- Nursery	Lumpsum	100.0	200	200			400.5	20.0	20.0				40.1		
Subtotal								55.0	170.0				225.3		
C. EQUIPMENTS															
- Functional Building	Lumpsum	5,000.0	70	300			440	350.0	1,500.0				2,200.0	1,760.0	440.0
- Nursery	Lumpsum	100.0	200	200			600	20.0	20.0				60.0	48.0	12.0
Subtotal								370.0	1,520.0				2,260.0	1,808.0	452.0
D. VEHICLES															
- Station Wagon	No.	1,000.0	5	10			15	5.0	10.0				15.0	12.0	3.0
- 4 WHD Jeep	No.	1,000.0	10	20			30	10.0	20.0				30.0	24.0	6.0
- Staff Bus	No.	1,500.0	2	2			6	3.0	3.0				9.0	7.2	1.8
- Truck	No.	1,200.0	6	10			22	7.2	12.0				26.4	21.1	5.3
- Motor Cycle	No.	60.0	100	150			350	6.0	9.0				21.0	16.8	4.2
- Bi-Cycle	No.	4.0	500	500			1,000	2.0	2.0				4.0	3.2	0.8
Subtotal								33.2	56.0				105.4	84.3	21.1

Table 15 - Cost Estimates - Human Resources Development, Research, Studies and Operation/Maintenance

Items	Unit	Unit Cost (Taka '000)	Number of Units					Total	Total Costs (Million Taka)						
			Year 1-5	6-10	11-15	16-20	21-25		Year 1-5	6-10	11-15	16-20	21-25	Total	FEC
A. TRAINING															
1. Overseas Training for BFD Staff	No	450.0	180	180			360	81.0	81.0				162.0	145.8	
2. Local Training to BFD Staff	No	10.0	500	500			2,000	5.0	5.0				20.0		
3. Local Training to Beneficiaries	No	0.6	50,000	100,000			350,000	30.0	60.0				210.0		
Subtotal								116.0	146.0				392.0	145.8	
C. MONITORING AND EVALUATION															
1. Ongoing monitoring		10,000.0	1	1			4	10.0	10.0				40.0		
1. Evaluation and Studies		5,000.0	1	1			4	5.0	5.0				20.0		
Subtotal								15.0	15.0				60.0		
D. CONSULTING SERVICES															
1. International		603.0	50	50			200	30.1	30.1				120.6	108.5	
2. Local		50.0	100	100			450	5.0	5.0				22.5		
Subtotal								35.1	35.1				143.1	108.5	
E. RECURRENT COSTS															
1. Existing Staff Salaries		77,000.0	1	1.2			5	77.0	88.6				384.2		
2. Incremental Staff Salaries		35,000.0	1	2			8.2	35.0	70.0				285.6		
3. Operation and Maintenance of Facilities		10,000.0	1	1			4	10.0	10.0				40.0	8.0	4.0
4. Vehicle/Equipment Operation/Maintenance		44,000.0	1	1			4	44.0	44.0				176.0	88.0	17.6
5. Office Supplies and Consumables		10,000.0	1	1			4	10.0	10.0				40.0	28.0	4.0
Subtotal								176.0	222.6				925.8	124.0	25.6

5. PARTICIPATORY FOREST PLANTATION DEVELOPMENT

Table 16 - Summary of Programme Costs

Programme Components	Million Taka			Million U \$			% of Base Costs	% of FEC
	Foreign	Local	Total	Foreign	Local	Total		
A. AGROFORESTRY								
1. Nursery	4.7	42.7	47.5	0.1	1.1	1.2	2.2	2.0
2. Plantation Establishment	6.6	59.8	66.5	0.2	1.5	1.7	3.0	2.8
3. Plantation Maintenance								
Subtotal	11.4	102.6	114.0	0.3	2.6	2.9	5.2	4.8
B. WOODLOT								
1. Nursery	27.9	250.9	278.8	0.7	6.4	7.2	12.8	11.7
2. Plantation Establishment	39.0	351.0	390.0	1.0	9.0	10.0	17.9	16.4
3. Plantation Maintenance							3.2	14.4
Subtotal	66.9	601.9	668.8	1.7	15.5	17.2	30.6	28.1
C. STRIP PLANTATION								
1. Nursery	9.9	88.8	98.7	0.3	2.3	2.5	4.5	4.1
2. Plantation Establishment	13.8	124.3	138.1	0.4	3.2	3.5	6.3	5.8
3. Plantation Maintenance	18.4	165.3	183.6	0.5	4.2	4.7	8.4	7.7
Subtotal	42.0	378.3	420.4	1.1	9.7	10.8	19.2	17.7
D. HOMESTEAD PLANTATION								
1. Nursery	49.1	441.5	490.6	1.3	11.4	12.6	22.5	20.6
2. Plantation Establishment	68.6	422.0	490.6	1.8	10.8	12.6	22.5	28.8
3. Plantation Maintenance								
Subtotal	117.7	863.5	981.2	3.0	22.2	25.2	44.9	49.5
E. KHETLAND PLANTATION								
1. Nursery								
2. Plantation Establishment								
3. Plantation Maintenance								
Subtotal								
BASE COSTS	238.0	1,946.3	2,184.3	6.1	50.0	56.2	100.0	100.0
Physical Contingencies	9.6	86.0	95.6	0.2	2.2	2.5		
TOTAL PROGRAMME COST	247.6	2,032.3	2,279.9	6.4	52.2	58.6		

Table 17 - Proposed Financing Plan, Million U \$

Project Components	Total Programme Cost			GOB Financing			Donors Financing			Beneficiaries Financing		
	Foreign	Local	Total	Foreign	Local	Total	Foreign	Local	Total	Foreign	Local	Total
A. AGROFORESTRY												
1. Nursery	0.1	1.1	1.2				0.1	0.9	1.0		0.2	0.2
2. Plantation Establishment	0.2	1.5	1.7				0.2	1.2	1.4		0.3	0.3
3. Plantation Maintenance												
Subtotal	0.3	2.6	2.9				0.3	2.1	2.4		0.5	0.5
B. WOODLOT												
1. Nursery	0.7	6.4	7.2				0.7	5.2	5.9		1.3	1.3
2. Plantation Establishment	1.0	9.0	10.0				1.0	7.2	8.2		1.8	1.8
3. Plantation Maintenance												
Subtotal	1.7	15.5	17.2				1.7	12.4	14.1		3.1	3.1
C. STRIP PLANTATION												
1. Nursery	0.3	2.3	2.5				0.3	1.8	2.1		0.5	0.5
2. Plantation Establishment	0.4	3.2	3.5				0.4	2.6	2.9		0.6	0.6
3. Plantation Maintenance	0.5	4.2	4.7				0.5	3.4	3.9		0.8	0.8
Subtotal	1.1	9.7	10.8				1.1	7.8	8.9		1.9	1.9
D. HOMESTEAD PLANTATION												
1. Nursery	1.3	11.4	12.6				1.3	9.1	10.3		2.3	2.3
2. Plantation Establishment	1.8	10.8	12.6				1.8	8.7	10.4		2.2	2.2
3. Plantation Maintenance												
Subtotal	3.0	22.2	25.2				3.0	17.8	20.8		4.4	4.4
E. KHETLAND PLANTATION												
1. Nursery												
2. Plantation Establishment												
3. Plantation Maintenance												
Subtotal												
BASE COSTS	6.1	50.0	56.2				6.1	40.0	46.1		10.0	10.0
Physical Contingencies	0.2	2.2	2.5				0.2	1.8	2.0		0.4	0.4
TOTAL PROGRAMME COST	6.4	52.2	58.6				6.4	41.8	48.2		10.4	10.4
Percentage	10.9	89.1	100.0				100.0	80.0	82.2		20.0	17.8

Table 18 - Phasing of Programme Costs, Million Taka

Programme Components	PY				Total Costs			
	Year 1 - 5 FY	1993/97	6 - 10 1998/02	11 - 15 2003/07	16 - 20 2008/12	Local	Foreign	Total
A. AGROFORESTRY								
1. Nursery		7.9	7.9	15.8	15.8	42.7	4.7	47.5
2. Plantation Establishment		11.1	11.1	22.2	22.2	59.8	6.6	66.5
3. Plantation Maintenance								
Subtotal		19.0	19.0	38.0	38.0	102.6	11.4	114.0
B. WOODLOT								
1. Nursery		27.9	55.8	83.6	111.5	250.9	27.9	278.8
2. Plantation Establishment		39.0	78.0	117.0	156.0	351.0	39.0	390.0
3. Plantation Maintenance								
Subtotal		66.9	133.8	200.6	267.5	601.9	66.9	668.8
C. STRIP PLANTATION								
1. Nursery		16.4	16.4	32.9	32.9	88.8	9.9	98.7
2. Plantation Establishment		23.0	23.0	46.0	46.0	124.3	13.8	138.1
3. Plantation Maintenance		30.6	30.6	61.2	61.2	165.3	18.4	183.6
Subtotal		70.1	70.1	140.1	140.1	378.3	42.0	420.4
D. HOMESTEAD PLANTATION								
1. Nursery		122.7	122.7	122.7	122.7	441.5	49.1	490.6
2. Plantation Establishment		171.6	171.6	171.6	171.6	422.0	68.6	490.6
3. Plantation Maintenance								
Subtotal		294.3	294.3	294.3	294.3	863.5	117.7	981.2
E. KHETLAND PLANTATION						863.5		
1. Nursery								
2. Plantation Establishment								
3. Plantation Maintenance								
Subtotal								
BASE COSTS		450.2	517.1	673.0	739.9	1,946.3	238.0	2,184.3
Physical Contingencies		18.6	22.0	25.9	29.2	86.0	9.6	95.6
TOTAL PROGRAMME COST		468.8	539.0	698.8	769.1	2,032.3	247.6	2,279.9

Table 19 - Cost Estimates - Forest Plantation Development

Items	Unit	Unit Cost (Taka '000)	Number of Units					Total	Total Costs (Million Taka)						
			Year 1 - 5	6 - 10	11 - 15	16 - 20	21 - 25		Year 1 - 5	6 - 10	11 - 15	16 - 20	21 - 25	Total	FEC
A. AGROFORESTRY															
1. Nursery															
- Stump	Ha	5.6	1,420	1,420	2,840	2,840	8,520	7.9	7.9	15.8	15.8	47.5	4.7		
- Polybags	Ha		1,420	1,420	2,840	2,840	8,520	7.9	7.9	15.8	15.8	47.5	4.7		
Subtotal															
2. Plantation Establishment															
- Stump	Ha	7.8	1,420	1,420	2,840	2,840	8,520	11.1	11.1	22.2	22.2	66.5	6.6		
- Polybags	Ha		1,420	1,420	2,840	2,840	8,520	11.1	11.1	22.2	22.2	66.5	6.6		
Subtotal															
3. Plantation Maintenance															
- Stump	Ha		1,420	1,420	2,840	2,840	8,520	19.0	19.0	38.0	38.0	114.0	11.4		
- Polybags	Ha		1,420	1,420	2,840	2,840	8,520	19.0	19.0	38.0	38.0	114.0	11.4		
Subtotal															
Total															
B. WOODLOT PLANTATION															
1. Nursery															
- Stump	Ha	5.6	5,000	10,000	15,000	20,000	50,000	27.9	55.8	83.6	111.5	278.8	27.9		
- Polybags	Ha		5,000	10,000	15,000	20,000	50,000	27.9	55.8	83.6	111.5	278.8	27.9		
Subtotal															
2. Plantation Establishment															
- Stump	Ha	7.8	5,000	10,000	15,000	20,000	50,000	39.0	78.0	117.0	156.0	390.0	39.0		
- Polybags	Ha		5,000	10,000	15,000	20,000	50,000	39.0	78.0	117.0	156.0	390.0	39.0		
Subtotal															
3. Plantation Maintenance															
- Stump	Ha		5,000	10,000	15,000	20,000	50,000	66.9	133.8	200.6	267.5	668.8	66.9		
- Polybags	Ha		5,000	10,000	15,000	20,000	50,000	66.9	133.8	200.6	267.5	668.8	66.9		
Subtotal															
Total															
C. STRIP PLANTATION															
1. Nursery															
- Stump	Ha	5.6	2,950	2,950	5,900	5,900	17,700	16.4	16.4	32.9	32.9	98.7	9.9		
- Polybags	Ha		2,950	2,950	5,900	5,900	17,700	16.4	16.4	32.9	32.9	98.7	9.9		
Subtotal															
2. Plantation Establishment															
- Stump	Ha	7.8	2,950	2,950	5,900	5,900	17,700	23.0	23.0	46.0	46.0	138.1	13.8		
- Polybags	Ha		2,950	2,950	5,900	5,900	17,700	23.0	23.0	46.0	46.0	138.1	13.8		
Subtotal															
3. Plantation Maintenance															
- Stump	Ha	10.4	2,950	2,950	5,900	5,900	17,700	30.6	30.6	61.2	61.2	183.6	18.4		
- Polybags	Ha		2,950	2,950	5,900	5,900	17,700	30.6	30.6	61.2	61.2	183.6	18.4		
Subtotal															
Total															

Table 19 - Cost Estimates - Forest Plantation Development (Cont'd.)

Items	Unit	Unit Cost (Taka '000)					Number of Units					Total Costs (Million Taka)				
		Year 1 - 5	6 - 10	11 - 15	16 - 20	21 - 25	Total	Year 1 - 5	6 - 10	11 - 15	16 - 20	21 - 25	Total	FEC	T and D	
D. HOMESTEAD PLANTATION																
1. Nursery																
- Stump	Ha															
- Polybags	Ha	5.6	22,000	22,000	22,000	22,000	88,000	122.7	122.7	122.7	122.7	122.7	490.6	49.1		
Subtotal			22,000	22,000	22,000	22,000	88,000	122.7	122.7	122.7	122.7	122.7	490.6	49.1		
2. Plantation Establishment																
- Stump	Ha															
- Polybags	Ha	7.8	22,000	22,000	22,000	22,000	88,000	171.6	171.6	171.6	171.6	171.6	686.4	68.6		
Subtotal			22,000	22,000	22,000	22,000	88,000	171.6	171.6	171.6	171.6	171.6	686.4	68.6		
3. Plantation Maintenance																
- Stump	Ha															
- Polybags	Ha		22,000	22,000	22,000	22,000	88,000									
Subtotal			22,000	22,000	22,000	22,000	88,000									
Total								294.3	294.3	294.3	294.3	294.3	1,177.0	117.7		
E. KHETLAND PLANTATION																
1. Nursery																
- Bed	Ha															
- Polybags	Ha															
Subtotal																
2. Plantation Establishment																
- Stump	Ha															
- Polybags	Ha															
Subtotal																
3. Plantation Maintenance																
- Stump	Ha															
- Polybags	Ha															
Subtotal																
Total																

6. WOOD-BASED ENERGY DEVELOPMENT

Table 20 - Summary of Programme Costs

Programme Components	Million Taka			Million U \$			% of Base Costs	% of FEC
	Foreign	Local	Total	Foreign	Local	Total		
A. FABRICATION OF IMPROVED STOVE								
1. Fabrication and Installation		375.0	375.0		9.6	9.6	61.2	
Subtotal		375.0	375.0		9.6	9.6	61.2	
B. EQUIPMENT AND VEHICLES								
1. Equipments	2.4	0.6	3.0	0.1	0.0	0.1	0.5	21.6
2. Vehicles	2.9	0.7	3.6	0.1	0.0	0.1	0.6	26.2
Subtotal	5.3	1.3	6.6	0.1	0.0	0.2	1.1	47.8
C. HUMAN RESOURCES DEVELOPMENT								
1. Training of Trainers		6.8	6.8		0.2	0.2	1.1	
2. Training to Users		2.4	2.4		0.1	0.1	0.4	
Subtotal		9.2	9.2		0.2	0.2	1.5	
D. RESEARCH AND DEVELOPMENT		8.0	8.0		0.2	0.2	1.3	
Subtotal		8.0	8.0		0.2	0.2	1.3	
E. PROMOTIONAL ACTIVITIES								
1. Exhibitions and Workshop		32.0	32.0		0.8	0.8	5.2	
2. Extension and Dissemination		20.0	20.0		0.5	0.5	3.3	
Subtotal		52.0	52.0		1.3	1.3	8.5	
F. MONITORING AND EVALUATION								
1. On-going Monitoring		8.0	8.0		0.2	0.2	1.3	
2. Evaluation Studies		12.0	12.0		0.3	0.3	2.0	
Subtotal		20.0	20.0		0.5	0.5	3.3	
G. RECURRENT COSTS								
1. Staff Salaries		132.2	132.2		3.4	3.4	21.6	
2. Vehicle/ Equipment Operation/ Maintenance	3.0	3.0	6.0	0.1	0.1	0.2	1.0	27.0
3. Office Supplies and Consumables	2.8	1.2	4.0	0.1	0.0	0.1	0.7	25.2
Subtotal	5.8	136.4	142.2	0.1	3.5	3.7	23.2	52.2
BASE COSTS	11.1	602.0	613.1	0.3	15.5	15.8	100.0	100.0
Physical Contingencies	0.6	48.9	49.4	0.0	1.3	1.3		
TOTAL PROGRAMME COST	11.7	650.9	662.5	0.3	16.7	17.0		

Table 21 - Proposed Financing Plan, Million U \$

Project Components	Total Programme Cost			GOB Financing			Donors Financing			Beneficiaries Financing		
	Foreign	Local	Total	Foreign	Local	Total	Foreign	Local	Total	Foreign	Local	Total
A. FABRICATION OF IMPROVED STOVE												
1. Fabrication and Installation		9.6	9.6					1.9			7.7	9.6
Subtotal		9.6	9.6					1.9			7.7	9.6
B. EQUIPMENT AND VEHICLES												
1. Equipments	0.1	0.0	0.1		0.0	0.0	0.1					
2. Vehicles	0.1	0.0	0.1		0.0	0.0	0.1					
Subtotal	0.1	0.0	0.2		0.0	0.0	0.1					
C. HUMAN RESOURCES DEVELOPMENT												
1. Training of Trainers		0.2	0.2					0.2				
2. Training to Users		0.1	0.1					0.1				
Subtotal		0.2	0.2					0.2				
D. RESEARCH AND DEVELOPMENT		0.2	0.2					0.2				
Subtotal		0.2	0.2					0.2				
E. PROMOTIONAL ACTIVITIES												
1. Exhibitions and Workshop		0.8	0.8					0.8				
2. Extension and Dissemination		0.5	0.5					0.5				
Subtotal		1.3	1.3					1.3				
F. MONITORING AND EVALUATION												
1. On-going Monitoring		0.2	0.2					0.2				
2. Evaluation Studies		0.3	0.3					0.3				
Subtotal		0.5	0.5					0.5				
G. RECURRENT COSTS												
1. Staff Salaries		3.4	3.4		3.4	3.4						
2. Vehicle/ Equipment Operation/ Maintenance	0.1	0.1	0.2		0.1	0.1	0.1					
3. Office Supplies and Consumables	0.1	0.0	0.1		0.0	0.0	0.1					
Subtotal	0.1	3.5	3.7		3.5	3.5	0.1					
BASE COSTS	0.3	15.5	15.8		3.5	3.5	0.3	4.2	2.6		7.7	9.6
Physical Contingencies	0.0	1.3	1.3		0.3	0.3	0.0	0.3	0.4		0.6	0.6
TOTAL PROGRAMME COST	0.3	16.7	17.0		3.8	3.8	0.3	4.6	2.9		8.3	10.3
Percentage	0.0	1.0	1.0		0.2	0.2	1.0	0.3	0.2		0.5	0.6

Table 22 - Phasing of Programme Costs, Million Taka

Programme Components	PY Year				Total Costs		
	1 - 5 FY 1993/97	6 - 10 1998/02	11 - 15 2003/07	16 - 20 2008/12	Local	Foreign	Total
A. CONSTRUCTION OF IMPROVED STOVE							
1. Fabrication and Installation	125.0	125.0	62.5	62.5	375.0		375.0
Subtotal	125.0	125.0	62.5	62.5	375.0		375.0
B. EQUIPMENT AND VEHICLES							
1. Equipments	1.5		1.5		0.6	2.4	3.0
2. Vehicles	1.7	0.2	1.5	0.2	0.7	2.9	3.6
Subtotal	3.2	0.2	3.0	0.2	1.3	5.3	6.6
C. HUMAN RESOURCES DEVELOPMENT							
1. Training of Trainers	3.4	3.4			6.8		6.8
2. Training to Users	0.6	0.6	0.6	0.6	2.4		2.4
Subtotal	4.0	4.0	0.6	0.6	9.2		9.2
D. RESEARCH AND DEVELOPMENT	5.0	3.0			8.0		8.0
Subtotal	5.0	3.0			8.0		8.0
E. PROMOTIONAL ACTIVITIES							
1. Exhibitions and Workshop	8.0	8.0	8.0	8.0	32.0		32.0
2. Extension and Dissemination	5.0	5.0	5.0	5.0	20.0		20.0
Subtotal	13.0	13.0	13.0	13.0	52.0		52.0
F. MONITORING AND EVALUATION							
1. On-going Monitoring	2.0	2.0	2.0	2.0	8.0		8.0
2. Evaluation Studies	3.0	3.0	3.0	3.0	12.0		12.0
Subtotal	5.0	5.0	5.0	5.0	20.0		20.0
G. RECURRENT COSTS							
1. Staff Salaries	26.5	30.5	35.0	40.3	132.2		132.2
2. Vehicle/ Equipment Operation/ Maintenance	1.5	1.5	1.5	1.5	3.0	3.0	6.0
3. Office Supplies and Consumables	1.0	1.0	1.0	1.0	1.2	2.8	4.0
Subtotal	29.0	33.0	37.5	42.8	136.4	5.8	142.2
BASE COSTS	184.2	183.2	121.6	124.1	602.0	11.1	613.1
Physical Contingencies	15.5	15.4	9.2	9.3	48.9	0.6	49.4
TOTAL PROGRAMME COST	199.7	198.6	130.8	133.4	650.9	11.7	662.5

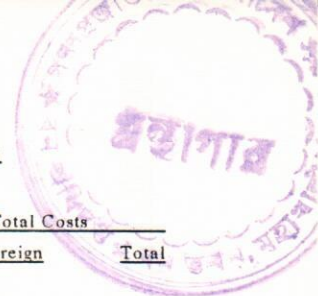


Table 23 - Cost Estimates - Civil Works, Equipments and Vehicles

Items	Unit Cost		Number of Units					Total Costs (Million Taka)							
	Unit (Taka '000)	Year 1-5	6-10	11-15	16-20	21-25	Total	Year 1-5	6-10	11-15	16-20	21-25	Total	FEC	T and D
A. CONSTRUCTION AND SETTING OF IMPROVED STOVES	No	0.1	1,000,000	1,000,000	500,000	500,000	3,000,000	125.0	125.0	62.5	62.5		375.0		
B. EQUIPMENTS	No	1,500.0	1		1		2	1.5		1.5			3.0	2.4	0.6
- Mobile Audio-visual Unit	No.	1,500.0	1		1		2	1.5		1.5			3.0	2.4	0.6
- 4 WHD Jeep	No.	4.0	54	54		54	162	0.2	0.2	0.2	0.2		0.6	0.5	0.1
- Bi-Cycle	No.							1.7	0.2	1.5	0.2		3.6	2.9	0.7
Subtotal															
D. TRAINING	No	15.0	228	228			456	3.4	3.4				6.8		
1. Training of Trainers	No	0.6	1,000	1,000	1,000	1,000	4,000	0.6	0.6	0.6	0.6		2.4		
2. Local Training to Users	No							4.0	4.0	0.6	0.6		9.2		
Subtotal								5.0	3.0				8.0		
E. RESEARCH AND DEVELOPMENT	NO	1,000.0	5	3			8								

Table 24 - Cost Estimates - Human Resources Development, Studies and Operation/Maintenance

Items	Unit Cost		Number of Units					Total Costs (Million Taka)							
	Unit (Taka '000)	Year 1-5	6-10	11-15	16-20	21-25	Total	Year 1-5	6-10	11-15	16-20	21-25	Total	FEC	T and D
F. PROMOTIONAL ACTIVITIES	No	100.0	80	80	80	80	320	8.0	8.0	8.0	8.0		32.0		
1. Exhibitions and Workshop	No	50.0	100	100	100	100	400	5.0	5.0	5.0	5.0		20.0		
2. Extension and Dissemination								13.0	13.0	13.0	13.0		52.0		
Subtotal															
G. MONITORING AND EVALUATION	No	1,000.0	2	2	2	2	8	2.0	2.0	2.0	2.0		8.0		
1. Ongoing monitoring	No	500.0	6	6	6	6	24	3.0	3.0	3.0	3.0		12.0		
1. Evaluation and Studies								5.0	5.0	5.0	5.0		20.0		
Subtotal															
H. RECURRENT COSTS	No	26,500.0	1	1.2	1.3	1.5	5	26.5	30.5	35.0	40.3		132.2		
1. Staff Salaries and Allowances	No	1,500.0	1	1	1	1	4	1.5	1.5	1.5	1.5		6.0	3.0	0.6
2. Vehicle/Equipment Operation/ Maintenance	No	1,000.0	1	1	1	1	4	1.0	1.0	1.0	1.0		4.0	2.8	0.4
3. Office Supplies and Consumables								29.0	33.0	37.5	42.8		142.2	5.8	1.0
Subtotal															

7. FOREST-BASED INDUSTRIES DEVELOPMENT

Table 25 - Summary of Programme Costs

Programme Components	Million Taka			Million U \$			% of Base Costs	% of FEC
	Foreign	Local	Total	Foreign	Local	Total		
A. PHYSICAL INFRASTRUCTURE								
1. Roads								
- Access Road	3.0	7.7	10.7	0.1	0.2	0.3	0.1	0.0
- Main Road	183.7	472.4	656.1	4.7	12.1	16.9	4.1	1.9
- Secondary Road	19.4	49.9	69.3	0.5	1.3	1.8	0.4	0.2
Subtotal	206.1	530.0	736.1	5.3	13.6	18.9	4.6	2.1
B. EXTRACTION EQUIPMENTS								
1. Equipment Procurement	349.0	309.4	658.4	9.0	8.0	16.9	4.1	3.5
2. Replacement of existing Equipments	1,345.1	1,192.9	2,538.0	34.6	30.7	65.2	15.7	13.6
Subtotal	1,694.1	1,502.3	3,196.4	43.5	38.6	82.2	19.8	17.1
C. FOREST-BASED INDUSTRIES								
1. Sawmilling	2,436.5	901.2	3,337.6	62.6	23.2	85.8	20.7	24.7
2. Newsprint	2,979.1	1,786.5	4,765.6	76.6	45.9	122.5	29.5	30.1
3. Printing and Writing Paper	2,567.9	1,540.0	4,107.8	66.0	39.6	105.6	25.4	26.0
Subtotal	7,983.4	4,227.7	12,211.1	205.2	108.7	313.9	75.6	80.8
BASE COSTS	9,883.6	6,259.9	16,143.6	254.1	160.9	415.0	100.0	100.0
Physical Contingencies	504.5	339.5	844.0	13.0	8.7	21.7		
TOTAL PROGRAMME COST	10,388.1	6,599.4	16,987.6	267.0	169.7	436.7		

Table 26 - Proposed Financing Plan, Million U \$

Project Components	Total Programme Cost			GOB Financing			Donors Financing			Beneficiaries Financing		
	Foreign	Local	Total	Foreign	Local	Total	Foreign	Local	Total	Foreign	Local	Total
A. PHYSICAL INFRASTRUCTURE												
1. Roads												
- Access Road	0.1	0.2	0.3				0.1	0.1	0.1	0.1	0.1	0.2
- Main Road	4.7	12.1	16.9				3.4	3.4	4.7	8.8	13.5	
- Secondary Road	0.5	1.3	1.8				0.4	0.4	0.5	0.9	1.4	
Subtotal	5.3	13.6	18.9				3.8	3.8	5.3	9.8	15.1	
B. EXTRACTION EQUIPMENTS												
1. Equipment Procurement	9.0	8.0	16.9				4.2	4.2	9.0	3.7	12.7	
2. Replacement of existing Equipments	34.6	30.7	65.2				16.3	16.3	34.6	14.4	48.9	
Subtotal	43.5	38.6	82.2				20.5	20.5	43.5	18.1	61.6	
C. FOREST-BASED INDUSTRIES												
1. Sawmilling	62.6	23.2	85.8				8.6	8.6	62.6	14.6	77.2	
2. Newsprint	76.6	45.9	122.5				21.0	21.0	76.6	25.0	101.5	
3. Printing and Writing Paper	66.0	39.6	105.6				18.1	18.1	66.0	21.5	87.5	
Subtotal	205.2	108.7	313.9				47.6	47.6	205.2	61.1	266.3	
BASE COSTS	254.1	160.9	415.0				71.9	71.9	254.1	89.0	343.1	
Physical Contingencies	13.0	8.7	21.7				3.8	3.8	13.0	4.9	17.9	
TOTAL PROGRAMME COST	267.0	169.7	436.7				75.8	75.8	267.0	93.9	360.9	
Percentage	0.6	0.4	1.0				0.4	0.2	1.0	0.6	0.8	

Table 27 - Phasing of Programme Costs, Million Taka

Programme Components	PY Year 1 - 5					Total Costs		
	FY	1993/97	1998/02	2003/07	2008/12	Local	Foreign	Total
A. PHYSICAL INFRASTRUCTURE								
1. Roads								
- Access Road		1.8	2.8	2.9	3.3	7.7	3.0	10.7
- Main Road		103.3	160.7	181.0	211.0	472.4	183.7	656.1
- Secondary Road		12.4	19.0	18.8	19.1	49.9	19.4	69.3
Subtotal		117.4	182.5	202.7	233.4	530.0	206.1	736.1
B. EXTRACTION EQUIPMENTS								
1. Equipment Procurement		410.8	1.4	13.8	33.4	309.4	349.0	658.4
2. Replacement of existing Equipments			848.1	615.2	516.6	1,192.9	1,345.1	2,538.0
Subtotal		410.8	849.5	629.0	550.0	1,502.3	1,694.1	3,196.4
C. FOREST-BASED INDUSTRIES								
1. Sawmilling		2,730.8	606.8			901.2	2,436.5	3,337.6
2. Newsprint			3,641.0		389.0	1,786.5	2,979.1	4,765.6
3. Printing and Writing Paper			3,641.0	466.8		1,540.0	2,567.9	4,107.8
Subtotal		2,730.8	8,624.5	466.8	389.0	4,227.7	7,983.4	12,211.1
BASE COSTS		3,259.0	9,656.5	1,298.5	1,172.4	6,259.9	9,883.6	16,143.6
Physical Contingencies		168.8	492.0	75.1	70.3	339.5	504.5	844.0
TOTAL PROJECT COST		3,427.8	10,148.5	1,373.6	1,242.7	6,599.4	10,388.1	16,987.6

Table 28 - Cost Estimates - Roads and Logging Equipments

Items	Unit Cost		Number of Units					Total Costs (Million Taka)								
	Unit	(Taka '000)	Year 1 - 5	6 - 10	11 - 15	16 - 20	21 - 25	Total	Year 1 - 5	6 - 10	11 - 15	16 - 20	21 - 25	Total	FEC	T and D
A. Physical Facilities																
1. Roads																
- Access Road	Km	345.0	5	8	8	10	31	31	1.8	2.8	2.9	3.3	10.7	3.0	2.1	
- Main Road	Km	345.0	299	466	525	612	1,902	1,902	103.3	160.7	181.0	211.0	656.1	183.7	131.2	
- Secondary Road	Km	57.5	216	331	326	332	1,205	1,205	12.4	19.0	18.8	19.1	69.3	19.4	13.9	
Subtotal			520	805	859	954	3,138	3,138	117.4	182.5	202.7	233.4	736.1	206.1	147.2	
B. EXTRACTION EQUIPMENTS																
1. Equipment Procurement																
- High Forest Logging	m ³	3.2	117,000				117,000	117,000	374.4				374.4	198.4	93.6	
- Plantation Forest Logging	m ³	0.8	45,500	1,750	17,250	41,750	248,750	355,000	36.4	1.4	13.8	33.4	199.0	284.0	150.5	71.0
Subtotal									410.8	1.4	13.8	33.4	199.0	658.4	349.0	164.6
2. Replacement																
- High Forest Logging	m ³	3.2	255,938		182,813	146,250	146,250	731,251		819.0	585.0	468.0	468.0	2,340.0	1,240.2	585.0
- Plantation Forest Logging	m ³	0.8	36,375		37,750	60,750	112,625	247,500		29.1	30.2	48.6	90.1	198.0	104.9	49.5
Subtotal									848.1	615.2	516.6	558.1	558.1	2,538.0	1,345.1	634.5
C. FABRICATION OF SAWMILLS																
- Large Scale																
	No	385,110.0		1				1		385.1				385.1	281.1	38.5
- Medium Scale																
	No	221,730.0	2	1				3	443.5	221.7				665.2	485.6	66.5
- Teak																
	No	190,610.0	12					12	2,287.3					2,287.3	1,669.7	228.7
- Small Scale																
	No	30,808.8	3	9	27	61	47	147	92.4	277.3	831.8	1,879.3	1,448.0	4,528.9	3,306.1	452.9
- Push Bench																
	No	6,224.0	18	59	175	144	1	397	112.0	367.2	1,089.2	896.3	6.2	2,470.9	1,803.8	247.1
Subtotal									2,730.8	606.8				3,337.6	2,436.5	333.8

