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GOVERNMENT OF BANGLADESH
MINISTRY OF ENVIRONMENT AND FORESTS

FIVE-YEAR ACTION PLAN

Volume 2



FORESTRY MASTER PLAN

ASIAN DEVELOPMENT BANK (TA NO. 1355-BAN)

UNDP/FAO BGD/88/025

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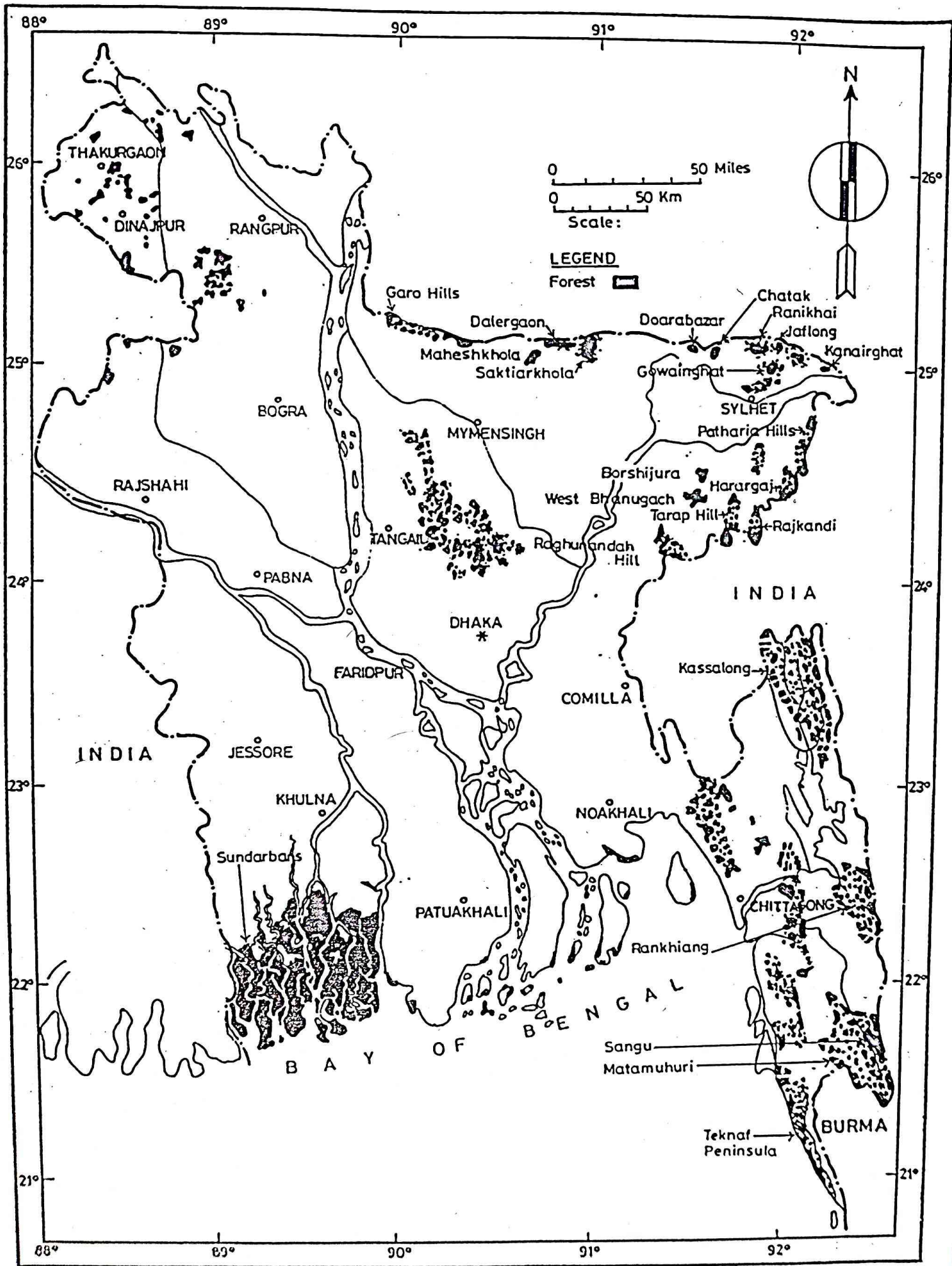
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FORESTRY MASTER PLAN
FIVE-YEAR ACTION PLAN

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Bangladesh - Key Map

FORESTRY MASTER PLAN
FIVE-YEAR ACTION PLAN

INTRODUCTION

General

Government of Bangladesh (GOB¹), assisted by the Asian Development Bank and the United Nations Development Programme is preparing a long term plan to preserve and develop the nation's forest resources. The 20-year Forestry Master Plan provides an overview of the Bangladesh forestry sector. It identifies sectoral strengths and weaknesses and presents an understanding of the steps required to enhance sectoral development.

The Plan recognizes three major focuses for forestry in Bangladesh: people-oriented forestry, production-directed forestry and institutional strengthening. Specific areas of investigation included: forestry institutional aspects, environment and landuse concerns; forest management requirements, forest-based industry prospects and the economic base for the sector. Focus was on institutional factors - policy, education and training and administrative structures. Special interest groups like the landless, women, non government organizations (NGOs), minorities and private industry received additional attention.

The main report comes in three volumes. Volume 1, the Main Plan consolidates the supporting subteam reports while this Five-Year Action Plan (Volume 2) gives details and estimates for work areas of immediate concern. Volume 3 is an Executive Summary which highlights policy measures, required institutional reforms, critical development requirements, sustainable resource strategies and recommended programmes and associated costs.

Five-Year Programmes

Master Plan development proposals consider two essential development options compared to the present day conditions. Scenario 1 adds additional money and peoples and retains, with slight changes, existing systems, technology, institutional structures, working methods, laws and regulations. Scenario 2 represents optimum development and adopts relevant new technology, incorporates institutional changes, plus the staffing and investment necessary to reach goals and targets. Scenario 1 continues to involve government departments and agencies directly in programme implementation as well as supervision. Scenario 2 presumes an entrepreneurial basis and direct implementation by programme participants with only government monitoring and coordination. Scenario 1 represents what is optimistically possible with the existing forestry system, while Scenario 2 measures what is potentially achievable under optimum conditions. There are a multitude of positions between these two alternatives for Government to select.

Five programmes designed especially for direct and visual public benefit involve environment management, participatory forestry, non wood forest products, wood energy conservation and bamboo development. Every citizen of Bangladesh benefits from an improved environment. Participatory benefit programmes are the base for assisting government's poverty alleviation efforts. Energy conservation lowers the demand for fuelwood or animal dung, reducing the pressure on forests and improving agriculture production. The bamboo development programmes help to offset effects of forecast reductions in bamboo, a major home building material for the rural population.

¹ For this and other abbreviations, terms or conversion factors, see Appendix 1.

Other programmes concentrate more directly on production-related forestry - large scale plantations on government forest land combined with wood harvesting equipment and roads, modernizing the sawmill industry and expansion in the pulp and paper industry. Institutional programmes strengthen and support education and training, forest research, human resource development and institutional changes required.

ENVIRONMENT MANAGEMENT

Programme Goals

The main goal of the environment programme is to ensure a balanced and managed environment which contributes towards improved national social and economical conditions, while preserving and improving environment values. This involves five subsidiary goals:

- Strengthening national conservation practices.
- Improving forest management to sustain or improve existing resources.
- Increasing productivity.
- Equitable distribution of forest benefit to disadvantaged groups.
- Improving environment management capability.

Strengthening Conservation - This programme focuses on bringing the present protected area under accepted standards and management and requires:

- Rationalizing the boundaries and preparing management plans for existing areas.
- Modifying relevant legislation to support the new goals and strategy.
- Developing and implementing endangered species action plans.
- Creating and empowering a new natural resources conservation department responsible and accountable for protecting wildlife, preserving biological variety and managing protected areas.
- Building up specialized national conservation facilities in the form of botanical gardens, herbaria and zoos.

Improving Forest Management - Meeting the goals defined by the recently agreed international environment management accord for sustained resource management means:

- Developing silviculture systems and practices which eliminate destructive impacts from harvesting and planting activities.
- Revising all existing, and new, forest management plans to include effective watershed, soil and wildlife protective measures.
- Regular continuous monitoring and reporting of forest conditions.
- Implementing the convention on biodiversity.

Increasing Productivity - The proper way to achieve this involves:

- Concentrating attention on existing and new plantations rather than the remaining natural Hill Forests.
- Introducing core and buffer areas zoned for multiple use management and production for different levels and types of uses, users and benefits.

