

5.A Supporting Strategy IV: Caring for the Environment and Sustainable Development

5.1 Human lives and livelihood in Bangladesh are intricately intertwined with nature. Consequently, no process of development and eradication of poverty can be conceived of without putting caring for environment and sustainable development at the centre-stage. On the other hand, as the poor depend heavily on nature for their livelihood, without the whole-hearted involvement of the poor, caring for environment becomes an extremely difficult task. Bangladesh is a signatory of the Multilateral Environmental Agreement by which government is committed to undertake certain environmental management actions which will be largely beneficial to the poor.

5.2 Operationally, poverty-environment linkages are evident at two levels - one is conservation of nature and natural resources for sustainable livelihood while the other is controlling/combating pollution for maintenance of biodiversity and protection of human health. The Government policies in the areas of macroeconomics and various sectors must keep in focus the impacts they might have on the environment. On the one hand there is “Green Vs. Brown” arguments that the country’s effort to grow fast, ignoring environmental concerns, may cause long-term damage to the environment and also dampen growth and development. At the same time it is also imperative for Bangladesh to grow faster in the short-run in order to reduce poverty. Therefore a careful balancing act must be orchestrated where economic growth is maximised without compromising environmental protection and safety. Policies and actions of the Government must not cause marginalization of the poor and force them to intensify over utilization of the open access natural resource base, or make them more vulnerable to pollution hazards.

5.3 On the other hand there is counter argument that growth will create fiscal space and resource that can be used to enhance the quality of growth and promote sustainable resource management. In terms of environmental issues it is important to keep in mind that in a country where the majority of the poor are highly dependent on natural resources, the improved management of natural resources is a prerequisite for poverty reduction.

5.I.1 Conservation of Nature

5.4 The linkage between poverty and conservation of natural resources is a mutually reinforcing process. Communities living in urban slums, people living in areas prone to severe floods, drought, salinity and bank erosion; and river/estuarine islands, tribal communities living in hills and forests, communities of landless and migrant workers, depend on natural resources for livelihood. On the one hand poverty perpetuates environmental degradation because the poor are forced to “mine” natural capital for survival beyond the sustainable limit and this leads to depletion and degradation of the resource base and deterioration of the quality of life. On the other hand, overexploitation of nature also implies decline in the *per capita* quantity and/or quality of water, land, forest, and biodiversity, which aggravates poverty. Thus conservation and regeneration of natural resources through appropriate intervention, investment and management have to be ensured so that the poor and vulnerable communities can depend on the use of natural resources on a sustainable basis.

5.5 In discussing conservation of natural resources attention is given mainly to five issues. These are (i) agricultural land degradation and salinity; (ii) biodiversity; (iii) public commons; (iv) afforestation and tree plantation; and (v) urbanization-related environmental issues.

5.6 **Agricultural Land Degradation and Salinity:** Depletion of organic matter in the soil, degradation of its physical and chemical properties of the soil, reduction in the availability of major micronutrients, imbalance in the fertiliser application and build-up of toxicity through improper use of pesticides are the major reasons for soil fertility decline. Furthermore, water erosion in terms of rill, sheet and gully erosion has a significant impact on the economy. Clearing of vegetation, earth removal, road construction, etc. cause most of the land degradation. Other issues related to land degradation include shifting cultivation (*jhum*) in the Chittagong hill regions, and unsustainable cultivation practices in the Barind and Madhupur tracts. Use of pesticides and overexploitation of biomass lead to denudation, deforestation and degradation of soil. The consequences of soil degradation should be considered while we strive to boost agricultural production.

5.7 Increase in salinity of topsoil also has a large impact on agricultural production. Since the Farakka barrage started its operation, the environment in the southwest region of Bangladesh has been adversely affected due to an increase in salinity. The northward movement of the salinity frontier has already threatened the mangrove forests, part of the World Heritage site, reduced agricultural productivity, and affected millions of people living in the south-western region of the country. The Indian River Linking Plan of diverting water from the Brahmaputra, in Assam, to the Ganges basin in West Bengal, without releasing sufficient water for Bangladesh will be disastrous for the economy and for the ecology of Bangladesh.

5.8 More than half of the land area is nutrient deficient, and subject to depletion of organic matter, or both. It has been estimated that loss of agricultural productivity due to land degradation might account for between 0.5 percent and 3.5 percent of GDP. Estimated cost of land degradation resulting from productivity loss is equivalent to Tk.60,832 million per year, and the cost of nutrient loss is Tk.47,245 million per year. The productivity loss per year equates to 4.3 percent of GDP (of 1997) and nutrient deficiency accounts for 3.4 percent of GDP (of 1997). The total estimated cost of degradation is nearly 7.7 percent of the 1997 GDP.