Table 29 - Cost Estimates - Forest-Based Industries

Items	Unit Cost		Number of Units						Total Costs (Million Taka)						
	Unit (Taka '000)	Year 1 - 5	6 - 10	11 - 15	16 - 20	21 - 25	Total	Year 1 - 5	6 - 10	11 - 15	16 - 20	21 - 25	Total	FEC	T and D
D. NEWSPRINT															
1. Machinery/Equipments	Sum	2,800,800.0	1				1	2,800.8					2,800.8	2,240.6	560.2
2. Structures	Sum	866,692.0	1				1	866.7					866.7	173.3	173.3
3. Operating Supplies	Sum	87,914.0	1				1	87.9					87.9		
4. Equipment Rent	Sum	52,515.0	1				1	52.5					52.5	42.0	
5. Startup Cost	Sum	153,266.0	1				1	153.3					153.3	30.7	15.3
6. Studies/Design	Sum	415,452.0	1				1	415.5					415.5	249.3	
Subtotal								4,376.6					4,376.6	2,735.9	748.8
1. Machinery/Equipments	Sum	248,960.0		1			1				249.0		249.0	199.2	49.8
2. Structures	Sum	77,022.0		1			1				77.0		77.0	15.4	15.4
3. Operating Supplies	Sum	7,780.0		1			1				7.8		7.8		
4. Equipment Rent	Sum	4,668.0		1			1				4.7		4.7	3.7	
5. Startup Cost	Sum	13,615.0		1			1				13.6		13.6	2.7	1.4
6. Studies/Design	Sum	36,955.0		1			1				37.0		37.0	22.2	
Subtotal								4,376.6			389.0		389.0	243.2	66.6
Total											389.0		4,765.6	2,979.1	815.4
E. PRINTING AND WRITING PAPER															
1. Machinery/Equipments	Sum	2,330,110.0	1				1	2,330.1					2,330.1	1,864.1	466.0
2. Structures	Sum	720,817.0	1				1	720.8					720.8	144.2	144.2
3. Operating Supplies	Sum	73,132.0	1				1	73.1					73.1		
4. Equipment Rent	Sum	43,568.0	1				1	43.6					43.6	34.9	
5. Startup Cost	Sum	127,592.0	1				1	127.6					127.6	25.5	12.8
6. Studies/Design	Sum	345,821.0	1				1	345.8					345.8	207.5	
Subtotal								3,641.0					3,641.0	2,276.1	622.9
1. Machinery/Equipments	Sum	298,752.0		1			1				298.8		298.8	239.0	59.8
2. Structures	Sum	92,582.0		1			1				92.6		92.6	18.5	18.5
3. Operating Supplies	Sum	9,336.0		1			1				9.3		9.3		
4. Equipment Rent	Sum	5,446.0		1			1				5.4		5.4	4.4	
5. Startup Cost	Sum	16,338.0		1			1				16.3		16.3	3.3	1.6
6. Studies/Design	Sum	44,346.0		1			1				44.3		44.3	26.6	
Subtotal											466.8		466.8	291.8	79.9
Total											466.8		4,107.8	2,567.9	702.8

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8. INSTITUTIONAL STRENGTHENING

Table 30 - Summary of Programme Costs

Programme Components	Million Taka			Million U \$			% of Base Costs	% of FEC
	Foreign	Local	Total	Foreign	Local	Total		
A. PHYSICAL INFRASTRUCTURE								
1. Land Acquisition		50.0	50.0		1.3	1.3	0.3	
2. Detail Engineering and Supervision		16.0	16.0		0.4	0.4	0.1	
3. Civil Works	26.7	240.4	267.1	0.7	6.2	6.9	1.5	1.1
Subtotal	26.7	306.4	333.1	0.7	7.9	8.6	1.9	1.1
B. FURNITURE, EQUIPMENT AND VEHICLES								
1. Furniture		17.6	17.6		0.5	0.5	0.1	
2. Equipments	59.5	14.9	74.4	1.5	0.4	1.9	0.4	2.5
3. Vehicles	137.0	34.2	171.2	3.5	0.9	4.4	1.0	5.8
Subtotal	196.5	66.7	263.2	5.1	1.7	6.8	1.5	8.4
C. HUMAN RESOURCES DEVELOPMENT								
1. Overseas Training for BFD Staff	364.5	40.5	405.0	9.4	1.0	10.4	2.3	15.5
2. Local Training to BFD Staff		100.0	100.0		2.6	2.6	0.6	
3. Local Training to Beneficiaries		300.0	300.0		7.7	7.7	1.7	
Subtotal	364.5	440.5	805.0	9.4	11.3	20.7	4.6	15.5
D. RESEARCH, DEVELOPMENT AND STUDIES								
1. Research and Development	1,239.6	945.5	2,185.2	31.9	24.3	56.2	12.4	52.7
2. Monitoring and Evaluation	40.0	100.0	140.0	1.0	2.6	3.6	0.8	1.7
Subtotal	1,279.6	1,045.5	2,325.2	32.9	26.9	59.8	13.2	54.4
E. CONSULTING SERVICES								
1. International	162.8	18.1	180.9	4.2	0.5	4.7	1.0	6.9
2. Local		36.9	36.9		0.9	0.9	0.2	
Subtotal	162.8	55.0	217.8	4.2	1.4	5.6	1.2	6.9
F. RECURRENT COSTS								
1. Existing Staff Salaries		8,732.5	8,732.5		224.5	224.5	49.7	
2. Incremental Staff Salaries		4,295.0	4,295.0		110.4	110.4	24.5	
3. Operation and Maintenance of Facilities	13.7	54.9	68.7	0.4	1.4	1.8	0.4	0.6
4. Vehicle/ Equipment Operation/ Maintenance	140.0	140.0	280.0	3.6	3.6	7.2	1.6	6.0
5. Office Supplies and Consumables	168.0	72.0	240.0	4.3	1.9	6.2	1.4	7.1
Subtotal	321.7	13,294.4	13,616.2	8.3	341.8	350.0	77.5	13.7
BASE COSTS	2,351.9	15,208.6	17,560.5	60.5	391.0	451.4	100.0	100.0
Physical Contingencies	118.9	775.8	894.7	3.1	19.9	23.0		
TOTAL PROGRAMME COST	2,470.8	15,984.4	18,455.2	63.5	410.9	474.4		

Table 31 - Proposed Financing Plan, Million U \$

Project Components	Total Programme Cost			GOB Financing			Donors Financing			Beneficiaries Financing		
	Foreign	Local	Total	Foreign	Local	Total	Foreign	Local	Total	Foreign	Local	Total
A. PHYSICAL INFRASTRUCTURE												
1. Land Acquisition			1.3		1.3	1.3	1.3					
2. Detail Engineering and Supervision			0.4		0.4	0.4			0.4		0.4	
3. Civil Works	0.7	6.2	6.9			0.2	0.2	0.7	6.0		6.6	
Subtotal	0.7	7.9	8.6			1.5	1.5	0.7	6.4		7.1	
B. FURNITURE, EQUIPMENT AND VEHICLES												
1. Furniture			0.5		0.5	0.5			0.5		0.5	
2. Equipments	1.5	0.4	1.9			0.4	0.4	1.5			1.5	
3. Vehicles	3.5	0.9	4.4			0.9	0.9	3.5			3.5	
Subtotal	5.1	1.7	6.8			1.3	1.3	5.1	0.5		5.5	
C. HUMAN RESOURCES DEVELOPMENT												
1. Overseas Training for BFD Staff	9.4	1.0	10.4					9.4	1.0		10.4	
2. Local Training to BFD Staff			2.6		2.6	2.6			2.6		2.6	
3. Local Training to Beneficiaries			7.7		7.7	7.7			7.7		7.7	
Subtotal	9.4	11.3	20.7			20.7		9.4	11.3		20.7	
D. RESEARCH, DEVELOPMENT AND STUDIES												
1. Research and Development	31.9	24.3	56.2			4.8	4.8	31.9	19.5		51.3	
2. Monitoring and Evaluation	1.0	2.6	3.6			0.2	0.2	1.0	2.4		3.4	
Subtotal	32.9	26.9	59.8			5.0	5.0	32.9	21.8		54.7	
E. CONSULTING SERVICES												
1. International		4.2	0.5		4.7	4.7			4.2	0.5	4.7	
2. Local			0.9		0.9	0.9			0.9		0.9	
Subtotal		4.2	1.4		5.6	5.6			4.2	1.4	5.6	
F. RECURRENT COSTS												
1. Existing Staff Salaries			224.5		224.5	224.5	224.5					
2. Incremental Staff Salaries			110.4		110.4	110.4	110.4					
3. Operation and Maintenance of Facilities	0.4	1.4	1.8			1.4	1.4	0.4			0.4	
4. Vehicle/ Equipment Operation/ Maintenance	3.6	3.6	7.2			3.6	3.6	3.6			3.6	
5. Office Supplies and Consumables	4.3	1.9	6.2			1.9	1.9	4.3			4.3	
Subtotal	8.3	341.8	350.0			341.8	341.8	8.3			8.3	
Physical Contingencies	3.1	19.9	23.0			17.5	17.5	3.1	2.4		5.5	
TOTAL PROGRAMME COSTS	63.5	410.9	474.4			367.1	367.1	63.5	43.8		107.3	
PERCENTAGE	13.4	86.6	100.0			89.3	77.4	100.0	10.7		22.6	

Table 32 - Phasing of Programme Costs, Million Taka

Programme Components	PY Year				Total Costs		
	1 - 5 FY 1993/97	6 - 10 1998/02	11 - 15 2003/07	16 - 20 2008/12	Local	Foreign	Total
A. PHYSICAL INFRASTRUCTURE							
1. Land Acquisition	50.0				50.0		50.0
2. Detail Engineering and Supervision	15.5	0.5			16.0		16.0
3. Civil Works	259.1	8.0			240.4	26.7	267.1
Subtotal	324.7	8.5			306.4	26.7	333.1
B. FURNITURE, EQUIPMENT AND VEHICLES							
1. Furniture	14.8			2.8	17.6		17.6
2. Equipments	37.2			37.2	14.9	59.5	74.4
3. Vehicles	85.6			85.6	34.2	137.0	171.2
Subtotal	137.6			125.6	66.7	196.5	263.2
C. HUMAN RESOURCES DEVELOPMENT							
1. Overseas Training for BFD Staff	202.5	202.5			40.5	364.5	405.0
2. Local Training to BFD Staff	25.0	25.0	25.0	25.0	100.0		100.0
3. Local Training to Beneficiaries	75.0	75.0	75.0	75.0	300.0		300.0
Subtotal	302.5	302.5	100.0	100.0	440.5	364.5	805.0
D. RESEARCH, DEVELOPMENT AND STUDIES							
1. Research and Development	576.7	572.1	500.7	535.7	945.5	1,239.6	2,185.2
2. Monitoring and Evaluation	35.0	35.0	35.0	35.0	100.0	40.0	140.0
Subtotal	611.7	607.1	535.7	570.7	1,045.5	1,279.6	2,325.2
E. CONSULTING SERVICES							
1. International	60.3	60.3	30.1	30.1	18.1	162.8	180.9
2. Local	11.9	12.5	6.3	6.3	36.9		36.9
Subtotal	72.2	72.8	36.4	36.4	55.0	162.8	217.8
F. RECURRENT COSTS							
1. Existing Staff Salaries	1,750.0	2,012.5	2,310.0	2,660.0	8,732.5		8,732.5
2. Incremental Staff Salaries	250.0	600.0	1,550.0	1,895.0	4,295.0		4,295.0
3. Operation and Maintenance of Facilities	17.2	17.2	17.2	17.2	54.9	13.7	68.7
4. Vehicle/ Equipment Operation/ Maintenance	70.0	70.0	70.0	70.0	140.0	140.0	280.0
5. Office Supplies and Consumables	60.0	60.0	60.0	60.0	72.0	168.0	240.0
Subtotal	2,147.2	2,759.7	4,007.2	4,702.2	13,294.4	321.7	13,616.2
BASE COSTS	3,595.9	3,750.6	4,679.2	5,534.8	15,208.6	2,351.9	17,560.5
Physical Contingencies	196.0	188.0	234.0	276.7	775.8	118.9	894.7
TOTAL PROJECT COST	3,791.9	3,938.5	4,913.2	5,811.5	15,984.4	2,470.8	18,455.2

Table 33 - Cost Estimates - Civil Works, Furniture, Equipments and Vehicles

Items	Unit	Unit Cost (Taka '000)	Number of Units					Total	Total Costs (Million Taka)								
			Year 1 - 5	6 - 10	11 - 15	16 - 20	21 - 25		Year 1 - 5	6 - 10	11 - 15	16 - 20	21 - 25	Total	FEC	T and D	
A. Physical Facilities																	
1. Land Acquisition	Ha	5,000.0	10				10										
2. Detail Engineering and Supervision I /	Percent	6.0															
Subtotal																	
3. Civil Works																	
- IFCU	m ²	10.1	8,500				8,500										
- Forest Academy	m ²	8.6	4,000				4,000										
- Sylhet Forest School	m ²	8.6	3,575				3,575										
- Chittagong Forest School	m ²	8.6	1,650				1,650										
- DFOs Office	m ²	8.6	1,850				1,850										
- Office for other Officers	m ²	5.4	1,550	1,481			3,031										
- Office for Other Staffs	m ²	5.4	2,200				2,200										
- Forest Extension Nursery	m ²	5.4	10,700				10,700										
Subtotal																	
B. Furniture																	
- IFCU	Lumpsum	2,100.0	1				1										
- Forest College	Lumpsum	1,000.0	1				1										
- Sylhet Forest School	Lumpsum	1,000.0	1				1										
- Chittagong Forest School	Lumpsum	1,200.0	1				1										
- DFOs Office	Lumpsum	100.0	19				19										
- Office for other Officers	Lumpsum	50.0	24				24										
- Office for Other Staffs	Lumpsum	40.0	89				89										
- Forest Extension Nursery	Lumpsum	40.0	72				72										
Subtotal																	
C. Equipments																	
- IFCU	Lumpsum	10,000.0	1				1										
- Forest College	Lumpsum	10,000.0	1				1										
- Sylhet Forest School	Lumpsum	1,000.0	1				1										
- Chittagong Forest School	Lumpsum	1,000.0	1				1										
- DFOs Office	Lumpsum	250.0	19				19										
- Office for other Officers	Lumpsum	100.0	24				24										
- Office for Other Staffs	Lumpsum	50.0	89				89										
- Forest Extension Nursery	Lumpsum	50.0	72				72										
Subtotal																	
D. Vehicles																	
- Motor Launch	No.	20,000.0	2				2										
- Cabin Trawler	No.	1,500.0	5				5										
- 4 WHD Jeep	No.	1,500.0	24				24										
- Motor Cycle	No.	60.0	35				35										
Subtotal																	

Table 34 - Cost Estimates - Human Resource Development, Research Studies and Operation/Maintenance

Items	Unit	Unit Cost (Taka '000)	Number of Units					Total	Total Costs (Million Taka)					FEC	T and D	
			Year 1 - 5	6 - 10	11 - 15	16 - 20	21 - 25		Year 1 - 5	6 - 10	11 - 15	16 - 20	21 - 25			Total
A. TRAINING																
1. Overseas Training for BFD Staff	No	450.0	100	80	22	22	224	202.5	202.5	93.4	25.7	25.7	25.7	25.7	405.0	364.5
2. Local Training to BFD Staff	No	10.0	200	200	200	200	800	25.0	25.0	10.0	10.0	10.0	10.0	100.0	100.0	
3. Local Training to Beneficiaries	No	0.6	125,000	125,000	125,000	125,000	500,000	75.0	75.0	75.0	56.3	56.3	56.3	300.0	300.0	
Subtotal								302.5	302.5	100.0	100.0	100.0	100.0	805.0	364.5	
B. RESEARCH AND DEVELOPMENT																
1. Overseas Training		1,167.0	100	80	22	22	224	116.7	116.7	93.4	25.7	25.7	25.7	261.4	235.3	
2. Local Training		50.0	200	200	200	200	800	10.0	10.0	10.0	10.0	10.0	10.0	40.0	40.0	
3. Improvement of Field Research Station		75,000.0	1	1	0.8	0.8	3.5	75.0	75.0	75.0	56.3	56.3	56.3	262.5	105.0	26.3
4. Improvement of Laboratory Facilities		75,000.0	1	1	0.8	0.8	3.5	75.0	75.0	75.0	56.3	56.3	56.3	262.5	210.0	26.3
5. Improvement of Library Facilities		25,000.0	1	0.5	0.3	0.3	2	25.0	12.5	6.3	6.3	6.3	6.3	50.0	35.0	5.0
6. Improvement of Seed Production Area		50,000.0	1	1.5	1.8	2	6.3	50.0	75.0	90.0	100.0	100.0	100.0	315.0	157.5	31.5
7. Improvement of Seed Storage Facilities		75,000.0	1	0.8	0.8	0.8	3.3	75.0	56.3	56.3	56.3	56.3	56.3	243.8	121.9	24.4
8. Technology Transfer		25,000.0	1	1	1	1	4	25.0	25.0	25.0	25.0	25.0	25.0	100.0	50.0	10.0
9. Operation of Research Programmes		125,000.0	1	1.2	1.4	1.6	5.2	125.0	150.0	175.0	200.0	200.0	200.0	650.0	325.0	65.0
Subtotal								576.7	572.1	500.7	535.7	535.7	535.7	2,185.2	1,239.6	188.4
C. MONITORING AND EVALUATION																
1. Ongoing monitoring		20,000.0	1	1	1	1	4	20.0	20.0	20.0	20.0	20.0	20.0	80.0	40.0	8.0
1. Evaluation and Studies		15,000.0	1	1	1	1	4	15.0	15.0	15.0	15.0	15.0	15.0	60.0	30.0	8.0
Subtotal								35.0	35.0	35.0	35.0	35.0	35.0	140.0	40.0	8.0
D. CONSULTING SERVICES																
1. International		603.0	100	100	50	50	300	60.3	60.3	30.1	30.1	30.1	30.1	180.9	162.8	
2. Local		50.0	238	250	125	125	738	11.9	12.5	6.3	6.3	6.3	6.3	36.9	36.9	
Subtotal								72.2	72.8	36.4	36.4	36.4	36.4	217.8	162.8	
E. RECURRENT COSTS																
1. Existing Staff Salaries		1,750,000.0	1	1.2	1.3	1.5	5	1,750.0	2,012.5	2,310.0	2,660.0	2,660.0	2,660.0	8,732.5		
2. Incremental Staff Salaries		250,000.0	1	2.4	6.2	7.6	17.2	250.0	600.0	1,550.0	1,895.0	1,895.0	1,895.0	4,295.0		
3. Operation and Maintenance of Facilities		17,170.0	1	1	1	1	4	17.2	17.2	17.2	17.2	17.2	17.2	68.7	13.7	6.9
4. Vehicle/Equipment Operation/Maintenance		70,000.0	1	1	1	1	4	70.0	70.0	70.0	70.0	70.0	70.0	280.0	140.0	28.0
5. Office Supplies and Consumables		60,000.0	1	1	1	1	4	60.0	60.0	60.0	60.0	60.0	60.0	240.0	168.0	24.0
Subtotal								2,147.2	2,759.7	4,007.2	4,702.2	4,702.2	4,702.2	13,616.2	321.7	58.9

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Date		Description		Debit		Credit		Balance	
Month	Day	To	By	Dr	Cr	Dr	Cr	Dr	Cr
Jan	1	Balance							
Jan	2								
Jan	3								
Jan	4								
Jan	5								
Jan	6								
Jan	7								
Jan	8								
Jan	9								
Jan	10								
Jan	11								
Jan	12								
Jan	13								
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APPENDIX 4
INVESTMENT PROGRAMME AND COSTS, SCENARIO 2

APPENDIX 4
INVESTMENT PROGRAMME AND COSTS, SCENARIO 2

FINANCIAL ANALYSIS

APPENDIX 4
INVESTMENT PROGRAMME AND COSTS, SCENARIO 2

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1. SUMMARY OF PROGRAMME COSTS BY CATEGORIES OF EXPENDITURE

Table 1 - Summary of Programme Costs by Categories of Expenditure

Programme Components	Million Taka			Million U \$			% of Base Costs	% of FEC
	Foreign	Local	Total	Foreign	Local	Total		
A. PHYSICAL INFRASTRUCTURE								
1. Land Acquisition		735.0	735.0		18.9	18.9	0.6	
2. Detail Engineering and Supervision		172.5	172.5		4.4	4.4	0.1	
3. Civil Works	411.4	2,463.2	2,874.5	10.6	63.3	73.9	2.3	1.0
4. Construction of Roads	618.6	1,590.6	2,209.2	15.9	40.9	56.8	1.8	1.5
Subtotal	1,029.9	4,961.3	5,991.3	26.5	127.5	154.0	4.8	2.5
B. FURNITURE, EQUIPMENT AND VEHICLES								
1. Furniture		879.3	879.3		22.6	22.6	0.7	
2. Equipments	656.4	744.1	1,400.4	16.9	19.1	36.0	1.1	1.6
3. Vehicles	3,012.2	335.0	3,347.2	77.4	8.6	86.0	2.7	7.4
4. Extraction Equipments	3,152.3	1,460.8	4,613.1	81.0	37.6	118.6	3.7	7.7
Subtotal	6,820.9	3,419.1	10,240.0	175.3	87.9	263.2	8.2	16.7
C. NEW LEGISLATION		337.3	337.3		8.7	8.7	0.3	
Subtotal		337.3	337.3		8.7	8.7	0.3	
D. HUMAN RESOURCES DEVELOPMENT								
1. Overseas Training for BFD Staff	755.8	84.0	839.7	19.4	2.2	21.6	0.7	1.9
2. Local Training to BFD Staff		171.4	171.4		4.4	4.4	0.1	
3. Local Training to Beneficiaries		2,049.0	2,049.0		52.7	52.7	1.6	
3. Seminar and Workshops		76.5	76.5		2.0	2.0	0.1	
Subtotal	755.8	2,380.9	3,136.6	19.4	61.2	80.6	2.5	1.9
E. RESEARCH, DEVELOPMENT AND STUDIES								
1. Research and Development	1,318.4	1,009.1	2,327.5	33.9	25.9	59.8	1.9	3.2
2. Monitoring and Evaluation	125.0	771.0	896.0	3.2	19.8	23.0	0.7	0.3
Subtotal	1,443.4	1,780.1	3,223.5	37.1	45.8	82.9	2.6	3.5
F. CONSULTING SERVICES								
1. International	938.8	104.3	1,043.1	24.1	2.7	26.8	0.8	2.3
2. Local		347.8	347.8		8.9	8.9	0.3	
Subtotal	938.8	452.1	1,390.9	24.1	11.6	35.8	1.1	2.3
G. PLANTATION DEVELOPMENT/FABRICATION OF ENERGY SAVING EQUIPMENTS								
1. Forest Production	1,710.2	15,813.7	17,523.8	44.0	406.5	450.5	14.0	4.2
2. Participatory Forestry	831.0	6,900.7	7,731.8	21.4	177.4	198.8	6.2	2.0
3. Non Wood Forest Products		353.5	353.5		9.1	9.1	0.3	
4. Wood-Based Energy	90.0	588.3	678.3	2.3	15.1	17.4	0.5	0.2
Subtotal	2,631.2	23,656.2	26,287.4	67.6	608.1	675.8	21.0	6.4
H. FOREST-BASED INDUSTRIES								
1. Sawmilling	5,954.9	2,202.5	8,157.3	153.1	56.6	209.7	6.5	14.6
2. Newsprint	4,378.6	2,626.5	7,005.1	112.6	67.5	180.1	5.6	10.7
3. Printing and Writing Paper	4,538.2	2,721.7	7,259.9	116.7	70.0	186.6	5.8	11.1
4. Wrapping/ Packaging Papers	3,618.9	2,169.8	5,788.7	93.0	55.8	148.8	4.6	8.9
5. Speciality Papers	7,617.2	4,566.6	12,183.9	195.8	117.4	313.2	9.7	18.7
Subtotal	26,107.9	14,287.1	40,394.9	671.2	367.3	1,038.4	32.3	63.9
I. RECURRENT COSTS								
1. Existing Staff Salaries		1,158.1	1,158.1		29.8	29.8	0.9	
2. Incremental Staff Salaries		31,091.0	31,091.0		799.3	799.3	24.8	
3. Operation and Maintenance of Facilities	60.8	123.2	184.0	1.6	3.2	4.7	0.1	0.1
4. Vehicle/ Equipment Operation/ Maintenance	535.0	535.0	1,070.0	13.8	13.8	27.5	0.9	1.3
5. Office Supplies and Consumables	513.1	219.9	733.0	13.2	5.7	18.8	0.6	1.3
Subtotal	1,108.9	33,127.1	34,236.0	28.5	851.6	880.1	27.3	2.7
BASE COSTS	40,836.7	84,401.2	125,237.9	1,049.8	2,169.7	3,219.5	100.0	100.0
Physical Contingencies	1,597.0	3,619.2	5,216.2	41.1	93.0	134.1		
TOTAL PROJECT COST	42,433.7	88,020.4	130,454.1	1,090.8	2,262.7	3,353.6		

2. LANDUSE, CONSERVATION AND ENVIRONMENTAL MANAGEMENT

Table 2 - Summary of Programme Costs

Programme Components	Million Taka			Million U \$			% of Base Costs	% of FEC
	Foreign	Local	Total	Foreign	Local	Total		
A. PHYSICAL INFRASTRUCTURE								
1. Land Acquisition		165.0	165.0		4.2	4.2	3.7	
2. Detail Engineering and Supervision		61.8	61.8		1.6	1.6	1.4	
3. Civil Works	103.0	926.7	1,029.7	2.6	23.8	26.5	23.1	12.7
Subtotal	103.0	1,153.5	1,256.5	2.6	29.7	32.3	28.1	12.7
B. FURNITURE, EQUIPMENT AND VEHICLES								
1. Furniture		36.3	36.3		0.9	0.9	0.8	
2. Equipments	203.6	50.9	254.4	5.2	1.3	6.5	5.7	25.1
3. Vehicles	94.1	23.5	117.6	2.4	0.6	3.0	2.6	11.6
Subtotal	297.6	110.7	408.3	7.7	2.8	10.5	9.1	36.7
C. HUMAN RESOURCES DEVELOPMENT								
1. Overseas Training	16.2	1.8	18.0	0.4	0.0	0.5	0.4	2.0
2. Short Courses (Overseas)	64.8	7.2	72.0	1.7	0.2	1.9	1.6	8.0
3. Training of Trainers		3.0	3.0		0.1	0.1	0.1	
4. Training of Local Government Officials		2.0	2.0		0.1	0.1	0.0	
5. Training of Villagers		720.0	720.0		18.5	18.5	16.1	
6. Workshop and Seminars		16.5	16.5		0.4	0.4	0.4	
Subtotal	81.0	750.5	831.5	2.1	19.3	21.4	18.6	
D. RESEARCH, DEVELOPMENT AND STUDIES								
1. Inventory		2.4	2.4		0.1	0.1		
2. Surveys		90.0	90.0		2.3	2.3	2.0	
3. Research and Development Studies		48.0	48.0		1.2	1.2	1.1	
4. Monitoring and Evaluation		100.0	100.0		2.6	2.6	2.2	
Subtotal		240.4	240.4		6.2	6.2	5.4	
E. CONSULTING SERVICES								
1. International	244.2	27.1	271.3	6.3	0.7	7.0	6.1	
2. Local		225.6	225.6		5.8	5.8	5.1	
Subtotal	244.2	252.8	496.9	6.3	6.5	12.8	11.1	30.1
F. RECURRENT COSTS								
1. Existing Staff Salaries		274.8	274.8		7.1	7.1	6.2	
2. Incremental Staff Salaries		798.3	798.3		20.5	20.5	17.9	
3. Operation and Maintenance of Facilities	4.0	16.0	20.0	0.1	0.4	0.5	0.4	0.5
4. Vehicle/ Equipment Operation/ Maintenance	40.0	40.0	80.0	1.0	1.0	2.1	1.8	4.9
5. Office Supplies and Consumables	42.0	18.0	60.0	1.1	0.5	1.5	1.3	5.2
Subtotal	86.0	1,147.1	1,233.1	2.2	29.5	31.7	27.6	10.6
BASE COSTS	811.8	3,654.9	4,466.7	20.9	94.0	114.8	100.0	100.0
Physical Contingencies	45.7	240.4	286.2	1.2	6.2	7.4		
TOTAL PROJECT COST	857.5	3,895.3	4,752.9	22.0	100.1	122.2		

Table 3 - Proposed Financing Plan, Million U \$

Project Components	Total Programme Cost			GOB Financing			Donors Financing			Beneficiaries Financing		
	Foreign	Local	Total	Foreign	Local	Total	Foreign	Local	Total	Foreign	Local	Total
A. PHYSICAL INFRASTRUCTURE												
1. Land Acquisition		4.2	4.2		4.2	4.2						
2. Detail Engineering and Supervision		1.6	1.6					1.6	1.6			
3. Civil Works	2.6	23.8	26.5		2.6	2.6	2.6	21.2	23.8			
Subtotal	2.6	29.7	32.3		6.9	6.9	2.6	22.8	25.4			
B. FURNITURE, EQUIPMENT AND VEHICLES												
1. Furniture		0.9	0.9					0.9	0.9			
2. Equipments	5.2	1.3	6.5		1.3	1.3	5.2		5.2			
3. Vehicles	2.4	0.6	3.0		0.6	0.6	2.4		2.4			
Subtotal	7.7	2.8	10.5		1.9	1.9	7.7	0.9	8.6			
C. HUMAN RESOURCES DEVELOPMENT												
1. Overseas Training	0.4	0.0	0.5				0.4	0.0	0.5			
2. Short Courses (Overseas)	1.7	0.2	1.9				1.7	0.2	1.9			
3. Training of Trainers		0.1	0.1					0.1	0.1			
4. Training of Local Government Officials		0.1	0.1					0.1	0.1			
5. Training of Villagers		18.5	18.5					18.5	18.5			
6. Workshop and Seminars		0.4	0.4					0.4	0.4			
Subtotal	2.1	19.3	21.4				2.1	19.3	21.4			
D. RESEARCH, DEVELOPMENT AND STUDIES												
1. Inventory		0.1	0.1					0.1	0.1			
2. Surveys		2.3	2.3					2.3	2.3			
3. Research and Development Studies		1.2	1.2					1.2	1.2			
4. Monitoring and Evaluation		2.6	2.6					2.6	2.6			
Subtotal		6.2	6.2					6.2	6.2			
E. CONSULTING SERVICES												
1. International	6.3	0.7	7.0				6.3	0.7	7.0			
2. Local		5.8	5.8					5.8	5.8			
Subtotal	6.3	6.5	12.8				6.3	6.5	12.8			
F. RECURRENT COSTS												
1. Existing Staff Salaries		7.1	7.1		7.1	7.1						
2. Incremental Staff Salaries		20.5	20.5							20.5	20.5	
3. Operation and Maintenance of Facilities	0.1	0.4	0.5		0.1	0.1	0.1		0.1	0.3	0.3	
4. Vehicle/ Equipment Operation/ Maintenance	1.0	1.0	2.1		0.2	0.2	1.0		1.0	0.8	0.8	
5. Office Supplies and Consumables	1.1	0.5	1.5		0.1	0.1	1.1		1.1	0.4	0.4	
Subtotal	2.2	29.5	31.7		7.4	7.4	2.2		2.2	22.0	22.0	
BASE COSTS	20.9	94.0	114.8		16.2	16.2	20.9	55.7	76.5	22.0	22.0	
Physical Contingencies	1.2	6.2	7.4		1.1	1.2	1.2	3.7	1.2	1.4	4.9	
TOTAL PROJECT COST	22.0	100.1	122.2		17.3	17.5	22.0	59.4	77.7	23.5	27.0	
PERCENTAGE	18.0	82.0	100.0		17.3	14.3	100.0	59.3	63.6	23.4	22.1	