Table 1 - Environment Management Action Plan, Scenario 1

Activity	Units	Year 1	Year 2	Year 3	Year 4	Year 5
Programme (Cumulative)						
1. Strengthen Department of Environment Building\Construction Vehicles	no.	-	-	-	3	7
	no.	7	14	20	27	32
2. Training\Technology Transfer Staff Target Group	no.	40	70	100	125	140
	no.	170	800	2,500	5,800	10,000
3. Research, Development, Studies Inventory, Survey, Studies Evaluation	no.	10	15	20	25	31
	no.	-	1	5	10	15
4. Consultants	month	350	600	800	1,000	1,150
5. Botanical\Zoological Conservation						
5a. Nature Conservation Centres	no.	-	2	3	5	7
5b. Natural History Museum	sets	-	-	-	-	1
6. Expand\Develop Protected Area						
6a. Old\New Parks\Sanctuaries	no.	-	-	2	4	6
6b. Resthouse	no.	-	2	3	5	10
Schedule						
Programme Planning						
Vehicle\Equipment - Tender - Evaluation						
Construction - Planning\Design - Supervision\Implement.						
Training - Programme Design - Overseas - Local - Target Group						
Research\Development Studies\Surveys Evaluation						
Consultants						
Conservation - Planning - Site Selection - Construction						
Protected Areas - Planning - Site Selection - Construction						
Activity						

- Recovering open and sparsely covered areas with species producing a wider variety of intermediate multipurpose products.

Equity Factors - Helping to make a more equal distribution of benefits will require:

- Effective local public involvement in resource planning, decisions, activities and management.
- Rationalizing forest reserve areas, particularly in the Chittagong Hill Tracts.
- Developing programmes which support or positively impact special groups - the poor, women and tribals.
- Integrating forestry programmes with other rural development activities.
- Introducing community-based resource management primarily controlled by and benefiting local residents.
- Actively involving NGO groups in local development.

Environment Management - Strengthening local capabilities to more effectively manage and plan resource development requires:

- Environment impact assessment training for Forest and Environment Department staff.
- Forming a coastal management development authority to manage coastal development in a coordinated and controlled fashion.
- Improved monitoring and evaluation of forestry activity and environment impact.
- Coordinating and implementing forestry development with the evolving national environmental management strategies and action plans.
- Keeping fringe coastal areas in mangroves, creating plantations on accreting areas, and prohibiting low-technology shrimp farming from further expansion.

Programme Description

1. Field Programmes

Environment improvement centres on three field and four support programmes. Field programmes include:

- **Botanical/Zoological Conservation** - building up specialized national facilities with herbaria, nature conservation centres, a national zoo and natural history museum.
- **Protected Area Expansion and Development** - physical improvement and facilities assisting the protection and management of existing protected areas, development of national parks and creation of a network of resthouses in parks and sanctuaries to support nature tourism.
- **Community-Based Resource Management** - a programme directly supporting and funding communities to become directly involved in planing, developing and benefitting from adjacent forest resources.

Table 2 - Environment Management Action Plan, Scenario 2

Activity	Units	Year 1	Year 2	Year 3	Year 4	Year 5
Programme (Cumulative)						
1. Strengthening Environment Management						
1a. New Resource Conservation Department Building\Construction Vehicles	no. no.	- 15	- 30	- 43	3 59	7 69
1b. Equip Environment and Forestry Dept Equipment	no.	-	2	2	2	2
2. Training\Technology Transfer						
Staff	no.	45	75	110	135	150
Target Group	no.	1,000	5,000	15,000	35,000	60,000
3. Research, Development, Studies						
Inventory\Survey\Studies	no.	10	15	20	25	29
Evaluation	no.	-	5	15	30	50
4. Consultants	month	400	700	900	1,100	1,300
5. Botanical\Zoological Conservation						
5a. Herbarium	no.	-	1	3	6	10
5b. Nature Conservation Centres	no.	1	3	6	9	13
5c. National Zoo	no.					1
5d. Natural History Museum	no.					1
6. Protected Area Expansion\Development						
6a. Old\New Parks\Sanctuaries	no.	-	1	2	4	6
6b. Resthouse	no.	-	5	10	15	30
7. Community Resource Management						
Communities	no.	-	5	20	75	150
Schedule						
Programme Planning\Monitoring						
Vehicle\Equipment - Tender						
- Evaluation						
Construction - Planning\Design						
- Supervision\Implementation						
Training - Programme Design						
- Overseas						
- Local						
- Target Group						
Research\Development						
Studies\Surveys						
Evaluation						
Consultants						
Conservation - Planning						
- Site Selection						
- Construction\Procurement						
Protected Areas - Planning						
- Site Selection						
- Construction\Procurement						
Community Resource Management, Planning						
- Community Surveys						
- Training						
- Implementation						
Activity						

2. Support Programmes

Support programmes assist in institutional areas, planning and coordination, they include:

- **Strengthened Environment Management** - This programme has two components, first, the creation of a new MOEF natural resource conservation department. The second component provides monitoring equipment to the existing Forest and Environment Departments.
- **Training** - Training provides departmental staff with environment impact assessment capability and gives environment management support to beneficiary or local groups involved or affected by field programmes.
- **Research and Development** - Covers the costs of inventories, surveys, planning studies, monitoring and evaluations to support physical development or institutional changes - new legislation or regulations or revised forest management plans.
- **Consultants** - This item pays for specialized technical knowledge for field or institution support programmes.

Action Plan

Scenario 1 action plan is illustrated in Table 1 and Scenario 2 in Table 2. Scenario 1 differs from Scenario 2 chiefly in three ways. First, the intensity and investment levels of common programmes is less. Second, community-based resource management and zoo and natural history museum facility construction are absent. Finally, existing departmental structures retain their traditional roles with modest strengthening provided.

PARTICIPATORY FORESTRY

Programme Goals

In Bangladesh participatory forestry means programmes implemented on private land, encroached Sal Forest land or on under used land under the jurisdiction of government departments other than the Forest Department. In the Master Plan the recognized programme goals are to:

- Attack the dual problems of poverty and encroachment in a positive replicable manner.
- Support private small farmer forestry.
- Increase productivity of under used government land.

Participatory forestry programme success depends on:

- Well organized social group involvement with clear strong understandings amongst members of group responsibilities and relationships, combined with enforced common shared property rights and protection duties for individuals.
- Good logistics and supply of inputs, including credit facilities.
- A focus on short term personal income gain for individual members.

- A responsive extension service linked to productive research and technology.
- Strong, transparent and sincere sponsor involvement.
- Guaranteed beneficiary rights to benefits.

Master Plan participatory programmes employ the following specifications to make them attractive to local participation.

- Favourable original and renewable terms on leased land, regardless of owner. Scenario 2 programmes consider the minimum lease as 20 years, allowing one rotation for quick growing timber species. Scenario 1 presumes a shorter period of at least seven years compared to today's conditions, ie. a one year renewable term.
- Signed and completed benefit sharing agreements, enforceable, transferable and inheritable.
- The sponsoring agency (including the Department) guarantee the length of tenure and rights of participants on other government leased land.
- Incentives where required, but subject to performance, to a maximum of three years.
- The fundamental technical requirement of certified and genetically improved seedlings.
- Using proven species only not unproved ones.
- More species choice for different sites and end products.
- Specially designed components and programmes for disadvantaged groups.
- Special credit facilities available through the normal agricultural banking system.
- Development of marketable products and an equitable marketing system.
- Adequate technical and extension staff and extension services to rural groups.
- Group formation amongst participants.
- NGO involvement for more effective programme implementation.

Programme Description

1. Field Programmes

Required field programmes suit a wide variety of land ownership and use categories based on income creation from tree planting. To these, support comes by providing technical advice, training and supporting/improving field extension. Field programmes are five in number and include.

- **Agroforestry** - Illegal settlers in the Sal Forest area grow fuelwood and light pole species, on a portion of encroached land, in return for the right to grow agriculture crops.
- **Woodlots** - Villagers, typically tribals, surrounding degrading Sal Forests, share in fuelwood and pole plantations established by BFD, in return for protecting the plantations.

- **Strip Plantations** - Landless people raise a mixture of species on the margins of roads, highways, rail roads, canals. Raised on flood protection embankments, these plantations also mitigate cyclone damage.
- **Homesteads** - Provide seedlings for planting private farmyards and homestead gardens.
- **Field Planting** - Provide seedlings for farmer to use on uncultivated land, sparsely planted in cultivated fields or on property boundaries.