5.9 It is clear that over time our dependence on land will not decrease, rather it will increase. The degradation of land is already hurting the economy, and the poor, because of reduced yield, are either gradually shifting away from agriculture or are encroaching on the marginal land of forests and wetlands to increase production. All these lead to further degradation of our environment. Consequently, efforts to halt degradation of soil are both poverty reducing and environment friendly. In this respect improvement in the monitoring of a range of factors affecting soil fertility and measures to improve the quality of agricultural inputs (fertilizers, pesticides etc) are essential.

5.10 **Biodiversity:** Biodiversity is an asset for a nation. However, population pressure, conversion of forestland and wetland into agricultural land, overexploitation of forest products and excessive withdrawal of water, relentless wetland depletion due to overexploitation of both flora and fauna are causing great harm to our biodiversity. Agro-diversity has been reduced and this limits potential of further growth and development in this sector. At the same time, a large section of terrestrial diversity of plants and animals is being threatened due to deforestation and

conversion of forestland. Similarly, aquatic diversity is also under pressure due to the drying up of rivers, reduction of flow of water in major rivers, and accumulation of pesticide residues in lake waters.

5.11 There are 16 protected areas (PAs) in the country. In addition, the Government has declared the Sundarbans, Cox's Bazar, Teknaf Sea Beach, St. Martin's Island, Sonadia Island, Hakaluki Haor, Tanguar Haor, Marjat Baor, Gulshan, Banani and Baridhara Lake as ecologically critical areas (ECAs) in Bangladesh. In terms of poverty, people living on the resources in these areas are generally poor. Consequently, reduction of opportunities to access resources from these ECAs and sanctuaries will result in conflicts and social unrest. Policies need to be adopted for community-based participatory management (where poor are included) to reduce and/or rationalize their dependence on such resources to ensure their sustainable management and poverty reduction.

5.12 To achieve biodiversity the participation of the poor at the community level is essential particularly given the fact they will be benefiting from conserving biodiversity. Improvement of biodiversity will benefit the poor particularly in terms of fisheries given that a large number of people depend on this activity both as an income generating activity and also as a source of protein. Thus it is essential to protect key-open water fisheries and other habitats.

5.13 **Public Commons:** Public commons includes natural resources such as land, open water resources in wetlands, forests, grasslands, grazing land, reed land, khas land, peat land, rivers, estuaries and the open seas with the characteristic that people in general have customary rights and access to them. These are sources of livelihood for the poor including the hardcore poor. They collect firewood, fodder and construction materials, fruits and vegetables for daily consumption from, graze animals upon, and catch fish in these resources. The dependence on common resources is very high: some 80 percent of the population depends, to some extent, on the utilization of these resources or on processing the resultant products. Thus public commons may be one of the most important safety net available to the poor particularly in the rural areas, provided these are managed in a sustainable manner.

5.14 Increasing access to natural resources for rural poor is an essential element of the process of reducing poverty in the rural areas. Rents from public commons, if captured by the poor, can help them initiate a process of capital accumulation that can help to pull them out of poverty and integrate them into the mainstream economy. However in most cases the poor have been excluded from access to the common property resources. They have access to at most low quality public commons. Thus the resource base for poverty reduction of the poor are either shrinking or degrading. This frequently leads to two kinds of problems. One is overexploitation of the resources to the point of total depletion while the other is the capture and management of quality resources by the Government and/or the local elites with the exclusion of the poor.

5.15 **Rural Energy and Afforestation (including tree plantation):** Biomass (fuel wood, tree leaves, crop residues and animal residues, mainly in the form of dried cow dung cakes or sticks) is the principal form of energy used by the people, particularly in the rural areas. According to a recent survey by BIDS, a rural household uses nearly 3 metric tons of biomass in a year. Of this about 1.7 metric tons is tree biomass composed of 1.2 metric tons of fuel wood and 0.5 metric tons of tree leaves. Practically all of the biomass is used for cooking and parboiling of rice. The relationship between the amount of the fire wood use and level of income

is clearly positive and monotonic. This means that the poor has much less access to quality fuel for cooking. Income poverty thus translates into energy poverty. While switching to modern and better quality energy such as electricity is highly preferable, it is not possible to do so fast. Secondly, it is highly desirable to have as much tree cover as possible as the country may benefit in two ways. Nationally and locally, this helps in reducing the energy deficiency while this also helps in keeping global carbon emission at a lower level.

5.16 The ground reality is quite stark. Population pressure on land has been leading to conversion of forest land and land under tree cover into other uses. This at the same time further lowers the supply of biomass and fuel wood for cooking raising their market value including further deforestation and cutting down of trees. Smoke due to fuel wood burning also is a major cause of a significant rise in the level of indoor air pollution affecting adversely the health of women and children. Increased demand for furniture also puts up pressure on forestland.