Table 4 - Phasing of Programme Costs, Million Taka

Programme Components	PY Year 1 - 5				Total Costs			
	FY	1993/97	1998/02	2003/07	2008/12	Local	Foreign	Total
A. PHYSICAL INFRASTRUCTURE								
1. Land Acquisition		15.0	50.0	50.0	50.0	165.0		165.0
2. Detail Engineering and Supervision		36.0	11.8	3.9	10.1	61.8		61.8
3. Civil Works		599.8	197.1	64.8	168.0	926.7	103.0	1,029.7
Subtotal		650.8	258.9	118.7	228.1	1,153.5	103.0	1,256.5
B. FURNITURE, EQUIPMENT AND VEHICLES								
1. Furniture		19.7	9.7	4.0	3.0	36.3		36.3
2. Equipments		195.3	12.0	7.0	40.1	50.9	203.6	254.4
3. Vehicles		58.2	16.2		43.2	23.5	94.1	117.6
Subtotal		273.2	37.9	11.0	86.3	110.7	297.6	408.3
C. HUMAN RESOURCES DEVELOPMENT								
1. Overseas Training		12.0	6.0			1.8	16.2	18.0
2. Short Courses (Overseas)		18.0	18.0	18.0	18.0	7.2	64.8	72.0
3. Training of Trainers		1.0	1.0	1.0		3.0		3.0
4. Training of Local Government Officials		0.5	0.5	0.5	0.5	2.0		2.0
5. Training of Villagers		120.0	160.0	200.0	240.0	720.0		720.0
6. Workshop and Seminars		7.5	4.5	3.0	1.5	16.5		16.5
Subtotal		159.0	190.0	222.5	260.0	750.5	81.0	831.5
D. RESEARCH, DEVELOPMENT AND STUDIES								
1. Inventory		2.4				2.4		2.4
2. Surveys		90.0				90.0		90.0
3. Research and Development Studies		16.0	16.0	8.0	8.0	48.0		48.0
4. Monitoring and Evaluation		25.0	25.0	25.0	25.0	100.0		100.0
Subtotal		133.4	41.0	33.0	33.0	240.4		240.4
E. CONSULTING SERVICES								
1. International		180.9	90.4			27.1	244.2	271.3
2. Local		155.6	70.0			225.6		225.6
Subtotal		336.5	160.5			252.8	244.2	496.9
F. RECURRENT COSTS								
1. Existing Staff Salaries		55.1	63.3	72.7	83.7	274.8		274.8
2. Incremental Staff Salaries		97.8	195.7	234.8	270.0	798.3		798.3
3. Operation and Maintenance of Facilities		5.0	5.0	5.0	5.0	16.0	4.0	20.0
4. Vehicle/ Equipment Operation/ Maintenance		20.0	20.0	20.0	20.0	40.0	40.0	80.0
5. Office Supplies and Consumables		15.0	15.0	15.0	15.0	18.0	42.0	60.0
Subtotal		192.9	299.0	347.5	393.7	1,147.1	86.0	1,233.1
BASE COSTS								
Physical Contingencies		119.8	62.3	42.6	61.5	240.4	45.7	286.2
TOTAL PROJECT COST		1,865.5	1,049.6	775.2	1,062.6	3,895.3	857.5	4,752.9

Table 5 - Cost Estimates - Civil Works, Furniture, Equipments and Vehicles

Items	Unit	Unit Cost (Taka 000)	Number of Units					Total	Total Costs (Million Taka)					Total	FEC	T and D			
			Year 1 - 5	6 - 10	11 - 15	16 - 20	21 - 25		Year 1 - 5	6 - 10	11 - 15	16 - 20	21 - 25						
A. PHYSICAL FACILITIES																			
1. Land Acquisition	Ha	5,000.0	3	10	10	10	33	15	50	50	50	165	1.0	1.0	1.0	1.0			
2. Detail Engineering and Supervision I /	Percent	6.0						36	11.8	3.9	10.1	61.8	2.6	2.6	2.6	2.6			
Subtotal								51.0	61.8	53.9	60.1	226.8							
3. Civil Works																			
- Department	m ²	10.1	1,000					1,000					1.0	1.0	1.0	1.0			
- Regional Offices	m ²	8.6	3,000					3,000					25.8	2.6	2.6	2.6			
- Existing National Parks(Protected Areas)	m ²	5.4	10,000					10,000					54.0	5.4	5.4	5.4			
- New Protected Areas	m ²	5.4	60,000	20,000				80,000					432.0	43.2	43.2	43.2			
- Field Rest House	m ²	5.4	4,700					4,700					25.4	2.5	2.5	2.5			
- Herbarium and Botanical Gardens	m ²	5.4	1,600					1,600					8.6	0.9	0.9	0.9			
- Regional Nature Conservation Center	m ²	5.4	1,500	4,500				6,000					8.1	24.3	3.2	3.2			
- National and Regional Zoo	m ²	5.4	10,700	12,000	12,000			46,700					57.8	64.8	25.2	25.2			
- Natural History Museum	m ²	8.6	10,000		12,000			22,000					86.0	103.2	189.2	18.9			
Subtotal								175,000.0					599.8	197.1	64.8	168.0	1,029.7	103.0	
B. FURNITURE																			
- Department of Natural Resource Conservation	Lumpsum	500.0	1		1			2					0.5	0.5	1.0	1.0			
- Regional Offices	Lumpsum	200.0	6		6			12					1.2	1.2	2.4	2.4			
- Existing National Parks(Protected Areas)	Lumpsum	5,000.0	1					1					5.0	5.0	5.0	5.0			
- New Protected Areas	Lumpsum	1,000.0	5	5				10					5.0	5.0	10.0	10.0			
- Field Rest House	Lumpsum	50.0	30	12	30			72					1.5	0.6	1.5	3.6			
- Herbarium	Lumpsum	300.0	10					10					3.0	3.0	3.0	3.0			
- Regional Nature Conservation Center	Lumpsum	150.0	13	17	5			35					2.0	0.8	5.3	5.3			
- National Zoo	Lumpsum	1,500.0	1	1	1			4					1.5	1.5	6.0	6.0			
- Natural History Museum	Lumpsum	1,500.0	1					1					1.5	1.5	1.5	1.5			
Subtotal								19.7	9.7	4.0	3.0	36.3	19.7	9.7	4.0	3.0	36.3		
C. EQUIPMENTS																			
- Department of Natural Resource Conservation	Lumpsum	10,000.0	1					2					10.0	10.0	20.0	20.0			
- Department of Environment	Lumpsum	10,000.0	1					2					10.0	10.0	20.0	20.0			
- Forest Department	Lumpsum	2,000.0	1					2					2.0	2.0	4.0	4.0			
- Regional Offices	Lumpsum	500.0	1					2					0.5	0.5	1.0	1.0			
- Existing National Parks(Protected Areas)	Lumpsum	5,000.0	1					2					5.0	5.0	10.0	10.0			
- New Protected Areas	Lumpsum	7,000.0	1					2					7.0	7.0	14.0	14.0			
- Field Rest House	Lumpsum	20.0	30	12	30			72					0.6	0.2	1.4	1.2			
- Herbarium	Lumpsum	14,500.0	10					10					145.0	116.0	290.0	290.0			
- Regional Nature Conservation Center	Lumpsum	400.0	13	17	5			35					5.2	6.8	14.0	11.2			
- National Zoo	Lumpsum	5,000.0	1	1	1			4					5.0	5.0	20.0	16.0			
- Natural History Museum	Lumpsum	5,000.0	1					1					5.0	5.0	5.0	4.0			
Subtotal								195.3	12.0	7.0	40.1	254.4	195.3	12.0	7.0	40.1	254.4	203.6	50.9
D. VEHICLES																			
- 4 WHD Jeep	No.	1,500.0	18	10				46					27.0	15.0	27.0	13.8			
- Motor Cycle	No.	60.0	30	20				80					1.8	1.2	4.8	3.8			
- Speed Boat	No.	1,200.0	12					24					14.4	14.4	28.8	23.0			
- Constal Research Vessel	No.	15,000.0	1					1					15.0	12.0	15.0	12.0			
- River Patrol Boat	No.	1,000.0	6					12					6.0	6.0	12.0	9.6			
- Amphibious Aircraft	No.	2,000.0	2					4					4.0	3.2	4.0	3.2			
Subtotal								58.2	16.2	43.2	117.6	117.6	58.2	16.2	43.2	117.6	94.1	23.5	

Table 6 - Cost Estimates - Human Resource Development, Research Studies, Monitoring and Operation/Maintenance

Items	Unit Cost		Number of Units					Total	Total Cost (Million)					FEC	T and D			
	Unit	(Taka '000)	Year 1 - 5	6 - 10	11 - 15	16 - 20	21 - 25		Year 1 - 5	6 - 10	11 - 15	16 - 20	21 - 25			10	15	20
A. TRAINING AND SEMINAR																		
1. Overseas Training	No	1,200.0	10	5			15						12.0	6.0				
2. Short Courses (Overseas)	No	450.0	40	40	40	40	160						18.0	18.0	18.0		16.2	
3. Training of Trainers	No	20.0	50	50	50	50	200						1.0	1.0	1.0	18.0		
4. Training of Local Government Officials	No	10.0	50	50	50	50	200						0.5	0.5	0.5		64.8	
5. Training of Villagers	No	2.0	60,000	80,000	100,000	120,000	360,000						120.0	160.0	200.0			
6. Workshop and Seminars	No	150.0	50	30	20	10	110						7.5	4.5	3.0			
Subtotal													159.0	190.0	222.5			
B. RESEARCH, DEVELOPMENT AND STUDIES																		
1. Inventory	Sum	400.0	6				6						2.4					81.0
2. Surveys	Sum	30,000.0	3				3						90.0					
3. Research and Development Studies	Sum	800.0	20	20	10	10	60						16.0	16.0	8.0			
4. Monitoring and Evaluation	Sum	500.0	50	50	50	50	200						25.0	25.0	25.0	8.0		
Subtotal													133.4	41.0	33.0	25.0		
C. COMMUNITY BASED RESOURCE MANAGEMENT																		
Sum		1,167,000.0	0.4	0.2	0.2	0.2	1						466.8	233.4	233.4			
D. CONSULTING SERVICES																		
1. International	mm	603.0	300	150			450						180.9	90.4				
2. Local	mm	155.6	1,000	450			1,450						155.6	70.0				
Subtotal													336.5	160.5				244.2
E. RECURRENT COSTS																		
1. Existing Staff Salaries	Sum	55,075.0	1	1.2	1.3	1.5	5						55.1	63.3	72.7			
2. Incremental Staff Salaries	Sum	97,825.2	1	2	2.4	2.8	8.2						97.8	195.7	234.8	83.7		
3. Operation and Maintenance of Facilities	Sum	5,000.0	1	1	1	1	4						5.0	5.0	5.0	2,700.0		
4. Vehicle/Equipment Operation/Maintenance	Sum	20,000.0	1	1	1	1	4						20.0	20.0	20.0	5.0		
5. Office Supplies and Consumables	Sum	15,000.0	1	1	1	1	4						15.0	15.0	15.0	20.0		
Subtotal													192.9	299.0	347.5	15.0		
																393.7		
																15.0		
																40.0		
																42.0		
																86.0		
																6.0		
																16.0		

3. FOREST PLANTATION DEVELOPMENT

Table 7 - Summary of Programme Costs

Programme Components	Million Taka			Million U \$			% of Base Costs	% of FEC
	Foreign	Local	Total	Foreign	Local	Total		
A. LONG ROTATION								
1. Nursery	42.5	382.4	424.9	1.1	9.8	10.9		
2. Plantation Establishment	74.5	670.1	744.6	1.9	17.2	19.1	4.2	4.4
3. Plantation Maintenance	186.0	1,674.2	1,860.3	4.8	43.0	47.8	10.6	10.9
Subtotal	303.0	2,726.8	3,029.8	7.8	70.1	77.9	17.3	17.7
B. MEDIUM ROTATION								
1. Nursery	91.9	826.7	918.6	2.4	21.3	23.6	5.2	5.4
2. Plantation Establishment	163.6	1,472.0	1,635.5	4.2	37.8	42.0	9.3	9.6
3. Plantation Maintenance	410.2	3,691.8	4,102.0	10.5	94.9	105.4		
Subtotal	665.6	5,990.5	6,656.1	17.1	154.0	171.1	38.0	38.9
C. SHORT ROTATION								
1. Nursery	42.2	380.0	422.2	1.1	9.8	10.9	2.4	2.5
2. Plantation Establishment	59.1	531.6	590.7	1.5	13.7	15.2	3.4	3.5
3. Plantation Maintenance	85.8	772.0	857.7	2.2	19.8	22.0	4.9	5.0
Subtotal	187.1	1,683.5	1,870.6	4.8	43.3	48.1	10.7	10.9
D. ENRICHMENT PLANTATION								
1. Nursery	126.5	1,138.4	1,264.9	3.3	29.3	32.5	7.2	7.4
2. Plantation Establishment	84.3	1,180.6	1,264.9	2.2	30.3	32.5	7.2	4.9
3. Plantation Maintenance	214.4	1,929.6	2,144.0	5.5	49.6	55.1	12.2	12.5
Subtotal	425.2	4,248.6	4,673.7	10.9	109.2	120.1	26.7	24.9
E. COASTAL AFFORESTATION								
1. Nursery	15.0	135.0	150.0	0.4	3.5	3.9	0.9	0.9
2. Plantation Establishment	42.9	386.1	429.0	1.1	9.9	11.0	2.4	2.5
3. Plantation Maintenance	15.0	135.0	150.0	0.4	3.5	3.9	0.9	0.9
Subtotal	72.9	656.1	729.0	1.9	16.9	18.7	4.2	4.3
F. PARKS AND GAME SANCTUARIES								
1. Nursery	14.6	131.6	146.3	0.4	3.4	3.8	0.8	0.9
2. Plantation Establishment	16.3	146.3	162.5	0.4	3.8	4.2	0.9	1.0
3. Plantation Maintenance	25.6	230.3	255.9	0.7	5.9	6.6	1.5	1.5
Subtotal	56.5	508.2	564.7	1.5	13.1	14.5	3.2	3.3
BASE COSTS	1,710.2	15,813.7	17,523.8	44.0	406.5	450.5	100.0	100.0
Physical Contingencies	58.3	524.4	582.6	1.5	13.5	15.0		
TOTAL PROJECT COST	1,768.4	16,338.0	18,106.5	45.5	420.0	465.5		

Table 8 - Proposed Financing Plan, Million U \$

Project Components	Total Programme Cost			GOB Financing			Donors Financing			Beneficiaries Financing		
	Foreign	Local	Total	Foreign	Local	Total	Foreign	Local	Total	Foreign	Local	Total
A. LONG ROTATION												
1. Nursery	1.1	9.8	10.9				1.1	7.9	9.0	2.0	2.0	
2. Plantation Establishment	1.9	17.2	19.1				1.9	13.8	15.7	3.4	3.4	
3. Plantation Maintenance	4.8	43.0	47.8				4.8	34.4	39.2	8.6	8.6	
Subtotal	7.8	70.1	77.9				7.8	56.1	63.9	14.0	14.0	
B. MEDIUM ROTATION												
1. Nursery	2.4	21.3	23.6				2.4	17.0	19.4	4.3	4.3	
2. Plantation Establishment	4.2	37.8	42.0				4.2	30.3	34.5	7.6	7.6	
3. Plantation Maintenance	10.5	94.9	105.4				10.5	75.9	86.5	19.0	19.0	
Subtotal	17.1	154.0	171.1				17.1	123.2	140.3	30.8	30.8	
C. SHORT ROTATION												
1. Nursery	1.1	9.8	10.9				1.1	7.8	8.9	2.0	2.0	
2. Plantation Establishment	1.5	13.7	15.2				1.5	10.9	12.5	2.7	2.7	
3. Plantation Maintenance	2.2	19.8	22.0				2.2	15.9	18.1	4.0	4.0	
Subtotal	4.8	43.3	48.1				4.8	34.6	39.4	8.7	8.7	
D. ENRICHMENT PLANTATION												
1. Nursery	3.3	29.3	32.5				3.3	23.4	26.7	5.9	5.9	
2. Plantation Establishment	2.2	30.3	32.5				2.2	24.3	26.4	6.1	6.1	
3. Plantation Maintenance	5.5	49.6	55.1				5.5	39.7	45.2	9.9	9.9	
Subtotal	10.9	109.2	120.1				10.9	87.4	98.3	21.8	21.8	
E. COASTAL AFFORESTATION												
1. Nursery	0.4	3.5	3.9				0.4	2.8	3.2	0.7	0.7	
2. Plantation Establishment	1.1	9.9	11.0				1.1	7.9	9.0	2.0	2.0	
3. Plantation Maintenance	0.4	3.5	3.9				0.4	2.8	3.2	0.7	0.7	
Subtotal	1.9	16.9	18.7				1.9	13.5	15.4	3.4	3.4	
F. PARKS AND GAME SANCTUARIES												
1. Nursery	0.4	3.4	3.8				0.4	2.7	3.1	0.7	0.7	
2. Plantation Establishment	0.4	3.8	4.2				0.4	3.0	3.4	0.8	0.8	
3. Plantation Maintenance	0.7	5.9	6.6				0.7	4.7	5.4	1.2	1.2	
Subtotal	1.5	13.1	14.5				1.5	10.5	11.9	2.6	2.6	
BASE COSTS	44.0	406.5	450.5				44.0	325.2	369.2	81.3	81.3	
Physical Contingencies	1.5	13.5	15.0				1.5	8.0	9.5	5.5	5.5	
TOTAL PROGRAMME COST	45.5	420.0	465.5				45.5	333.2	378.6	86.8	86.8	
Percentage	9.8	90.2	100.0				100.0	79.3	81.3	20.7	18.7	

Table 9 - Phasing of Programme Costs, Million Taka

Programme Components	PY Year 1 - 5		6 - 10	11 - 15	16 - 20	Total Costs		
	FY	1993/97	1998/02	2003/07	2008/12	Local	Foreign	Total
A. LONG ROTATION								
1. Nursery		111.2	109.1	96.3	108.3	382.4	42.5	424.9
2. Plantation Establishment		188.9	189.6	175.6	190.5	670.1	74.5	744.6
3. Plantation Maintenance		451.8	468.5	461.8	478.2	1,674.2	186.0	1,860.3
Subtotal		751.9	767.2	733.7	777.0	2,726.8	303.0	3,029.8
B. MEDIUM ROTATION								
1. Nursery		229.7	229.7	229.7	229.7	826.7	91.9	918.6
2. Plantation Establishment		408.9	408.9	408.9	408.9	1,472.0	163.6	1,635.5
3. Plantation Maintenance		1,025.5	1,025.5	1,025.5	1,025.5	3,691.8	410.2	4,102.0
Subtotal		1,664.0	1,664.0	1,664.0	1,664.0	5,990.5	665.6	6,656.1
C. SHORT ROTATION								
1. Nursery		79.7	99.7	121.4	121.4	380.0	42.2	422.2
2. Plantation Establishment		111.5	139.4	169.8	169.8	531.6	59.1	590.7
3. Plantation Maintenance		162.0	202.5	246.6	246.6	772.0	85.8	857.7
Subtotal		353.2	441.6	537.9	537.9	1,683.5	187.1	1,870.6
D. ENRICHMENT PLANTATION								
1. Nursery		316.2	316.2	316.2	316.2	1,138.4	126.5	1,264.9
2. Plantation Establishment		210.7	210.7	210.7	210.7	1,180.6	84.3	1,264.9
3. Plantation Maintenance		536.0	536.0	536.0	536.0	1,929.6	214.4	2,144.0
Subtotal		1,062.9	1,062.9	1,062.9	1,062.9	4,248.6	425.2	4,673.7
E. COASTAL AFFORESTATION								
1. Nursery		37.5	37.5	37.5	37.5	135.0	15.0	150.0
2. Plantation Establishment		107.3	107.3	107.3	107.3	386.1	42.9	429.0
3. Plantation Maintenance		37.5	37.5	37.5	37.5	135.0	15.0	150.0
Subtotal		182.3	182.3	182.3	182.3	656.1	72.9	729.0
F. PARKS AND GAME SANCTUARIES								
1. Nursery		36.6	36.6	36.6	36.6	131.6	14.6	146.3
2. Plantation Establishment		40.6	40.6	40.6	40.6	146.3	16.3	162.5
3. Plantation Maintenance		64.0	64.0	64.0	64.0	230.3	25.6	255.9
Subtotal		141.2	141.2	141.2	141.2	508.2	56.5	564.7
BASE COSTS		4,155.5	4,259.1	4,321.9	4,365.2	15,813.7	1,710.2	17,523.8
Physical Contingencies		145.8	145.8	145.1	145.9	524.4	58.3	582.6
TOTAL PROJECT COST		4,301.2	4,404.9	4,467.0	4,511.1	16,338.0	1,768.4	18,106.5

Table 10 - Cost Estimates - Forest Plantation Development

Items	Unit	Unit Cost (Taka '000)					Number of Units					Total Costs (Million Taka)				
		Year 1 - 5	6 - 10	11 - 15	16 - 20	21 - 25	Total	Year 1 - 5	6 - 10	11 - 15	16 - 20	21 - 25	Total	FEC	T and D	
A. LONG ROTATION																
1. Nursery																
- Stump	Ha	3.0	11,904	13,205	14,575	13,902	53,586	35.7	39.6	43.7	41.7	160.8	16.1			
- Polybags	Ha	7.3	10,411	9,585	7,255	9,188	36,439	75.5	69.5	52.6	66.6	264.2	26.4			
Subtotal			22,315	22,790	21,830	23,090	90,025	111.2	109.1	96.3	108.3	424.9	42.5			
2. Plantation Establishment																
- Stump	Ha	7.0	11,904	13,205	14,575	13,902	53,586	83.3	92.4	102.0	97.3	375.1	37.5			
- Polybags	Ha	10.1	10,411	9,585	7,255	9,188	36,439	105.6	97.2	73.6	93.2	369.5	36.9			
Subtotal								188.9	189.6	175.6	190.5	744.6	74.5			
3. Plantation Maintenance																
- Stump	Ha	23.4	11,904	13,205	14,575	13,902	53,586	278.6	309.0	341.1	325.3	1,253.9	125.4			
- Polybags	Ha	16.6	10,411	9,585	7,255	9,188	36,439	173.2	159.5	120.7	152.9	606.3	60.6			
Subtotal								451.8	468.5	461.8	478.2	1,860.3	186.0			
Total								751.9	767.2	733.7	777.0	3,029.8	303.0			
B. MEDIUM ROTATION																
1. Nursery																
- Stump	Ha	3.0	31,250	31,250	31,250	31,250	125,000	93.8	93.8	93.8	93.8	375.0	37.5			
- Polybags	Ha	7.2	18,750	18,750	18,750	18,750	75,000	135.9	135.9	135.9	135.9	543.6	54.4			
Subtotal			50,000	50,000	50,000	50,000	200,000	229.7	229.7	229.7	229.7	918.6	91.9			
2. Plantation Establishment																
- Stump	Ha	7.0	31,250	31,250	31,250	31,250	125,000	218.8	218.8	218.8	218.8	875.0	87.5			
- Polybags	Ha	10.1	18,750	18,750	18,750	18,750	75,000	190.1	190.1	190.1	190.1	760.5	76.1			
Subtotal								408.9	408.9	408.9	408.9	1,635.5	163.6			
3. Plantation Maintenance																
- Stump	Ha	21.6	31,250	31,250	31,250	31,250	125,000	675.0	675.0	675.0	675.0	2,700.0	270.0			
- Polybags	Ha	18.7	18,750	18,750	18,750	18,750	75,000	350.5	350.5	350.5	350.5	1,402.0	140.2			
Subtotal								1,025.5	1,025.5	1,025.5	1,025.5	4,102.0	410.2			
Total								1,664.0	1,664.0	1,664.0	1,664.0	6,656.1	665.6			
C. SHORT ROTATION																
1. Nursery																
- Stump	Ha							79.7	99.7	121.4	121.4	422.2	42.2			
- Polybags	Ha							79.7	99.7	121.4	121.4	422.2	42.2			
Subtotal																
2. Plantation Establishment																
- Stump	Ha							111.5	139.4	169.8	169.8	590.7	59.1			
- Polybags	Ha							111.5	139.4	169.8	169.8	590.7	59.1			
Subtotal																
3. Plantation Maintenance																
- Stump	Ha							162.0	202.5	246.6	246.6	857.7	85.8			
- Polybags	Ha							162.0	202.5	246.6	246.6	857.7	85.8			
Subtotal								353.2	441.6	537.9	537.9	1,870.6	187.1			
Total																

4. PARTICIPATORY FORESTRY INSTITUTIONAL DEVELOPMENT

Table 11 - Summary of Programme Costs

Programme Components	Million Taka			Million U \$			% of Base Costs	% of FEC
	Foreign	Local	Total	Foreign	Local	Total		
A. PHYSICAL INFRASTRUCTURE								
1. Land Acquisition		120.0	120.0		3.1	3.1	1.4	
2. Detail Engineering and Supervision		35.2	35.2		0.9	0.9	0.4	
3. Civil Works	58.6	527.3	585.9	1.5	13.6	15.1	7.0	1.4
Subtotal	58.6	682.4	741.0	1.5	17.5	19.0	8.9	1.4
B. FURNITURE, EQUIPMENT AND VEHICLES								
1. Furniture		580.0	580.0		14.9	14.9	6.9	
2. Equipments	3,344.0	836.0	4,180.0	86.0	21.5	107.5	50.0	79.1
3. Vehicles	182.1	45.5	227.6	4.7	1.2	5.9	2.7	4.3
Subtotal	3,526.1	1,461.5	4,987.6	90.6	37.6	128.2	59.7	83.4
C. HUMAN RESOURCES DEVELOPMENT								
1. Overseas Training for BFD Staff	243.0	27.0	270.0	6.2	0.7	6.9	3.2	5.7
2. Local Training to BFD Staff		55.0	55.0		1.4	1.4	0.7	
3. Local Training to Beneficiaries		390.0	390.0		10.0	10.0	4.7	
Subtotal	243.0	472.0	715.0	6.2	12.1	18.4	8.6	5.7
D. MONITORING AND STUDIES								
1. On-going Monitoring		60.0	60.0		1.5	1.5	0.7	
2. Evaluation Studies		100.0	100.0		2.6	2.6	1.2	
Subtotal		160.0	160.0		4.1	4.1	1.9	
E. CONSULTING SERVICES								
1. International	162.8	18.1	180.9	4.2	0.5	4.7	2.2	3.9
2. Local		32.5	32.5		0.8	0.8	0.4	
Subtotal	162.8	50.6	213.4	4.2	1.3	5.5	2.6	3.9
F. RECURRENT COSTS								
1. Existing Staff Salaries		384.2	384.2		9.9	9.9	4.6	
2. Incremental Staff Salaries		652.8	652.8		16.8	16.8	7.8	
3. Operation and Maintenance of Facilities	16.0	64.0	80.0	0.4	1.6	2.1	1.0	0.4
4. Vehicle/ Equipment Operation/ Maintenance	180.0	180.0	360.0	4.6	4.6	9.3	4.3	4.3
5. Office Supplies and Consumables	42.0	18.0	60.0	1.1	0.5	1.5	0.7	1.0
Subtotal	238.0	1,299.0	1,537.0	6.1	33.4	39.5	18.4	5.6
BASE COSTS	4,228.5	4,125.6	8,354.0	108.7	106.1	214.8	100.0	100.0
Physical Contingencies	34.3	97.0	131.3	0.9	2.5	3.4		
TOTAL PROJECT COST	4,262.8	4,222.5	8,485.3	109.6	108.5	218.1		

Table 12 - Proposed Financing Plan, Million U \$

Project Components	Total Programme Cost			GOB Financing			Donors Financing			Beneficiaries Financing		
	Foreign	Local	Total	Foreign	Local	Total	Foreign	Local	Total	Foreign	Local	Total
A. PHYSICAL INFRASTRUCTURE												
1. Land Acquisition		3.1	3.1							3.1	3.1	
2. Detail Engineering and Supervision		0.9	0.9					0.9	0.9			
3. Civil Works	1.5	13.6	15.1		1.5	1.5	1.5	12.0	13.6			
Subtotal	1.5	17.5	19.0		1.5	1.5	1.5	13.0	14.5		3.1	3.1
B. FURNITURE, EQUIPMENT AND VEHICLES												
1. Furniture		14.9	14.9					14.9	14.9			
2. Equipments	86.0	21.5	107.5		21.5	21.5	86.0		86.0			
3. Vehicles	4.7	1.2	5.9		1.2	1.2	4.7		4.7			
Subtotal	90.6	37.6	128.2		22.7	22.7	90.6	14.9	105.6			
C. HUMAN RESOURCES DEVELOPMENT												
1. Overseas Training for BFD Staff	6.2	0.7	6.9				6.2	0.7	6.9			
2. Local Training to BFD Staff		1.4	1.4					1.4	1.4			
3. Local Training to Beneficiaries		10.0	10.0					10.0	10.0			
Subtotal	6.2	12.1	18.4				6.2	12.1	18.4			
D. MONITORING AND STUDIES												
1. On-going Monitoring		1.5	1.5					1.5	1.5			
2. Evaluation Studies		2.6	2.6					2.6	2.6			
Subtotal		4.1	4.1					4.1	4.1			
E. CONSULTING SERVICES												
1. International	4.2	0.5	4.7				4.2	0.5	4.7			
2. Local		0.8	0.8					0.8	0.8			
Subtotal	4.2	1.3	5.5				4.2	1.3	5.5			
F. RECURRENT COSTS												
1. Existing Staff Salaries		9.9	9.9		9.9	9.9						
2. Incremental Staff Salaries		16.8	16.8							16.8	16.8	
3. Operation and Maintenance of Facilities	0.4	1.6	2.1				0.4		0.4	1.6	1.6	
4. Vehicle/ Equipment Operation/ Maintenance	4.6	4.6	9.3				4.6		4.6	4.6	4.6	
5. Office Supplies and Consumables	1.1	0.5	1.5				1.1		1.1	0.5	0.5	
Subtotal		6.1	33.4		9.9	9.9	6.1		6.1	23.5	23.5	
BASE COSTS	108.7	106.1	214.8		34.0	34.0	108.7	45.4	154.1	26.6	26.6	
Physical Contingencies	0.9	2.5	3.4		0.8	0.8	0.9	1.1	2.0	0.6	0.6	
TOTAL PROGRAMME COST	109.6	108.5	218.1		34.8	34.8	109.6	46.5	156.1	27.2	27.2	
Percentage	50.2	49.8	100.0		32.1	16.0	100.0	42.8	71.5	25.1	12.5	

Table 13 - Phasing of Programme Costs, Million Taka

Programme Components	PY Year				Total Costs			
	1 - 5 FY	1993/97	6 - 10 1998/02	11 - 15 2003/07	16 - 20 2008/12	Local	Foreign	Total
A. PHYSICAL INFRASTRUCTURE								
1. Land Acquisition		45.0	75.0			120.0		120.0
2. Detail Engineering and Supervision		13.0	22.2			35.2		35.2
3. Civil Works		216.1	369.8			527.3	58.6	585.9
Subtotal		274.1	466.9			682.4	58.6	741.0
B. FURNITURE, EQUIPMENT AND VEHICLES								
1. Furniture		135.0	310.0		135.0	580.0		580.0
2. Equipments		810.0	2,560.0		810.0	836.0	3,344.0	4,180.0
3. Vehicles		59.9	117.0		50.7	45.5	182.1	227.6
Subtotal		1,004.9	2,987.0		995.7	1,461.5	3,526.1	4,987.6
C. HUMAN RESOURCES DEVELOPMENT								
1. Overseas Training for BFD Staff		135.0	135.0			27.0	243.0	270.0
2. Local Training to BFD Staff		10.0	15.0	15.0	15.0	55.0		55.0
3. Local Training to Beneficiaries		60.0	90.0	120.0	120.0	390.0		390.0
Subtotal		205.0	240.0	135.0	135.0	472.0	243.0	715.0
D. MONITORING AND STUDIES								
1. On-going Monitoring		15.0	15.0	15.0	15.0	60.0		60.0
2. Evaluation Studies		25.0	25.0	25.0	25.0	100.0		100.0
Subtotal		40.0	40.0	40.0	40.0	160.0		160.0
E. CONSULTING SERVICES								
1. International		60.3	60.3	30.1	30.1	18.1	162.8	180.9
2. Local		10.0	10.0	6.3	6.3	32.5		32.5
Subtotal		70.3	70.3	36.4	36.4	50.6	162.8	213.4
F. RECURRENT COSTS								
1. Existing Staff Salaries		77.0	88.6	101.6	117.0	384.2		384.2
2. Incremental Staff Salaries		80.0	160.0	192.0	220.8	652.8		652.8
3. Operation and Maintenance of Facilities		20.0	20.0	20.0	20.0	64.0	16.0	80.0
4. Vehicle/ Equipment Operation/ Maintenance		90.0	90.0	90.0	90.0	180.0	180.0	360.0
5. Office Supplies and Consumables		15.0	15.0	15.0	15.0	18.0	42.0	60.0
Subtotal		282.0	373.6	418.6	462.8	1,299.0	238.0	1,537.0
BASE COSTS		1,876.3	4,177.8	630.0	1,669.9	4,125.6	4,228.5	8,354.0
Physical Contingencies		29.9	36.2	31.5	33.7	97.0	34.3	131.3
TOTAL PROJECT COST		1,906.1	4,214.0	661.5	1,703.6	4,222.5	4,262.8	8,485.3

Table 14 - Cost Estimates - Civil Works, Furniture, Equipments and Vehicles

Items	Unit Cost		Number of Units					Total Costs (Million Taka)								
	Unit	(Taka '000)	Year 1-5	6-10	11-15	16-20	21-25	Total	Year 1-5	6-10	11-15	16-20	21-25	Total	FEC	T and D
A. PHYSICAL FACILITIES																
1. Land Acquisition	Ha	5,000.0	9	15			24		45.0	75.0				120.0		
2. Detail Engineering and Supervision I /	Percent	6.0							58.0	97.2				155.2		
Subtotal																
3. Civil Works																
- Functional Building	m ²	8.5	3,400	7,500			10,900		28.9	63.8				92.7	9.3	9.3
- Residential	m ²	5.4	18,000	40,000			58,000		97.2	216.0				313.2	31.3	31.3
- Nursery	m ²	4.5	20,000	20,000			40,000		90.0	90.0				180.0	18.0	18.0
Subtotal									216.1	369.8				585.9	58.6	58.6
B. FURNITURE																
- Functional Building	Lumpsum	500.0	150	500		150	800		75.0	250.0		75.0		400.0		
- Nursery	Lumpsum	100.0	600	600		600	1,800		60.0	60.0		60.0		180.0		
Subtotal									135.0	310.0		135.0		580.0		
C. EQUIPMENTS																
- Functional Building	Lumpsum	5,000.0	150	500		150	800		750.0	2,500.0		750.0		4,000.0	3,200.0	800.0
- Nursery	Lumpsum	100.0	600	600		600	1,800		60.0	60.0		60.0		180.0	144.0	36.0
Subtotal									810.0	2,560.0		810.0		4,180.0	3,344.0	836.0
D. VEHICLES																
- Station Wagon	No.	1,000.0	10	20		10	40		10.0	20.0		10.0		40.0	32.0	8.0
- 4 WHD Jeep	No.	1,000.0	20	40		20	80		20.0	40.0		20.0		80.0	64.0	16.0
- Staff Bus	No.	1,500.0	5	10		5	20		7.5	15.0		7.5		30.0	24.0	6.0
- Truck	No.	1,200.0	6	10		6	22		7.2	12.0		7.2		26.4	21.1	5.3
- Motor Cycle	No.	60.0	200	400		100	700		12.0	24.0		6.0		42.0	33.6	8.4
- Bi-Cycle	No.	4.0	800	1,500			2,300		3.2	6.0		50.7		9.2	7.4	1.8
Subtotal									59.9	117.0		50.7		227.6	182.1	45.5