Table 3 - Participatory Forestry Action Plan, Scenario 1

Activity	Units	Year 1	Year 2	Year 3	Year 4	Year 5
Programme (Cumulative)						
1. Improve Extension Services Building\Construction* Vehicles	no. no.	30 55	70 125	130 225	280 475	365 623
2. Training\Technology Transfer Staff Target Group	no. no.	60 4,100	130 10,000	250 18,800	510 37,500	680 50,000
3. Consultants	month	50	70	100	125	150
4. Poverty Alleviation\Anti Encroachment						
4a. Agroforestry	families	200	500	800	1,100	1,400
4b. Woodlot	families	1,400	3,200	5,600	7,800	10,000
4c. Strip Plantation	families	800	1,900	3,300	4,600	5,900
4d. Homestead	families	112,000	225,000	338,000	451,000	563,200
Total		114,400	230,600	347,700	464,500	580,500
Schedule						
Programme Planning						
Vehicle\Equipment Procurement Tender Evaluation						
Construction, Planning\Design Supervision\Implementation						
Training - Programme Design						
- Overseas						
- Local						
- Target Group						
Research Development, Evaluation						
Consultants						
Poverty Alleviation\Anti Encroachment, Planning Seedling Production Planting\Maintenance Supervision						
Activity						

* Offices, residence and nurseries

2. Support Programmes

Support programmes envisaged are:

- **Consultant Services** - This is specialist assistance in such areas as women and tribals, social surveys, special programme design and evaluation, training and extension skills.

• **Training** - Includes overseas and local staff training in extension, public education and communication techniques; other government departments in forestry awareness and linkages; and target groups in practical technical knowledge, environmental awareness, group formation, family health and education.

• **Extension Service Support and Infrastructure** - Provides equipment, vehicles, staff salaries and operating cost for the required extension programme.

Table 4 - Participatory Forestry Action Plan, Scenario 2

Activity	Units	Year 1	Year 2	Year 3	Year 4	Year 5
Programme (Cumulative)						
1. Strengthen\Support Extension Services Building\Construction* Vehicles	no.	75	180	330	680	900
	no.	90	210	380	790	1,040
2. Training\Technology Transfer Staff Target Group	no.	110	260	475	975	1,300
	no.	8,000	20,000	38,000	75,000	100,000
3. Consultants	month	100	140	200	250	300
4. Poverty Alleviation\Anti Encroachment						
4a. Agroforestry	families	300	700	1,200	1,650	2,150
4b. Woodlot	families	1,400	3,200	5,600	7,800	10,000
4c. Strip Plantation	families	2,300	5,300	9,200	12,900	16,500
4d. Homestead	families	1,280,000	2,560,000	3,840,000	5,120,000	6,400,000
4e. Field planting	families	4,300	8,600	12,900	17,200	21,500
Total		1,288,300	2,577,800	3,868,900	5,159,550	6,450,150
Schedule						
Programme Planning\Monitoring						
Vehicle\Equipment Procurement Tender Evaluation						
Construction, Planning\Design Supervision\Implementation						
Training - Programme Design						
- Overseas						
- Local						
- Target Group						
Research Development, Studies Evaluation						
Consultants						
Poverty Alleviation\Anti Encroachment Planning						
Family Selection						
Nursery Programme						
Beneficiary Planting\Maintenance						
Activity						

* Offices, residence and nurseries

Action Plan

Tables 3 and 4 present action plans for Scenario 1 and 2, respectively. Scenario 1 programmes differ from Scenario 2 in three respects - programme size, intended level of public involvement and one new programme in Scenario 2. Scenario 2 contemplates a doubling in training efforts for both staff and programme participants. In field planting programmes there is a tenfold increase in targeted families, principally directed to farmer and homestead planting. Scenario 2 presumes full fledged unimpeded public involvement and programme direction, while Scenario 1 is freer than present, but is still inhibited by government control and direction. Scenario 2 introduces a programme of open field or boundary planting for farmers.

WOOD ENERGY CONSERVATION

Programme Goals

Wood energy goals are to reduce the volume of wood used for fuel and the amount of animal dung used as a wood fuel substitute in the major fuelwood deficit areas - the north central, north western and western regions of the country. This requires:

- Coordinating wood energy policy with other energy sectors of the economy.
- Supporting widespread energy conservation measures.
- Increasing fuelwood supplies.
- Reducing wastage.
- Encouraging energy substitution.

Coordinated policy development involves policy changes and implementation offers the most immediate way to reduce wood energy consumption. Quick results are available by eliminating fuelwood use in the brick industry and in government road construction projects. Continuing the moratorium on the use of fuelwood for brick burning requires strict enforcement. This means:

- Supplying alternative fuels at fair prices, even in the remote areas, eg. natural gas or coal, possibly subsidized.
- Government projects buying only coal-fired bricks.
- Barring both public works and highways from using fuelwood in road tarring. Bottled gas is a readily available substitute.

Planting trees is the best long term way to increase fuelwood supplies. However, this only makes sense if trees are grown for other purposes and fuelwood is a by product. Tree planting projects which both attack poverty and supply more fuelwood service dual social goals. Conserving fuelwood is the second most effective long term option. Improved stoves are available which reduce energy losses and uses less fuel.

It is uneconomic now to use high forest extraction timber waste as fuelwood since it requires much transportation to market. Manufacturing charcoal and wood briquettes from the waste timber left behind during extraction converts the wastes to charcoal economically and reduces transportation costs. This is only necessary as long as the present high forest silviculture system continues. Adopting a new

silviculture system may eliminate the current waste if it no longer becomes necessary to remove all remaining vegetation following timber extraction operations. There are a number of substitutes for fuelwood. Use of biogas is a possible economic option, and a viable technology is readily available. Another possibility is solar timber kilns, which are commercially technically and economically viable.

Programme Description

1. Field Programmes

Wood energy conservation includes three field programmes:

- **Improved Stoves** - Supply of improved stove designed for distribution in the large villages and district towns and directed mainly to the lower income levels.
- **Biogas Plants** - Installation of biogas plant generating methane from cow manure and directed to higher income families owning livestock.
- **Introduction of Charcoal Kilns** - Adoption of charcoal making to convert unused logging wastes to an economically marketable fuel product.

Table 5 - Wood-Based Energy Conservation Action Plan, Scenario 1

Activity	Units	Year 1	Year 2	Year 3	Year 4	Year 5
Programme (Cumulative)						
1. Strengthen Extension Public Education Vehicle	no.	10	20	35	40	55
2. Training\Technology Transfer Staff Target Group	no.	70	110	160	210	228
	no.	200	400	600	800	1,000
3. Research, Development, Studies	no.	2	3	3	4	5
4. Rural Energy Conservation Programme Improved Stoves ^b	families		0.28	.57	0.85	1.0
Schedule						
Vehicle\Equipment Procurement Tender Evaluation						
Training - Programme Design - Local - Target Group						
Research\Development, Studies Evaluation						
Public Education Programme						
Improved Stove Distribution						
Activity			= Heavy		= Light	

^b Million of families

2. Support Programmes

Three support programmes supply the planning, training, extension and public education programmes back stopping the field programme, as follows:

- **Research and Development** - Funds planning studies to focus programme efforts and evaluate field results.
- **Training** - Provides extension staff with the special skills required to transfer the skills needed in the field programme and training of target groups and beneficiaries.
- **Strengthen Extension and Public Education** - Provides vehicles, equipment, staff and operating costs to support the wood energy conservation programme annual overhead and operating costs.

Table 6 - Wood-Based Energy Action Plan, Scenario 2

Activity	Units	Year 1	Year 2	Year 3	Year 4	Year 5
Programme (Cumulative)						
1. Strengthen Extension Public Education Vehicle	no.	15	30	45	55	69
2. Training\Technology Transfer Staff Target Group	no.	75	125	180	230	253
	no.	900	4,600	14,000	32,000	55,000
3. Research, Development, Studies Evaluation	no.	4	7	9	11	13
	no.	-	2	4	6	7
4. Energy Conservation Programme Improved Stoves ^b Biogas Plants Charcoal Kilns	families	-	0.28	.57	0.85	1.00
	families	-	1,000	2,500	6,500	10,000
	no.	-	100	250	600	1,015
Schedule						
Programme Planning, Monitoring, Coordination						
Vehicle/Equipment Procurement Tender Evaluation						
Training - Programme Design						
	- Overseas					
	- Local					
- Target Group						
Research\Development, Studies Evaluations						
Field Programme	Public Education Programme					
	Organize Stove Manufacture					
	Arrange Stove Distribution					
	Charcoal Production					
	Biogas Plant Institution					
Activity						

^b Million of families

Action Plan

Tables 5 and 6 present Scenario 1 and 2 actions plan. Scenario 1 differs from Scenario 2 in having a lower level of common programme activities plus two fewer field conservation programmes. Much more effort goes into beneficiary training in Scenario 2 and more intensive efforts go to public education. The two new field programmes encourage the use of biogas plants in the more energy

deficient regions of the country and support the manufacture of charcoal from the wasted material now remaining after Hill Forest wood harvesting operations.