5.17 The annual deforestation rate up to the 1990s is estimated to be 3.3 percent resulting in a decrease of per capita forest land from 0.035 ha in 1969 to 0.02 ha in 1990, one of the lowest in the world, because of logging, unplanned conversion to agriculture and other non-forestry uses, like grazing, shrimp cultivation and other anthropogenic influences. The recuperative capacity of the natural growth of plants has failed to keep pace with the increasing demand. The estimated per capita consumption of timber and fuel wood is only 0.01 m³ and 0.07m³, respectively—perhaps one of the lowest levels of consumption in the world. The supply is inadequate even to meet the low level of consumption. In 2002, the per capita demand for timber and fuel wood was calculated to be 3.2 and 8.7 million m³, thus giving an estimated deficit of 62 percent and 60 percent respectively.

5.18 The impacts and manifestations of such an alarming rate of deforestation are multifaceted. The cost of these impacts to the economy was estimated to be 1 percent of GDP in 1990. Decrease in timber and other forest products incur direct economic loss. People who live in rural and hilly areas and depend on forests for their subsistence are severely affected. The ever-increasing population of Bangladesh has been exerting pressure on existing forests for more food, fuel wood, timber, fodder and other forest products, resulting in exploitation. About 70 percent of the plain land Sal forests are encroached upon. Other forestlands are also degraded. Consequently, their productivity is unacceptably low. The major causes of forest depletion are (i) lack of a conservation approach; (ii) low priority attached to biodiversity conservation ; (iii) encroachment from outsiders; (iv) inadequate participation of people and civil society; (v) lack of law and order and inadequate legal supports; (vi) corruption and pressure from the local elites; (vii) poor management and administration; (viii) lack of proper monitoring and accountability; and (ix) absence of incentives for Forest Department employees.

5.19 There are a lot of problems, limitations, and challenges of the Bangladesh forestry sector. While rate of deforestation needs to be managed properly reforestation also must be the given due emphasis as a way forward. Community-based participatory afforestation practices, or social forestry (SF), have been increasingly felt to be the most feasible strategy for the long-term sustainability of the forests. Experts suggest that there is significant scope for vertical expansion of forests through multiple forests. It is estimated that some 1.51 m ha of marginal and fallow lands are potentially available and can be brought under forest and environmental improvement

projects through SF programmes facilitated by the Government and NGOs. Such programmes may also make a judicious use of the disadvantaged sections of human resources, including women and educated unemployed youth. A sustainable development strategy for the forestry sector must incorporate institutional reforms, management strategies, and policies to ensure that this sector remains productive.

5.20 Urbanization Related Environmental Issues: Urban areas particularly the big cities including Dhaka have serious pollution problems with respect to solid waste management, growth of slum areas without supply of clean water, and sanitation facilities, with congested living conditions, inadequate drainage system, and untreated industrial waste disposal. Most of these factors affect the urban poor in terms of general hardship, ill-health and even death. As usual it is the women and the children who are the worst victims. Such appalling conditions also adversely affect labour productivity due to disease and morbidity and thus increases vulnerability of the poor. Reduction of environmental problems related to urbanization must address improvement in the existing solid waste disposal system in all towns and cities, living conditions of the slums, and drainage congestions. The regulatory framework must be strengthened and implemented strictly with provisions for proper and adequate incentives to entrepreneurs to ensure that all industrial wastes are properly treated before disposal. With respect to waste disposal public/private collaboration is essential, system must be efficient and the Government needs to introduce sanitary landfill for all solid waste disposals and/or arrange for using the waste to produce energy. The disposal of hazardous and medical wastes in urban areas is a major cause of concern for urban life including that of the poor who are engaged in scavenging activities.

5.21 Another serious problem in the urban areas is improperly planned land development, whereby low lying lands, canals, and ponds are filled up for constructing residential and commercial buildings. This is causing reduction in the floodwater retention areas, water logging and drainage problems. Construction of roads without appropriate environmental mitigation measures is also adding to these problems. Flood protection activities around urban areas without appropriate environmental mitigation measures are also responsible for water logging.

5.22 Policy Recommendations: In order to address environmental issues relevant to the conservation of nature it is important to appropriately integrate environmental issues in all policies including macroeconomic policies. The Government needs to initiate studies on the impact of macroeconomic, sectoral, fiscal and trade policies and pricing of resources on the environment. For example if the Government is to remove subsidy from the agriculture sector, then it should do so by first removing subsidy from environmentally damaging chemical-based inputs such as fertilisers and pesticides. Instead, this money may be spent to train the farmers on integrated farming and pest management methods. Not only environmental analysis should take place at the policy level but also environmental considerations need to be included in project design and implementation. It is essential to introduce public hearings for projects with possible major environmental impacts. In this respect it is also essential to prepare Environmental Impact Assessment (EIA) documents on all projects and programmes available in the public domain.