Table 15 - Cost Estimates - Human Resource Development, Studies and Operation/Maintenance

Items	Unit Cost		Number of Units					Total Costs (Million Taka)								
	Unit	(Taka '000)	Year 1-5	6-10	11-15	16-20	21-25	Total	Year 1-5	6-10	11-15	16-20	21-25	Total	FEC	T and D
A. TRAINING																
1. Overseas Training for BFD Staff	No	450.0	300	300			600		135.0	135.0				270.0	243.0	
2. Local Training to BFD Staff	No	10.0	1,000	1,500		1,500	5,500		10.0	15.0		15.0		55.0		
3. Local Training to Beneficiaries	No	0.6	100,000	150,000		200,000	650,000		60.0	90.0		120.0		390.0		
Subtotal									205.0	240.0		135.0		715.0	243.0	
B. MONITORING AND EVALUATION																
1. Ongoing monitoring		15,000.0	1	1		1	4		15.0	15.0		15.0		60.0		
1. Evaluation and Studies		10,000.0	1	1		1	4		10.0	10.0		10.0		40.0		
Subtotal									25.0	25.0		25.0		100.0		
C. CONSULTING SERVICES																
1. International		603.0	100	100		50	300		60.3	60.3		30.1		180.9	162.8	
2. Local		50.0	200	200		125	650		10.0	10.0		6.3		32.5		
Subtotal									70.3	70.3		36.4		213.4	162.8	
D. RECURRENT COSTS																
1. Existing Staff Salaries		77,000.0	1	1.2		1.5	5		77.0	88.6		101.6		384.2		
2. Incremental Staff Salaries		80,000.0	1	2		2.8	8.2		80.0	160.0		192.0		652.8		
3. Operation and Maintenance of Facilities		20,000.0	1	1		1	4		20.0	20.0		20.0		80.0	16.0	8.0
4. Vehicle/Equipment Operation/Maintenance		90,000.0	1	1		1	4		90.0	90.0		90.0		360.0	180.0	36.0
5. Office Supplies and Consumables		15,000.0	1	1		1	4		15.0	15.0		15.0		60.0	42.0	6.0
Subtotal									282.0	373.6		418.6		1,537.0	238.0	50.0

5. PARTICIPATORY FORESTRY PLANTATION DEVELOPMENT

Table 16 - Summary of Programme Costs

Programme Components	Million Taka			Million U \$			% of Base Costs	% of FEC
	Foreign	Local	Total	Foreign	Local	Total		
A. AGROFORESTRY								
1. Nursery	28.0	252.4	280.5	0.7	6.5	7.2	3.6	3.4
2. Plantation Establishment	39.2	353.2	392.4	1.0	9.1	10.1	5.1	4.7
3. Plantation Maintenance								
Subtotal	67.3	605.6	672.9	1.7	15.6	17.3	8.7	8.1
B. WOODLOT								
1. Nursery	36.2	326.2	362.4	0.9	8.4	9.3	4.7	4.4
2. Plantation Establishment	50.7	456.3	507.0	1.3	11.7	13.0	6.6	6.1
3. Plantation Maintenance								
Subtotal	86.9	782.5	869.4	2.2	20.1	22.3	11.2	10.5
C. STRIP PLANTATION								
1. Nursery	86.7	780.5	867.2	2.2	20.1	22.3	11.2	10.4
2. Plantation Establishment	121.3	1,091.9	1,213.3	3.1	28.1	31.2	15.7	14.6
3. Plantation Maintenance	34.0	306.3	340.4	0.9	7.9	8.7	4.4	4.1
Subtotal	242.1	2,178.8	2,420.8	6.2	56.0	62.2	31.3	29.1
D. HOMESTEAD PLANTATION								
1. Nursery	145.0	1,304.6	1,449.6	3.7	33.5	37.3	18.7	17.4
2. Plantation Establishment	202.8	1,246.8	1,449.6	5.2	32.1	37.3	18.7	24.4
3. Plantation Maintenance								
Subtotal	347.8	2,551.4	2,899.2	8.9	65.6	74.5	37.5	41.8
E. KHETLAND PLANTATION								
1. Nursery	36.2	326.2	362.4	0.9	8.4	9.3	4.7	4.4
2. Plantation Establishment	50.7	456.3	507.0	1.3	11.7	13.0	6.6	6.1
3. Plantation Maintenance								
Subtotal	86.9	782.5	869.4	2.2	20.1	22.3	11.2	10.5
BASE COSTS	831.0	6,900.7	7,731.8	21.4	177.4	198.8	100.0	100.0
Physical Contingencies	23.7	213.3	237.0	0.6	5.5	6.1		
TOTAL PROJECT COST	854.7	7,114.0	7,968.7	22.0	182.9	204.9		

Table 17 - Proposed Financing Plan, Million U \$

Project Components	Total Programme Cost			GOB Financing			Donors Financing			Beneficiaries Financing		
	Foreign	Local	Total	Foreign	Local	Total	Foreign	Local	Total	Foreign	Local	Total
A. AGROFORESTRY												
1. Nursery	0.7	6.5	7.2				0.7	5.2	5.9	1.3	1.3	2.6
2. Plantation Establishment	1.0	9.1	10.1				1.0	7.3	8.3	1.8	1.8	3.6
3. Plantation Maintenance												
Subtotal	1.7	15.6	17.3				1.7	12.5	14.2	3.1	3.1	6.2
B. WOODLOT												
1. Nursery	0.9	8.4	9.3				0.9	6.7	7.6	1.7	1.7	3.4
2. Plantation Establishment	1.3	11.7	13.0				1.3	9.4	10.7	2.3	2.3	4.6
3. Plantation Maintenance												
Subtotal	2.2	20.1	22.3				2.2	16.1	18.3	4.0	4.0	8.0
C. STRIP PLANTATION												
1. Nursery	2.2	20.1	22.3				2.2	16.1	18.3	4.0	4.0	8.0
2. Plantation Establishment	3.1	28.1	31.2				3.1	22.5	25.6	5.6	5.6	11.2
3. Plantation Maintenance	0.9	7.9	8.7				0.9	6.3	7.2	1.6	1.6	3.2
Subtotal	6.2	56.0	62.2				6.2	44.8	51.0	11.2	11.2	22.4
D. HOMESTEAD PLANTATION												
1. Nursery	3.7	33.5	37.3				3.7	26.8	30.6	6.7	6.7	13.4
2. Plantation Establishment	5.2	32.1	37.3				5.2	25.6	30.9	6.4	6.4	12.8
3. Plantation Maintenance												
Subtotal	8.9	65.6	74.5				8.9	52.5	61.4	13.1	13.1	26.2
E. KHETLAND PLANTATION												
1. Nursery	0.9	8.4	9.3				0.9	6.7	7.6	1.7	1.7	3.4
2. Plantation Establishment	1.3	11.7	13.0				1.3	9.4	10.7	2.3	2.3	4.6
3. Plantation Maintenance												
Subtotal	2.2	20.1	22.3				2.2	16.1	18.3	4.0	4.0	8.0
BASE COSTS	21.4	177.4	198.8				21.4	141.9	163.3	35.5	35.5	71.0
Physical Contingencies	0.6	5.5	6.1				0.6	4.4	5.0	1.1	1.1	2.2
TOTAL PROGRAMME COST	22.0	182.9	204.9				22.0	146.3	168.3	36.6	36.6	73.2
Percentage	10.7	89.3	100.0				100.0	80.0	82.1	20.0	17.9	36.6

Table 18 - Phasing of Programme Costs, Million Taka

Programme Components	PY Year				Total Costs			
	1 - 5 FY	1993/97	6 - 10 1998/02	11 - 15 2003/07	16 - 20 2008/12	Local	Foreign	Total
A. AGROFORESTRY								
1. Nursery		15.6	62.3	77.9	124.7	252.4	28.0	280.5
2. Plantation Establishment		21.8	87.2	109.0	174.4	353.2	39.2	392.4
3. Plantation Maintenance								
Subtotal		37.4	149.5	186.9	299.1	605.6	67.3	672.9
B. WOODLOT								
1. Nursery		36.2	72.5	108.7	145.0	326.2	36.2	362.4
2. Plantation Establishment		50.7	101.4	152.1	202.8	456.3	50.7	507.0
3. Plantation Maintenance								
Subtotal		86.9	173.9	260.8	347.8	782.5	86.9	869.4
C. STRIP PLANTATION								
1. Nursery		59.9	163.2	267.4	376.7	780.5	86.7	867.2
2. Plantation Establishment		83.9	228.4	374.1	527.0	1,091.9	121.3	1,213.3
3. Plantation Maintenance		29.2	79.4	108.1	123.7	306.3	34.0	340.4
Subtotal		173.0	471.0	749.6	1,027.3	2,178.8	242.1	2,420.8
D. HOMESTEAD PLANTATION								
1. Nursery		362.4	362.4	362.4	362.4	1,304.6	145.0	1,449.6
2. Plantation Establishment		507.0	507.0	507.0	507.0	1,246.8	202.8	1,449.6
3. Plantation Maintenance								
Subtotal		869.4	869.4	869.4	869.4	2,551.4	347.8	2,899.2
E. KHETLAND PLANTATION						2,551.4		
1. Nursery		90.6	90.6	90.6	90.6	326.2	36.2	362.4
2. Plantation Establishment		126.8	126.8	126.8	126.8	456.3	50.7	507.0
3. Plantation Maintenance								
Subtotal		217.4	217.4	217.4	217.4	782.5	86.9	869.4
BASE COSTS		1,384.1	1,881.1	2,284.1	2,760.9	6,900.7	831.0	7,731.8
Physical Contingencies		48.9	56.5	62.0	69.6	213.3	23.7	237.0
TOTAL PROJECT COST		1,433.0	1,937.7	2,346.0	2,830.5	7,114.0	854.7	7,968.7

Table 19 - Cost Estimates - Forest Plantation Development

Items	Unit	Unit Cost (Taka '000)	Number of Units					Total	Total Costs (Million Taka)							
			Year 1 - 5	6 - 10	11 - 15	16 - 20	21 - 25		Year 1 - 5	6 - 10	11 - 15	16 - 20	21 - 25	Total	FEC	T and D
A. AGROFORESTRY																
1. Nursery																
- Stump	Ha	7.2														
- Polybags	Ha		2,150	8,600	10,750	17,200	38,700	15.6	62.3	77.9	124.7	280.5	28.0			
Subtotal			2,150	8,600	10,750	17,200	38,700	15.6	62.3	77.9	124.7	280.5	28.0			
2. Plantation Establishment																
- Stump	Ha	10.1														
- Polybags	Ha		2,150	8,600	10,750	17,200	38,700	21.8	87.2	109.0	174.4	392.4	39.2			
Subtotal			2,150	8,600	10,750	17,200	38,700	21.8	87.2	109.0	174.4	392.4	39.2			
3. Plantation Maintenance																
- Stump	Ha															
- Polybags	Ha		2,150	8,600	10,750	17,200	38,700	37.4	149.5	186.9	299.1	672.9	67.3			
Subtotal			2,150	8,600	10,750	17,200	38,700	37.4	149.5	186.9	299.1	672.9	67.3			
Total																
B. WOODLOT PLANTATION																
1. Nursery																
- Stump	Ha	7.2														
- Polybags	Ha		5,000	10,000	15,000	20,000	50,000	36.2	72.5	108.7	145.0	362.4	36.2			
Subtotal			5,000	10,000	15,000	20,000	50,000	36.2	72.5	108.7	145.0	362.4	36.2			
2. Plantation Establishment																
- Stump	Ha	10.1														
- Polybags	Ha		5,000	10,000	15,000	20,000	50,000	50.7	101.4	152.1	202.8	507.0	50.7			
Subtotal			5,000	10,000	15,000	20,000	50,000	50.7	101.4	152.1	202.8	507.0	50.7			
3. Plantation Maintenance																
- Stump	Ha															
- Polybags	Ha		5,000	10,000	15,000	20,000	50,000	86.9	173.9	260.8	347.8	869.4	86.9			
Subtotal			5,000	10,000	15,000	20,000	50,000	86.9	173.9	260.8	347.8	869.4	86.9			
Total																
C. STRIP PLANTATION																
1. Nursery																
- Medium Rotation	Ha	7.2	2,070	5,630	7,670	8,770	24,140	15.0	40.8	55.6	63.6	175.0	17.5			
- Short Rotation	Ha	7.2	6,200	16,890	29,220	43,200	95,510	44.9	122.4	211.8	313.1	692.3	69.2			
Subtotal			8,270	22,520	36,890	51,970	119,650	59.9	163.2	267.4	376.7	867.2	86.7			
2. Plantation Establishment																
- Medium Rotation	Ha	10.1	2,070	5,630	7,670	8,770	24,140	21.0	57.1	77.8	88.9	244.8	24.5			
- Short Rotation	Ha	10.1	6,200	16,890	29,220	43,200	95,510	62.9	171.3	296.3	438.0	968.5	96.8			
Subtotal			8,270	22,520	36,890	51,970	119,650	83.9	228.4	374.1	527.0	1,213.3	121.3			
3. Plantation Maintenance																
- Medium Rotation	Ha	14.1	2,070	5,630	7,670	8,770	24,140	29.2	79.4	108.1	123.7	340.4	34.0			
- Short Rotation	Ha		6,200	16,890	29,220	43,200	95,510	29.2	79.4	108.1	123.7	340.4	34.0			
Subtotal			8,270	22,520	36,890	51,970	119,650	58.4	158.8	216.2	247.4	680.8	68.0			
Total																

Table 19 - Cost Estimates - Forest Plantation Development (Cont'd)

Items	Unit	Unit Cost (Taka '000)	Number of Units					Total	Total Costs (Million Taka)					Total	FEC	T and D	
			Year 1 - 5	6 - 10	11 - 15	16 - 20	21 - 25		Year 1 - 5	6 - 10	11 - 15	16 - 20	21 - 25				
D. HOMESTEAD PLANTATION																	
1. Nursery																	
- Stump	Ha																
- Polybags	Ha	7.2	50,000	50,000	50,000	50,000	50,000	200,000	362.4	362.4	362.4	362.4	362.4	1,449.6	145.0		
Subtotal			50,000	50,000	50,000	50,000	200,000		362.4	362.4	362.4	362.4	362.4	1,449.6	145.0		
2. Plantation Establishment																	
- Stump	Ha																
- Polybags	Ha	10.1	50,000	50,000	50,000	50,000	200,000	507.0	507.0	507.0	507.0	507.0	507.0	2,028.0	202.8		
Subtotal								507.0	507.0	507.0	507.0	507.0	507.0	2,028.0	202.8		
3. Plantation Maintenance																	
- Stump	Ha																
- Polybags	Ha		50,000	50,000	50,000	200,000		869.4	869.4	869.4	869.4	869.4	869.4	3,477.6	347.8		
Subtotal								869.4	869.4	869.4	869.4	869.4	869.4	3,477.6	347.8		
Total																	
E. KHETLAND PLANTATION																	
1. Nursery																	
- Bed	Ha																
- Polybags	Ha	7.2	12,500	12,500	12,500	12,500	50,000	90.6	90.6	90.6	90.6	90.6	90.6	362.4	36.2		
Subtotal			12,500	12,500	12,500	12,500	50,000	90.6	90.6	90.6	90.6	90.6	90.6	362.4	36.2		
2. Plantation Establishment																	
- Stump	Ha																
- Polybags	Ha	10.1	12,500	12,500	12,500	12,500	50,000	126.8	126.8	126.8	126.8	126.8	126.8	507.0	50.7		
Subtotal								126.8	126.8	126.8	126.8	126.8	126.8	507.0	50.7		
3. Plantation Maintenance																	
- Stump	Ha																
- Polybags	Ha		12,500	12,500	12,500	50,000		217.4	217.4	217.4	217.4	217.4	217.4	869.4	86.9		
Subtotal								217.4	217.4	217.4	217.4	217.4	217.4	869.4	86.9		
Total																	

6. WOOD-BASED ENERGY DEVELOPMENT

Table 20 - Summary of Programme Costs

Programme Components	Million Taka			Million U \$			% of Base Costs	% of FEC
	Foreign	Local	Total	Foreign	Local	Total		
A. DEVELOPMENT SUPPORT								
1. Improved Stoves		375.0	375.0		9.6	9.6	30.6	
2. Charcoal Kilns (mud and brick)		1.1	1.1		0.0	0.0	0.1	
3. Charcoal Kilns (Portable Drum)		2.2	2.2		0.1	0.1	0.2	
4. Bio-gas Plants	90.0	210.0	300.0	2.3	5.4	7.7	24.5	69.4
Subtotal	90.0	588.3	678.3	2.3	15.1	17.4	55.3	69.4
B. EQUIPMENT AND VEHICLES								
1. Equipments	2.4	0.6	3.0	0.1	0.0	0.1	0.2	1.9
2. Vehicles	22.7	5.7	28.4	0.6	0.1	0.7	2.3	17.5
Subtotal	25.1	6.3	31.4	0.6	0.2	0.8	2.6	19.3
C. HUMAN RESOURCES DEVELOPMENT								
1. Training of Trainers		7.5	7.5		0.2	0.2	0.6	
2. Training to Users		231.0	231.0		5.9	5.9	18.8	
Subtotal		238.5	238.5		6.1	6.1	19.4	
D. RESEARCH AND DEVELOPMENT		21.0	21.0		0.5	0.5	1.7	
Subtotal		21.0	21.0		0.5	0.5	1.7	
E. PROMOTIONAL ACTIVITIES								
1. Exhibitions and Workshop		36.0	36.0		0.9	0.9	2.9	
2. Extension and Dissemination		24.0	24.0		0.6	0.6	2.0	
Subtotal		60.0	60.0		1.5	1.5	4.9	
F. MONITORING AND EVALUATION								
1. On-going Monitoring		8.0	8.0		0.2	0.2	0.7	
2. Evaluation Studies		14.0	14.0		0.4	0.4	1.1	
Subtotal		22.0	22.0		0.6	0.6	1.8	
G. RECURRENT COSTS								
1. Staff Salaries		149.7	149.7		3.8	3.8	12.2	
2. Vehicle/ Equipment Operation/ Maintenance	9.0	9.0	18.0	0.2	0.2	0.5	1.5	6.9
3. Office Supplies and Consumables	5.6	2.4	8.0	0.1	0.1	0.2	0.7	4.3
Subtotal	14.6	161.1	175.7	0.4	4.1	4.5	14.3	11.3
BASE COSTS	129.7	1,097.2	1,226.8	3.3	28.2	31.5	100.0	100.0
Physical Contingencies	11.4	84.4	95.7	0.3	2.2	2.5		
TOTAL PROGRAMME COST	141.1	1,181.5	1,322.6	3.6	30.4	34.0		

Table 21 - Proposed Financing Plan, Million U \$

Project Components	Total Programme Cost			GOB Financing			Donors Financing			Beneficiaries Financing		
	Foreign	Local	Total	Foreign	Local	Total	Foreign	Local	Total	Foreign	Local	Total
A. DEVELOPMENT SUPPORT												
1. Improved Stoves		9.6	9.6					1.9	1.9		7.7	7.7
2. Charcoal Kilns (mud and brick)		0.0	0.0					0.0	0.0		0.0	0.0
3. Charcoal Kilns (Portable Drum)		0.1	0.1					0.0	0.0		0.0	0.0
4. Bio-gas Plants	2.3	5.4	7.7				2.3	1.1	3.4		4.3	4.3
Subtotal	2.3	15.1	17.4				2.3	3.0	5.3		12.1	12.1
B. EQUIPMENT AND VEHICLES												
1. Equipments	0.1	0.0	0.1		0.0	0.0	0.1		0.1			
2. Vehicles	0.6	0.1	0.7		0.1	0.1	0.6		0.6			
Subtotal	0.6	0.2	0.8		0.2	0.2	0.6		0.6			
C. HUMAN RESOURCES DEVELOPMENT												
1. Training of Trainers		0.2	0.2					0.2	0.2			
2. Training to Users		5.9	5.9					5.9	5.9			
Subtotal		6.1	6.1					6.1	6.1			
D. RESEARCH AND DEVELOPMENT		0.5	0.5					0.5	0.5			
Subtotal		0.5	0.5					0.5	0.5			
E. PROMOTIONAL ACTIVITIES												
1. Exhibitions and Workshop		0.9	0.9					0.9	0.9			
2. Extension and Dissemination		0.6	0.6					0.6	0.6			
Subtotal		1.5	1.5					1.5	1.5			
F. MONITORING AND EVALUATION												
1. On-going Monitoring		0.2	0.2					0.2	0.2			
2. Evaluation Studies		0.4	0.4					0.4	0.4			
Subtotal		0.6	0.6					0.6	0.6			
G. RECURRENT COSTS												
1. Staff Salaries		3.8	3.8		3.8	3.8						
2. Vehicle/ Equipment Operation/ Maintenance	0.2	0.2	0.5		0.2	0.2	0.2		0.2			
3. Office Supplies and Consumables	0.1	0.1	0.2		0.1	0.1	0.1		0.1			
Subtotal	0.4	4.1	4.5		4.1	4.1	0.4		0.4			
BASE COSTS	3.3	28.2	31.5		4.3	4.3	3.3	11.8	15.1		12.1	12.1
Physical Contingencies	0.3	2.2	2.5		0.3	0.3	0.3	0.9	1.2		0.9	0.9
TOTAL PROGRAMME COST	3.6	30.4	34.0		4.6	4.6	3.6	12.7	16.3		13.0	13.0
Percentage	0.1	0.9	1.0		0.2	0.1	1.0	0.4	0.5		0.4	0.4

Table 22 - Phasing of Programme Costs, Million Taka

Programme Components	PY Year 1 - 5				Total Costs			
	FY	1993/97	1998/02	2003/07	2008/12	Local	Foreign	Total
A. DEVELOPMENT SUPPORT								
1. Improved Stoves		125.0	125.0	62.5	62.5	375.0		375.0
2. Charcoal Kilns (mud and brick)		0.6	0.2	0.2	0.2	1.1		1.1
3. Charcoal Kilns (Portable Drum)		2.0	0.1	0.1	0.1	2.2		2.2
4. Bio-gas Plants		75.0	75.0	75.0	75.0	210.0	90.0	300.0
Subtotal		202.6	200.2	137.7	137.8	588.3	90.0	678.3
B. EQUIPMENT AND VEHICLES								
1. Equipments		1.5		1.5		0.6	2.4	3.0
2. Vehicles		14.1	0.2	13.9	0.2	5.7	22.7	28.4
Subtotal		15.6	0.2	15.4	0.2	6.3	25.1	31.4
C. HUMAN RESOURCES DEVELOPMENT								
1. Training of Trainers		3.8	3.8			7.5		7.5
2. Training to Users		33.0	66.0	66.0	66.0	231.0		231.0
Subtotal		36.8	69.8	66.0	66.0	238.5		238.5
D. RESEARCH AND DEVELOPMENT		13.0	7.0	1.0		21.0		21.0
Subtotal		13.0	7.0	1.0		21.0		21.0
E. PROMOTIONAL ACTIVITIES								
1. Exhibitions and Workshop		9.0	9.0	9.0	9.0	36.0		36.0
2. Extension and Dissemination		6.0	6.0	6.0	6.0	24.0		24.0
Subtotal		15.0	15.0	15.0	15.0	60.0		60.0
F. MONITORING AND EVALUATION								
1. On-going Monitoring		2.0	2.0	2.0	2.0	8.0		8.0
2. Evaluation Studies		3.5	3.5	3.5	3.5	14.0		14.0
Subtotal		5.5	5.5	5.5	5.5	22.0		22.0
G. RECURRENT COSTS								
1. Staff Salaries		30.0	34.5	39.6	45.6	149.7		149.7
2. Vehicle/ Equipment Operation/ Maintenance		4.5	4.5	4.5	4.5	9.0	9.0	18.0
3. Office Supplies and Consumables		2.0	2.0	2.0	2.0	2.4	5.6	8.0
Subtotal		36.5	41.0	46.1	52.1	161.1	14.6	175.7
BASE COSTS		324.9	338.7	286.7	276.6	1,097.2	129.7	1,226.8
Physical Contingencies		26.6	27.1	21.2	20.7	84.4	11.4	95.7
TOTAL PROGRAMME COST		351.6	365.8	307.9	297.3	1,181.5	141.1	1,322.6

Table 23 - Cost Estimates - Civil Works, Furniture, Equipments and Vehicles

Items	Unit Cost		Number of Units					Total Costs (Million Taka)								
	Unit	(Taka '000)	Year 1-5	6-10	11-15	16-20	21-25	Total	Year 1-5	6-10	11-15	16-20	21-25	Total	FEC	T and D
A. PRODUCTION SUPPORT																
- Improved Stoves	No	0.1	1,000,000	1,000,000	500,000	500,000	3,000,000	3,000,000	125.0	125.0	62.5	62.5	62.5	375.0		
- Charcoal Kilns (mud and brick)	No	40.0	15	4	4	4	27	27	0.6	0.2	0.2	0.2	1.1			
- Charcoal Kilns (Portable Drum)	No	2.0	1,000	25	25	50	1,100	1,100	2.0	0.1	0.1	0.1	2.2			
- Bio-gas Plants	No	7.5	10,000	10,000	10,000	10,000	40,000	40,000	75.0	75.0	75.0	75.0	300.0	90.0	30.0	
Subtotal									202.6	200.2	137.7	137.8	678.3	90.0	30.0	
B. EQUIPMENTS																
- Mobile Audio-visual Unit	No	1,500.0	1		1		2	2	1.5		1.5		3.0	2.4	0.6	
- Briquetting equipment	No	150.0	2	2	2	2	8	8	0.3	0.3	0.3	0.3	1.2	1.0	0.2	
- Weighing Balance	No	50.0	5		5		10	10	0.3		0.3		0.5	0.4	0.1	
- Crosscut Saw	No	100.0	2				2	2	0.2				0.2	0.2	0.0	
- Laboratory Equipment	No	1,500.0	3	2			5	5	6.8	3.3	2.1	0.3	12.4	9.9	2.5	
Subtotal									4.5	9.0	4.5	0.3	18.0	14.4	3.6	
C. VEHICLES																
- 4 WHD Jeep	No.	1,500.0	3		3		6	6	4.5		4.5		9.0	7.2	1.8	
- Truck	No.	1,500.0	6		6		12	12	9.0		9.0		18.0	14.4	3.6	
- Motor Cycle	No.	60.0	6		6		12	12	0.4		0.4		0.7	0.6	0.1	
- Bi-Cycle	No.	4.0	54	54			162	162	0.2	0.2	0.2	0.2	0.6	0.5	0.1	
Subtotal									14.1	0.2	13.9	0.2	28.4	22.7	5.7	
D. TRAINING																
1. Training of Trainers	No	15.0	250	250			500	500	3.8	3.8			7.5			
2. Local Training to Users	No	0.6	55,000	110,000	110,000	110,000	385,000	385,000	33.0	66.0	66.0	66.0	231.0			
2. Overseas Training	No	1,244.8	3	2	1		6	6	3.7	2.5	1.2		7.5	6.7		
Subtotal									36.8	69.8	66.0	66.0	238.5			
E. RESEARCH AND DEVELOPMENT																
	No	1,000.0	13	7	1		21	21	13.0	7.0	1.0		21.0			

Table 24 - Cost Estimates - Human Resource Development, Studies and Operation/Maintenance

Items	Unit Cost		Number of Units					Total Costs (Million Taka)								
	Unit	(Taka '000)	Year 1-5	6-10	11-15	16-20	21-25	Total	Year 1-5	6-10	11-15	16-20	21-25	Total	FEC	T and D
F. PROMOTIONAL ACTIVITIES																
1. Exhibitions and Workshop	No	100.0	90	90	90	90	360	360	9.0	9.0	9.0	9.0	36.0			
2. Extension and Dissemination	No	50.0	120	120	120	120	480	480	6.0	6.0	6.0	6.0	24.0			
Subtotal									15.0	15.0	15.0	15.0	60.0			
G. MONITORING AND EVALUATION																
1. Ongoing monitoring		1,000.0	2	2	2	2	8	8	2.0	2.0	2.0	2.0	8.0			
1. Evaluation and Studies		500.0	7	7	7	7	28	28	3.5	3.5	3.5	3.5	14.0			
Subtotal									5.5	5.5	5.5	5.5	22.0			
H. RECURRENT COSTS																
1. Staff Salaries and Allowances		30,000.0	1	1.2	1.3	1.5	5	5	30.0	34.5	39.6	45.6	149.7		1.8	
2. Vehicle/Equipment Operation/Maintenance		4,500.0	1	1	1	1	4	4	4.5	4.5	4.5	4.5	18.0	9.0	1.8	
3. Office Supplies and Consumables		2,000.0	1	1	1	1	4	4	2.0	2.0	2.0	2.0	8.0	5.6	0.8	
Subtotal									36.5	41.0	46.1	52.1	175.7	14.6	2.6	

7. NON WOOD-BASED FOREST PRODUCTS DEVELOPMENT

Table 25 - Summary of Programme Costs

Programme Components	Million Taka			Million U \$			% of Base Costs	% of FEC
	Foreign	Local	Total	Foreign	Local	Total		
A. PHYSICAL INFRASTRUCTURE								
1. Land Acquisition		50.0	50.0		1.3	1.3	5.0	
2. Detail Engineering and Supervision		1.2	1.2		0.0	0.0	0.1	
3. Civil Works	2.0	18.0	20.0	0.1	0.5	0.5	2.0	1.2
Subtotal	2.0	69.2	71.1	0.1	1.8	1.8	7.1	1.2
B. FURNITURE, EQUIPMENT AND VEHICLES								
1. Furniture		3.0	3.0		0.1	0.1	0.3	
2. Equipments	2.4	0.6	3.0	0.1	0.0	0.1	0.3	1.5
3. Vehicles	33.3	8.3	41.7	0.9	0.2	1.1	4.1	20.4
Subtotal	35.7	11.9	47.7	0.9	0.3	1.2	4.7	21.8
C. HUMAN RESOURCES DEVELOPMENT								
1. Overseas Training	43.0	4.8	47.7	1.1	0.1	1.2	4.7	26.2
2. Short Foreign Training	24.3	2.7	27.0	0.6	0.1	0.7	2.7	14.8
3. Local Training		3.9	3.9		0.1	0.1	0.4	
4. Local Training to Beneficiaries		108.0	108.0					
Subtotal	67.3	11.4	78.6	1.7	0.3	2.0	7.8	41.1
D. PLANTATION DEVELOPMENT								
1. Medicinal Plants		45.0	45.0		1.2	1.2	4.5	
2. Rattan Plantation		266.0	266.0		6.8	6.8	26.5	
3. Murta Plantation		6.0	6.0		0.2	0.2	0.6	
4. Lali/ Catechu Plantation		36.5	36.5		0.9	0.9	3.6	
Subtotal		353.5	353.5		9.1	9.1	35.2	
E. MONITORING AND STUDIES								
1. Research and Development		353.5	353.5		9.1	9.1	35.2	
2. Surveys and Evaluation	5.0	15.5	20.5	0.1	0.4	0.5	2.0	3.1
Subtotal	5.0	369.0	374.0	0.1	9.5	9.6	37.2	3.1
F. CONSULTING SERVICES								
1. International	43.4	4.8	48.2	1.1	0.1	1.2	4.8	26.5
2. Local		4.7	4.7		0.1	0.1	0.5	
Subtotal	43.4	9.5	52.9	1.1	0.2	1.4	5.3	26.5
G. RECURRENT COSTS								
1. Staff Salaries		6.2	6.2		0.2	0.2	0.6	
2. Operation and Maintenance of Facilities	0.8	3.2	4.0	0.0	0.1	0.1	0.4	0.5
3. Vehicle/ Equipment Operation/ Maintenance	6.0	6.0	12.0	0.2	0.2	0.3	1.2	3.7
4. Office Supplies and Consumables	3.5	1.5	5.0	0.1	0.0	0.1	0.5	2.1
Subtotal	10.3	16.9	27.2	0.3	0.4	0.7	2.7	6.3
BASE COSTS	163.7	841.4	1,005.0	4.2	21.6	25.8	100.0	100.0
Physical Contingencies	2.0	6.4	8.4	0.1	0.2	0.2		
TOTAL PROJECT COST	165.7	847.8	1,013.5	4.3	21.8	26.1		