NON WOOD FOREST PRODUCTS

Programme Goals

Developing non wood forest products (NWFP) is an important area with tremendous potential to create employment, support widespread economic development and help reduce poverty. Government's role is supporting and facilitating development, arranging reasonable credit, increasing raw material supplies, and supplying training and extension services. Specific project identification is best left to individual entrepreneurs or active NGOs.

Non wood products are not actively developed presently and therefore do not appear in Scenario 1. Scenario 2 programme goals:

- Target enterprise-driven programmes facilitated, by but without GOB direct investment.
- Call for a high level of effective local participation and benefit.
- Involve private as well as forest land.
- Support established, but now declining industries.

Principal programmes to improve Bangladesh's non wood products resource and industry must involve:

- Coordinated GOB institutional support backed by a development policy integrating national social and economic goals.
- Introducing better technical management and effective, positive regulation.
- Financial support and credit facilities.
- More advanced processing technology and product development.
- Research and development of appropriate growing, harvesting, and processing methods.

Programme Description





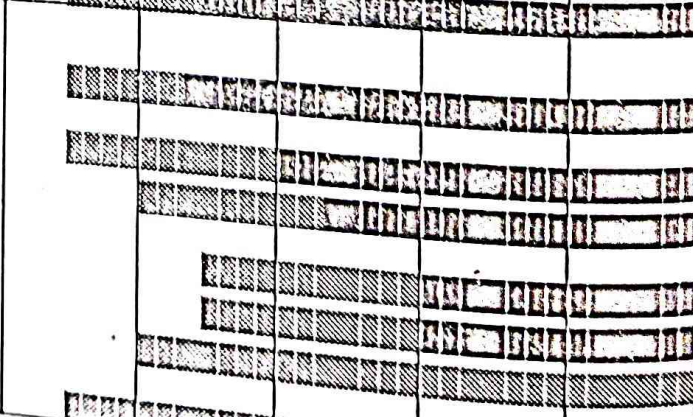
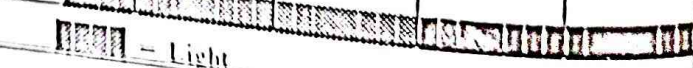
NWFP programmes focus on separate packages supporting major products commonly used in rural Bangladesh. Some products are also exported as handicrafts. Excepting golpatta, all raw material supplies are declining, reducing investment and employment in the relevant industries. In the case of golpatta, existing natural supplies are below requirements. Most industries employ outdated equipment or use time-honoured manual processing and traditional product designs. Marketing and product development needs attention particularly for the export market. Owing to the wide variety of products and different raw materials, the handicraft or cottage industry lacks a formal organization and structure. This makes introducing new working methods and business practices fragmented and difficult to organize.

Recommended programmes therefore all include provision for accurate assessment of existing and potential resources and plantation programmes to boost supplies. The next most common feature is training to introduce new growing, processing and marketing techniques, followed by provision of equipment and infrastructure to rebuild previous institutions which supported a profitable industry.

Table 7 - Non Wood Forest Products Action Plan, Scenario 2

Activity	Units	Year 1	Year 2	Year 3	Year 4	Year 5
Programme (Cumulative)						
1. Rattan Development Plantation* Training - Staff - Target Group	ha no. no.	500 5 400	1,500 10 800	3,000 20 1,800	4,500 30 3,000	6,000 38 4,000
2. Lac Development Plantations Demonstration\Brood Farm Training - Staff - Target Group	ha no. no.	- - 20	100 - 30 500	300 1 40 1,000	750 2 45 1,600	1,680 3 53 2,585
3. Lali\Catechu Plantation Training - Staff - Target Group	ha no. no.	- 5 700	100 8 1,600	250 9 3,500	450 10 6,000	715 10 9,000
4. Murta Development Plantations Craft School Training - Staff - Target Group	ha no. no. no.	100 - 15 200	400 1 20 400	800 1 25 800	1,400 1 30 1,400	2,660 1 30 2,075
5. Medicinal Plant Farms Plantations Demonstration Farms Training - Staff - Target Group	ha no. no. no.	- - 12 50	50 1 15 100	200 2 18 175	450 3 20 300	880 3 24 450
6. Hogla Development Plantations Training - Staff - Target Group	ha no. no. no.	10 2 10	20 3 20	25 4 25	40 4 40	60 4 60
7. Golpatta Development Plantations Training - Staff	ha no.	10 3	40 4	80 5	130 6	210 6

Schedule

Planning, Coordination, Monitoring	
Vehicle\Equipment Tender Evaluation	
Construction Planning, Design, Supervision Lac Institute Rehabilitation\Brood Farms Murta Development, Craft Centre Medicinal Plant Farm	
Training\Technology Transfer Programme Design Overseas Local Target Groups	
Plantation Development Forest, Other Government and Private Land Rattan Forest and Private Land Murta Medicinal Plant Farm Other State and Private Land Lac Lali Hogla Forest Land Golpatta	
Activity	

* Includes tea garden and commercial plantation

Recommended programmes according to priority are:

- **Rattan Development** - Building up rattan supplies in Bangladesh on unused private, tea garden and Unclassified State Forest land and underplanted on forest plantations. This involves forest villagers, farmers, commercial companies and government directly. Training provides new technology on growing, harvesting and processing for growers, manufacturer and retailers, plus training for extension and research workers. This component will make the latest technology available in Bangladesh.
- **Lac Development** - A programme to spread host tree planting on farmland and unused other government land, raising shellac-producing insects, establishment of several lac demonstration and brood farms, support and infrastructure for the local lac institute, and research training in lac technology for local scientists, and extension workers.
- **Lali/Catechu** - This programme builds up plantation of khair trees on vacant or unused other government and farm land, supported by a major extension programme, training for local research and extension workers and beneficiaries plus support for staff and operating costs.
- **Murta** - The programme for murta includes: substantial additions to existing areas; an extension programme and training for local researchers, extension workers, beneficiaries, participatory farmers, growers and village craftsmen. The murta industry has major potential for expansion and development with very little investment, but it needs new ideas and processes.
- **Medicinal Plants Farms** - This programmes involves forest villagers, farmers, tea gardens and drug companies growing a wide variety of plants on unused private or degraded forest land, or underplanted on forest plantations. Landless groups could use unused other government or degraded forest land. A training component involves local extension, technical and research staff, plus participants in suitable species growing, harvesting and primary processing techniques.
- **Hogla Development** - Very little information exists to anchor a definite programme. Therefore, initial hogla development is principally to assess existing resources, potential growth, and management requirements. These results would form the basis for a future investment programme. In the meantime, one segment of the programme assists existing villages with hogla resources to manage them more effectively and profitably.
- **Golpatta** - This programme consists of plantations to increase supply of this palm leaf, plus research training to local scientists in resource management technology.

Action Plan

All the above programmes make up Scenario 2 programme, there is no Scenario 1 programme, Table 7 includes the action plan.

BAMBOO DEVELOPMENT

Programme Goals

Bamboo is a critical resource for Bangladesh's peasant community who depend on it for shelter and in some cases for their livelihood. Goals of the proposed bamboo development should achieve the following:

- Substantially offset forecast reduced supply.

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- Keep bamboo prices as cheap as possible.
- Increase employment and income from village level bamboo industries.
- Improve bamboo products quality and design in the local and export markets.
- More effective bamboo research.

Table 8 - Bamboo Development Action Plan, Scenario 2

Activity	Units	Year 1	Year 2	Year 3	Year 4	Year 5
Programme (Cumulative)						
1. Resource Management\Development						
Natural Regeneration	ha	200	1,000	2,500	6,500	10,000
Plantation - Private	ha	10	50	130	250	575
- State	ha	100	500	1,300	2,400	5,700
2. Preservative Treatment (Culm)	million	1.0	4.8	12.0	31.1	47.8
3. Craft Training Centre	no.			1	1	1
4. Training - Staff	no.	2	4	6	6	6
- Beneficiaries	no.	200	800	2,000	5,200	8,000
5. Research, Development, Studies						
Germplasm Centre Construction	no.					1
Tissue Culture Laboratory	no.					1
Schedule						
Programme Planning Coordinations, Monitoring		██████████	██████	████	████	████
Resource Management\Development						
Establish\Maintain Research Plots			██████████	██████████	██████████	██████████
Natural Regeneration		██████████	██████████	██████████	██████████	██████████
Farmer Training		██████████	██████████	██████████	██████████	██████████
Plantation Establishment		██████████	██████████	██████████	██████████	██████████
Product Development\Improvement						
Establish Treatment Centres			██████████	██████████	██████████	██████████
Preservation Treatment Demonstration			██████████	██████████	██████████	██████████
Craft Training Centre						
Construction Design\Supervision				██████████	██████████	██████████
Equipment\Vehicle Procurement					██████████	██████████
Training			██████████	██████████	██████████	██████████
Research\Development						
Germplasm Centre Construction					██████████	██████████
Tissue Culture Laboratory					██████████	██████████
Training					██████████	██████████
Activity		██████ = Heavy	██████ = Light			

Programme Description

Since bamboo receives little attention presently, there are no appropriate programmes for Scenario 1. Scenario 2 programmes focus activities in three major areas - resource management and development, product development and improved research. The three envisaged programmes are:

- Resource Management and Development - Assesses the national bamboo resources, introduces scientific management, establishes plantations, assists natural regeneration, and gives bamboo extension and training to rural farmers.
- Product Development and Improvements - Widespread introduction of simple preservation treatments, and establishes a crafts training centre to improve products design and quality.
- Research - Creates a separate bamboo division under the research institute, begins a bamboo germplasm centre, starts a tissue culture laboratory, and funds scientist manpower training.