5.23 The Government also needs to increase direct expenditure on increasing environmental awareness and undertake environment-related projects and programmes with a view to ensuring biodiversity, preventing land degradation, protecting forests and expanding social forestation,

identifying and disseminating alternative cooking fuel and energy etc. In the area of common resources two measures are essential. The Government needs to take initiatives to expand and renew the depleted public commons, improve and systematise access of the poor to the natural commons and introduce community-based participatory natural resource management. In this respect enacting laws and regulatory frameworks and recognizing the rights of the ethnic minority and rural people to local common property resources are essential. The conservation of nature needs to include the goal of ensuring sustainable livelihood for the poor. Bangladesh needs to take the opportunity to access financial assistance from the international community to take pro-poor environmental friendly actions under Carbon Credit and Global Environment Facility funds.

5.1.2 Combating Pollution

5.24 Poverty-pollution linkages are the direct and indirect consequences of pollution, particularly of air and water, generated by public/private industries. These kinds of pollution have a strong human health impact, a major cause of erosion of human productivity and of death in many instances, particularly among the poor and marginalised communities. The combined pressure from the shrinking resource base and worsening living conditions weaken the productive capacity of the poor, make them more marginalised over time, and eventually trap them in what is often referred to as the “vicious circle of poverty.”

5.25 **Air Pollution:** Air pollution needs to address both the outdoor and indoor sources of pollution. Outdoor pollution has been a major problem in the cities of Bangladesh, especially in Dhaka. Over the past few years, air pollution has been reduced because of the introduction of lead-free gasoline in Bangladesh. But air pollution due to suspended particulate matters (SPM) is 4-8 times higher than the standard. Estimates show that more than 3500 premature births a year in Dhaka are attributable to air pollution due to SPM. It has further increased the number of asthma patients in the city. Causes of air pollution are linked with the rise in vehicular traffic as well as increase in population density in the cities (which leads to concentration of vehicles in a smaller zone). Unfortunately, the slum dwellers, who live in open air, are the major victims of this degradation. Indoor air pollution is mainly caused by cooking fuels such as firewood and dried cow dung. Most of the poor families use these as fuel and women and children are the main victims of indoor air pollution. Due to air pollution the number of people suffering from respiratory diseases is on the rise. Brickfields are an important source of air pollution in the rural areas.

5.26 Recently, increases in the gasoline prices have led to large-scale conversion of vehicles into gas driven. Such an effort has not only led to savings in terms of foreign exchange but also reduced air pollution in Dhaka. However, increase in the natural gas price will slow down the rate of gain and the situation will become worse if the relative price gap between petrol and natural gas is reduced. Besides, all two-stroke engines should be eliminated all over the country. For controlling indoor air pollution use of natural gas, biogas and LPG may be encouraged through various means including policy supports for their lower relative prices as well as more efficient and cost-effective cooking stoves. The Government may consider undertaking a project for giving free LPG gas cylinders to the VGD/VGF cardholders. Government expenditure needs to increase for providing support (credit and subsidy) for the diffusion of less polluting stoves and four-stroke engines. Biogas digesters integrated with livestock projects

supported by micro-credit programmes should be promoted. The “Brick Burning Act and Rules,” needs to be amended and strictly implemented, and at the same time an improved and energy efficient brick kiln should be introduced. With respect to car emission two-stroke auto-rickshaws should be phased out and all vehicles older than 15 years should be banned. Improved mass-transport systems in major cities must be introduced to reduce both traffic congestion and air pollution. To reduce dust pollution, dust control measures should be made mandatory in construction works. An air quality index should be measured and disseminated to the public on a daily basis.

5.27 **Water Pollution:** Water pollution has two dimensions. One is surface water pollution and the other is groundwater pollution. Surface water pollution refers to pollution of flowing waters (river, canal etc), and open water (non-flowing) reservoirs (ponds, haors, baors etc.). Flowing waters are mainly polluted because of the disposal of untreated wastes into the river system from industries and also from cities whereas the non-flowing water pollution is caused by excessive use of pesticides and soil erosion. However, these two kinds of water bodies are related to each other. Water pollution of surface water affects the health of poor people who cannot afford to choose between contaminated and non-contaminated sources. Waterborne diseases are the major cause of suffering for the poor people living in rural and urban areas. This combines with the problem of water supply for bathing in both rural and urban areas (especially for the poor families) as a major health problem for Bangladesh.

5.28 Most of the liquid wastes created by the industries in Dhaka are dumped directly or indirectly into the rivers Buriganga, Balu and Sitalakhya. Estimates show that pollution from tanneries in Hazaribagh is responsible for an increase in the health-related expenditure of people living in the vicinity of the tanneries by 125 US dollar per capita. In Khulna, industrial areas include Shiromoni, Kalishpur and Rupsha. Some 300 mills and factories located in and around Khulna City currently discharge huge amounts of liquid waste into the river Bhairab. These include Khulna Newsprint Mill, a large number of jute mills, many match factories, textile mills and Bangladesh Cable Shilpa Sangstha—all are causing severe pollution in the Bhairab River. These pollutants are causing serious damage to both freshwater and marine ecosystems of the region including those of the Sundarbans.