Table 26 - Proposed Financing Plan, Million U \$

Project Components	Total Programme Cost			GOB Financing			Donors Financing			Beneficiaries Financing		
	Foreign	Local	Total	Foreign	Local	Total	Foreign	Local	Total	Foreign	Local	Total
A. PHYSICAL INFRASTRUCTURE												
1. Land Acquisition		1.3	1.3		1.3	1.3						
2. Detail Engineering and Supervision		0.0	0.0					0.0	0.0			
3. Civil Works	0.1	0.5	0.5		0.0	0.0	0.1	0.5	0.5			
Subtotal	0.1	1.8	1.8		1.3	1.3	0.1	0.5	0.5			
B. FURNITURE, EQUIPMENT AND VEHICLES												
1. Furniture		0.1	0.1					0.1	0.1			
2. Equipments	0.1	0.0	0.1		0.0	0.0	0.1		0.1			
3. Vehicles	0.9	0.2	1.1		0.2	0.2	0.9		0.9			
Subtotal	0.9	0.3	1.2		0.2	0.2	0.9	0.1	1.0			
C. HUMAN RESOURCES DEVELOPMENT												
1. Overseas Training	1.1	0.1	1.2				1.1	0.1	1.2			
2. Short Foreign Training	0.6	0.1	0.7				0.6	0.1	0.7			
3. Local Training		0.1	0.1					0.1	0.1			
4. Local Training to Beneficiaries												
Subtotal	1.7	0.3	2.0				1.7	0.3	2.0			
D. PLANTATION DEVELOPMENT												
1. Medicinal Plants		1.2	1.2					0.9	0.9		0.2	0.2
2. Rattan Plantation		6.8	6.8					5.5	5.5		1.4	1.4
3. Murta Plantation		0.2	0.2					0.1	0.1		0.0	0.0
4. Lali/ Catechu Plantation		0.9	0.9					0.7	0.7		0.2	0.2
Subtotal		9.1	9.1					7.3	7.3		1.8	1.8
E. MONITORING AND STUDIES												
1. Research and Development		9.1	9.1					9.1	9.1			
2. Surveys and Evaluation	0.1	0.4	0.5				0.1	0.4	0.5			
Subtotal	0.1	9.5	9.6				0.1	9.5	9.6			
F. CONSULTING SERVICES												
1. International	1.1	0.1	1.2				1.1	0.1	1.2			
2. Local		0.1	0.1					0.1	0.1			
Subtotal	1.1	0.2	1.4				1.1	0.2	1.4			
G. RECURRENT COSTS												
1. Staff Salaries		0.2	0.2					0.2	0.2			
2. Operation and Maintenance of Facilities	0.0	0.1	0.1				0.0	0.0	0.0		0.1	0.1
3. Vehicle/ Equipment Operation/ Maintenance	0.2	0.2	0.3				0.2	0.0	0.2		0.1	0.1
4. Office Supplies and Consumables	0.1	0.0	0.1				0.1	0.0	0.1		0.0	0.0
Subtotal	0.3	0.4	0.7				0.3	0.2	0.5		0.2	0.2
BASE COSTS	4.2	21.6	25.8		1.5	1.5	4.2	18.1	22.3		2.0	2.0
Physical Contingencies	0.1	0.2	0.2		0.0	0.0	0.1	0.1	0.2		0.0	0.0
TOTAL PROGRAMME COST	4.3	21.8	26.1		1.5	1.5	4.3	18.2	22.5		2.1	2.1
PERCENTAGE	16.3	83.7	100.0		7.0	5.9	100.0	83.5	86.2		9.4	7.9

Table 27 - Phasing of Programme Costs, Million Taka

Programme Components	PY Year				Total Costs			
	1 - 5 FY	1993/97	6 - 10 1998/02	11 - 15 2003/07	16 - 20 2008/12	Local	Foreign	Total
A. PHYSICAL INFRASTRUCTURE								
1. Land Acquisition		50.0				50.0		50.0
2. Detail Engineering and Supervision		1.2				1.2		1.2
3. Civil Works		20.0				18.0	2.0	20.0
Subtotal		71.1				69.2	2.0	71.1
B. FURNITURE, EQUIPMENT AND VEHICLES								
1. Furniture		1.0	1.0		1.0	3.0		3.0
2. Equipments		1.0	1.0		1.0	0.6	2.4	3.0
3. Vehicles		18.6	7.5		15.6	8.3	33.3	41.7
Subtotal		20.6	9.5		17.6	11.9	35.7	47.7
C. HUMAN RESOURCES DEVELOPMENT								
1. Overseas Training		28.1	19.7			4.8	43.0	47.7
2. Short Foreign Training		22.5	4.5			2.7	24.3	27.0
3. Local Training		2.4	1.5			3.9		3.9
4. Local Training to Beneficiaries		40.0	40.0	28.0		108.0		108.0
Subtotal		53.0	25.7			11.4	67.3	78.6
D. PLANTATION DEVELOPMENT								
1. Medicinal Plants		11.3	11.3	11.3	11.3	45.0		45.0
2. Rattan Plantation		66.5	66.5	66.5	66.5	266.0		266.0
3. Murta Plantation		1.5	1.5	1.5	1.5	6.0		6.0
4. Lali/Catechu Plantation		9.1	9.1	9.1	9.1	36.5		36.5
Subtotal		88.4	88.4	88.4	88.4	353.5		353.5
E. MONITORING AND STUDIES								
1. Research and Development		88.4	88.4	88.4	88.4	353.5		353.5
2. Monitoring and Evaluation		5.5	5.5	5.5	4.0	15.5	5.0	20.5
Subtotal		93.9	93.9	93.9	92.4	369.0	5.0	374.0
F. CONSULTING SERVICES								
1. International		36.2	12.1			4.8	43.4	48.2
2. Local		3.0	1.7			4.7		4.7
Subtotal		39.2	13.8			9.5	43.4	52.9
G. RECURRENT COSTS								
1. Staff Salaries		1.3	1.4	1.7	1.9	6.2		6.2
2. Operation and Maintenance of Facilities		1.0	1.0	1.0	1.0	3.2	0.8	4.0
3. Vehicle/ Equipment Operation/ Maintenance		3.0	3.0	3.0	3.0	6.0	6.0	12.0
4. Office Supplies and Consumables		1.3	1.3	1.3	1.3	1.5	3.5	5.0
Subtotal		6.5	6.7	6.9	7.2	16.9	10.3	27.2
BASE COSTS		372.6	237.8	189.1	205.5	841.4	163.7	1,005.0
Physical Contingencies		15.8	0.7	0.2	1.1	6.4	2.0	8.4
TOTAL PROJECT COST		388.5	238.6	189.3	206.5	847.8	165.7	1,013.5

Table 28 - Cost Estimates - Civil Works, Furniture, Equipments and Vehicles

Items	Unit	Unit Cost (Taka '000)	Number of Units					Total	Total Costs (Million Taka)					FEC	T and D	
			Year 1 - 5	6 - 10	11 - 15	16 - 20	21 - 25		Year 1 - 5	6 - 10	11 - 15	16 - 20	21 - 25			Total
A. PHYSICAL FACILITIES																
1. Land Acquisition	Ha	5,000.0	10					10							50.0	
2. Detail Engineering and Supervision 1/	Percent	6.0													1.2	
Subtotal															51.2	
3. Civil Works																
- Medicinal Plants Development	m ²	8.6	350					350							3.0	0.3
- Murta Plantation Development	m ²	8.6	370					370							3.2	0.3
- Sylhet Forest School	m ²	8.6	1,600					1,600							13.8	1.4
Subtotal															20.0	2.0
B. FURNITURE																
- Medicinal Plants Development	Lumpsum	200.0	1	1				1							0.2	0.2
- Murta Plantation Development	Lumpsum	300.0	1	1				1							0.3	0.3
- Sylhet Forest School	Lumpsum	500.0	1	1				1							0.5	0.5
Subtotal															1.0	1.0
C. EQUIPMENTS																
- Medicinal Plants Development	Lumpsum	200.0	1	1				1							0.2	0.2
- Murta Plantation Development	Lumpsum	300.0	1	1				1							0.3	0.3
- Sylhet Forest School	Lumpsum	500.0	1	1				1							0.5	0.5
Subtotal															1.0	1.0
D. VEHICLES																
- 4 WHD Jeep	No.	1,500.0	10	5				10							15.0	7.5
- Motor Cycle	No.	60.0	9					9							0.5	0.5
- Motorized Boat	No.	1,500.0	2					2							3.0	3.0
- Bi-Cycle	No.	4.0	10					10							0.0	0.0
Subtotal															18.6	7.5
															37.5	30.0
															1.1	0.9
															3.0	2.4
															0.1	0.1
															41.7	33.3
															2.0	8.3

Table 29 - Cost Estimates - Human Resource Development, Research, Studies and Operation/Maintenance

Items	Unit	Unit Cost (Taka '000)	Number of Units					Total	Total Costs (Million Taka)					
			Year 1-5	6-10	11-15	16-20	21-25		Year 1-5	6-10	11-15	16-20	21-25	Total
A. TRAINING														
1. Overseas Training	No	1,404.0	20	14			34	28.1	19.7				47.7	43.0
2. Short Foreign Training	No	450.0	50	10			60	22.5	4.5				27.0	24.3
3. Local Training	No	15.0	160	100		260		2.4	1.5				3.9	
4. Local Training to Beneficiaries	No	2.0	20,000	20,000	14,000	54,000		40.0	40.0	28.0			108.0	
Subtotal								53.0	25.7				78.6	67.3
B. PLANTATION DEVELOPMENT														
1. Medicinal Plants	Ha	12.5	900	900	900	3,600		11.3	11.3	11.3	11.3		45.0	
2. Rattan Plantation	Ha	13.3	5,000	5,000	5,000	20,000		66.5	66.5	66.5	66.5		266.0	
3. Murta Plantation	Ha	7.5	200	200	200	800		1.5	1.5	1.5	1.5		6.0	
4. Lal/Catechu Plantation	Ha	12.8	715	715	715	2,860		9.1	9.1	9.1	9.1		36.5	
Subtotal								88.4	88.4	88.4	88.4		353.5	
C. MONITORING AND STUDIES														
1. Ongoing monitoring		2,500.0	1	1	1	4		2.5	2.5	2.5	2.5		10.0	5.0
1. Survey and Studies		150.0	20	20	20	70		3.0	3.0	3.0	3.0		10.5	5.0
Subtotal								5.5	5.5	5.5	4.0		20.5	5.0
D. CONSULTING SERVICES														
1. International		603.0	60	20		80		36.2	12.1				48.2	43.4
2. Local		50.0	60	34		94		3.0	1.7				4.7	
Subtotal								39.2	13.8				52.9	43.4
E. RECURRENT COSTS														
1. Staff Salaries		1,250.0	1	1.2	1.3	1.5		1.3	1.4	1.7	1.9		6.2	
3. Operation and Maintenance of Facilities		1,000.0	1	1	1	4		1.0	1.0	1.0	1.0		4.0	0.8
4. Vehicle/Equipment Operation/Maintenance		3,000.0	1	1	1	4		3.0	3.0	3.0	3.0		12.0	6.0
5. Office Supplies and Consumables		1,250.0	1	1	1	4		1.3	1.3	1.3	1.3		5.0	3.5
Subtotal								6.5	6.7	6.9	7.2		27.2	10.3

8. FOREST-BASED INDUSTRIES DEVELOPMENT

Table 30 - Summary of Programme Costs

Programme Components	Million Taka			Million U \$			% of Base Costs	% of FEC
	Foreign	Local	Total	Foreign	Local	Total		
A. PHYSICAL INFRASTRUCTURE								
1. Roads								
- Access Road	14.8	38.1	52.9	0.4	1.0	1.4	0.1	0.1
- Main Road	325.2	836.3	1,161.5	8.4	21.5	29.9	2.6	1.2
- Secondary Road	278.6	716.3	994.9	7.2	18.4	25.6	2.2	1.0
Subtotal	618.6	1,590.6	2,209.2	15.9	40.9	56.8	4.9	2.2
B. EXTRACTION EQUIPMENTS								
1. Equipment Procurement	509.5	451.9	961.4	13.1	11.6	24.7	2.1	1.8
2. Replacement of existing Equipments	970.8	860.9	1,831.7	25.0	22.1	47.1	4.0	3.4
Subtotal	1,480.3	1,312.8	2,793.1	38.1	33.7	71.8	6.2	5.2
C. FOREST-BASED INDUSTRIES								
1. Sawmilling	5,954.9	2,202.5	8,157.3	153.1	56.6	209.7	18.0	21.1
2. Newsprint	4,378.6	2,626.5	7,005.1	112.6	67.5	180.1	15.4	15.5
3. Printing and Writing Paper	4,538.2	2,721.7	7,259.9	116.7	70.0	186.6	16.0	16.1
4. Wrapping/Packaging Papers	3,618.9	2,169.8	5,788.7	93.0	55.8	148.8	12.8	12.8
5. Speciality Papers	7,617.2	4,566.6	12,183.9	195.8	117.4	313.2	26.8	27.0
Subtotal	26,107.9	14,287.1	40,394.9	671.2	367.3	1,038.4	89.0	92.6
BASE COSTS	28,206.8	17,190.5	45,397.3	725.1	441.9	1,167.0	100.0	100.0
Physical Contingencies	1,269.1	835.8	2,104.9	32.6	21.5	54.1		
TOTAL PROGRAMME COST	29,475.9	18,026.3	47,502.2	757.7	463.4	1,221.1		

Table 31 - Proposed Financing Plan, Million U \$

Project Components	Total Programme Cost			GOB Financing			Donors Financing			Beneficiaries Financing		
	Foreign	Local	Total	Foreign	Local	Total	Foreign	Local	Total	Foreign	Local	Total
A. PHYSICAL INFRASTRUCTURE												
1. Roads												
- Access Road	0.4	1.0	1.4				0.4	0.8	1.2		0.2	0.2
- Main Road	8.4	21.5	29.9				8.4	17.2	25.6		4.3	4.3
- Secondary Road	7.2	18.4	25.6				7.2	14.7	21.9		3.7	3.7
Subtotal	15.9	40.9	56.8				15.9	32.7	48.6		8.2	8.2
B. EXTRACTION EQUIPMENTS												
1. Equipment Procurement	13.1	11.6	24.7				13.1	9.3	22.4		2.3	2.3
2. Replacement of existing Equipments	25.0	22.1	47.1				25.0	17.7	42.7		4.4	4.4
Subtotal	38.1	33.7	71.8				38.1	27.0	65.1		6.7	6.7
C. FOREST-BASED INDUSTRIES												
1. Sawmilling	153.1	56.6	209.7				153.1	45.3	198.4		11.3	11.3
2. Newsprint	112.6	67.5	180.1				112.6	54.0	166.6		13.5	13.5
3. Printing and Writing Paper	116.7	70.0	186.6				116.7	56.0	172.6		14.0	14.0
4. Wrapping/Packaging Papers	93.0	55.8	148.8				93.0	44.6	137.7		11.2	11.2
5. Speciality Papers	195.8	117.4	313.2				195.8	93.9	289.7		23.5	23.5
Subtotal	671.2	367.3	1,038.4				671.2	293.8	965.0		73.5	73.5
BASE COSTS	725.1	441.9	1,167.0				725.1	353.5	1,078.6		88.4	88.4
Physical Contingencies	32.6	21.5	54.1				32.6	17.2	49.8		4.3	4.3
TOTAL PROGRAMME COST	757.7	463.4	1,221.1				757.7	370.7	1,128.5		92.7	92.7
Percentage	0.6	0.4	1.0				100.0	80.0	92.4		20.0	8.0

Table 32 - Phasing of Programme Costs, Million Taka

Programme Components	PY FY	Year				Total Costs		
		1 - 5 1993/97	6 - 10 1998/02	11 - 15 2003/07	16 - 20 2008/12	Local	Foreign	Total
A. PHYSICAL INFRASTRUCTURE								
1. Roads								
- Access Road		9.5	14.0	14.5	14.8	38.1	14.8	52.9
- Main Road		210.5	310.3	317.1	323.6	836.3	325.2	1,161.5
- Secondary Road		180.3	265.8	271.6	277.2	716.3	278.6	994.9
Subtotal		400.3	590.1	603.2	615.6	1,590.6	618.6	2,209.2
B. EXTRACTION EQUIPMENTS								
1. Equipment Procurement		313.2	6.6	10.2	56.8	451.9	509.5	961.4
2. Replacement of existing Equipments			521.6	412.8	394.6	860.9	970.8	1,831.7
Subtotal		313.2	528.2	423.0	451.4	1,312.8	1,480.3	2,793.1
C. FOREST-BASED INDUSTRIES								
1. Sawmilling		2,127.8	2,571.3	2,349.6	1,108.7	2,202.5	5,954.9	8,157.3
2. Newsprint			4,475.1	1,265.0	1,265.0	2,626.5	4,378.6	7,005.1
3. Printing and Writing Paper			3,641.0	1,867.2	1,751.7	2,721.7	4,538.2	7,259.9
4. Wrapping/Packaging Papers			840.2	2,147.7	2,800.8	2,169.8	3,618.9	5,788.7
5. Speciality Papers			4,726.7	3,151.3	4,305.8	4,566.6	7,617.2	12,183.9
Subtotal		2,127.8	16,254.4	10,780.7	11,232.0	14,287.1	26,107.9	40,394.9
BASE COSTS		2,841.3	17,372.7	11,806.9	12,299.0	17,190.5	28,206.8	45,397.3
Physical Contingencies		162.1	716.1	527.1	645.7	835.8	1,269.1	2,104.9
TOTAL PROJECT COST		3,003.4	18,088.7	12,334.1	12,944.8	18,026.3	29,475.9	47,502.2

Table 33 - Cost Estimates - Roads and Logging Equipments

Items	Unit	Unit Cost (Taka '000)	Number of Units					Total	Total Costs (Million Taka)					Total	FEC	T and D
			Year 1 - 5	6 - 10	11 - 15	16 - 20	21 - 25		Year 1 - 5	6 - 10	11 - 15	16 - 20	21 - 25			
A. PHYSICAL FACILITIES																
1. Roads																
- Access Road	Km	460.0	21	31	31	32	115	9.5	14.0	14.5	14.8	52.9	14.8	10.6		
- Main Road	Km	333.5	631	930	951	970	3,482	210.5	310.3	317.1	323.6	1,161.5	325.2	232.3		
- Secondary Road	Km	124.2	1,452	2,140	2,187	2,232	8,011	180.3	265.8	271.6	277.2	994.9	278.6	199.0		
Subtotal			2,104	3,101	3,169	3,234	11,608	400.3	590.1	603.2	615.6	2,209.2	618.6	441.8		
B. EXTRACTION EQUIPMENTS																
1. Equipment Procurement																
- High Forest Logging	m ³	3.2	50,000				50,000	160.0				160.0	84.8	40.0		
- Plantation Forest Logging	m ³	0.8	191,500	8,250	12,750	71,000	718,250	1,001,750	153.2	6.6	10.2	56.8	574.6	801.4	424.7	200.4
Subtotal									313.2	6.6	10.2	56.8	574.6	961.4	509.5	240.4
2. Replacement																
- High Forest Logging	m ³	3.2		124,688	89,063	71,250	71,250	356,251	399.0	285.0	228.0	228.0	1,140.0	604.2	285.0	
- Plantation Forest Logging	m ³	0.8		153,250	159,750	208,250	343,375	864,625	122.6	127.8	166.6	274.7	691.7	366.6	172.9	
Subtotal									521.6	412.8	394.6	502.7	1,831.7	970.8	457.9	
C. FABRICATION OF SAWMILLS																
- Large Scale																
- Medium Scale	No	385,110.0	1	3	2	5	11	221.7	665.2	443.5	1,108.7	2,439.0	1,780.5	243.9		
- Teak	No	221,730.0	10	10	10	30	30	1,906.1	1,906.1	1,906.1	5,718.3	4,174.4	571.8			
- Small Scale	No	30,808.8	3	2	98	200	303	92.4	61.6	3,019.3	6,161.8	9,335.1	6,814.6	933.5		
- Push Bench	No	6,224.0	31	62	186	290	569	192.9	385.9	1,157.7	1,805.0	3,541.5	2,585.3	354.1		
Subtotal									2,127.8	2,571.3	2,349.6	1,108.7	8,157.3	5,954.9	815.7	

Table 33 - Cost Estimates - Forest-Based Industries Development (Cont'd.)

Items	Unit	Unit Cost (Taka '000)					Number of Units					Total Costs (Million Taka)				
		Sum	1-5	6-10	11-15	16-20	21-25	Total	Year 1-5	6-10	11-15	16-20	21-25	Total	FEC	T and D
D. NEWSPRINT																
1. Machinery/Equipments	Sum	2,053,920.0					1		2,053.9					2,053.9	1,643.1	410.8
2. Structures	Sum	635,626.0					1		635.6					635.6	127.1	127.1
3. Operating Supplies	Sum	64,574.0					1		64.6					64.6		
4. Equipment Rent	Sum	38,900.0					1		38.9					38.9	31.1	11.2
5. Startup Cost	Sum	112,032.0					1		112.0					112.0	22.4	
6. Studies/Design	Sum	304,976.0					1		305.0					305.0	183.0	
Subtotal							1		3,210.0					3,210.0	2,006.8	549.1
1. Machinery/Equipments	Sum	809,120.0					1		809.1					809.1	809.1	
2. Structures	Sum	250,516.0					1		250.5					250.5	250.5	
3. Operating Supplies	Sum	25,674.0					1		25.7					25.7	25.7	
4. Equipment Rent	Sum	15,560.0					1		15.6					15.6	15.6	
5. Startup Cost	Sum	44,346.0					1		44.3					44.3	44.3	
6. Studies/Design	Sum	119,812.0					1		119.8					119.8	119.8	
Subtotal							1		1,265.0					1,265.0	1,265.0	432.7
1. Machinery/Equipments	Sum	809,120.0					1		809.1					809.1	809.1	
2. Structures	Sum	250,516.0					1		250.5					250.5	250.5	
3. Operating Supplies	Sum	25,674.0					1		25.7					25.7	25.7	
4. Equipment Rent	Sum	15,560.0					1		15.6					15.6	15.6	
5. Startup Cost	Sum	44,346.0					1		44.3					44.3	44.3	
6. Studies/Design	Sum	119,812.0					1		119.8					119.8	119.8	
Subtotal							1		1,265.0					1,265.0	1,265.0	432.7
Total							1		4,475.1					4,475.1	1,265.0	1,265.0
E. PRINTING AND WRITING PAPER																
1. Machinery/Equipments	Sum	2,330,110.0					1		2,330.1					2,330.1	1,864.1	466.0
2. Structures	Sum	720,817.0					1		720.8					720.8	144.2	144.2
3. Operating Supplies	Sum	73,132.0					1		73.1					73.1		
4. Equipment Rent	Sum	43,568.0					1		43.6					43.6	34.9	12.8
5. Startup Cost	Sum	127,592.0					1		127.6					127.6	25.5	
6. Studies/Design	Sum	345,821.0					1		345.8					345.8	207.5	
Subtotal							1		3,641.0					3,641.0	790.6	216.4
1. Machinery/Equipments	Sum	1,195,008.0					1		1,195.0					1,195.0	956.0	239.0
2. Structures	Sum	369,550.0					1		369.6					369.6	73.9	73.9
3. Operating Supplies	Sum	31,111.0					1		31.3					31.3		
4. Equipment Rent	Sum	22,562.0					1		22.6					22.6	18.0	
5. Startup Cost	Sum	65,352.0					1		65.4					65.4	13.1	6.5
6. Studies/Design	Sum	177,384.0					1		177.4					177.4	106.4	
Subtotal							1		1,867.2					1,867.2	1,167.5	319.4
1. Machinery/Equipments	Sum	1,120,320.0					1		1,120.3					1,120.3	896.3	224.1
2. Structures	Sum	346,988.0					1		347.0					347.0	69.4	69.4
3. Operating Supplies	Sum	35,399.0					1		35.4					35.4		
4. Equipment Rent	Sum	21,006.0					1		21.0					21.0	16.8	
5. Startup Cost	Sum	61,462.0					1		61.5					61.5	12.3	6.1
6. Studies/Design	Sum	166,492.0					1		166.5					166.5	99.9	
Subtotal							1		1,751.7					1,751.7	1,094.6	299.6
Total							1		3,641.0					3,641.0	4,538.2	1,242.0

Table 34 - Cost Estimates, Forest-Based Industries Development

Items	Unit Cost (Taka '000)	Number of Units						Total Costs (Million Taka)							
		Year 1-5	6-10	11-15	16-20	21-25	Total	Year 1-5	6-10	11-15	16-20	21-25	Total	FEC	T and D
F. WRAPPING AND PACKAGING															
1. Machinery/Equipments	Sum	537,598.0	1					537.6					537.6	430.1	107.5
2. Structures	Sum	166,492.0	1					166.5					166.5	33.3	33.3
3. Operating Supplies	Sum	16,727.0	1					16.7					16.7		
4. Equipment Rent	Sum	10,114.0	1					10.1					10.1	8.1	2.9
5. Startup Cost	Sum	29,175.0	1					29.2					29.2	5.8	
6. Studies/Design	Sum	80,134.0	1					80.1					80.1	48.1	
Subtotal								840.2					840.2	525.4	143.7
1. Machinery/Equipments	Sum	1,374,337.0		1						1,374.3			1,374.3	1,099.5	274.9
2. Structures	Sum	424,788.0		1						424.8			424.8	85.0	85.0
3. Operating Supplies	Sum	43,179.0		1						43.2			43.2	20.5	
4. Equipment Rent	Sum	25,674.0		1						25.7			25.7	15.1	7.5
5. Startup Cost	Sum	75,466.0		1						75.5			75.5	15.1	
6. Studies/Design	Sum	204,225.0		1						204.2			204.2	122.5	
Subtotal								2,147.7					2,147.7	1,342.6	367.4
1. Machinery/Equipments	Sum	1,792,512.0		1						1,792.5			1,792.5	1,434.0	358.5
2. Structures	Sum	554,714.0		1						554.7			554.7	110.9	110.9
3. Operating Supplies	Sum	56,016.0		1						56.0			56.0	26.8	
4. Equipment Rent	Sum	33,454.0		1						33.5			33.5	19.6	9.8
5. Startup Cost	Sum	98,028.0		1						98.0			98.0	159.6	
6. Studies/Design	Sum	266,076.0		1						266.1			266.1	175.0	91.1
Subtotal								2,800.8					2,800.8	1,751.0	479.2
Total								840.2					840.2	3,618.9	990.4
G. SPECIALITY PAPERS															
1. Machinery/Equipments	Sum	3,024,864.0	1					3,024.9					3,024.9	2,419.9	605.0
2. Structures	Sum	935,934.0	1					935.9					935.9	187.2	187.2
3. Operating Supplies	Sum	94,527.0	1					94.5					94.5		
4. Equipment Rent	Sum	56,794.0	1					56.8					56.8	45.4	16.6
5. Startup Cost	Sum	165,714.0	1					165.7					165.7	33.1	
6. Studies/Design	Sum	448,906.0	1					448.9					448.9	269.3	
Subtotal								4,726.7					4,726.7	2,955.0	808.7
1. Machinery/Equipments	Sum	2,016,576.0		1						2,016.6			2,016.6	1,613.3	403.3
2. Structures	Sum	623,956.0		1						624.0			624.0	124.8	124.8
3. Operating Supplies	Sum	63,018.0		1						63.0			63.0		
4. Equipment Rent	Sum	38,122.0		1						38.1			38.1	30.5	
5. Startup Cost	Sum	110,476.0		1						110.5			110.5	22.1	11.0
6. Studies/Design	Sum	299,141.0		1						299.1			299.1	179.5	
Subtotal								3,151.3					3,151.3	1,970.1	539.2
1. Machinery/Equipments	Sum	2,756,065.0		1						2,756.1			2,756.1	2,204.9	551.2
2. Structures	Sum	852,299.0		1						852.3			852.3	170.5	170.5
3. Operating Supplies	Sum	85,969.0		1						86.0			86.0		
4. Equipment Rent	Sum	51,348.0		1						51.3			51.3	41.1	15.1
5. Startup Cost	Sum	150,932.0		1						150.9			150.9	30.2	
6. Studies/Design	Sum	409,228.0		1						409.2			409.2	245.5	
Subtotal								4,726.7					4,726.7	2,692.1	736.8
Total								840.2					840.2	3,618.9	2,084.7

9. INSTITUTIONAL DEVELOPMENT

Table 35 - Summary of Programme Costs

Programme Components	Million Taka			Million U S			% of Base Costs	% of FEC
	Foreign	Local	Total	Foreign	Local	Total		
A. PHYSICAL INFRASTRUCTURE								
1. Land Acquisition		400.0	400.0		10.3	10.3	1.0	
2. Detail Engineering and Supervision		74.3	74.3		1.9	1.9	0.2	
3. Civil Works	247.8	991.2	1,239.0	6.4	25.5	31.9	3.1	5.2
Subtotal	247.8	1,465.6	1,713.4	6.4	37.7	44.0	4.3	5.2
B. FURNITURE, EQUIPMENT AND VEHICLES								
1. Furniture		260.0	260.0		6.7	6.7	0.7	
2. Equipments	448.0	112.0	560.0	11.5	2.9	14.4	1.4	9.4
3. Vehicles	1,008.0	252.0	1,260.0	25.9	6.5	32.4	3.2	21.2
Subtotal	1,456.0	624.0	2,080.0	37.4	16.0	53.5	5.3	30.6
C. NEW LEGISLATION		337.3	337.3		8.7	8.7	0.9	
Subtotal		337.3	337.3		8.7	8.7	0.9	
D. HUMAN RESOURCES DEVELOPMENT								
1. Overseas Training for BFD Staff	364.5	40.5	405.0	9.4	1.0	10.4	1.0	7.7
2. Local Training to BFD Staff		100.0	100.0		2.6	2.6	0.3	
3. Local Training to Beneficiaries		600.0	600.0		15.4	15.4	1.5	
Subtotal	364.5	740.5	1,105.0	9.4	19.0	28.4	2.8	7.7
E. RESEARCH, DEVELOPMENT AND STUDIES								
1. Research and Development	1,318.4	847.7	2,166.1	33.9	21.8	55.7	5.5	27.7
2. Monitoring and Evaluation	120.0	120.0	240.0	3.1	3.1	6.2	0.6	2.5
Subtotal	1,438.4	967.7	2,406.1	37.0	24.9	61.9	6.1	30.2
F. CONSULTING SERVICES								
1. International	488.4	54.3	542.7	12.6	1.4	14.0	1.4	10.3
2. Local		85.0	85.0		2.2	2.2	0.2	
Subtotal	488.4	139.3	627.7	12.6	3.6	16.1	1.6	10.3
G. RECURRENT COSTS								
1. Existing Staff Salaries		499.0	499.0		12.8	12.8	1.3	
2. Incremental Staff Salaries		29,484.0	29,484.0		757.9	757.9	74.6	
3. Operation and Maintenance of Facilities	40.0	40.0	80.0	1.0	1.0	2.1	0.2	0.8
4. Vehicle/Equipment Operation/Maintenance	300.0	300.0	600.0	7.7	7.7	15.4	1.5	6.3
5. Office Supplies and Consumables	420.0	180.0	600.0	10.8	4.6	15.4	1.5	8.8
Subtotal	760.0	30,503.0	31,263.0	19.5	784.1	803.7	79.1	16.0
BASE COSTS	4,755.1	34,777.4	39,532.4	122.2	894.0	1,016.3	100.0	100.0
Physical Contingencies	152.6	1,617.5	1,770.1	3.9	41.6	45.5		
TOTAL PROJECT COST	4,907.6	36,394.9	41,302.5	126.2	935.6	1,061.8		

Table 36 - Proposed Financing Plan, Million U S

Project Components	Total Programme Cost			GOB Financing			Donors Financing			Beneficiaries Financing		
	Foreign	Local	Total	Foreign	Local	Total	Foreign	Local	Total	Foreign	Local	Total
A. PHYSICAL INFRASTRUCTURE												
1. Land Acquisition		10.3	10.3							10.3		10.3
2. Detail Engineering and Supervision		1.9	1.9					1.9	1.9			
3. Civil Works	6.4	25.5	31.9		3.2	3.2	6.4	22.3	28.7			
Subtotal	6.4	37.7	44.0		3.2	3.2	6.4	24.2	30.6	10.3		10.3
B. FURNITURE, EQUIPMENT AND VEHICLES												
1. Furniture		6.7	6.7					6.7	6.7			
2. Equipments	11.5	2.9	14.4		2.9	2.9	11.5		11.5			
3. Vehicles	25.9	6.5	32.4		6.5	6.5	25.9		25.9			
Subtotal	37.4	16.0	53.5		9.4	9.4	37.4	6.7	44.1			
C. NEW LEGISLATION		8.7	8.7					8.7	8.7			
Subtotal		8.7	8.7					8.7	8.7			
D. HUMAN RESOURCES DEVELOPMENT												
1. Overseas Training for BFD Staff	9.4	1.0	10.4				9.4	1.0	10.4			
2. Local Training to BFD Staff		2.6	2.6					2.6	2.6			
3. Local Training to Beneficiaries		15.4	15.4					15.4	15.4			
Subtotal	9.4	19.0	28.4				9.4	19.0	28.4			
E. RESEARCH, DEVELOPMENT AND STUDIES												
1. Research and Development	33.9	21.8	55.7		5.1	5.1	33.9	16.7	50.6			
2. Monitoring and Evaluation	3.1	3.1	6.2				3.1	3.1	6.2			
Subtotal	37.0	24.9	61.9		5.1	5.1	37.0	19.8	56.8			
F. CONSULTING SERVICES												
1. International	12.6	1.4	14.0				12.6	1.4	14.0			
2. Local		2.2	2.2					2.2	2.2			
Subtotal	12.6	3.6	16.1				12.6	3.6	16.1			
G. RECURRENT COSTS												
1. Existing Staff Salaries		12.8	12.8		12.8	12.8						
2. Incremental Staff Salaries		757.9	757.9							757.9	757.9	
3. Operation and Maintenance of Facilities	1.0	1.0	2.1		0.1	0.1	1.0		1.0		0.9	0.9
4. Vehicle/Equipment Operation/Maintenance	7.7	7.7	15.4		0.8	0.8	7.7		7.7		6.9	6.9
5. Office Supplies and Consumables	10.8	4.6	15.4		0.5	0.5	10.8		10.8		4.2	4.2
Subtotal	19.5	784.1	803.7		14.2	14.2	19.5		19.5		770.0	770.0
BASE COSTS	122.2	894.0	1,016.3		31.8	31.8	122.2	82.0	204.2		780.3	780.3
Physical Contingencies	3.9	41.6	45.5		1.7	1.7	3.9	3.7	7.7		36.2	36.2
TOTAL PROGRAMME COST	126.2	935.6	1,061.8		33.5	33.5	126.2	85.7	211.9		816.4	816.4
Percentage	11.9	88.1	100.0		3.6	3.2	100.0	9.2	20.0		87.3	76.9