FOREST PRODUCTION AND MANAGEMENT

Programme Goals

Bangladesh's forests today are exploited beyond natural capacity and are deteriorating steadily. The nation's forest management goals include:

- Reducing forest product shortages.
- Improving forest management practices.
- Reducing deforestation and encroachment.
- Involving NGO participation.
- Minimizing environment damage.
- Keeping all forest land under technically sound and approved working plans.

Lessening forest product shortages primarily involves developing higher yielding species, replacing existing poor quality plantation by higher yielding ones, and reforesting bare Reserve Forest and USF land under BFD control. Secondary tactics includes, raising utilization standards, encouraging composite wood products, and focusing planting to the major wood deficit regions.

Better forest management requires adopting and following non harmful silvicultural practices, preserving the maximum amount of natural forest, making intensive high yielding plantations the cornerstone of management, keeping harvest levels within realistic sustained yield limits, and paying a concerted effort to the social and economic benefit gained from increased non wood forest products supplies.

Deforestation and encroachment are controllable through local community involvement in protecting and managing resources, adopting effective public-benefiting forestry programmes, and by developing positive special programmes in areas with abnormal forest losses.

Increasing NGO involvement serves to promote group development and transparent, locally managed forestry programmes, links all planting to processing activities, ensures programmes generate short term incomes and generates activities which organize local participation.

Some existing environmentally harmful forest management practices need controlled by terminating hill forest extraction as quickly as possible, insisting on properly designed permanent roads, taking special precautions in harvesting operations and plantation establishment to protect soil and watershed values, and defining the higher technical practices needed to protect against soil and watershed damage.

Programme Description

Plantation programmes breakdown into two types, depending on main objective - industrial and environmental, this classification is not by any means mutually exclusive. Industrial areas will generate exceptional environment benefits and values by replacing bare, low quality, sparse or degraded areas by denser vegetation cover. Environment areas will yield commercial wood products but not to the same extent as industrial plantations.

Within industrial plantations, three are envisaged, while environmentally targeted plantations have four types. Industrial plantation programmes are:

- **Timber Plantations** - These are the longer growing, denser, more valuable species located on the better quality land in the major hill reserved forests. The species are grown for their high value and special uses.
- **Timber and Pole Plantations** - this component uses lighter, less dense and lower value local and exotic species grown for both timber and pole values. Located on better quality land bordering on, or land outside reserved hill forests, unclassified forest or coastal areas.
- **Pulpwood Plantations** - Here are light, fast growing local species located on barren or degraded reserved or unclassified forest areas close to population centres.

Table 9 - Forest Production and Management Action Plan, Scenario 1

Activity	Units	Year 1	Year 2	Year 3	Year 4	Year 5
Programme (Cumulative)						
1. Industrial Plantations						
1a. Timber	ha	2,700	5,500	8,000	11,000	13,800
1b. Timber and Poles	ha	10,000	20,000	30,000	40,000	50,000
1c. Pulpwood	ha	1,500	2,900	4,300	5,800	6,700
Total	ha	14,200	28,400	42,300	56,800	70,500
2. Environment Plantations						
2a. Sal Forest Rehabilitation	ha	1,100	2,200	3,200	4,300	5,800
2b. Parks/Game Sanctuaries	ha	600	1,300	1,900	2,600	3,300
2c. Cyclone Protection	ha	2,500	5,000	7,200	10,000	12,500
Total	ha	4,200	8,500	12,300	16,900	21,600
Total Plantation	ha	18,400	36,900	54,600	73,700	92,100
Schedule						
Industrial Plantations, Planning						
Area Selection		██████	██████	██████	██████	██████
Mapping		██████	██████	██████	██████	██████
Nursery Preparation		██████	██████	██████	██████	██████
Planting			██████	██████	██████	██████
Cultural Operations		██████		██████	██████	██████
Environment Plantation, Planning						
Mapping		██████	██████	██████	██████	██████
Area Selection		██████	██████	██████	██████	██████
Nursery Preparation		██████	██████	██████	██████	██████
Plantation Establishment		██████	██████	██████	██████	██████
Activity		██████ = Heavy	██████ = Light			

Two other differences exist - Scenario 2 planting targets are higher, by 20% overall, and include two additional components compared to Scenario 1 - watershed protection and more attention to rejuvenating the Sal Forest.

The principal differences between Scenario 1 and 2 forest production programmes are the growth rates targeted. Scenario 1 adopts the growth rate standards obtained in Bangladesh with the extensive level of forest management practices in the 1960's, when industrial forest development began in Bangladesh. Scenario 2, on the other hand, targets a substantial increase in growth rates and absolutely depends on intensive forestry practices, responsive and target-oriented research and regular increased yields from genetically improved seedling stock. Scenario 2 demands the most advanced technical practices and continuous advance and improvement.

Table 10 - Forest Production and Management Action Plan, Scenario 2

Activity	Units	Year 1	Year 2	Year 3	Year 4	Year 5
Programme (Cumulative)						
1. Industrial Plantation						
1a. Timber	ha	4,400	8,900	13,000	17,800	22,300
1b. Timber and Poles	ha	7,600	15,400	22,600	30,900	38,700
1c. Pulpwood	ha	2,200	4,400	6,400	8,800	11,000
Total		14,200	28,700	42,000	57,500	72,000
2. Environmental						
2a. Watershed Protection	ha	2,000	4,300	6,200	8,500	11,200
2b. Sal Forest Rehabilitation	ha	2,100	4,400	6,300	8,600	11,500
2c. Parks\Game Sanctuaries	ha	600	1,300	1,900	2,600	3,200
2d. Cyclone Protection	ha	3,000	6,000	8,700	12,000	15,000
Total		7,700	16,000	23,100	31,700	40,900
Total	ha	21,900	44,700	65,100	89,200	112,900
Schedule						
Industrial Plantations, Planning						
Area Selection						
Arrange Local Agreement						
Mapping						
Nursery Preparation						
Planting						
Cultural Operations						
Watershed Protection Planning						
Survey Degraded Areas						
Select\Confirm Areas						
Mapping						
Arrange Local Agreements						
Seedling\Nursery Programme						
Planting						
Cultural Operations						
Environment Plantations, Planning						
Survey\Map Areas						
Arrange Local Agreement						
Select\Confirm Areas\Agreement						
Planting Cultural Operation						
Activity						

Plantations intended primarily for environmental purpose include:

- **Watershed Protection** - Plantation species grown on existing barren or degraded areas specifically identified for watershed protection, or already subject to erosion. More productive sites would support timber and pole species and the least productive areas the pulpwood species. These areas will require longer growing periods and extra precautions for extraction and roads construction compared to the industrial targeted areas.
- **Sal Forest Rehabilitation** - This component involves two parts, reforesting open areas and enrichment planting in open areas plus the replacement of the old plantations. This involves local and introduced species with a wide variety of uses and products in addition to sal.
- **Parks and Game Sanctuaries** - Many of the existing designated areas lack adequate forest cover. This programme would reforest a major portion of the existing protected areas now without effective forest cover and improve the forested areas in national parks.
- **Cyclone Protection** - This programme afforests all the newly accreting land in the Bay of Bengal.

Action Plan

Forest production action plans for Scenarios 1 and 2 are in Tables 9 and 10.

FOREST INDUSTRY

Programme Goals
















The industry needs relevant supporting legislation, regulations and workable guidelines and necessary infrastructure. Also lacking are accurate and up to date information concerning technical, economic and trade conditions, and adequate and appropriate financing. There is little attention given to worker skill training and upgrading, while research and new technology is ignored or not accessed. Trade and manufacturing organizations and associations are weakly developed, as a result information does not flow freely between and across the various industries involved. The industry would benefit from the development of a market-oriented economy operating in a more favourable business background. In addition, there is a need for regular assessment and review of the effects of industrial uses and practices on the environment. Finally, Government cannot expect a productive, efficient industry until such time proposals include one for wood harvesting and another for industrial development.