5.29 In Chittagong, the main polluters are the pulp and paper, fertilizer and petroleum refineries/ industries. Most of the industries are located on the banks of the Karnafuli River and the Kaptai Lake. Similarly, the ship building industry contributes significantly to marine oil pollution. The other source of oil pollution is the ships and mechanised boats all over the country especially those using the port and the outer anchorage area of Chittagong. Ballast and bilge water from oil tankers and ships anchored in the port should only be emptied at installations where the oil can be separated and recycled. This is mandatory in many countries, but in Chittagong ships directly discharge their waste oil-water mixtures into the Bay of Bengal.

5.30 In combating surface water pollution the Government needs to introduce land zoning of industries, strengthen water quality monitoring; enforce the Environment Conservation Act & Rules; introduce waste reception and treatment facilities in ports, and clean-up and rehabilitate hot spot areas in Dhaka, Chittagong and Khulna. The Government also needs to ensure reduction of effluent discharges from mechanised vessels in rivers; provide fiscal and other financial incentives for retro-fitting or for reduction of effluents from industries. Further the Government needs to take measures for creating appropriate institutional, technical, human and logistic capacity for identifying, monitoring and implementing remedial measures.

5.31 **Rural Water and Arsenic Pollution:** Contamination of arsenic in ground water provides a graphic picture of environmental degradation as well as its impact on poor population of Bangladesh. It has been documented by now that the first victims of such pollution are the people with low nutrition (often people with low body weight). Women suffer from arsenic not only in terms of physical illness but also social consequences as they can't get married and become a burden to their families and their communities.

5.32 In a recent survey conducted in 270 villages of Bangladesh, more than 7000 arsenicosis patients have so far been identified. *Arsenicosis is the term for a number of arsenic related ailments, which include increased or decreased pigmentation and thickening of the skin. In its later stages, arsenicosis may lead to cancers of, for example, the liver and kidney.* In another study by the National Institute of Preventive and Social Medicine (NIPSOM), arsenic related diseases (arsenicosis) have been identified in 37 districts. Over 30 million people in Bangladesh are exposed to arsenic concentrations above the Bangladesh drinking water standard of 0.05 mg/l; among them over 27 million or close to 90 percent live in rural areas.

5.33 **Noise Pollution:** Noise pollution gets less attention in pollution discussion although the noise pollution level in the major urban centres of Bangladesh exceeds its legal standards. Noise pollution is not only disturbing but also has health implications. This is mainly an urban phenomenon caused by vehicular congestion and affects the poor who work outdoors, for example the rickshaw-pullers, street vendors, small shopkeepers etc. Some regulation regarding use of horns, particularly banning hydraulic horns and raising public awareness against the habit of honking can help in solving this situation to a large extent. Another aspect of noise pollution is occupational exposure to industrial noise, which disproportionately affects poor workers. In this case the solutions are enforcement of occupational health standards and the provision/use of personal protective equipments.

5.34 **International Aspects of Environment:** There are several major global environmental phenomena and practices that impinge upon the development processes and prospects of Bangladesh. Bio-diversity losses as well as existing intellectual property rights systems that allow alien rights on indigenous species of plants and life threaten not simply the capacity and the right of the country to use its own environmental resources for betterment of livelihood and living conditions, but if taken to its extreme may jeopardise the very existence of the natural life support system. Similarly, the issue of climate change is a cause of grave concern to Bangladesh. Bangladesh is vulnerable to consequences of global climate change including sea level rise. She has to take measures against such vulnerabilities to protect the gains of the process of economic development as well as the poor who will be affected most adversely. Similarly, environmental interventions such as the river linking project in India are expected to inflict severe environmental, economic and social sufferings to Bangladesh. The Government and the people therefore needs to be vigilant and continuously participate in global and regional environmental dialogues and negotiations and try to ensure the environmental safety of the country.

The relevant Policy Matrix providing major goals and actions to be taken to ensure sustainable development is presented in Annexure 4.