Table 37 - Phasing of Programme Costs, Million Taka

Programme Components	PY Year				Total Costs			
	1 - 5 FY	6 - 10 1993/97	11 - 15 1998/02	16 - 20 2003/07	2008/12	Local	Foreign	Total
A. PHYSICAL INFRASTRUCTURE								
1. Land Acquisition		150.0	150.0	100.0		400.0		400.0
2. Detail Engineering and Supervision		18.8	22.7	13.4	19.4	74.3		74.3
3. Civil Works		313.8	378.4	222.9	323.9	991.2	247.8	1,239.0
Subtotal		482.6	551.1	336.3	343.4	1,465.6	247.8	1,713.4
B. FURNITURE, EQUIPMENT AND VEHICLES								
1. Furniture		80.0	130.0	30.0	20.0	260.0		260.0
2. Equipments		145.0	145.0	125.0	145.0	112.0	448.0	560.0
3. Vehicles		430.0	430.0	185.0	215.0	252.0	1,008.0	1,260.0
Subtotal		655.0	705.0	340.0	380.0	624.0	1,456.0	2,080.0
C. NEW LEGISLATION		272.0	21.8	21.8	21.8	337.3		337.3
Subtotal		272.0	21.8	21.8	21.8	337.3		337.3
D. HUMAN RESOURCES DEVELOPMENT								
1. Overseas Training for BFD Staff		202.5	202.5			40.5	364.5	405.0
2. Local Training to BFD Staff		25.0	25.0	25.0	25.0	100.0		100.0
3. Local Training to Beneficiaries		150.0	150.0	150.0	150.0	600.0		600.0
Subtotal		377.5	377.5	175.0	175.0	740.5	364.5	1,105.0
E. RESEARCH, DEVELOPMENT AND STUDIES								
1. Research and Development		543.4	539.3	522.8	560.7	847.7	1,318.4	2,166.1
2. Monitoring and Evaluation		60.0	60.0	60.0	60.0	120.0	120.0	240.0
Subtotal		603.4	599.3	582.8	620.7	967.7	1,438.4	2,406.1
F. CONSULTING SERVICES						24.9	37.0	61.9
1. International		180.9	180.9	120.6	60.3	54.3	488.4	542.7
2. Local		30.0	30.0	20.0	5.0	85.0		85.0
Subtotal		210.9	210.9	140.6	65.3	139.3	488.4	627.7
G. RECURRENT COSTS								
1. Existing Staff Salaries		100.0	115.0	132.0	152.0	499.0		499.0
2. Incremental Staff Salaries		5,670.0	6,804.0	7,938.0	9,072.0	29,484.0		29,484.0
3. Operation and Maintenance of Facilities		20.0	20.0	20.0	20.0	40.0	40.0	80.0
4. Vehicle/ Equipment Operation/ Maintenance		150.0	150.0	150.0	150.0	300.0	300.0	600.0
5. Office Supplies and Consumables		150.0	150.0	150.0	150.0	180.0	420.0	600.0
Subtotal		6,090.0	7,239.0	8,390.0	9,544.0	30,503.0	760.0	31,263.0
BASE COSTS		8,691.4	9,704.5	9,986.5	11,150.1	34,777.4	4,755.1	39,532.4
Physical Contingencies		364.1	421.3	464.4	520.2	1,617.5	152.6	1,770.1
TOTAL PROJECT COST		9,055.4	10,125.8	10,450.9	11,670.3	36,394.9	4,907.6	41,302.5

Table 38 - Cost Estimates - Civil Works, Furniture, Equipments and Vehicles

Items	Unit	Unit Cost (Taka '000)	Number of Units					Total	Total Costs (Million Taka)					FEC	T and D
			Year 1 - 5	6 - 10	11 - 15	16 - 20	21 - 25		Year 1 - 5	6 - 10	11 - 15	16 - 20	21 - 25		
A. PHYSICAL FACILITIES															
1. Land Acquisition	Ha	5,000.0	30	30	20		80	150.0	150.0	100.0					400.0
2. Detail Engineering and Supervision 1/	Percent	6.0						18.8	22.7	13.4		19.4			74.3
Subtotal								168.8	172.7	113.4		19.4			474.3
3. Civil Works															
- Enterprise Building	m ²	10.1	13,950	13,950	9,300	9,300	46,500	140.9	140.9	93.9	93.9				469.7
- Production Unit	m ²	8.6	8,360	10,000	15,000	15,000	48,360	71.9	86.0	129.0	129.0				415.9
- Forestry Board	m ²	10.1	10,000	15,000	10,000	10,000	35,000	101.0	151.5		101.0				353.5
Subtotal								313.8	378.4	222.9	323.9				1,239.0
B. FURNITURE															
- Enterprise Building	Lumpsum	10,000.0	2	2	1		5	20.0	20.0	10.0					50.0
- Production Unit	Lumpsum	10,000.0	5	10	2	2	19	50.0	100.0	20.0	20.0				190.0
- Forestry Board	Lumpsum	10,000.0	1	1			2	10.0	10.0						20.0
Subtotal								80.0	130.0	30.0	20.0				260.0
C. EQUIPMENTS															
- Enterprise Office	Lumpsum	50,000.0	1	1	1	1	4	50.0	50.0	50.0	50.0				200.0
- Production Unit	Lumpsum	75,000.0	1	1	1	1	4	75.0	75.0	75.0	75.0				300.0
- Forestry Board	Lumpsum	20,000.0	1	1	1	1	3	20.0	20.0	20.0	20.0				60.0
Subtotal								145.0	145.0	125.0	145.0				560.0
D. VEHICLES															
- Motor Launch	No.	20,000.0	10	10	5	5	30	200.0	200.0	100.0	100.0				600.0
- Cabin Trawler	No.	1,000.0	50	50	10	10	120	50.0	50.0	10.0	10.0				120.0
- 4 WHD Jeep	No.	1,500.0	100	100	50	50	300	150.0	150.0	75.0	75.0				450.0
- Motor Cycle	No.	60.0	500	500	500	500	1,500	30.0	30.0	30.0	30.0				90.0
Subtotal								430.0	430.0	185.0	215.0				1,260.0
E. NEW LEGISLATION/IMPLEMENTATION															
		272,000.0	1	0.1	0.1	0.1	1.2	272.0	21.8	21.8	21.8				337.3

Table 29 - Cost Estimates - Research Studies and Operation/Maintenance

Items	Unit Cost		Number of Units					Total Costs (Million Taka)								
	Unit	(Taka '000)	Year 1 - 5	6 - 10	11 - 15	16 - 20	21 - 25	Total	Year 1 - 5	6 - 10	11 - 15	16 - 20	21 - 25	Total	FEC	T and D
A. TRAINING																
1. Overseas Training	No	450.0	450	450				900	202.5	202.5				405.0	364.5	
2. Local Training	No	10.0	2,500	2,500	2,500	2,500	10,000	10,000	25.0	25.0	25.0	25.0	25.0	100.0		
3. Local Training to Beneficiaries	No	0.6	250,000	250,000	250,000	250,000	1,000,000	1,000,000	150.0	150.0	150.0	150.0	150.0	600.0		
Subtotal									377.5	377.5	175.0	175.0	175.0	1,105.0	364.5	
B. RESEARCH AND DEVELOPMENT																
1. Overseas Training		1,167.0	50	30	20	22	122	122	58.4	35.0	23.3	25.7		142.4	128.1	
2. Local Training		50.0	200	200	200	200	800	800	10.0	10.0	10.0	10.0		40.0		
3. Improvement of Field Research Station		75,000.0	1	1	0.8	0.8	3.5	3.5	75.0	75.0	56.3	56.3		262.5	157.5	26.3
4. Improvement of Laboratory Facilities		75,000.0	1	1	0.8	0.8	3.5	3.5	75.0	75.0	56.3	56.3		262.5	157.5	26.3
5. Improvement of Library Facilities		25,000.0	1	0.5	0.3	0.3	2	2	25.0	12.5	6.3	6.3		50.0	30.0	5.0
6. Improvement of Seed Production Area		50,000.0	1	1.5	1.8	2	6.3	6.3	50.0	75.0	90.0	100.0		315.0	189.0	31.5
7. Improvement of Seed Storage Facilities		75,000.0	1	0.8	0.8	0.8	3.3	3.3	75.0	56.3	56.3	56.3		243.8	146.3	24.4
8. Technology Transfer		25,000.0	1	1	1	1	4	4	25.0	25.0	25.0	25.0		100.0	60.0	10.0
9. Operation of Research Programmes		150,000.0	1	1.2	1.3	1.5	5	5	150.0	175.5	199.5	225.0		750.0	450.0	75.0
Subtotal									543.4	539.3	522.8	560.7		2,166.1	1,318.4	198.4
C. MONITORING AND EVALUATION																
1. Ongoing monitoring		40,000.0	1	1	1	1	4	4	40.0	40.0	40.0	40.0		160.0	80.0	16.0
1. Evaluation and Studies		20,000.0	1	1	1	1	4	4	20.0	20.0	20.0	20.0		80.0	40.0	
Subtotal									60.0	60.0	60.0	60.0		240.0	120.0	16.0
D. CONSULTING SERVICES																
1. International		603.0	300	300	200	100	900	900	180.9	180.9	120.6	60.3		542.7	488.4	
2. Local		50.0	600	600	400	100	1,700	1,700	30.0	30.0	20.0	5.0		85.0		
Subtotal									210.9	210.9	140.6	65.3		627.7	488.4	
D. RECURRENT COSTS																
1. Existing Staff Salaries		100,000.0	1	1.2	1.3	1.5	5	5	100.0	115.0	132.0	152.0		499.0		
2. Incremental Staff Salaries for Enterprises		5,520,000.0	1	1.2	1.4	1.6	5.2	5.2	5,520.0	6,624.0	7,728.0	8,832.0		28,704.0		
3. Incremental Staff Salaries Research/Development		150,000.0	1	1.2	1.4	1.6	5.2	5.2	150.0	180.0	210.0	240.0		780.0		
4. Operation and Maintenance of Facilities		20,000.0	1	1	1	1	4	4	20.0	20.0	20.0	20.0		80.0	40.0	8.0
5. Vehicle/Equipment Operation/Maintenance		150,000.0	1	1	1	1	4	4	150.0	150.0	150.0	150.0		600.0	300.0	60.0
6. Office Supplies and Consumables		150,000.0	1	1	1	1	4	4	150.0	150.0	150.0	150.0		600.0	420.0	60.0
Subtotal									6,090.0	7,239.0	8,390.0	9,544.0		31,263.0	760.0	128.0

Date	Description	1900												1901																
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec					
Jan 1	Balance	100											100																	
Jan 15	...		50											50																
Jan 31	...			100											100															
Feb 1	...				150											150														
Feb 15	...					200											200													
Feb 28	...						250											250												
Mar 1	...							300											300											
Mar 15	...								350											350										
Mar 31	...									400											400									
Apr 1	...										450											450								
Apr 15	...											500											500							
Apr 30	...												550											550						
May 1	...													600										600						
May 15	...														650									650						
May 31	...															700								700						
Jun 1	...																750								750					
Jun 15	...																	800								800				
Jun 30	...																		850								850			
Jul 1	...																			900								900		
Jul 15	...																				950								950	
Jul 31	...																					1000								1000
Aug 1	...																											1050		
Aug 15	...																												1100	
Aug 31	...																												1150	
Sep 1	...																												1200	
Sep 15	...																												1250	
Sep 30	...																												1300	
Oct 1	...																												1350	
Oct 15	...																												1400	
Oct 31	...																												1450	
Nov 1	...																												1500	
Nov 15	...																												1550	
Nov 30	...																												1600	
Dec 1	...																												1650	
Dec 15	...																												1700	
Dec 31	...																												1750	

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APPENDIX 5
FINANCIAL AND ECONOMIC ANALYSIS

APPENDIX 2
FINANCIAL AND ECONOMIC ANALYSIS

FINANCIAL ANALYSIS

APPENDIX 5
FINANCIAL AND ECONOMIC ANALYSIS

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1c. Forest Management and Production Economic Analysis (Tk Million)

	Year 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25-60		
A. Inflow																											
Incremental Benefit																											
- from Fuelwood	1.3	1.3	1.3	1.3	1.3	24.5	24.5	24.5	24.5	24.5	41.0	41.0	41.0	41.0	41.0	108.5	108.5	108.5	108.5	237.6	237.6	237.6	237.6	237.6	237.6	238.9	
- from Poles	57.8	57.8	57.8	57.8	57.8	115.2	108.5	108.5	108.5	120.3	295.5	295.5	295.5	295.5	290.6	430.1	430.1	430.1	430.1	535.6	705.4	705.4	705.4	705.4	705.4	739.4	
- from Sawlogs	131.6	131.6	131.6	131.6	131.6	415.1	415.1	415.1	415.1	2102.6	1934.0	1890.0	1890.0	1890.0	1890.0	4174.8	4174.8	4174.8	4174.8	4174.8	4549.5	4549.5	4549.5	4549.5	4549.5	9949.5	
Total	189.4	189.4	189.4	189.4	189.4	530.3	523.6	523.6	523.6	2223.0	2229.5	2185.5	2185.5	2185.5	2180.6	4604.9	4604.9	4604.9	4604.9	4710.4	5254.9	5254.9	5254.9	5254.9	5254.9	10654.9	
B. Outflow																											
Project Investment Costs	284.2	284.2	284.2	284.2	284.2	198.0	198.0	198.0	198.0	198.0	198.0	10.0	10.0	10.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
Incremental Operating Cost	454.8	454.8	454.8	454.8	454.8	577.4	577.4	577.4	577.4	577.4	826.8	826.8	826.8	826.8	826.8	965.8	965.8	965.8	965.8	965.8	965.8	965.8	965.8	965.8	965.8	965.8	965.8
Incremental Production Costs	198.5	243.2	287.8	348.4	379.7	380.9	381.5	380.1	380.5	411.1	433.8	438.6	443.4	451.0	465.8	489.2	494.0	498.8	505.2	515.1	270.3	215.9	215.9	148.5	86.6	54.6	
Total	937.5	982.1	1026.8	1087.4	1118.7	1156.3	1157.0	1155.6	1156.0	1458.7	1275.5	1280.3	1287.8	1307.6	1470.0	1474.8	1479.6	1486.0	1495.9	1251.1	1196.8	1129.3	1067.4	1035.4			
Incremental Net Benefit	-748.1	-792.7	-837.4	-898.0	-929.3	-626.0	-633.4	-631.9	-632.3	1,036.4	770.8	910.0	905.2	897.7	873.0	3,135.0	3,130.2	3,125.4	3,118.9	3,214.5	4,003.8	4,058.1	4,125.6	9,587.5	9,653.5		
Base Case EIRR	16%																										

NPV @ 12% 1,537.6 Million

SENSITIVITY ANALYSIS

	EIRR	SENSITIVITY INDICATOR
(i) Decrease in Benefits	20%	14%
(ii) Increase in Costs	20%	15%
(iii) Combination of (i) & (ii)	14%	14%

Switching Values (at 12 % Change)

Incremental Production Benefit-25.2	
Incremental Production Costs	131.8
Investment Costs	2.4
Project Recurrent Costs	68.5

Benefits Lag

Lagged 1 year	16.1
2 years	13.7
3 years	11.8

Id. Participatory Forestry Economic Analysis (Tk Million)

	Year 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25-40	
A. Inflow																										
Incremental Benefit																										
- from Fuelwood	0.0	0.0	0.0	0.0	149.2	23.0	23.0	23.0	23.0	23.0	220.7	220.7	220.7	220.7	220.7	386.4	386.4	386.4	386.4	386.4	689.2	689.2	689.2	689.2	689.2	689.2
- from Poles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	65.5	65.5	65.5	65.5	65.5	114.9	114.9	114.9	114.9	114.9	514.6	514.6	514.6	514.6	514.6	514.6
- from Sawlogs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	277.2	277.2	277.2	277.2	277.2	501.0	501.0	501.0	501.0	501.0	864.1	864.1	864.1	864.1	864.1	864.1
Total	0.0	0.0	0.0	0.0	149.2	23.0	23.0	23.0	23.0	23.0	563.4	563.4	563.4	563.4	563.4	1002.2	1002.2	1002.2	1002.2	1002.2	2068.0	2068.0	2068.0	2068.0	2068.0	2068.0
B. Outflow																										
Project Investment Costs	122.9	122.9	122.9	122.9	122.9	354.1	354.1	354.1	354.1	354.1	25.3	25.3	25.3	25.3	25.3	85.8	85.8	85.8	85.8	85.8	85.8	0.0	0.0	0.0	0.0	0.0
Incremental Operating Cost	28.4	28.4	28.4	28.4	28.4	36.6	36.6	36.6	36.6	36.6	40.9	40.9	40.9	40.9	40.9	45.7	45.7	45.7	45.7	45.7	45.7	45.7	45.7	45.7	45.7	45.7
Incremental Production Costs	22.2	22.2	22.2	22.2	22.2	23.5	23.5	23.5	23.5	23.5	47.9	47.9	47.9	47.9	47.9	30.9	30.9	30.9	30.9	30.9	30.9	0.0	0.0	0.0	0.0	0.0
Total	173.6	173.6	173.6	173.6	173.6	414.3	414.3	414.3	414.3	414.3	114.2	114.2	114.2	114.2	114.2	162.5	162.5	162.5	162.5	162.5	162.5	45.7	45.7	45.7	45.7	45.7
Incremental Net Benefit	-173.6	-173.6	-173.6	-173.6	-24.4	-391.3	-391.3	-391.3	-391.3	-391.3	449.2	449.2	449.2	449.2	449.2	839.7	839.7	839.7	839.7	839.7	2,022.2	2,022.2	2,022.2	2,022.2	2,022.2	2,022.2
Base Case EIRR	17%										NPV @ 12%	488.8	Million													

SENSITIVITY ANALYSIS

	EIRR	SENSITIVITY INDICATOR
(i) Decrease in Benefits	10%	1.17
(ii) Increase in Capital Cost	10%	1.17
(iii) Combination of (i) & (ii)	14%	

Switching Values (at 12 % Change)

	EIRR
Incremental Benefit	-34.5
Incremental Plantation Costs	73.2
Project Investments	19.1
Project Recurrent Costs	449.5

Benefits Lag

	EIRR
Lagged 1 year	6.7
2 years	6.0
3 years	4.4

2c. Forest Management and Production Economic Analysis (Tk Million)

	Year 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24-50	
A. Inflow																									
Incremental Benefit																									
- from Fuelwood	54.7	54.7	54.7	54.7	54.7	144.9	144.9	144.9	144.9	144.9	205.1	205.1	205.1	205.1	205.1	391.7	391.7	391.7	391.7	391.7	386.4	386.4	386.4	386.4	386.4
- from Poles and Pulp	57.3	57.3	57.3	57.3	311.9	311.9	311.9	311.9	311.9	328.5	562.0	562.0	562.0	562.0	572.2	836.5	836.5	836.5	836.5	836.5	914.8	763.6	867.8	867.8	867.8
- from Sawlogs	615.5	615.5	615.5	615.5	870.8	870.8	870.8	870.8	870.8	4110.8	4281.4	4228.5	4228.5	4228.5	4228.5	7127.1	7127.1	7127.1	7127.1	7127.1	7127.1	6377.8	6377.8	6377.8	6377.8
Total	727.5	727.5	727.5	727.5	1327.6	1327.6	1327.6	1327.6	1327.6	4584.2	5048.5	4995.6	4995.6	4995.6	5005.9	8355.3	8355.3	8355.3	8355.3	8355.3	8428.2	7527.8	7632.0	7632.0	7632.0
B. Outflow																									
Project Investment Costs	438.9	438.9	438.9	438.9	419.1	419.1	419.1	419.1	419.1	419.1	268.2	268.2	268.2	268.2	268.2	266.1	266.1	266.1	266.1	266.1	266.1	0.0	0.0	0.0	0.0
Incremental Operating Cost	774.4	774.4	774.4	774.4	774.4	774.4	774.4	774.4	774.4	774.4	774.4	774.4	774.4	774.4	774.4	774.4	774.4	774.4	774.4	774.4	774.4	774.4	774.4	774.4	774.4
Incremental Production Costs	278.3	352.5	406.2	493.8	534.2	536.6	539.7	537.8	540.0	583.8	583.6	583.6	584.0	585.2	613.6	600.4	598.1	595.3	595.4	595.7	595.7	327.5	255.0	191.2	113.0
Total	1491.5	1565.8	1619.5	1707.0	1747.5	1730.1	1733.2	1731.2	1733.5	1777.2	1626.1	1626.2	1626.5	1627.7	1656.2	1640.9	1638.6	1635.8	1635.8	1636.2	1101.9	1029.4	965.6	887.4	887.4
Incremental Net Benefit	-764.0	-838.3	-891.9	-979.5	-1020.0	-402.4	-405.6	-403.6	-405.9	2806.9	3422.3	3369.5	3369.1	3367.9	3349.7	6714.4	6716.7	6719.5	6719.4	6792.0	6425.9	6602.6	6666.4	6666.4	13224.5
Base Case EIRR	24%	NPV @ 12%		13,296.8	Million																				

SENSITIVITY ANALYSIS

	EIRR	SENSITIVITY INDICATOR
(i) Decrease in Benefits	20%	1.0
(ii) Increase in Costs	20%	0.8
(iii) Combination of (i) & (ii)	18%	

Switching Values (at 12 %)

	% Change
Incremental Production Benefit	-50.4
Incremental Production Costs	454.5
Investments Costs	10.0
Project Recurrent Costs	357.6

Benefits Lag

Lagged 1 year	23.1
2 years	20.0
3 years	17.8

2d. Participatory Forestry Economic Analysis (Tk Million)

Year 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25-40	
A. Inflow																									
Incremental Benefit																									
- from Fuelwood	0.0	0.0	0.0	0.0	149.2	9.9	9.9	9.9	9.9	9.9	569.5	569.5	569.5	569.5	569.5	1539.5	1539.5	1539.5	1539.5	1539.5	1539.5	3134.2	3134.2	3134.2	
- from Poles	0.0	0.0	0.0	0.0	0.0	923.3	923.3	923.3	923.3	923.3	923.3	923.3	923.3	923.3	923.3	2051.6	2051.6	2051.6	2051.6	2051.6	2051.6	3106.9	3106.9	3106.9	
- from Sawlogs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	484.6	484.6	484.6	484.6	484.6	3203.8	3203.8	3203.8	3203.8	3203.8	3203.8	58357.1	58357.1	58357.1	
Total	0.0	0.0	0.0	0.0	149.2	933.2	933.2	933.2	933.2	933.2	1977.4	1977.4	1977.4	1977.4	1977.4	6794.8	6794.8	6794.8	6794.8	6794.8	6794.8	64598.2	64598.2	64598.2	
B. Outflow																									
Project Investment Costs	260.2	260.2	260.2	260.2	260.2	606.9	606.9	606.9	606.9	606.9	42.0	42.0	42.0	42.0	42.0	42.3	42.3	42.3	42.3	42.3	42.3	0.0	0.0	0.0	
Incremental Operating Cost	45.5	45.5	45.5	45.5	45.5	60.5	60.5	60.5	60.5	60.5	68.2	68.2	68.2	68.2	68.2	75.7	75.7	75.7	75.7	75.7	75.7	75.7	75.7	75.7	
Incremental Production Costs	220.6	220.6	220.6	220.6	220.6	309.1	309.1	309.1	309.1	309.1	375.3	375.3	375.3	375.3	375.3	450.8	450.8	450.8	450.8	450.8	450.8	0.0	0.0	0.0	
Total	526.4	526.4	526.4	526.4	526.4	976.5	976.5	976.5	976.5	976.5	485.5	485.5	485.5	485.5	485.5	568.8	568.8	568.8	568.8	568.8	568.8	75.7	75.7	75.7	
Incremental Net Benefit	-526.4	-526.4	-526.4	-526.4	-377.2	-43.3	-43.3	-43.3	-43.3	-43.3	1491.9	1491.9	1491.9	1491.9	1491.9	6226.0	6226.0	6226.0	6226.0	6226.0	6226.0	64522.5	64522.5	64522.5	
Base Case EIRR	32%	NPV@ 12%		28,042.3 Million																					

SENSITIVITY ANALYSIS

(i) Decrease in Benefits	10%	30%	EIRR	SENSITIVITY INDICATOR
(ii) Increase in Capital Cost	10%	31%		2.35
(iii) Combination of (i) & (ii)		30%		1.18

Switching Values (at 12 %)

Benefits Lag	EIRR
Incremental Crop Benefit	-89.5
Incremental Crop Costs	1,849.5
Project Investments	542.1
Project Recurrent Costs	1,931.7

Benefits Lag	EIRR
Lagged 1 year	28.6
2 years	27.0
3 years	24.1

3. PLANTATION MODELS, FINANCIAL ANALYSIS

3a. Financial Analysis of 1 ha Long Rotation Teak Plantation Model (Rotation = 45 Years, MAI = 2.5 m³/ha/A)

Unit	Year 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
INFLOW																									
A. Yield 1 /																									
1. Thinning 2 /																									
- Fuelwood	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
- Pole	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
- Log	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2. Final felling 3 /																									
- Fuelwood	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
- Pole	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
- Log	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B. Total Volume of Production																									
- Fuelwood	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
- Pole	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
- Log	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C. Price 4 /																									
- Fuelwood	Tk/m ³	0	0	0	0	405	0	0	0	0	405	0	0	0	0	0	0	0	0	0	0	0	0	0	0
- Pole	Tk/m ³	0	0	0	0	0	0	0	0	0	1765	0	0	0	0	0	0	0	0	0	0	0	0	0	0
- Log	Tk/m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL INCOME	Tk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OUTFLOW																									
D. Physical Inputs																									
Seedlings 5 /	No	3500																							
In-fill Seedlings	No	0																							
Fertilizer	Kg	60																							
Labour - Establishment 6 /	md	75																							
Labour - Maintenance 7 /	md	45	49	45	15	30																			
Labour - Thinning	md					0																			
TOTAL LABOUR REQUIREMENT	md	120	49	45	15	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
E. FINANCIAL INPUTS																									
Seedlings	Tk	3500																							
In-fill Seedlings	Tk	0																							
Fertilizer	Tk	360																							
Tools and Equipments	Tk					0																			
Non Labour Costs	Tk	3860	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Labour Cost @ Tk 50/day	Tk	6000	2450	2250	750	1500	1500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL COSTS	Tk	9860	2450	2250	750	1500	1500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NET BENEFIT BEFORE FINANCING	Tk	-9860	-2450	-2250	-750	-1500	-1500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

3a. Financial Analysis of 1 ha Long Rotation Teak Plantation Model (Rotation = 45 Years MAI = 2.5 m³/ha/A) (Cont'd)

Unit	Year 25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45		
INFLOW																							
A. Yield 1 /																							
1. Thinning 2 /	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
- Fuelwood	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
- Pole	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
- Log	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2. Final felling 3 /	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12.15	
- Fuelwood	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12.15	
- Pole	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12.15	
- Log	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	56.7	
B. Total Volume of Production																							
- Fuelwood	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12.15	
- Pole	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12.15	
- Log	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	56.7	
C. Price 4 /																							
- Fuelwood	Tk/m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	400	
- Pole	Tk/m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1240	
- Log	Tk/m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4500	
TOTAL INCOME	Tk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	275076
D. PHYSICAL INPUTS																							
Seedlings 5 /	No																						
In-fill Seedlings	No																						
Fertilizer	Kg																						
Labour - Establishment 6 /	md																						
Labour - Maintenance 7 /	md																						
Labour - Thinning	md																						
TOTAL LABOUR REQUIREMENT	md	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
E. FINANCIAL INPUTS																							
Seedlings	Tk																						
In-fill Seedlings	Tk																						
Fertilizer	Tk																						
Tools and Equipments	Tk	100																					
Non Labour Costs	Tk	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Labour Cost @ Tk 50/day	Tk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL COSTS	Tk	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NET BENEFIT BEFORE FINANCING	Tk	-100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	275076
FIRR	13%	SWITCHING VALUES TO BRING FIRR TO 12%																					
NPV @ 12%	2,441.9	(a) Benefit -5% (b) Cost 6%																					

1 / Average MAI of 2.5 m³ per ha per year has been assumed.
 2 / Thinning is done at year 20.
 3 / At final felling 450 trees will be available.
 4 / Based on the existing stumpage value calculated at 12.5 percent of market value.
 5 / Spacing of 1.82m x 1.82m and a sapling mortality rate of 17% has been assumed.
 6 / Operation includes survey, layout, site preparation, planting, fire breaks etc.
 7 / Operation includes weeding and cleaning.
 8 / Based on the pulpwood plantation in Kaptai and Teak plantation in Bandarban area.

3b. Financial Analysis of 1 ha Long Rotation Teak Plantation Model (Polybags) (Rotation = 45 Years, MAI = 2.5 m³/ha/A)

Unit	Year 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
INFLOW																									
A. Yield 1 /																									
1. Thinning 2 /																									
- Fuelwood	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
- Pole	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
- Log	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2. Final felling 3 /																									
- Fuelwood	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
- Pole	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
- Log	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B. Total Volume of Production																									
- Fuelwood	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
- Pole	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
- Log	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C. Price 4 /																									
- Fuelwood	Tk/m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
- Pole	Tk/m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
- Log	Tk/m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL INCOME	Tk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OUTFLOW																									
D. PHYSICAL INPUTS																									
Seedlings 5 /	No	1370																							
In-fill Seedlings	No	0																							
Fertilizer	Kg	116		0																					
Labour - Establishment 6 /	md	111																							
Labour - Maintenance 7 /	md	0	45	45	165																				
Labour - Thinning	md	111	45	45	165	0																			
TOTAL LABOUR REQUIREMENT	md	111	45	45	165	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
E. FINANCIAL INPUTS																									
Seedlings	Tk	4452.5																							
In-fill Seedlings	Tk	0																							
Fertilizer	Tk	696																							
Tools and Equipments	Tk					0																			
Non Labour Costs	Tk	5148.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Labour Cost @ Tk 50/day	Tk	5550	2250	2250	8250	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL COSTS	Tk	10698.5	2250	2250	8250	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NET BENEFIT BEFORE FINANCING	Tk	-10698.5	-2250	-2250	-8250	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

3b. Financial Analysis of 1 ha Long Rotation Teak Plantation Model (Polybags) (Rotation = 45 Years, MAI = 2.5 m³/ha/A) (Cont'd)

Unit	Year 25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	
A. Yield 1 /																						
1. Thinning 2 /	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
- Fuelwood	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
- Pole	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
- Log	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2. Final felling 3 /																						
- Fuelwood	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
- Pole	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
- Log	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B. Total Volume of Production																						
- Fuelwood	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
- Pole	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
- Log	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C. Price 4 /																						
- Fuelwood	Tk/m ³	0	0	0	0	0	400	0	0	0	0	0	0	0	0	0	400	0	0	0	0	0
- Pole	Tk/m ³	0	0	0	0	0	1240	0	0	0	0	0	0	0	0	0	1240	0	0	0	0	0
- Log	Tk/m ³	0	0	0	0	0	3500	0	0	0	0	0	0	0	0	0	3500	0	0	0	0	0
TOTAL INCOME	Tk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OUTFLOW																						
D. PHYSICAL INPUTS																						
Seedlings 5 /	No																					
In-fill Seedlings	No																					
Fertilizer	Kg																					
Labour - Establishment 6 /	md																					
Labour - Maintenance 7 /	md																					
Labour - Thinning	md	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL LABOUR REQUIREMENT	md	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
E. FINANCIAL INPUTS																						
Seedlings	Tk																					
In-fill Seedlings	Tk																					
Fertilizer	Tk																					
Tools and Equipments	Tk	100																				
Non Labour Costs	Tk	100	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Labour Cost @ Tk 50/day	Tk	0	0	0	0	0	500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL COSTS	Tk	100	0	0	0	0	600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NET BENEFIT BEFORE FINANCING	Tk	-100	0	0	0	0	-600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FIRR	10%	SWITCHING VALUES TO BRING FIRR TO 12%																				
NPV @ 12%	-4579.45	(a) Benefit 47% (b) Cost -32%																				

1 / Average MAI of 2.5 m³ per ha per year has been assumed.
 2 / Thinning is done at year 20.
 3 / At final felling 450 trees will be available.
 4 / Based on the existing stumpage value calculated at 12.5 percent of market value.
 5 / Spacing of 1.82m x 1.82m and a sapling mortality rate of 17% has been assumed.
 6 / Operation includes survey, layout, site preparation, planting, fire breaks etc.
 7 / Operation includes weeding and cleaning.
 8 / Based on the pulpwood plantation in Kaptai and Teak plantation in Bandarban area.