1. Wood Harvesting

Harvesting development needs attention mainly in two main investment areas - provision of mechanical logging equipment and a permanent road system. Immediate goals are to:

- Re-equip BFIDC's extraction operation in the Kassalong Reserved Forest.
- Eliminate potentially harmful effects from road construction.
- Determine the feasibility of developing inaccessible areas and plantation logging systems.

Table 11 - Wood Harvesting Action Plan, Scenario 1

Activity	Units	Year 1	Year 2	Year 3	Year 4	Year 5
Programme						
1. Mechanical Extraction High Forest Plantation Total	m ³ \A m ³ \A	117,000 <u>5,000</u> 122,000	117,000 <u>10,000</u> 127,000	117,000 <u>20,000</u> 137,000	117,000 <u>30,000</u> 147,000	17,000 <u>45,500</u> 62,500
2. Training - Overseas - Local*	no. no.	3 1	6 2	9 2	9 2	9 2
3. New Road Construction	km	110	160	200	300	520
Schedule						
Equipment Procurement, Tender Evaluation						
Training, Overseas Local						
Feasibility Study						
Road Construction, Planning Engineering Implementation						
Activity		 = Heavy	 = Light			

* Foreign Specialist

2. Industrial Development

The plywood, veneer and match industries show very little scope for direct government involvement during the short term due to raw material shortage and stable or declining markets. These industries are left for the private sector direction for the next five years. Both timber seasoning and preservation treatment have future roles. Also, furniture has a good potential, but it will not develop until significant volumes of high value wood becomes readily available. Improvements in the sawmill industry which reduce manufacturing waste by increased recovery offer the most obvious short and long term benefits to the nation over the next five years.

There is major scope for improving the sawmilling industry by replacing existing mills by mills with higher sawwood recovery and better suited to log physical characteristics. Expansion of the pulp wood and paper industry appears possible about 2000 when sufficient plantation pulpwood supplies appear. Adopting higher yielding pulping technology also would contribute to the expansion potential. For the pulp and paper industry, the next five years are a consolidation period to resolve the raw material problems facing mills and place them on an economic footing, unless substitutes become available from agriculture residues, or imports increase. Obvious goals are to:

- Replace existing low recovery sawmills with higher recovery mills in a balanced manner as plantation sawlog volume become available.
- Form a joint industry-government board to guide the sawmill industry modernization and rationalization programme.
- Revise consumer laws and regulations to favour the use of seasoned and preservative or treated wood products.

- Modify the VAT and customs tax structure to encourage the use or import of seasoned and preservative-treated wood products.
- Introduce size standards and the use of seasoned wood in the furniture industry in anticipation of developing furniture exports.
- Evolve government policy, laws and regulatory changes which place control of pulpwood supplies substantially within mill control.
- Determine pulp and paper expansion feasibility in the 2nd 5-year plan period.
- Establish improved and appropriate pollution control standards for new and existing industries, especially wood preservation plant and pulp and paper mills.
- Rationalize and restructure the public forest products sector.

Programme Description

Wood Harvesting - Three programme apply in wood harvesting or extraction. These are designed to prevent further environment damage, reduce wood costs, replace old extraction equipment or supply new equipment for plantation logging, as follows:

- **Extraction Equipment Supply** - Provide replacement equipment for the mechanized logging operation in the Kassalong Reserve Forest plus basic equipment to support harvesting plantations on steeper ground.

Table 12 - Wood Harvesting Action Plan, Scenario 2

Activity	Units	Year 1	Year 2	Year 3	Year 4	Year 5
Programme (Cumulative)						
1. Mechanical Extraction						
High Forest	m ³ /A	50,000	50,000	50,000	50,000	50,000
Plantation	m ³ /A	-	25,000	50,000	100,000	91,500
Total		50,000	75,000	100,000	150,000	241,500
2. Training - Overseas	no.	8	12	16	24	38
- Local*	no.	3	6	9	12	12
3. New Road Construction	km	450	650	900	1,300	2,100
Schedule						
Equipment Procurement, Tender						
Evaluation						
Training, Overseas						
Local						
Feasibility Studies ^b						
Road Construction, Planning						
Establish Engineering Cell						
Engineering\Design						
Implementation\Supervision						
Activity						
		* Foreign Specialist ^b Sangu-Matamuhuri, Sylhet Bamboo, Timber Plantation				

- **Training** - Offers both overseas and locally based training for existing high forest operations, contemplated plantation harvesting and quality road construction standards and methods for management and operating staff.
- **Research, Development, Studies** - A series of feasibility and technical studies, including topographic mapping of presently inaccessible bamboo and timber areas in Sylhet and Sangu-Matamuhuri Reserve Forest, and plantation logging systems.
- **Road Construction** - Implements a programme to construct a permanent system of improved roads in plantation areas to reduce costs, and eliminate erosion hazards.

Table 13 - Industrial Development Action Plan, Scenario 1

Activity	Units	Year 1	Year 2	Year 3	Year 4	Year 5
Programme (Cumulative)						
1. Sawmill Industry Rationalization						
Buyout Old Mills		-	20	60	110	489
New Mill Construction	no. (under const.)	nil	nil	nil	nil	
Large						-
Medium						2
Teak						12
Small						3
Pushbench						18
Total						35
2. Pulp and Paper Expansion						
Newsprint	ADT\A	nil	nil	nil	nil	nil
Printing and Writing	ADT\A	nil	nil	nil	nil	nil
Schedule						
Sawmill Industry Rehabilitation						
Planning						
Form and Operate Industry\Government Committees						
Old Mill Buyout Programme						
Financing Arrangement						
Feasibility Studies						
Mill Design						
Equipment Procurement						
Construction						
Pulp and Paper Expansion						
Planning and Coordination						
Evolve Secure Wood Supply Tenure						
Feasibility Study						
Public Sector Industry						
Rationalize Existing Operations						
Rehabilitate Retained Operations						
Rebuild Kaptai Sawmill						
Activity		= Heavy		= Light		

Industrial Development -The solidwood industry occupies development over the next five years, activities in pulp and paper are limited. Recommended programmes are:

- **Solidwood Industry Rehabilitation** - This programme concentrates on revitalizing the sawmilling industry and establishing conditions and institutions more favourable to all solidwood industries while the switch over from natural wood to plantation supplies begins.
- **Pulp and Paper Expansion** - A very minor programme assesses the feasibility of expansion alternatives in the second five-year period. The balance of programme efforts is institutional, involving joint planning and coordination of expansion potential between the Ministry and the pulp and paper sector over the timing and type of future pulpwood supplies, including agreeing secure tenure on raw material supply.

Action Plan

Wood harvesting action plans for Scenario 1 and 2 are in Tables 11 and 12. Both Scenarios have similar programmes, therefore needing the same corrective action plans. But Scenarios differ in programme size and component volumes. In addition, Scenario 2's road construction programme calls for higher road construction standards and closer spacing.

Table 14 - Industrial Development Action Plan, Scenario 2

Activity	Units	Year 1	Year 2	Year 3	Year 4	Year 5
Programme (Cumulative)						
1. Sawmill Industry Rationalization						
Buyout Old Mills	no.	-	10	30	50	219
New Mill Construction						1
Medium	no.	-	-	-	-	10
Teak	(under const.)	-	-	-	-	3
Small		-	-	-	-	31
Pushbench	no.	-	-	-	-	45
Total		-	-	-	-	-
2. Pulp and Paper Expansion						
Newsprint	ADT\A	nil	nil	nil	nil	nil
Printing and Writing	ADT\A	nil	nil	nil	nil	nil
Schedule						
Planning, Monitoring, Coordination		[Gantt chart: heavy activity from Year 1 to Year 5]				
Solidwood Industry Rehabilitation		[Gantt chart: heavy activity from Year 1 to Year 5]				
Establish Industry\Government Committee		[Gantt chart: heavy activity in Year 1]				
Board Planning\Coordination		[Gantt chart: heavy activity from Year 1 to Year 5]				
Form and Operate Industry\Government Committees		[Gantt chart: heavy activity from Year 1 to Year 5]				
Old Mill Buyout Programme				[Gantt chart: heavy activity from Year 3 to Year 5]		
Financing Arrangement				[Gantt chart: heavy activity from Year 4 to Year 5]		
Feasibility Studies				[Gantt chart: heavy activity from Year 3 to Year 5]		
Mill Design				[Gantt chart: heavy activity from Year 4 to Year 5]		
Equipment Procurement				[Gantt chart: heavy activity from Year 4 to Year 5]		
Construction				[Gantt chart: heavy activity from Year 5 to Year 5]		
Training				[Gantt chart: heavy activity from Year 5 to Year 5]		
Pulp and Paper Expansion						
Planning and Coordination						[Gantt chart: heavy activity in Year 5]
Feasibility Study					[Gantt chart: heavy activity from Year 4 to Year 5]	
Activity		[Gantt chart: heavy activity]		[Gantt chart: light activity]		

Tables 13 and 14 present the required action for industrial development. Scenario 1 and 2 differ in the scale of activity and investment, Scenario 2 is much greater because of higher wood supplies.