Policy Matrix 1: Environment and Sustainable Development

Strategic Goal	Key Targets	Action taken/ Underway	PRSP Policy Agenda (FY 05–06)	Future Priorities	Responsibilities
(1)	(2)	(3)	(4)	(5)	(6)
<p>1. Ensure Sustainable livelihood of the poor</p> <p>2. Integrate environmental issues in all policies and plans</p> <p>3. Strengthen the process of environmental analysis in project design and implementation</p>			<ul style="list-style-type: none"> • Establish clear property rights of ownership and of use e.g., licensing systems for use of water bodies or harvesting forests) • Undertake National Action Plan to implement the Johannesburg Plan of Implementation as approved at the WSSD • Finalise The Wetland Policy in consultation with the stakeholders • Take projects and programmes to preserve rights of the poor on common property resources • Finalise Rural energy strategy 	<ul style="list-style-type: none"> • Monitor and revise policies, plans of action and regulatory frameworks on the basis of experiences of implementation • Replicate success stories of participatory environmental management in other parts of the country 	<p>MoL, MoWR, LGD, MoEF, MoLJPA, MoCHT, MoE, REB, LGED, CBOs, NGOs</p>
	<ul style="list-style-type: none"> • Improve access of the poor to natural resources for production, health and nutrition • Increased access of the poor to Common Property Resources (CPR) through policy and project intervention 	<ul style="list-style-type: none"> • NEMAP raised issues related to Common Property Resources • WSSD Country Report addressed sustainable livelihood issues • Under SEMP, pilot projects have been undertaken to ensure sustainable livelihood of the poor (Model developed for combating Monga at Kurigram district. Trying to replicate) • Important projects are on participatory charland management, haor and flood plain management, eco-village etc. (Pilot projects implemented. Trying for arranging fund to expand the activities) 	<ul style="list-style-type: none"> • Replicate success stories of participatory forestry in other parts of the country 		<p>MoEF, FD</p>

Strategic Goal	Key Targets	Action taken/ Underway	PRSP Policy Agenda (FY 05–06)	Future Priorities	Responsibilities
(1)	(2)	(3)	(4)	(5)	(6)
	<ul style="list-style-type: none"> • Ensure access of the poor in NRM- especially in forestry 	<ul style="list-style-type: none"> • Participatory forestry has been introduced to allow increased access of the poor in the forestry sector 	<ul style="list-style-type: none"> • Enact laws and introduce regulatory frameworks recognizing the rights of indigenous and rural people on common property 		FD, MoEF, MoLJPA, DOE
			<ul style="list-style-type: none"> • Train scientific, technical and managerial personnel for strengthening of national institutions • Publish Regularly SOE, periodicals and journals • Involve electronic and print media for raising environmental awareness • Develop and implement education, training and public awareness programme on environment • Ensure public access to environmental information 	<ul style="list-style-type: none"> • Adopt more projects and programmes on training and public awareness • Increase involvement of electronic and print media allowing access of public to environmental information • Develop website and bring all sectoral Ministries/Agencies under internet services 	MoEF, MoE, MoI, DOE, FEJB, SDNBD Text Book Board, PID, DFP, DOE, BTV, private TV channels, news papers
	Raise general awareness about the role of environment in sustainable livelihood	<ul style="list-style-type: none"> • Under SEMP, training and public awareness programme on environment has been taken up • Environmental education has been inducted into the syllabus at primary and secondary levels (Also trying to incorporate Environmental issues to the relevant Training Academy) • Documental centre established in the Department of Environment, organised awareness raising workshops • Under SEMP, internet service was extended to many agencies/NGOs (Recently internet connectivity established at Chittagong University) • State of Environment (SOE) Reports published 	<ul style="list-style-type: none"> • Continue dialogue among and between the sectoral ministries/agencies on integration of environmental issues • Initiate studies on impacts of various macro-economic and sectoral policies including pricing of resources, fiscal and trade related policies and their impact on environment 	<ul style="list-style-type: none"> • Update and revise policies and plan of action as appropriate; • Continue coordination of policies and programmes with environmental consequences • Raise awareness among the policy makers and the executives on environmental integration 	All relevant ministries
	<ul style="list-style-type: none"> • Incorporate 	<ul style="list-style-type: none"> • Through SEMP, project 	<ul style="list-style-type: none"> • Revise project format approved that 	<ul style="list-style-type: none"> • Develop sector-specific EIA 	MoEF, DOE,