3c. Financial Analysis of 1 ha Long Rotation Teak Plantation Model (Rotation = 40 Years, MAI = 7.5 m³/ha/A)

Unit	Year 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
INFLOW																									
A. Yield 1 /																									
1. Thinning 2 /																									
- Fuelwood	m ³	0	0	0	0	0	0	0	0	0	34	0	0	0	0	0	0	0	0	0	16	0	0	0	0
- Pole	m ³	0	0	0	0	0	0	0	0	0	27.2	0	0	0	0	0	0	0	0	0	40	0	0	0	0
- Log	m ³	0	0	0	0	0	0	0	0	0	6.8	0	0	0	0	0	0	0	0	0	24	0	0	0	0
2. Final felling 3 /																									
- Fuelwood	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
- Pole	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
- Log	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B. Total Volume of Production																									
- Fuelwood	m ³	0	0	0	0	0	0	0	0	0	34	0	0	0	0	0	0	0	0	0	13.8	0	0	0	0
- Pole	m ³	0	0	0	0	0	0	0	0	0	27.2	0	0	0	0	0	0	0	0	0	34.5	0	0	0	0
- Log	m ³	0	0	0	0	0	0	0	0	0	6.8	0	0	0	0	0	0	0	0	0	20.7	0	0	0	0
C. Price 4 /																									
- Fuelwood	Tk/m ³	0	0	0	0	405	0	0	0	0	405	0	0	0	0	0	0	0	0	0	400	0	0	0	0
- Pole	Tk/m ³	0	0	0	0	0	0	0	0	1240	0	0	0	0	0	0	0	0	0	0	1240	0	0	0	0
- Log	Tk/m ³	0	0	0	0	0	0	0	0	4500	0	0	0	0	0	0	0	0	0	0	4500	0	0	0	0
TOTAL INCOME	Tk	0	0	0	0	0	0	0	0	0	78098	0	0	0	0	0	0	0	0	0	141450	0	0	0	0
OUTFLOW																									
D. PHYSICAL INPUTS																									
Seedlings 5 /	No	3500																							
In-fill Seedlings	No	0																							
Fertilizer	Kg	94	66																						
Labour - Establishment 6 /	md	89																							
Labour - Maintenance 7 /	md	5	57	64	76																				
Labour - Thinning	md					44					44										40				
TOTAL LABOUR REQUIREMENT	md	94	57	64	76	44	44	0	0	0	44	0	0	0	0	0	0	0	0	0	40	0	0	0	0
E. FINANCIAL INPUTS																									
Seedlings	Tk	3500																							
In-fill Seedlings	Tk	0																							
Fertilizer	Tk	564	396																						
Tools and Equipments	Tk				100						100														
Non Labour Costs	Tk	4064	0	396	0	100	0	0	0	0	100	0	0	0	0	0	0	0	0	0	100	0	0	0	0
Labour Cost @ Tk 50/day	Tk	4700	2850	3200	3800	2200	0	0	0	0	2200	0	0	0	0	0	0	0	0	0	2000	0	0	0	0
TOTAL COSTS	Tk	8764	2850	3596	3800	2300	0	0	0	0	2300	0	0	0	0	0	0	0	0	0	2100	0	0	0	0
NET BENEFIT BEFORE FINANCING	Tk	-8764	-2850	-3596	-3800	-2300	0	0	0	0	75798	0	0	0	0	0	0	0	0	0	139350	0	0	0	0

3c. Financial Analysis of 1 ha Long Rotation Teak Plantation Model (Rotation = 40 Years, MAI = 7.5 m³/ha/A) (Cont'd)

Unit	Year 25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	
INFLOW																	
A. Yield 1 /																	
- Thinning 2 /																	
- Fuelwood	m ³	0	0	0	0	0	12	0	0	0	0	0	0	0	0	0	
- Pole	m ³	0	0	0	0	0	24	0	0	0	0	0	0	0	0	0	
- Log	m ³	0	0	0	0	0	17	0	0	0	0	0	0	0	0	0	
2. Final felling 3 /																	
- Fuelwood	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18.3	
- Pole	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18.3	
- Log	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	74	
B. Total Volume of Production																	
- Fuelwood	m ³	0	0	0	0	0	12	0	0	0	0	0	0	0	0	0	18.3
- Pole	m ³	0	0	0	0	0	24	0	0	0	0	0	0	0	0	0	18.3
- Log	m ³	0	0	0	0	0	17	0	0	0	0	0	0	0	0	0	74
C. Price 4 /																	
- Fuelwood	Tk/m ³	0	0	0	0	0	400	0	0	0	0	0	0	0	0	0	400
- Pole	Tk/m ³	0	0	0	0	0	1240	0	0	0	0	0	0	0	0	0	1240
- Log	Tk/m ³	0	0	0	0	0	4500	0	0	0	0	0	0	0	0	0	4500
TOTAL INCOME	Tk	0	0	0	0	0	111060	0	0	0	0	0	0	0	0	0	363012
OUTFLOW																	
D. PHYSICAL INPUTS																	
Seedlings 5 /	No																
In-fill Seedlings	No																
Fertilizer	Kg																
Labour - Establishment 6 /	md																
Labour - Maintenance 7 /	md																
Labour - Thinning	md						10										
TOTAL LABOUR REQUIREMENT	md	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0
E. FINANCIAL INPUTS																	
Seedlings	Tk																
In-fill Seedlings	Tk																
Fertilizer	Tk																
Tools and Equipments	Tk	100															
Non Labour Costs	Tk	100	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0
Labour Cost @ Tk 50/day	Tk	0	0	0	0	0	500	0	0	0	0	0	0	0	0	0	0
TOTAL COSTS	Tk	100	0	0	0	0	600	0	0	0	0	0	0	0	0	0	0
NET BENEFIT BEFORE FINANCING	Tk	-100	0	0	0	0	110460	0	0	0	0	0	0	0	0	0	0
FIRR	22%																
NPV @ 12%	30,056.54																
SWITCHING VALUES TO BRING FIRR TO 12%																	
	(a) Benefit	-63%														(b) Cost	173%

1 / Average MAI of 7.5 m³ per ha per year has been assumed.
 2 / At 1st thinning 1,500 trees will be taken out and no intermediate production is assumed.
 At 2nd thinning about 750 trees will be taken out.
 At 3rd thinning about 350 trees will be taken out and at 4th thinning about 150 trees will be taken out.
 3 / At final felling 200 trees will be available.
 4 / Based on the existing stumpage value calculated at 12.5 percent of the market price of the respective products.
 5 / Spacing of 1.82m x 1.82m and a sapling mortality rate of 17% has been assumed.
 6 / Operation includes survey, layout, site preparation, planting, fire breaks etc.
 7 / Operation includes weeding and cleaning.
 8 / Based on the pulpwood plantation in Kapai and Teak plantation in Bandarban area.

3d. Financial Analysis of 1 ha Long Rotation Teak Plantation Model (Rotation = 30 Years, MAI = 20 m³/ha/A)

Unit	Year 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
INFLOW															
A. Yield 1 /															
1. Thinning 2 /															
- Fuelwood	m ³	0	0	0	0	0	0	0	0	0	64	0	0	0	0
- Pole	m ³	0	0	0	0	0	0	0	0	0	51	0	0	0	0
- Log	m ³	0	0	0	0	0	0	0	0	0	12.8	0	0	0	0
2. Final felling 3 /															
- Fuelwood	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0
- Pole	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0
- Log	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B. Total Volume of Production															
- Fuelwood	m ³	0	0	0	0	0	0	0	0	0	64	0	0	0	0
- Pole	m ³	0	0	0	0	0	0	0	0	0	51	0	0	0	0
- Log	m ³	0	0	0	0	0	0	0	0	0	12.8	0	0	0	0
C. Price 4 /															
- Fuelwood	Tk/m ³	0	0	0	0	400	0	0	0	0	405	0	0	0	0
- Pole	Tk/m ³	0	0	0	0	0	0	0	0	0	1240	0	0	0	0
- Log	Tk/m ³	0	0	0	0	0	0	0	0	0	4500	0	0	0	0
TOTAL INCOME	Tk	0	0	0	0	0	0	0	0	0	146760	0	0	0	0
OUTFLOW															
D. PHYSICAL INPUTS															
Seedlings 5 /	No	3500													
In-fill Seedlings	No	0													
Fertilizer	Kg	150	67												
Labour - Establishment 6 /	md	138													
Labour - Maintenance 7 /	md	0	57	64	76										
Labour - Thinning	md										40				
TOTAL LABOUR REQUIREMENT	md	138	57	64	76	0	0	0	0	0	40	0	0	0	0
E. FINANCIAL INPUTS															
Seedlings	Tk	3500													
In-fill Seedlings	Tk	0													
Fertilizer	Tk	250	100												
Tools and Equipments	Tk				100										
Non Labour Costs	Tk	3750	0	100	0	100	0	0	0	0	100	0	0	0	0
Labour Cost @ Tk 50/day	Tk	6900	2850	3200	3800	0	0	0	0	0	2000	0	0	0	0
TOTAL COSTS	Tk	10650	2850	3300	3800	100	0	0	0	0	2100	0	0	0	0
NET BENEFIT BEFORE FINANCING	Tk	-10650	-2850	-3300	-3800	-100	0	0	0	0	144660	0	0	0	0

3d. Financial Analysis of 1 ha Long Rotation Teak Plantation Model (Rotation = 30 Years, MAI = 20 m³/ha/A) (Cont'd)

Unit	Year 16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
INFLOW															
A. Yield 1 /															
- Fuelwood	m ³	0	0	0	0	20	0	0	0	0	0	0	0	0	0
- Pole	m ³	0	0	0	0	45	0	0	0	0	0	0	0	0	0
- Log	m ³	0	0	0	0	45	0	0	0	0	0	0	0	0	0
2. Final felling 3 /															
- Fuelwood	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	30
- Pole	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	30
- Log	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	150
B. Total Volume of Production															
- Fuelwood	m ³	0	0	0	0	20	0	0	0	0	0	0	0	0	30
- Pole	m ³	0	0	0	0	45	0	0	0	0	0	0	0	0	30
- Log	m ³	0	0	0	0	45	0	0	0	0	0	0	0	0	150
C. Price 4 /															
- Fuelwood	Tk/m ³	0	0	0	0	400	0	0	0	0	0	0	0	0	400
- Pole	Tk/m ³	0	0	0	0	1240	0	0	0	0	0	0	0	0	1240
- Log	Tk/m ³	0	0	0	0	4500	0	0	0	0	0	0	0	0	4500
TOTAL INCOME	Tk	0	0	0	0	266300	0	0	0	0	0	0	0	0	724200
OUTFLOW															
D. PHYSICAL INPUTS															
Seedlings 5 /	No	0	0	0	0	0	0	0	0	0	0	0	0	0	0
In-fill Seedlings	No	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fertilizer	Kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Labour - Establishment 6 /	md	0	0	0	0	40	0	0	0	0	0	0	0	0	10
Labour - Maintenance 7 /	md	0	0	0	0	40	0	0	0	0	0	0	0	0	10
Labour - Thinning	md	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL LABOUR REQUIREMENT	md	0	0	0	0	40	0	0	0	0	0	0	0	0	0
E. FINANCIAL INPUTS															
Seedlings	Tk	0	0	0	0	100	0	0	0	0	0	0	0	0	100
In-fill Seedlings	Tk	0	0	0	0	100	0	0	0	0	0	0	0	0	100
Fertilizer	Tk	0	0	0	0	2000	0	0	0	0	0	0	0	0	500
Tools and Equipments	Tk	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non Labour Costs	Tk	0	0	0	0	100	0	0	0	0	0	0	0	0	100
Labour Cost @ Tk 50/day	Tk	0	0	0	0	2000	0	0	0	0	0	0	0	0	500
TOTAL COSTS	Tk	0	0	0	0	2100	0	0	0	0	0	100	0	0	600
NET BENEFIT BEFORE FINANCING	Tk	0	0	0	0	264200	0	0	0	0	-100	0	0	0	723600
FIRR	29%	SWITCHING VALUES TO BRING FIRR TO 12%													
NPV @ 12%	81,510	(a) Benefit	-82%											(b) Cost	465%

- 1 / Average MAI of 20 m³ per ha per year has been assumed.
- 2 / At 1st thinning 1,500 trees will be taken out and no intermediate Production is assumed.
- 3 / At 2nd thinning about 750 trees will be taken out.
- 4 / At 3rd thinning about 350 trees will be taken out and at 4th thinning about 150 trees will be taken out.
- 5 / At final felling 200 trees will be available.
- 6 / Based on the existing stumpage value calculated at 12.5 percent of the market price of the respective products.
- 7 / Spacing of 1.82m x 1.82m and a sapling mortality rate of 17% has been assumed.
- 8 / Operation includes survey, layout, site preparation, planting, fire breaks etc.
- 9 / Operation includes weeding and cleaning.

3e. Financial Analysis of 1 ha Long Rotation Garjan Plantation Model (Rotation = 30 Years, MAI = 25 m³/ha/A)

Unit	Year 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
INFLOW															
A. Yield 1 /															
- Thinning 2 /											64	0	0	0	0
- Fuelwood	m ³	0	0	0	0	0	0	0	0	0	51	0	0	0	40
- Pole	m ³	0	0	0	0	0	0	0	0	0	13	0	0	0	100
- Log	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	60
2. Final felling 3 /															
- Fuelwood	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0
- Pole	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0
- Log	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B. Total Volume of Production															
- Fuelwood	m ³	0	0	0	0	0	0	0	0	0	64	0	0	0	40
- Pole	m ³	0	0	0	0	0	0	0	0	0	51	0	0	0	100
- Log	m ³	0	0	0	0	0	0	0	0	0	12.8	0	0	0	60
C. Price 4 /															
- Fuelwood	Tk/m ³	0	0	0	0	400	0	0	0	0	127.8	0	0	0	200
- Pole	Tk/m ³	0	0	0	0	0	0	0	0	0	405	0	0	0	0
- Log	Tk/m ³	0	0	0	0	0	0	0	0	0	1240	0	0	0	0
TOTAL INCOME															
	Tk	0	0	0	0	0	0	0	0	0	146760	0	0	0	0
OUTFLOW															
D. PHYSICAL INPUTS															
Seedlings 5 /	No	1370													
In-fill Seedlings	No	0													
Fertilizer	Kg	195	86												
Labour - Establishment 6 /	md	180													
Labour - Maintenance 7 /	md	0	98	74	50	85									
Labour - Thinning	md									40					
TOTAL LABOUR REQUIREMENT	md	180	98	74	50	85	0	0	0	0	40	0	0	0	0
E. FINANCIAL INPUTS															
Seedlings	Tk	7247.3													
In-fill Seedlings	Tk	0													
Fertilizer	Tk	1170	516												
Tools and Equipments	Tk					100									
Non Labour Costs	Tk	8417.3	0	516	0	100	0	0	0	0	100	0	0	0	0
Labour Cost @ Tk 50/day	Tk	9000	4900	3700	2500	4250	0	0	0	0	2000	0	0	0	0
TOTAL COSTS	Tk	17417.3	4900	4216	2500	4350	0	0	0	0	2100	0	0	0	0
NET BENEFIT BEFORE FINANCING	Tk	-17417.3	-4900	-4216	-2500	-4350	0	0	0	0	144660	0	0	0	0

3e. Financial Analysis of 1 ha Long Rotation Garjan Plantation Model (Rotation = 30 Years, MAI = 25 m³/ha/A) (Cont'd)

Unit	Year 16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
INFLOW															
A. Yield 1 /															
- Thinning 2 /						28	0	0	0	0	0	0	0	0	0
- Fuelwood	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0
- Pole	m ³	0	0	0	0	56	0	0	0	0	0	0	0	0	0
- Log	m ³	0	0	0	0	56	0	0	0	0	0	0	0	0	0
2. Final felling 3 /															
- Fuelwood	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	36
- Pole	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	36
- Log	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	168
B. Total Volume of Production															
- Fuelwood	m ³	0	0	0	0	30	0	0	0	0	0	0	0	0	52
- Pole	m ³	0	0	0	0	60	0	0	0	0	0	0	0	0	52
- Log	m ³	0	0	0	0	60	0	0	0	0	0	0	0	0	168
C. Price 4 /															
- Fuelwood	Tk/m ³	0	0	0	0	150	0	0	0	0	0	0	0	0	272
- Pole	Tk/m ³	0	0	0	0	400	0	0	0	0	0	0	0	0	400
- Log	Tk/m ³	0	0	0	0	1240	0	0	0	0	0	0	0	0	1240
	Tk/m ³	0	0	0	0	4500	0	0	0	0	0	0	0	0	4500
TOTAL INCOME	Tk	0	0	0	0	356400	0	0	0	0	0	0	0	0	841280
OUTFLOW															
D. PHYSICAL INPUTS															
Seedlings 5 /	No														
In-fill Seedlings	No														
Fertilizer	Kg														
Labour - Establishment 6 /	md														
Labour - Maintenance 7 /	md														
Labour - Thinning	md	40	0	0	0	40	0	0	0	0	0	0	0	0	10
TOTAL LABOUR REQUIREMENT	md	40	0	0	0	40	0	0	0	0	0	0	0	0	10
E. FINANCIAL INPUTS															
Seedlings	Tk														
In-fill Seedlings	Tk														
Fertilizer	Tk														
Tools and Equipments	Tk					100					100				100
Non Labour Costs	Tk	0	0	0	0	100	0	0	0	0	100	0	0	0	100
Labour Cost @ Tk 50/day	Tk	0	0	0	0	2000	0	0	0	0	0	0	0	0	500
TOTAL COSTS	Tk	0	0	0	0	2100	0	0	0	0	100	0	0	0	600
NET BENEFIT BEFORE FINANCING	Tk	0	0	0	0	354300	0	0	0	0	-100	0	0	0	840680

SWITCHING VALUES TO BRING FIRR TO 12%

	24%	(a) Benefit	-76%	(b) Cost	309%
FIRR	84,845				
NPV @ 12%					
1 / Average MAI of 25 m ³ per ha per year has been assumed.					
2 / At 1st thinning 470 trees will be taken out and no intermediate production is assumed.					
At 2nd thinning about 300 trees will be taken out.					
At 3rd thinning about 350 trees will be taken out and at 4th thinning about 300 trees will be taken out.					
3 / At final felling 300 trees will be available.					
4 / Based on the existing stumpage value calculated at 12.5 percent of the market price of the respective products.					
5 / Spacing of 2.78 m x 2.78 m has been assumed.					
6 / Operation includes survey, layout, site preparation, planting, fire breaks etc.					
7 / Operation includes weeding and cleaning.					

3f. Financial Analysis of 1 ha Medium Rotation Teak Plantation Model (Rotation = 20 Years, MAI = 12.5 m³/ha/A)

Unit	Year 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
INFLOW																					
A. Yield 1 /																					
1. Thinning 2 /																					
- Fuelwood	m³	0	0	0	0	0	0	0	0	0	35	0	0	0	0	12	0	0	0	0	0
- Pole	m³	0	0	0	0	0	0	0	0	0	28	0	0	0	0	27	0	0	0	0	0
- Log	m³	0	0	0	0	0	0	0	0	0	7	0	0	0	0	16	0	0	0	0	0
2. Final felling 3 /																					
- Fuelwood	m³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20
- Pole	m³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20
- Log	m³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	91
B. Total Volume of Production																					
- Fuelwood	m³	0	0	0	0	0	0	0	0	0	35	0	0	0	0	11.8	0	0	0	0	19.5
- Pole	m³	0	0	0	0	0	0	0	0	0	28	0	0	0	0	27	0	0	0	0	19.5
- Log	m³	0	0	0	0	0	0	0	0	0	7	0	0	0	0	16.2	0	0	0	0	91
C. Price 4 /																					
- Fuelwood	Tk/m³	0	0	0	0	400	0	0	0	0	70	0	0	0	0	55	0	0	0	0	130
- Pole	Tk/m³	0	0	0	0	0	0	0	0	0	400	0	0	0	0	400	0	0	0	0	400
- Log	Tk/m³	0	0	0	0	0	0	0	0	0	1240	0	0	0	0	1240	0	0	0	0	1240
TOTAL INCOME	Tk	0	0	0	0	0	0	0	0	0	169400	0	0	0	0	136132	0	0	0	0	111930
OUTFLOW																					
D. PHYSICAL INPUTS																					
417462																					
Seedlings 5 /	No	3500																			
In-fill Seedlings	No	0																			
Fertilizer	Kg	67																			
Labour - Establishment 6 /	md	89	83																		
Labour - Maintenance 7 /	md	4	57	65	76																
Labour - Thinning	md	93	57	148	76	45					45	0	0	0	0	20	0	0	0	0	0
TOTAL LABOUR REQUIREMENT	md	93	57	148	76	45	0	0	0	0	45	0	0	0	0	20	0	0	0	0	0
E. FINANCIAL INPUTS																					
Seedlings	Tk	3500																			
In-fill Seedlings	Tk	0																			
Fertilizer	Tk	402	0																		
Tools and Equipments	Tk					100															
Overhead 8 /	Tk	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Non Labour Costs	Tk	5902	2000	2000	2000	2100	2000	2000	2000	2000	2500	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Labour Cost @ Tk 50/day	Tk	4650	2850	7400	3800	2250	0	0	0	0	2250	0	0	0	0	1000	0	0	0	0	0
TOTAL COSTS	Tk	10552	4850	9400	5800	4350	2000	2000	2000	2000	4750	2000	2000	2000	2000	3000	2000	2000	2000	2000	2000
NET BENEFIT	Tk	-10552	-4850	-9400	-5800	-4350	-2000	-2000	-2000	-2000	164650	-2000	-2000	-2000	-2000	133132	-2000	-2000	-2000	-2000	109930
FIRR	26%																				
NPV @ 12%	56,086																				

SWITCHING VALUES TO BRING FIRR TO 12%

(a) Benefit -62% (b) Cost 161%

- 1 / Average MAI of 12.5m³ per ha per year has been assumed.
- 2 / At 1st thinning 1,500 trees will be removed, at 2nd thinning 750 trees will be taken out, at 3rd thinning about 300 trees will be removed and at 4th thinning 150 trees will be felled.
- 3 / At final felling 200 trees will be available.
- 4 / Based on the existing stumpage value estimated at 12.5 percent of market price.
- 5 / Spacing of 1.82m x 1.82m and a sapling mortality rate of 17% has been assumed.
- 6 / Operation includes survey, layout, site preparation, planting, fire breaks etc.
- 7 / Operation includes weeding and cleaning.
- 8 / Based on the pulpwood plantation in Kaplaj and Teak plantation in Bandarban area.

3g. Financial Analysis of 1 ha Medium Rotation Teak Plantation Model (Rotation = 20 Years, MAI = 30 m³/ha/A)

Unit	Year 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
A. Yield 1 /																					
- Thinning 2 /																					
- Fuelwood	m ³	0	0	0	0	0	0	0	0	0	68	0	0	0	0	45	0	0	0	0	0
- Pole	m ³	0	0	0	0	0	0	0	0	0	54	0	0	0	0	113	0	0	0	0	0
- Log	m ³	0	0	0	0	0	0	0	0	0	14	0	0	0	0	68	0	0	0	0	0
2. Final felling 3 /																					
- Fuelwood	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
- Pole	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
- Log	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B. Total Volume of Production																					
- Fuelwood	m ³	0	0	0	0	0	0	0	0	0	68	0	0	0	0	45	0	0	0	0	0
- Pole	m ³	0	0	0	0	0	0	0	0	0	54	0	0	0	0	113	0	0	0	0	0
- Log	m ³	0	0	0	0	0	0	0	0	0	14	0	0	0	0	68	0	0	0	0	0
C. Price 4 /																					
- Fuelwood	Tk/m ³	0	0	0	0	400	0	0	0	0	400	0	0	0	0	400	0	0	0	0	400
- Pole	Tk/m ³	0	0	0	0	0	0	0	0	0	1240	0	0	0	0	1240	0	0	0	0	1240
- Log	Tk/m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3500	0	0	0	0	3500
TOTAL INCOME	Tk	0	0	0	0	0	0	0	0	0	84320	0	0	0	0	451300	0	0	0	0	137862
OUTFLOW																					
D. PHYSICAL INPUTS																					
Seedlings 5 /	No	1370																			
In-fill Seedlings	No	0																			
Fertilizer	Kg	195		86																	
Labour - Establishment 6 /	md	180																			
Labour - Maintenance 7 /	md	0	100	74	50	70															
Labour - Thinning	md	0																			
TOTAL LABOUR REQUIREMENT	md	180	100	74	50	70	0	0	0	0	57	0	0	0	0	26	0	0	0	0	0
E. FINANCIAL INPUTS																					
Seedlings	Tk	7247.3																			
In-fill Seedlings	Tk	0																			
Fertilizer	Tk	1170		516																	
Tools and Equipments	Tk	2000	2000	2000	2000	2000	2000	2000	2000	2000	500	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Overhead 8 /	Tk	10417.3	2000	2516	2000	2100	2000	2000	2000	2000	2500	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Non Labour Costs	Tk	9000	5000	3700	2500	3500	0	0	0	0	2850	0	0	0	0	1300	0	0	0	0	0
Labour Cost @ Tk 50/day	Tk	19417.3	7000	6216	4500	5600	2000	2000	2000	2000	5350	2000	2000	2000	2000	3300	2000	2000	2000	2000	2000
TOTAL COSTS	Tk	-19417.3	-7000	-6216	-4500	-5600	-2000	-2000	-2000	-2000	78970	-2000	-2000	-2000	-2000	448000	-2000	-2000	-2000	-2000	-2000
NET BENEFIT																					
FIRR	24%	SWITCHING VALUES TO BRING FIRR TO 12%																			
NPV @ 12%	81,467	(a) Benefit	-66%	(b) Cost	192%																

1 / Average MAI of 30 m³ per ha per year has been assumed.
 2 / At 1st thinning 1,500 trees will be taken out.
 3 / At 2nd thinning about 1,000 trees will be taken out.
 4 / At final felling 500 trees will be available.
 5 / Based on the existing stumpage value.
 6 / Spacing of 15 cm x 15 cm and a sapling mortality rate of 17% has been assumed.
 7 / Operation includes survey, layout, site preparation, planting, fire breaks etc.
 8 / Based on the pulpwood plantation in Kaptai and Teak plantation in Bandarban area.

3h. Financial Analysis of 1 ha Medium Rotation Enrichment (Sal) Plantation Model (Rotation = 20 Years, MAI = 12.5 m³/ha/A)

Unit	Year 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
INFLOW																				
A. Yield 1 /																				
1. Thinning 2 /																				
- Fuelwood	m ³	0	0	0	0	60	0	0	0	0	28	0	0	0	0	8	0	0	0	0
- Pole	m ³	0	0	0	0	0	0	0	0	0	22	0	0	0	0	21	0	0	0	0
- Log	m ³	0	0	0	0	0	0	0	0	0	6	0	0	0	0	13	0	0	0	0
2. Final Felling 3 /																				
- Fuelwood	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18
- Pole	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18
- Log	m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	83
B. Total Volume of Production																				
- Fuelwood	m ³	0	0	0	0	60	0	0	0	0	28	0	0	0	0	8	0	0	0	0
- Pole	m ³	0	0	0	0	0	0	0	0	0	22	0	0	0	0	21	0	0	0	0
- Log	m ³	0	0	0	0	0	0	0	0	0	6	0	0	0	0	13	0	0	0	0
C. Price 4 /																				
- Fuelwood	Tk/m ³	0	0	0	0	400	0	0	0	0	400	0	0	0	0	400	0	0	0	0
- Pole	Tk/m ³	0	0	0	0	0	0	0	0	0	1700	0	0	0	0	1700	0	0	0	0
- Log	Tk/m ³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3500	0	0	0	0
TOTAL INCOME	Tk	0	0	0	0	0	0	0	0	0	47600	0	0	0	0	87100	0	0	0	144210
OUTFLOW																				
D. PHYSICAL INPUTS																				
Seedlings 5 /	No	3000																		
In-fill Seedlings	No	0																		
Fertilizer	Kg	150	108																	
Labour - Establishment 6 /	md	144																		
Labour - Maintenance 7 /	md	0	100	74	50	24														
Labour - Thinning	md	144	100	74	50	58					58					52				
TOTAL LABOUR REQUIREMENT	md	144	100	74	50	82	0	0	0	0	58	0	0	0	0	52	0	0	0	0
E. FINANCIAL INPUTS																				
Seedlings	Tk	3000																		
In-fill Seedlings	Tk	0																		
Fertilizer	Tk	900	648																	
Tools and Equipments	Tk					100					500									
Overhead 8 /	Tk	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Non Labour Costs	Tk	5900	2000	2648	2000	2100	2000	2000	2000	2000	2500	2000	2000	2000	2000	2000	2000	2000	2000	2000
Labour Cost @ Tk 50/day	Tk	7200	5000	3700	2500	4100	0	0	0	0	2900	0	0	0	0	2600	0	0	0	0
TOTAL COSTS	Tk	13100	7000	6348	4500	6200	2000	2000	2000	2000	5400	2000	2000	2000	2000	4600	2000	2000	2000	2000
NET BENEFIT	Tk	-13100	-7000	-6348	-4500	-6200	-2000	-2000	-2000	-2000	42200	-2000	-2000	-2000	-2000	82500	-2000	-2000	-2000	142210
FIRR	14%	SWITCHING VALUES TO BRING FIRR TO 12%																		
NPV @ 12%	8,716	(a) Benefit -19% (b) Cost 23%																		

1 / Average MAI of 12.5 m³ per ha per year has been assumed.
 2 / At 1st thinning 1,500 trees will be taken out.
 3 / At 2nd thinning about 1,000 trees will be taken out.
 4 / At final felling 500 trees will be available.
 5 / Based on the existing stumpage value.
 6 / Spacing of 15 cm x 15 cm and a sapling mortality rate of 17% has been assumed.
 7 / Operation includes survey, layout, site preparation, planting, fire breaks etc.
 8 / Operation includes weeding and cleaning.
 9 / Based on the pulpwood plantation in Kaptai and Tenk plantation in Bandarban area.