INSTITUTIONAL STRENGTHENING AND SUPPORT

Programme Goals

Government of Bangladesh policy lays stress on: poverty alleviation, rural development, income and employment generation increased local participation, social equity, cooperatives, private initiative, export-oriented production and environmental conservation. Forests, fortunately a natural renewable resource, are capable of significantly contributing towards the achievement of these national goals and objectives. However, the forestry sector situation today in Bangladesh, and the factors allowing conditions to persist, are the cumulative results of a long period of neglect and indifference. Achieving this forestry sector potential calls for major changes in policy, reorientation and restructuring of institutions, legal, research and education, and firm, sustained political commitment.

Institutional improvement goals are to:

- Replace existing forest policy to reinforce support for GOB's national goals and objectives.
- Enact new laws and regulations in forestry, wildlife conservation and environment supporting new policy.
- Place more emphasis on human resource development.
- Give forestry research organizations full functional authority and performance accountability.
- Restructure the forestry sector based on enterprise principles.

Existing policy needs replaced by a comprehensive and dynamic policy covering the whole sector, and involving private, public, cooperative and community efforts. Policy must incorporate clear goals, policy measures, operational guidelines and strategies. A new national forest policy should include forestry activities outside government lands, and the private and cooperative sector of the economy. The policy needs to support and promote people's participation in nature conservation, sustained management of resources and more economic activities at, and controlled at, the rural level.

New forest laws with related rules, regulations and procedures must facilitate forestry development, promote institutional autonomy and functional decentralisation. They should remove impediments for people's and private sector participation in forestry, and encourage involvement of non government organizations in the sectoral activities. Legal changes should promote healthy entrepreneurial involvement of people and other groups in Bangladesh's forest resource development.

Expanded human resource development for the forestry sector in the future in terms of numbers, skill types and levels, working conditions and facilities to support the level of planned activity. Existing training institutions are inappropriate and qualified trainers, and incentives need planned systematically and with foresight.

Research organizations need full functional autonomy to set research programmes and priorities by consulting and involving the users and clients. Aspects such as goal-oriented and field-oriented research, training and orientation of researchers, dissemination and demonstration of research results, transfer of technology and interaction among research organisations needs adequate attention.

Table 15 - Institutional Programme Action Plan, Scenario 1

Activity	Units	Year 1	Year 2	Year 3	Year 4	Year 5
		Programme (Cumulative)				
				80	150	204
1. Institutional Strengthening\Support Building\Construction ^a Other Construction ^b Vehicles	no. no. no.	20 25	40 1 35	80 2 45	150 3 55	204 4 66
2. Training\Technology Transfer Overseas Local Target Groups	no. no. no.	25 100 10,000	75 200 20,000	150 500 40,000	280 1,200 80,000	450 2,500 25,000
3. Research, Development, Studies Evaluation	no.			1	1	1
4. Consultants	month	50	12	200	300	338
5. Research and Development Programme	%		15	30	60	100
Field Station Improved	%	10	20	40	80	100
Laboratory Improvement	%		20	40	50	100
Library Facilities	%	10	20	30	80	100
Genetic Improvement	%		15	30	60	100
Seed Production	%					
Seed Storage Facilities	%					
Research Training Overseas Local	no. no.	20	40	80	160	200
Schedule						
Planning						
Vehicle Equipment, Tender Evaluation						
BFD Construction ^a , Planning						
Supervision\Implementation						
Educational Construction, Planning						
Implementation\Supervision						
Training, Programme Design						
Overseas						
Local						
Target Groups						
Research, Development, Evaluation						
Consultants						
Research Station\Laboratory\Library Improvement						
Planning\Design						
Construction\Supervision						
Equipment Procurement						
Seed Production\Storage Programme						
Planning\Design ²						
Site Selection						
Seed Orchard Establishment						
Construct Storage\Certification Facilities						
Equipment Procurement						
Improved Seed Production						
Research Training Overseas						
Local						
Activity						
		^a Offices, residences, nurseries ^b Education and Training Facilities				

Presently the forestry sector is functionally and financially bound by authority and lacks productive ingenuity. Restructuring the sector demands separating authority functions from development and social improvement responsibilities now placed on the sector. The existing structure and system cannot cope with its mixed responsibilities. A new structure must promote private, cooperative and organized people's involvement in the forest sector in all aspects from resource management, education, research, natural conservation and environment protection as well as resource processing. Owing to government's limited financial resources, this system must generate its own funds, this means that all activities and programme have direct, planned, enterprise goals.

Programme Description

Required institutional programmes fall into five similar categories in both Scenarios. Scenario 2 has an extra programme involving sector restructuring. The five common programmes are as follows, major Scenario differences are described in each sections:

- **Institutional Strengthening and Support** - This programme covers the construction cost of new buildings, furnishings, equipment and vehicles required, plus recurrent costs of staff and vehicle/equipment/office operations. Scenario 1 incorporates construction, furnishing and equipment costs for extending education and training facilities at the Institute of Forestry Chittagong University, the Bangladesh Forest Academy and the Sylhet and Chittagong Forest Schools. These facilities will provide original professional, refresher professional, and technical training and education. In Scenario 2, the construction, equipment, vehicle and furnishing costs are attributed to the new forestry board, enterprise facilities and production units created.

Scenario 1 is a reorganization and expansion of BFD to account for a wider, but still limited, interest in conservation, watershed management and public forestry programmes. The administration structure planned consists of four functional divisions under a Chief Conservator, not a fundamental reorganization. GOB is currently, considering a similar functional reorganization and expansion of the existing system. Scenario 1 reorganization allows for increased delegation of higher responsibility, administrative and financial power. It allows some decentralisation and expects low level people's participation.


Scenario 2 presumes a complete restructuring of the forestry sector. First, by separating the authority function from the enterprise function, and second, by providing full-fledged functional and financial autonomy for all forest-related activities to a wide range of enterprise. All enterprises fall under the jurisdiction of a central National Forestry Board. A Forest Authority assumes the essential role of the Forest Department under the Ministry with vested powers for enforcing government forest policies, legislation and regulation. The Authority also collects levies and other charges.

- **Training and Technology Transfer** - This programme covers overseas and local professional training, local staff and other government officers in-service training and required training for beneficiaries. Scenario 2 training provides the reorientation training essential to support the system change planned.
- **Research, Development, Studies** - This programmes covers the costs of overall sectoral monitoring and evaluations of institutional achievements.
- **Consulting Services** - Provides for specialized assistance in developing education and training facilities and materials and the higher physical targets planned. Scenario 2 allows more effort on reorganizations studies, personnel development and restructuring changes.

Table 16 - Institutional Programme Action Plan, Scenario 2

Activity	Units	Year 1	Year 2	Year 3	Year 4	Year 5
Programme (Cumulative)						
1. Institutional Support/Strengthening Building\Construction Vehicles	no. no.	100	350	450	550	660
2. Training\Technology Transfer Staff Beneficiaries	no. no.*	300 0.03	600 0.06	1,200 0.09	1,900 0.16	3,050 0.25
3. Research, Development, Studies Evaluation	no	-	-	1	1	1
4. Consultants	month	300	500	650	750	900
5. Institution Changes New Legislation New Policy	no. no.	- 1	1 2	2 3	3 3	3 3
6. Research Improvement						
6a. Field Research	no.	-	1	2	3	6
6b. Laboratory Facilities	no.	-	1	2	3	6
6c. Library Facilities	%	-	15	30	50	100
6d. Improved Seed Production	%	25	45	65	75	100
6e. Seed Storage	%	25	45	65	75	100
6f. Training - Foreign	no.	25	35	40	45	50
- Local	no.	100	140	160	180	200
Schedule						
Planning, Coordination, Monitoring		[Gantt chart bars]				
Vehicle Equipment, Tender Evaluation		[Gantt chart bars]				
Construction ^c - Planning\Design		[Gantt chart bars]				
Supervision\Implementation		[Gantt chart bars]				
Training, Programme Design		[Gantt chart bars]				
Overseas		[Gantt chart bars]				
Local		[Gantt chart bars]				
Target Groups		[Gantt chart bars]				
Research, Development, Evaluation		[Gantt chart bars]				
Consultants		[Gantt chart bars]				
Institutional Changes		[Gantt chart bars]				
Human Resource Restructuring\Development		[Gantt chart bars]				
New Policy Development\Implementation		[Gantt chart bars]				
New Legislation Development\Implementation		[Gantt chart bars]				
Research Station\Laboratory\Library Improvement		[Gantt chart bars]				
Planning\Design		[Gantt chart bars]				
Construction\Supervision		[Gantt chart bars]				
Equipment Procurement		[Gantt chart bars]				
Seed Production\Storage Programme		[Gantt chart bars]				
Planning\Design		[Gantt chart bars]				
Site Selection		[Gantt chart bars]				
Seed Orchard Establishment		[Gantt chart bars]				
Construct Storage\Certification Facilities		[Gantt chart bars]				
Equipment Procurement		[Gantt chart bars]				
Improved Seed Production		[Gantt chart bars]				
Research Training		[Gantt chart bars]				
Overseas		[Gantt chart bars]				
Local		[Gantt chart bars]				
Activity		[Gantt chart bars]				