Strategic Goal	Key Targets	Action taken/ Underway	PRSP Policy Agenda (FY 05–06)	Future Priorities	Responsibilities
(1)	(2)	(3)	(4)	(5)	(6)
	environmental issues and concerns with mitigation measures in all sectoral policies and plans <ul style="list-style-type: none"> • Strengthen professional and resource management capacity of the MOEF and DOE 	was taken to integrate environmental issues and concerns by involving the cross- sectoral ministries/Agencies. A dialogue was initiated. (To form a Network, the Stakeholders are identified and a database already created on this) <ul style="list-style-type: none"> • National Agenda 21 was partially developed through adoption of NEMAP 	will integrate environmental concerns in project design <ul style="list-style-type: none"> • Make provisions for open public hearings on projects with major environmental implications • Make EIA report a public document for consideration by the stakeholders • Develop sector specific EIA guidelines • Amend Environment Conservation Rules, 1997 keeping provision of public participation in EIA approval 	guidelines <ul style="list-style-type: none"> • Provision for contingency plan during major environmental disaster 	MoF, LG D
	<ul style="list-style-type: none"> • Strict enforcement of Environment Conservation Act 1995 and Environment Conservation Rules 1997 • Increased public participation in environment related decisions 	<ul style="list-style-type: none"> • Public participation in environment related project formulation and implementation is being practiced 			
Resource/sector specific issues					
1. Land degradation reversed and land quality improved	<ul style="list-style-type: none"> • Improved organic contents and micronutrient in soils of affected areas 	<ul style="list-style-type: none"> • NEMAP highlighted adverse effects of agro-chemicals on the environment • Popularised programmes for use of organic manures, e.g., through farmer field schools • Integrated Pest Management (IPM) programme promoted • Ratification of Stockholm Convention is under process • Formulation of National Implementation Plan (NIP) 	<ul style="list-style-type: none"> • Ensure balanced use of chemical fertiliser with organic manures and adopt Integrated Plant Nutrient System (IPNS), extension of Integrated Pest Management (IPM), adjustment of cropping patterns incorporating legume/ green manure crops • Ensure balanced use of fertiliser through market-based mechanism and improved supply • Ensure adequate funds for saline-tolerant crop varieties • Extend and continue with IPM all over the country 	<ul style="list-style-type: none"> • Undertake research on crop varieties and crop rotation for lowering fertiliser use • Reduction of micronutrient deficiency in soil. Reversion of phosphate fixation • Reduction of advancement of salinity frontier to the north. Improvement of organic content of soil. Reduction of pesticide residues in soil 	MoA, MoEF, DOE, DAE, NGOs

Strategic Goal	Key Targets	Action taken/ Underway	PRSP Policy Agenda (FY 05–06)	Future Priorities	Responsibilities
(1)	(2)	(3)	(4)	(5)	(6)
		<p>on Persistent Organic Pollutants (POPs) is in process</p> <ul style="list-style-type: none"> • Research on saline-tolerant and drought tolerant varieties Ongoing • Enrichment of land quality through Biogas Technology • Ban on polythene enforced • Sustainable Land Management Project formulation is in process 			
2. Reduce the rate of deforestation	<ul style="list-style-type: none"> • Bring 20percent of land under forest by 2015 • (National Forest Policy 1994) 	<ul style="list-style-type: none"> • Social forestry introduced on pilot basis • People started to receive benefits from participatory forestry • Replication of Coastal afforestation • Replication of Homestead forestry 	<ul style="list-style-type: none"> • Generate tree-cover on denuded forestland with suitable native species • Develop market-based incentive mechanisms to prevent illegal tree-felling • Develop mechanism to involve local communities for afforestation activities 	<ul style="list-style-type: none"> • Involve community -based organizations for social afforestation with appropriate benefit distribution systems 	MoEF, FD, NGOs
3. Conserve the bio- diversity of the country	<ul style="list-style-type: none"> • Improve floral and faunal bio-diversity • Halt destruction of habitat and overexploitation of flora and fauna, and encroachment of the natural forests • Document the state of floral and faunal biodiversity of the country by ecosystems • Implement policies to protect biodiversity by involving local 	<ul style="list-style-type: none"> • 16 Protected Areas (PAs) and 8 Ecologically Critical Areas (ECAs) established • Development of co-management model on afforestation • Development of Wildlife Policy is in process • Development of Wildlife Act is in process • Reformulation of Bio-safety Guidelines, Finalization of National Biodiversity Strategy and Action Plan (NBSAP), Biodiversity and Community Knowledge Protection Act (draft), Formulation of National Biodiversity Framework, 	<ul style="list-style-type: none"> • Formulation and implementation of biodiversity policy; Implement NBSAP • Develop Guidelines for ECAs and PAs • Survey floral and faunal biodiversity in new PAs • Introduce and promote local and indigenous varieties of fish stock 	<ul style="list-style-type: none"> • Establish a network of ECAs • Develop environmentally sound biotechnology updating biodiversity conservation regulation • Develop digitised national database on biodiversity • Prepare inventory of all flora and fauna by ecosystems in Bangladesh • Introduce regulatory measures (both market based and command and control types) to protect biodiversity of nature • Study possibilities of reintroduction of extinct species in selected areas 	MoEF, MoF, MoSICT, MoA, DOE, FD, National Herbarium, BFRI, NGOs