3i. Financial Analysis of 1 ha Short Rotation Pulpwood Plantation (Rotation = 10 Years, MAI = 15 m³/ha/A)

	Unit	Year 1	2	3	4	5	6	7	8	9	10
INFLOW											
A. Yield											
- Fuelwood	m ³	0	0	0	0	0	0	0	0	0	60
- Pulp	m ³	0	0	0	0	0	0	0	0	0	90
B. Total Volume of Production											
- Fuelwood	m ³	0	0	0	0	0	0	0	0	0	60
- Pole	m ³	0	0	0	0	0	0	0	0	0	90
C. Price											
- Fuelwood	Tk/m ³	0	0	0	0	400	0	0	0	0	400
- Pole	Tk/m ³	0	0	0	0	0	0	0	0	0	1240
TOTAL INCOME	Tk	0	0	0	0	0	0	0	0	0	74400
OUTFLOW											
D. PHYSICAL INPUTS											
Seedlings	No	1370									
In-fill Seedlings	No	0									
Fertilizer	Kg	90		0							
Labour - Establishment	md	100		0							
Labour - Maintenance 8_/	md	0	40	40	20	20					
Labour - Thinning	md										45
TOTAL LABOUR REQUIREMENT	md	100	40	40	20	20	0	0	0	0	45
E. FINANCIAL INPUTS											
Seedlings	Tk	5137.5									
In-fill Seedlings	Tk	0									
Fertilizer	Tk	540		0							
Tools and Equipments	Tk					100					500
Overhead	Tk	0	0	0	0	0	0	0	0	0	0
Non Labour Costs	Tk	5677.5	0	0	0	100	0	0	0	0	500
Labour Cost @ Tk 50/day	Tk	5000	2000	2000	1000	1000	0	0	0	0	2250
TOTAL COSTS 19527.5	Tk	10677.5	2000	2000	1000	1100	0	0	0	0	2750
NET BENEFIT	Tk	-10677.5	-2000	-2000	-1000	-1100	0	0	0	0	71650
FIRR		17%	SWITCHING VALUES TO BRING FIRR TO 12%								
NPV @ 12%		7.258	(a) Benefit -39%								(b) Cost 63%

3j. Financial Analysis of 1 ha Short Rotation Pulpwood Plantation (Rotation = 10 Years, MAI = 20 m³/ha/A)

	Unit	Year 1	2	3	4	5	6	7	8	9	10
INFLOW											
A. Yield											
- Fuelwood	m ³	0	0	0	0	0	0	0	0	0	60
- Pulp	m ³	0	0	0	0	0	0	0	0	0	140
B. Total Volume of Production											
- Fuelwood	m ³	0	0	0	0	0	0	0	0	0	60
- Pole	m ³	0	0	0	0	0	0	0	0	0	140
C. Price											
- Fuelwood	Tk/m ³	0	0	0	0	400	0	0	0	0	400
- Pole	Tk/m ³	0	0	0	0	0	0	0	0	0	1240
TOTAL INCOME	Tk	0	0	0	0	0	0	0	0	0	74400
OUTFLOW											
D. PHYSICAL INPUTS											
Seedlings	No	1370									
In-fill Seedlings	No	0									
Fertilizer	Kg	90		50							
Labour - Establishment	md	100		0							
Labour - Maintenance	md	0	40	50	20	20					
Labour - Thinning	md										45
TOTAL LABOUR REQUIREMENT	md	100	40	50	20	20	0	0	0	0	45
E. FINANCIAL INPUTS											
Seedlings	Tk	5137.5									
In-fill Seedlings	Tk	0									
Fertilizer	Tk	540		300							
Tools and Equipments	Tk					100					500
Overhead	Tk	0	0	0	0	0	0	0	0	0	0
Non Labour Costs	Tk	5677.5	0	300	0	100	0	0	0	0	500
Labour Cost @ Tk 50/day	Tk	5000	2000	2500	1000	1000	0	0	0	0	2250
TOTAL COSTS	Tk	10677.5	2000	2800	1000	1100	0	0	0	0	2750
NET BENEFIT	Tk	-10677.5	-2000	-2800	-1000	-1100	0	0	0	0	71650
FIRR		19%	SWITCHING VALUES TO BRING FIRR TO 12%								
NPV @ 12%		8.689	(a) Benefit -36%								(b) Cost 57%

3k. Financial Analysis of 1 ha Short Rotation Pulpwood Plantation (Rotation = 10 Years, MAI = 45 m³/ha/A)

	Unit	Year 1	2	3	4	5	6	7	8	9	10
INFLOW											
A. Yield											
- Fuelwood	m ³	0	0	0	0	0	0	0	0	0	160
- Pulp	m ³	0	0	0	0	0	0	0	0	0	240
B. Total Volume of Production											
- Fuelwood	m ³	0	0	0	0	0	0	0	0	0	160
- Pole	m ³	0	0	0	0	0	0	0	0	0	240
C. Price											
- Fuelwood	Tk/m ³	0	0	0	0	400	0	0	0	0	400
- Pole	Tk/m ³	0	0	0	0	0	0	0	0	0	1240
TOTAL INCOME	Tk	0	0	0	0	0	0	0	0	0	198400
OUTFLOW											
D. PHYSICAL INPUTS											
Seedlings	No	1370									
in-fill Seedlings	No	0									
Fertilizer	Kg	90		50							
Labour - Establishment	md	200		0							
Labour - Maintenance	md	0	40	60	20	60					
Labour - Thinning	md										45
TOTAL LABOUR REQUIREMENT	md	200	40	60	20	60	0	0	0	0	45
E. FINANCIAL INPUTS											
Seedlings	Tk	5137.5									
in-fill Seedlings	Tk	0									
Fertilizer	Tk	540		300							
Tools and Equipments	Tk					100					500
Overhead	Tk	0	0	0	0	0	0	0	0	0	0
Net Labour Costs	Tk	5677.5	0	300	0	100	0	0	0	0	500
Labour Cost @ Tk 50/day	Tk	10000	2000	3000	1000	3000	0	0	0	0	2250
TOTAL COSTS 27827.5	Tk	15677.5	2000	3300	1000	3100	0	0	0	0	2750
NET BENEFIT	Tk	-15677.5	-2000	-3300	-1000	-3100	0	0	0	0	195650
FIRR	28%	SWITCHING VALUES TO BRING FIRR TO 12%									
NPV @ 12%	42.658										
		(a) Benefit -67%					(b) Cost 201%				

4. ECONOMIC AND FINANCIAL INPUT PRICES

4a. Fertilizers

	Unit	1992	1993	1994	1995	2000	2005
AT EXPORT PARITY							
UREA 46% N							
FOB Source Price in 1985 Constant 1_/	U \$/Ton	101.00	105.00	108.00	108.00	120.00	112.00
MUV Multiplier	U \$/Ton	1.48	1.48	1.48	1.48	1.48	1.48
FOB Price in 1992 Constant	U \$/Ton	149.48	155.40	159.84	159.84	177.60	165.76
Exchange Rate (U \$ = Tk)		38.90	38.90	38.90	38.90	38.90	38.90
FOB at Port of Exit	Tk/ton	5814.77	6045.06	6217.78	6217.78	6908.64	6448.06
Port Dues/Handling etc. 2_/	Tk/ton	1400.00	1400.00	1400.00	1400.00	1400.00	1400.00
Handling/Transport/Storage	Tk/ton	400	400	400	400	400	400
Value Ex-store/Market	Tk/ton	4014.772	4245.06	4417.776	4417.776	5108.64	4648.064
Transport Market-Farmgate	Tk/ton	250.00	250.00	250.00	250.00	250.00	250.00
Distributors Margin	Tk/ton	500.00	500.00	500.00	500.00	500.00	500.00
FARMGATE PRICE							
Financial	Tk/kg	3.26	3.50	3.67	3.67	4.36	3.90
Economic 3_/	Tk/kg	3.77	4.01	4.18	4.18	4.87	4.41
TSP 46% P AT IMPORT PARITY							
FOB Source Price in 1985 Constant 1_/	U \$/Ton	79.00	90.00	93.00	96.00	98.00	98.00
MUV Multiplier	U \$/Ton	1.48	1.48	1.48	1.48	1.48	1.48
Price in 1992 Constant	U \$/Ton	116.92	133.20	137.64	142.08	145.04	145.04
Freight and Insurance	U \$/Ton	70.00	70.00	70.00	70.00	70.00	70.00
CIF Chittagong at Entry Port	U \$/Ton	186.92	203.20	207.64	212.08	215.04	215.04
Exchange Rate (U \$ = Tk)		38.90	38.90	38.90	38.90	38.90	38.90
CIF Chittagong at Entry Port	Tk/ton	7271.19	7904.48	8077.20	8249.91	8365.06	8365.06
Port Dues/Handling etc. 2_/	Tk/ton	1400	1400	1400	1400	1400	1400
Handling/Transport/Storage	Tk/ton	400	400	400	400	400	400
Value Ex-store/Market	Tk/ton	9071.188	9704.48	9877.196	10049.91	10165.06	10165.06
Transport Market-Farmgate	Tk/ton	800.00	800.00	800.00	800.00	800.00	800.00
Distributors Margin	Tk/ton	500.00	500.00	500.00	500.00	500.00	500.00
FARMGATE PRICE							
Financial	Tk/kg	7.77	8.40	8.58	8.75	8.87	8.87
Economic 3_/	Tk/kg	7.59	8.23	8.40	8.57	8.69	8.69
MURATE OF POTASH 60% K20 AT IMPORT PARITY							
FOB Source Price in 1985 Constant 1_/	U \$/Ton	73.00	72.00	72.00	72.00	71.00	71.00
MUV Multiplier	U \$/Ton	1.48	1.48	1.48	1.48	1.48	1.48
Price in 1992 Constant	U \$/Ton	108.04	106.56	106.56	106.56	105.08	105.08
Freight and Insurance	U \$/Ton	70.00	70.00	70.00	70.00	70.00	70.00
CIF Chittagong at Entry Port	U \$/Ton	178.04	176.56	176.56	176.56	175.08	175.08
Exchange Rate (U \$ = Tk)		38.90	38.90	38.90	38.90	38.90	38.90
CIF Chittagong at Entry Port	Tk/ton	6925.76	6868.18	6868.18	6868.18	6810.61	6810.61
Port Dues/Handling etc. 2_/	Tk/ton	1400.00	1400.00	1400.00	1400.00	1400.00	1400.00
Handling/Transport/Storage	Tk/ton	400.00	400.00	400.00	400.00	400.00	400.00
Value Ex-store/Market	Tk/ton	8725.76	8668.18	8668.18	8668.18	8610.61	8610.61
Transport Market-Farmgate	Tk/ton	800.00	800.00	800.00	800.00	800.00	800.00
Distributors Margin	Tk/ton	500.00	500.00	500.00	500.00	500.00	500.00
FARMGATE PRICE							
Financial	Tk/kg	7.43	7.37	7.37	7.37	7.31	7.31
Economic 3_/	Tk/kg	7.33	7.27	7.27	7.27	7.21	7.21

1_/ Based on IBRD, Commodity Price Forecast, February 1992

2_/ Include wharfage dues, storage, arrestre, stevedoring charges and handling.

3_/ All local costs adjusted by SCF of 0.80 for derivation of economic prices

Price Base:

Urea : FOB Chittagong/Chalna

TSP : FOB US Gulf

MP : FOB US Gulf

4b. Paddy/Wheat

	Unit	1992	1993	1994	1995	2000	2005
AT IMPORT PARITY							
RICE/PADDY							
FOB Source Price in 1985 Constant 1_/	U \$/Ton	196.00	176.00	175.00	178.00	197.00	176.00
MUV Multiplier	U \$/Ton	1.48	1.48	1.48	1.48	1.48	1.48
FOB Price in 1992 Constant	U \$/Ton	290.08	260.48	259.00	263.44	291.56	260.48
Quality Adjustment 2_/	U \$/Ton	217.56	195.36	194.25	197.58	218.67	195.36
Freight and Insurance	U \$/Ton	40.00	40.00	40.00	40.00	40.00	40.00
CIF Chittagong at Entry Port	U \$/Ton	257.56	235.36	234.25	237.58	258.67	235.36
Exchange Rate (U \$ = Tk)		38.90	38.90	38.90	38.90	38.90	38.90
CIF Chittagong at Entry Port	Tk/ton	10019.08	9155.50	9112.33	9241.86	10062.26	9155.50
Port Dues/Handling etc. 3_/	Tk/ton	1400.00	1400.00	1400.00	1400.00	1400.00	1400.00
Handling/Transport/Storage	Tk/ton	400.00	400.00	400.00	400.00	400.00	400.00
Value Ex-store/Market	Tk/ton	11819.08	10955.50	10912.33	11041.86	11862.26	10955.50
Processing Cost	Tk/ton	320.00	320.00	320.00	320.00	320.00	320.00
Distributors Margin	Tk/ton	800.00	800.00	800.00	800.00	800.00	800.00
Transport/Handling Mill-Farmgate	Tk/ton	250.00	250.00	250.00	250.00	250.00	250.00
Processing Ratio		0.67	0.67	0.67	0.67	0.67	0.67
FARMGATE PRICE							
Financial	Tk/kg	7.00	6.42	6.39	6.48	7.03	6.42
Economic 4_/	Tk/kg	6.94	6.36	6.34	6.42	6.97	6.36
WHEAT							
FOB Source Price in 1985 Constant 1_/	U \$/Ton	97.00	101.00	106.00	108.00	109.00	114.00
MUV Multiplier	U \$/Ton	1.48	1.48	1.48	1.48	1.48	1.48
Price in 1992 Constant	U \$/Ton	143.56	149.48	156.88	159.84	161.32	168.72
Freight and Insurance	U \$/Ton	70.00	70.00	70.00	70.00	70.00	70.00
CIF Chittagong at Entry Port	U \$/Ton	213.56	219.48	226.88	229.84	231.32	238.72
Exchange Rate (U \$ = Tk)		38.90	38.90	38.90	38.90	38.90	38.90
CIF Chittagong at Entry Port	Tk/ton	8307.48	8537.77	8825.63	8940.78	8998.35	9286.21
Port Dues/Handling etc. 3_/	Tk/ton	1400.00	1400.00	1400.00	1400.00	1400.00	1400.00
Handling/Transport/Storage	Tk/ton	400.00	400.00	400.00	400.00	400.00	400.00
Value Ex-store/Market	Tk/ton	10107.48	10337.77	10625.63	10740.78	10798.35	11086.21
Processing Cost	Tk/ton	120.00	120.00	120.00	120.00	120.00	120.00
Distributors Margin	Tk/ton	800.00	800.00	800.00	800.00	800.00	800.00
Transport/Handling Mill-Farmgate	Tk/ton	250.00	250.00	250.00	250.00	250.00	250.00
Processing Ratio		0.90	0.90	0.90	0.90	0.90	0.90
FARMGATE PRICE							
Financial	Tk/kg	8.04	8.25	8.51	8.61	8.67	8.92
Economic 4_/	Tk/kg	7.93	8.14	8.40	8.50	8.55	8.81

1_/ Based on IBRD, Commodity Price Forecast, February 1992

2_/ Quality differential @25% for Rice/Paddy

3_/ Include warehousing dues, storage, arrears, stevedoring charges and handling.

4_/ All local costs adjusted by SCF of 0.80 for derivation of economic prices

Price base : - Rice (Thai), White, milled, 5% broken, government standard, export price,
FOB Bangkok.

4c. Sawlogs

	Unit	1992	1993	1994	1995	2000	2005
AT IMPORT PARITY							
ROUND LOGS							
FOB Source Price in 1985 Constant	U \$/m ³	157.00	161.00	162.00	163.00	174.00	189.00
MUV Multiplier	U \$/m ³	1.48	1.48	1.48	1.48	1.48	1.48
FOB Price in 1992 Constant	U \$/m ³	232.36	238.28	239.76	241.24	257.52	279.72
Quality Adjustment 2_/	U \$/m ³	153.3576	157.2648	158.2416	159.2184	169.9632	184.6152
Freight and Insuarence	U \$/m ³	21.00	21.00	21.00	21.00	21.00	21.00
CIF Chittagong at Entry Port	U \$/m ³	174.36	178.26	179.24	180.22	190.96	205.62
Exchange Rate (U \$ = Tk)		38.90	38.90	38.90	38.90	38.90	38.90
CIF Chittagong at Entry Port	Tk/m ³	6782.51	6934.50	6972.50	7010.50	7428.47	7998.43
Port Dues/Handling etc. 3_/	Tk/m ³	200.00	200.00	200.00	200.00	200.00	200.00
Handling/Transport/Storage	Tk/m ³	150.00	150.00	150.00	150.00	150.00	150.00
Value Ex-store/Market	Tk/m ³	7132.51	7284.50	7322.50	7360.50	7778.47	8348.43
Cost of Extraction	Tk/m ³	320.00	320.00	320.00	320.00	320.00	320.00
Wholesellers Margin	Tk/m ³	900.00	900.00	900.00	900.00	900.00	900.00
Transport/Handling Market-Farmgate	Tk/m ³	100.00	100.00	100.00	100.00	100.00	100.00
Economic Stumpage Value	Tk/m ³	6006.51	6158.50	6196.50	6234.50	6652.47	7222.43
Stumpage Value at Market Price							
Wholesale Market Price of Average Quality Log	Tk/m ³	14000	14000	14000	14000	14000	14000
Cost of Extraction	Tk/m ³	3000	3000	3000	3000	3000	3000
Transport to Market	Tk/m ³	500	500	500	500	500	500
Stumpage Value at Market Price	Tk/m ³	10500	10500	10500	10500	10500	10500
Log Price Conversion Factor 4_/		0.57	0.59	0.59	0.59	0.63	0.69
Economic Stumpage Value of Other Wood Products							
A. Peelers							
- Stumpage Value at Market Prices		4200.00	4200.00	4200.00	4200.00	4200.00	4200.00
- Economic Stumpage Value		2402.60	2463.40	2478.60	2493.80	2660.99	2888.97
B. Poles							
- Stumpage Value at Market Prices		2590.00	2590.00	2590.00	2590.00	2590.00	2590.00
- Economic Stumpage Value		1481.61	1519.10	1528.47	1537.84	1640.94	1781.53
C. Short Rotation Sawlogs							
- Stumpage Value at Market Prices		5500.00	5500.00	5500.00	5500.00	5500.00	5500.00
- Economic Stumpage Value		3146.27	3225.88	3245.78	3265.69	3484.63	3783.18

1_/ Based on IBRD, Commodity Price Forecast, February 1992

2_/ Quality differential @ 33%

3_/ All local costs adjusted by SCF of 0.86 for derivation of economic prices

4_/ Economical: Financial ratios

Source:

- Logs (Malaysian), Meranti, Sabah best quality, sale price charged by importers, Japan

4d. Fuelwood

	Unit	1992	1993	1994	1995	2000	2005
AT IMPORT PARITY							
KEROSENE							
FOB Source Price in 1985 Constant	U S/BBL	10.50	10.80	11.30	11.70	14.80	14.10
MUV Multiplier	U S/BBL	1.48	1.48	1.48	1.48	1.48	1.48
FOB Price in 1992 Constant	U S/BBL	15.54	15.98	16.72	17.32	21.90	20.87
Freight and Insurance	U S/BBL	21.00	21.00	21.00	21.00	21.00	21.00
CIF Chittagong at Entry Port	U S/BBL	36.54	36.98	37.72	38.32	42.90	41.87
Exchange Rate (U S = Tk)		38.90	38.90	38.90	38.90	38.90	38.90
CIF Chittagong at Entry Port	Tk/BBL	1421.41	1438.68	1467.46	1490.49	1668.97	1628.67
Port Dues/Handling etc. 3_/	Tk/BBL	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00
Handling/Transport/Storage	Tk/BBL	800.00	800.00	800.00	800.00	800.00	800.00
Value Ex-store/Market	Tk/BBL	3221.41	3238.68	3267.46	3290.49	3468.97	3428.67
Wholesellers Margin	Tk/BBL	900.00	900.00	900.00	900.00	900.00	900.00
Transport/Handling Market-Farmgate	Tk/BBL	100.00	100.00	100.00	100.00	100.00	100.00
Economic Value of Kerosene	Tk/Gallon	46.85	47.24	47.90	48.42	52.48	51.56
Market Value of Kerosene	Tk/Gallon	58.50	58.50	58.50	58.50	58.50	58.50
Conversion Factor for Kerosene		0.80	0.81	0.82	0.83	0.90	0.88
Weighted Fuelwood Conversion Factor (80%*CF+20%*SCF)		0.80	0.81	0.82	0.82	0.88	0.87
Mangrove Fuelwood							
Retail Market Price		1050.00	1050.00	1050.00	1050.00	1050.00	1050.00
Cost of Extraction		500.00	500.00	500.00	500.00	500.00	500.00
Transport		70.00	70.00	70.00	70.00	70.00	70.00
Margin		350.00	350.00	350.00	350.00	350.00	350.00
Stumpage Value at Market Prices		130.00	130.00	130.00	130.00	130.00	130.00
Economic Stumpage Value		104.09	104.79	105.95	106.88	114.09	112.46
Industrial Plantation Fuelwood							
Retail Market Price		1400.00	1400.00	1400.00	1400.00	1400.00	1400.00
Cost of Extraction		500.00	500.00	500.00	500.00	500.00	500.00
Transport		70.00	70.00	70.00	70.00	70.00	70.00
Margin		350.00	350.00	350.00	350.00	350.00	350.00
Stumpage Value at Market Prices		480.00	480.00	480.00	480.00	480.00	480.00
Economic Stumpage Value		384.33	386.91	391.20	394.64	421.26	415.25

1_/ Based on IBRD, Commodity Price Forecast, February 1992

2_/ All local costs adjusted by SCF of 0.80 for derivation of economic prices

Source:

- Average OPEC price (OPEC government sales weighted by OPEC exports).

5. ESTIMATES OF ECONOMIC RENT*

Cost Items	Sawmills		Plywood Mills	
	Log Quality			
	Low	Medium	High	High
	per m ³			
Sales Price - Ex Millgate	21000	24000	28000	32000
Cost of Production				
A. Variable Costs				
- Labour	2163	2472	2884	3296
- Power, fuel, oil	588	588	588	896
- Spare parts and consumable	630	630	630	960
- Maintenance	525	525	525	700
- Misc.	420	520	520	500
Total :	4326	4735	5147	6352
B. Fixed Cost				
- Administration salaries	840	945	945	1200
- Office expenses	630	630	630	960
- Depreciation	420	480	600	640
- Debt servicing	840	1092	1092	1280
- Misc.	210	315	315	320
Total :	2940	3462	3582	4400
C. Profit Margin for the Miller	2100	2400	2800	3200
D. Wood Paying Capability	11634	13403	16471	18048
E. Recovery Rate				
- Paying capability of log at millgate	0.375	0.425	0.475	0.48
	4363	5696	7824	8663
F. Logging Costs				
- Layout - tree marking	61	58	58	58
- Felling and bucking	100	95	95	95
- Yarding and skidding	763	726	726	726
- Loading and unloading	122	116	116	116
- Hauling	419	547	751	832
- Log pond	79	75	75	75
- Road construction	602	573	573	573
- Road maintenance	122	116	116	116
Subtotal :	2269	2306	2510	2591
G. Overhaed Cost	681	692	753	777
H. Profit Margin	454	461	502	518
TOTAL LOGGING COST	3403	3459	3765	3886
I. Estimated Economic Rent (Capability to pay for logs)	960	2238	4059	4777
- Average product price	8400	7200	4200	4800
- Average logging cost	1361	1038	565	583
- Average mill price	1745	1709	1174	1299
- Quality Distribution	0.40	0.30	0.15	0.15
- Average stumpage value	384	671	609	717
- Stumpage value as % of mill gate price of log	22	39	52	55

* High forest logs.

ESTIMATE OF ECONOMIC BENEFIT

Project Description		Benefit Category		Benefit Value	
Item	Quantity	Unit	Value	Item	Quantity
A. Direct Benefits					
1. Increase in production	1000	units	10000	2. Increase in employment	50
3. Increase in income	5000	units	50000	4. Increase in savings	2000
5. Increase in investment	1000	units	10000	6. Increase in government revenue	500
B. Indirect Benefits					
7. Increase in multiplier effect	1000	units	10000	8. Increase in social welfare	500
9. Increase in regional development	1000	units	10000	10. Increase in national income	5000
C. Total Benefits					
Total Direct Benefits			20000	Total Indirect Benefits	
Total Benefits			40000		
D. Costs					
11. Investment cost	1000	units	10000	12. Operating cost	500
13. Maintenance cost	500	units	5000	14. Other costs	200
E. Net Benefits					
Total Benefits			40000	Total Costs	
Net Benefits			30000		

APPENDIX 6
FINANCIAL AND ECONOMIC ANALYSES ASSUMPTIONS

FINANCIAL AND ECONOMIC ANALYSIS ASSUMPTIONS
APPENDIX 6

PROJECT 372001/27
FORESTRY MASTER PLAN,
BANGLADESH (TA NO.1355-BAN)

ASIAN DEVELOPMENT BANK
MANILA PHILIPPINES
DATE: JANUARY 1993

FINANCIAL ANALYSIS

APPENDIX 6
FINANCIAL AND ECONOMIC ANALYSES ASSUMPTIONS

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Economic and financial analyses have been carried out for two major programmes separately and the Master Plan as a whole. Major assumptions underlying financial and economic analysis are outlined below:

Period of Analysis

The Plan will be implemented over a period of 20 years. The life of the Plan has been estimated to be 60 years for Scenario 1 and 50 years for Scenario 2. No residual values have been included in the Master Plan benefits because they are insignificant when discounted after year 20. Full development in terms of different forest products is estimated to be attained in year 30 for Scenario 1 and in year 35 for Scenario 2 based on the projected plantation programmes, rotations and growth rates used.

Life of Infrastructure and Facilities

All building and civil works are assumed to have an economic life of 50 years, equipments, furniture and vehicles 10 years. The cost of replacing these items has been taken into account as and when applicable.

Prices

All Financial and economic prices of different forest products to be produced have been expressed in 1993 constant values. These prices are based on farmgate or plantation-gate prices derived on the basis of prevailing market prices and adjusted by relevant conversion factors. Use of market (financial) prices as a basis for subsequent derivation was considered justified in view of the competitive nature of the market for fuelwood, poles and timber in Bangladesh. The outputs in question are not traded internationally, and therefore, valuing them in terms of imported resources would be inappropriate. Of the output sub-categories, only fuelwood is considered to be close substitute for an import (kerosene). Kerosene, however, is used minimally in rural Bangladesh. Thus, even allowing for a possible future fall in its real price, the true degree of substitutability among fuels in Bangladesh is yet to be established. Given the (IBRD) projected increase in the real price of kerosene between 1988 and 1995 (\$22.5/barrel in 1995 compared with \$16.6/barrel in 1988, both at 1988 constant prices) the possibility of significant fall in the price of an internationally traded substitute for Bangladesh-produce fuelwood (i.e. kerosene) appears unlikely. In any case, a "kerosene priority" price turns out to be substantially above the price used here.

Almost independently of the ups and downs of the world market for crude and its derivatives, real prices of fuelwood have been steadily rising in Bangladesh as have those of timber and poles (by about 1 and 2 per cent per annum respectively). This trend is expected to continue given the acute shortage and expected increasing demand of different forest products. The economic prices for internationally traded commodities (like fertiliser) are based on projected 1995-2000 prices taken from the World Bank Commodity price projections of August, 1992. These have been rebased to 1993 constant prices using the World Bank's Manufacturing Unit Value (MUV) Index.

Foreign Exchange Rate

The Bangladeshi Taka is linked to weighted basket of currencies with US dollar as the intervention currency. It has progressively devalued over the last few years. The prevailing exchange rate of Taka 38.9 = US \$1.00 has been used in the analysis.

Standard Conversion Factor (SCF)

For the purpose of economic analysis, the costs and benefits of the Plan have to be evaluated at world market prices to reflect the real opportunity costs of the country's resources and to measure the country's net economic benefits properly. This requires certain adjustments since most items are not traded in the world market and others are affected by tariffs, subsidies and trade restrictions. To make them comparable i.e. to convert their domestic market prices to border prices, a standard conversion factor (SCF) is applied to the non-traded goods and services in the absence of specific information on the cost composition of these goods and services and specific conversion factors for their components. For valid comparison with other donor assisted project in Bangladesh, a SCF of 0.80 has been applied to all local costs excluding unskilled labour.

Value of Unskilled Labour

The average market wage rate for unskilled labour is estimated at Taka 50 per day in rural Bangladesh. It varies significantly depending on the month and the location. Since there is a wide unemployment and under-employment and seasonality in the demand of unskilled labour, a conversion factor of 0.75 has been applied to reflect the real opportunity cost.

Investment and Recurrent Cost

The costs included in the economic analysis are all initial investment costs, investment cost for replacement, plantation development costs, recurrent expenditures and incremental costs to support directly the forest production and participatory programmes of the Master Plan under both the development options. Taxes and associated with these costs are excluded but physical contingencies are included. Local costs are expressed in border prices after applying SCF of 0.80.

"Without" and "With Plan" Conditions

It has been assumed that no significant changes in the production of different forest products will take place without the Plan intervention which has been considered as Status Quo (without plan) situation. Projections for "without" and "with plan" conditions are based on published reports and Consultant's estimates.

Master Plan Benefits

The major quantified benefits resulting from the implementation of the Master Plan are the primary products - sawlogs, pulpwood, poles and fuelwood - under both the development scenario. The value of incremental net benefits is taken as the Plan's benefit in the analysis. In each case, value of different forest products under the Status Quo situation has been subtracted from the value of production of different forest products estimated under development Scenarios 1 and 2 to obtain the incremental benefit streams. These are expected from better management, use of higher inputs, high yielding species, peoples active participation in the plantation development and maintenance as well as protection of the forest areas. Plan benefits accruing from other programmes are not quantified because of difficulty and also due to the conjectural nature of the benefits.

Plantation Programme and Growth Rates

1. Forest Production

Plantation development for forest production has been proposed mainly in the hill areas which includes existing natural forest, denuded area covering entire Chittagong hilltracts, Chittagong, Cox's Bazar, and Shylhet. For Sal Forest, under both the Scenarios, plantation development will take place on participatory basis on encroached, denuded land and enrichment plantation on low density existing sal forest. Coastal plantation has also been proposed under both the development options. The plantation programme, rotation and the corresponding growth projected by five-year plan period under Scenario 1 and 2 is given in Tables 1 and 2.

Table 1 - Annual Plantation Programme under Scenario 1 (ha)

Rotation Year	MAI m3/ha	Type of Forest	Area to be planted annually by 5-year period			
			1993-1998	1998-2003	2003-2008	2008-2013
40	7.5	Hill forest	3,439	3,073	3,528	5,535
20	12.5	- Do -	10,000	10,000	10,000	10,000
10	15	- Do -	1,350	1,750	3,400	3,500
6-8	15	Sal forest	2,986	2,980	2,986	2,986
20	12.5	- Do -	1,150	1,150	1,150	1,150
20	30	- Do -	1,050	1,050	1,050	1,050
25	7	- Do -	3,000	3,000	3,000	3,000

Table 2 - Annual Plantation Programme under Scenario 2 (ha)

Rotation Year	MAI m3/ha	Type of Forest	Area to be planted annually by 5-year period			
			1993-1998	1998-2003	2003-2008	2008-2013
30	20	Hill forest	4,463	4,558	4,566	4,818
20	30	- Do -	10,000	10,000	10,000	10,000
10	45	- Do -	2,200	2,750	3,350	3,350
6-8	15	Sal forest	2,986	2,980	2,986	2,986
20	12.5	- Do -	1,150	1,150	1,150	1,150
20	30	- Do -	1,050	1,050	1,050	1,050
25	7	- Do -	3,000	3,000	3,000	3,000

2. Participatory Forestry

Strip Plantations - The land along roads, flood embankments and canals to be used for strip plantations cannot be cultivated to agricultural crops because of its physical features as well as the damage systematic cultivation of agricultural crops would pose to the adjoining structures. Planting embankments is largely free of these disadvantages, although it is likely to lead to a loss of grass output mainly due to shading. At the same time, the planted trees will provide certain quantities of foliage, (not counted separately among Project benefits) which will largely substitute for grass for grazing purposes. In addition, shading provided by trees must be considered a real benefit (to both humans, and cattle) under the conditions prevailing in Bangladesh. On balance, therefore, an assumption made here of zero opportunity cost of land to be planted to strips is, if anything, conservative.

Agroforestry - Virtually the entire agroforestry component of the Project will be implemented on land which is currently encroached upon and cultivated (albeit often inefficiently) to agricultural crops. Under the component, part of each encroachment holding will revert to forestry, and trees will therefore replace existing agricultural output in a proportion which depends on the agroforestry model applied and the percentage of total area planted to trees (varying from 20 per cent to 66 per cent of each holding if fruit trees are counted).

For the average holding, trees are most likely to be planted where existing or potential agricultural output is least. The assumption of declining opportunity cost of land is justified even without envisaging future loss of agricultural output on the least fertile portion of land planted to trees, provided it is accepted that the same trees will help productive segments of each holding.

Ground Crops - In many of the plantation components under the project, intercropping will be possible in the early years. A large variety of ground crops will be introduced into the agroforestry component. Based on the experience of the Community Forestry Development Project, the most popular crops will be lentils, mustard, ground nuts and sugar cane (in addition to the pigeon peas). The Plan by no means restricts these crops, but to simplify the analysis, these four crops were considered to be representative examples. It has been assumed that annual crops occupy about 80 per cent of the productive area and that the proportion of land given to each of the four crops is about equal. Yields gradually diminish as shade from trees contains the growth of these crops.

Woodlots - It is assumed that 80 per cent of woodlots will be simple plantations designed to grow fuelwood over an eight to ten-year period. Yields will also include small amounts of poles and fodder.

The remaining 20 per cent of the woodlots will be more complicated to assess. A representative model has been devised based on fuelwood being the dominant product, with lesser amounts of sawlogs and poles produced. Suitable ground crops are intercropped for two years and bamboo and fruit trees planted around the perimeter of the woodlot blocks.

The woodlot component suits land the major part of which (80% of the total) is degraded, and other than some fuelwood, offers little scope for agricultural use. This land, however, is relatively fragile, and if continually used for agriculture is likely to lose its productivity. The remaining portion of the land (5 per cent of the total of proposed woodlots) is low-lying and potentially fertile. If surrounded by trees it could support relatively productive agriculture.

Homestead - Unlike agroforestry or strip plantation, it is necessary to introduce any particular plantation model for private homestead. The average size of homestead area in Bangladesh is estimated to be 0.028 ha and all homestead are already under fruit or forest trees or used as vegetable garden or both. The economic evaluation of this component does not quantify the psychological and other (i.e. shade provision) benefits of this component which are quite likely to be substantial in Bangladesh.

The plantation development programme for the participatory forestry under both the development options are given below:

Table 3 - Annual Plantation Programme under Scenario 1 (ha)

Rotation Year	MAI m ³ /ha	Type of Forest	Area to be planted annually by 5-year period			
			1993-1998	1998-2003	2003-2008	2008-2013
10	15	Strip	590	590	1,180	1,180
10	15	Agroforestr	284	284	508	568
10	15	Woodlot	1,000	1,000	2,000	6,000
20	12.5	Homestead	4,400	4,400	4,400	4,400

Table 4 - Annual Plantation Programme under Scenario 2 (ha)

Rotation Year	MAI m ³ /ha	Type of Forest	Area to be planted annually by 5-year period			
			1993-1998	1998-2003	2003-2008	2008-2013
10	45	Strip Plant	1,656	4,504	7,792	11,521
10	45	Agroforestry-	430	1,720	2,150	2,150
10	45	Woodlot	1,000	2,000	3,000	4,000
20	30	Homestead	10,000	10,000	10,000	10,000
20	30	Khetland	2,500	2,500	2,500	2,500

**APPENDIX 7
REFERENCES**

APPENDIX
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