* Million
 = Heavy
 Forest, environment, wildlife

 = Light
 Offices, residences, nurseries

- **Research and Development Programmes** - This programme funds all organized formal research under a separate research organization. It includes any construction, equipment, furnishing and vehicles costs for research activities, including recurrent staff and operating costs for research programmes operation. Both Scenario elements are identical, except for a minor difference in research operating cost and overseas training. Scenario 2 calls for implementations of all programmes, target achievement depends on research results, but this is not critical to Scenario 1.

Scenario 1 development relies essentially on existing technology and completed research. In Scenario 1 research, all programme elements need improving but the priority for funding clearly has to favour genetically improved seed production and certification, dissemination of existing useful research results, back stopping extension efforts and the continuation of existing research on the utilization and products from of lesser known species.

- **Institutional Change** - Scenario 2 calls for developing new forestry sector policy incorporating all sectoral aspects. This will require revamping existing laws and regulations. This programme covers these new policy and legislation costs as well as the management and reorganizational studies and advice necessary to help the transition from a bureaucratically-controlled to an entrepreneurial-driven system.

Action Plans

Institutional action plans for Scenarios 1 and 2 are in Tables 15 and 16, respectively.

FIVE-YEAR ACTION PLAN COST

During the first five years, Scenario 1 costs total an estimated Tk 12.9 billion, of which foreign exchange amounts to Tk 4.6 billion, 35% of period expenditure. In comparison, Scenario 2 costs nearly double to Tk 23.5 billion, of which foreign exchange costs are 24% of total investment, or Tk 5.6 billion. Table 17 gives programme details.

INTRODUCING SCENARIO 2

Adopting major institutional structural changes dictates a managed transition dependent definite well coordinated planning. Once the change is decided on, the transition demands close piloting by Government (MOEF and BFD) in linked phases. Conversion will take up to two years before all the legal and regulatory instruments are finalised and detailed plans prepared for the enterprises and units. An obvious possibility is to convert some of the existing regional or other programmes into enterprises earlier than others. First consideration goes to existing functional or geographic alignments (eg rubber development and integrated development of Sundarbans).

The initial buildup of the National Forestry Board should occur in two to three years time. Complete change from the present to the proposed system should have a maximum target of five to six years to avoid stagnation and misdirection. Along with the process of changeover, in order to test and improve the enterprise system, pilot enterprises a selected areas are necessary to provide demonstration effect.

Table 17 - Five Year Action Plan Costs, Tk Billion

Programme	Scenario 1			Scenario 2		
	Foreign	Local	Total	Foreign	Local	Total
People-Oriented Forestry	0.13	0.58	0.71	0.32	1.89	2.21
Environment	0.50	0.86	1.36	0.99	2.27	3.26
Participatory Forestry		0.18	0.18	0.04	0.29	0.33
Wood Energy				0.05	0.29	0.34
Non Wood Forest Products				0.03	0.20	0.23
Bamboo Development				1.43	4.94	6.37
Total	<u>0.63</u>	<u>1.62</u>	<u>2.25</u>			
Production-Directed Forestry				0.34	3.08	3.42
Forest Production	0.21	1.92	2.13	2.08	1.13	3.21
Forest Industries	2.78	1.54	4.32	2.42	4.21	6.63
Total	<u>2.99</u>	<u>3.46</u>	<u>6.45</u>			
Institution Strengthening				0.22	0.92	1.14
BFD/Enterprise Infrastructure	0.12	0.14	0.26	0.33	5.76	6.09
BFD/Enterprise Recurrent Costs	0.05	2.10	2.15	0.09	0.60	0.69
Education Infrastructure	0.04	0.15	0.19	0.12	0.26	0.38
Training/Technology Transfer	0.14	0.16	0.30	0.12	0.03	0.06
Monitoring/Evaluation	0.01	0.03	0.04	0.03	0.05	0.21
Consultants	0.05	0.02	0.07	0.16	0.27	0.27
Institutional Restructuring				0.39	0.28	0.67
Research Programme	0.33	0.25	0.58	1.34	8.17	9.51
Total	<u>0.74</u>	<u>2.85</u>	<u>3.59</u>			
Base Cost	4.36	7.93	12.29	5.19	17.32	22.51
Physical Contingencies	0.20	0.39	0.59	0.42	0.52	0.94
Total	<u>4.56</u>	<u>8.32</u>	<u>12.88</u>	<u>5.61</u>	<u>17.84</u>	<u>23.45</u>
Percentage	35	65	100	24	76	100

A phased changeover is possible without disrupting development activities or programmes. Table 18 indicates a time schedule for changeover. Although the changeover could easily consume 10 years, or more, a short period appears more suitable to steer the change.

Table 18 - Timetable for Adopting Scenario 2

Activity	Timing					
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Area delineation, transition plans, details of sharing of staff, and conversion schedules	■ ■ ■ ■					
Management plans, feasibility studies, legal and regulatory instruments	■ ■ ■ ■	■ ■ ■ ■				
Infrastructure development, initiation of selected pilot trials, enterprises, and tests; position Forestry Board	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■			
System refinement, establish more enterprises, complete arrangements for transfer of staff and resources				■ ■ ■ ■	■ ■ ■ ■	
Fine tune systems and legislation, planning and programming, budgeting, financial management, monitoring and evaluation					■ ■ ■ ■	■ ■ ■ ■
Complete system changes						■ ■ ■ ■

Since the changeover needs managing on a timebound plan, it must proceed as a priority project - involving specialists and experts to look into all related aspects, such as law, business and company management, institutional development, financing, forestry, agroforestry, rural development, social anthropology and environmental conservation. Such a project is very appropriate for donor assistance.

Scenario 2 presumes extensive private investment compared to today's conditions. Obtaining this, when needed, and for the amount required, is a difficult, but not an impossible task. Prior sections discussed the required major factors. These, summarized below, apply in differing degrees for each enterprise:

- Stable, guaranteed raw material supply - This means a regular, or increasing supply of raw wood of known physical specifications at predictable volumes, timing and conditions of availability. Substantial control of this supply has to rest with the investor for a period commensurate with the investment level.
- Favourable investment climate - Bangladesh is already considering adopting a strategy to encourage more private investment. Other industrial sectors face similar investment conditions to the forestry sector. This industry is no different than others in its investment requirements and will benefit from changes introduced in other economic segments. In the main, favourable conditions include:
 - Supportive, progressive and forthright government policy.
 - A productive labour force.
 - Favourable import and export policies.
 - Reasonable and balanced taxation rates.

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APPENDIX 1
ABBREVIATIONS, TERMS AND CONVERSION FACTORS

PROJECT 372001/32-2
FORESTRY MASTER PLAN,
BANGLADESH (TA NO. 1355-BAN)

ASIAN DEVELOPMENT BANK
MANILA PHILIPPINES
DATE: MARCH 1993

FORESTRY MASTER PLAN
FIVE-YEAR ACTION PLAN

APPENDIX 1
ABBREVIATIONS, TERMS AND CONVERSION FACTORS

ABBREVIATIONS

%	-Percent
A	-annum
ADT	-Airdry metric tonne
BFD	-Bangladesh Forest Department
GOB	-Government of Bangladesh
ha	-Hectare
km	-kilometre
m ³	-cubic metres
NGO	-Non government organization
no.	-Number
NWFP	-Non wood forest products
Sal	-Shorea robusta
USF	-Unclassified Forest Land
VAT	-Value added tax

"It must be remembered that there is nothing more difficult to plan, more doubtful of success, nor more dangerous to manage than the creation of a new system. For the initiator has the enmity of all who would profit by the preservation of the old institution and merely lukewarm defenders in those who would gain by the new one". Machiavelli: The Prince. (1513)

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