Strategic Goal	Key Targets	Action taken/ Underway	PRSP Policy Agenda (FY 05–06)	Future Priorities	Responsibilities
(1)	(2)	(3)	(4)	(5)	(6)
	communities	development of the Sundarbans Biodiversity Conservation Project are in process <ul style="list-style-type: none"> • Coastal and Wetland Biodiversity Management at Cox's Bazar and Hakaluki Haor Project is in progress • Making Encyclopedia on flora and fauna of Bangladesh -in progress 			
4. Control air pollution in major metropolitan cities and rural settings	<ul style="list-style-type: none"> • Improve ambient air quality at the national standard level, reduce air pollution from automobile and brick kiln sources, control indoor air pollution • Introduction of energy efficient cooking stoves in rural areas • Improvement of air quality of all major hot spots, particularly in metropolitan towns • Reduction of emissions from motorised vehicles • Strengthening of regulatory measures against industrial emissions 	<ul style="list-style-type: none"> • Banned two-stroke three-wheeler in the Dhaka city since September1, 2002, switching to green fuel (e.g. CNG) • Installation of Catalytic Converter and Diesel Particulate Filter becomes mandatory, installation of Continuous Air Monitoring Station in Dhaka • Invented fuel-efficient cooking stoves for the poor • Limited diffusion of efficient stoves • Two-stroke engine vehicles replaced with four-stroke, CNG run ones (in Dhaka) • Vehicular Emission Standard and Ambient Air Quality Standard updated under AQMP Project 	<ul style="list-style-type: none"> • Amend Brick Burning Act and Rules • Introduce improved and energy efficient brick kiln • Switch to clean fuel (CNG/LPG /LNG) • Ban plying 15 year old vehicle, Phase-out 2 stroke auto-rickshaw • dust control measures in construction work • Improve mass-transport system in major cities • Follow appropriate road structure strategy • Disseminate air quality information • Build coalitions with NGOs for wider dissemination of fuel-efficient cooking stoves • Promote R&D to change building and construction standards and designs for pollution-free kitchens 	<ul style="list-style-type: none"> • Introduce economically encouraging measures, promotion of investigation and research, establishment of air pollution monitoring stations in all municipalities • Enact/revise laws and regulatory framework for transport-related and industrial emissions with international standards as benchmark • Use fiscal measures for encouraging use of emission-reducing equipment and machines 	MoSICT, MoEF, MoPT, MoF, MoC, DoE, BCSIR,
5. Improve solid waste management system	<ul style="list-style-type: none"> • Introduce efficient collection and transportation of municipal waste to the disposal site 	<ul style="list-style-type: none"> • Polythene Shopping Bags have been banned • With the help of JICA, DCC has submitted Master Plan for sustainable solid 	<ul style="list-style-type: none"> • Introduce segregate organic and non-organic waste at the household level • Develop public-private partnership for solid waste management • Formulate and implement solid waste 	<ul style="list-style-type: none"> • Developing framework and building capacity to handle trans-boundary hazardous waste under Basel Convention • Continue with the initiatives and 	LG D, MoE, MoEF, MoLJPA, MoLGRDC, MoSW,

Policy Matrix

Strategic Goal	Key Targets	Action taken/ Underway	PRSP Policy Agenda (FY 05–06)	Future Priorities	Responsibilities
(1)	(2)	(3)	(4)	(5)	(6)
	<ul style="list-style-type: none"> • Segregate at source and introduce safe disposal of hazardous autoclaving, shredding & incineration of hazardous medical waste • Improve solid waste disposal method (including Clinical Waste) in all towns 	<p>waste management</p> <ul style="list-style-type: none"> • Community based urban solid waste management by Waste Concern under SEMP is in progress. Formulation of draft waste management guidelines • Promotion of alternative environment friendly shopping bags • Pilots are Ongoing in Secondary Towns on Solid Waste Management 	<p>management master plan for each municipality, and replicate them in other major cities</p> <ul style="list-style-type: none"> • Popularise private-public partnership in waste removal from cities • Improve waste disposal systems and their management substantially • Introduce sanitary land-fill for all solid waste disposal • Recycle, reduce and reuse of industrial and other solid waste 	interventions taken during 2005-2007	MoHFW, City Corporation, DoE, Municipalities, CSOs and NGOs
6. Improve living environment in the Slums	<ul style="list-style-type: none"> • Reduce drainage congestions in cities • Establish regulatory framework to ensure treatment of all industrial pollution before disposal 	<ul style="list-style-type: none"> • A major rural towns study identified environment improvement needs • Secondary towns improvement project Ongoing • Other metropolitan city investments proposed and Ongoing 	<ul style="list-style-type: none"> • Prepare and adopt a national policy on urban development • Set up slum improvement cell in every municipality • Extend solid waste collection service, water points and sanitary latrines in slams • Undertake awareness programme for basic sanitation • Strengthen and enforce conservancy laws and regulatory frameworks • Revise property tax systems in local governments to generate resources for conservancy • Recover wetlands, rivers, canals from land-grabbers to ensure efficient drainage network in cities 	<ul style="list-style-type: none"> • Introduction of physical planning and land use control legislation, review of broad based government land ownership and present use and future needs, repatriation of willing slum people to their own villages, introduction of effective commuter transport services 	MoEF,LGD, DCC, DOE, WASA, Municipalities, NGOs
7. Control industrial pollution	<ul style="list-style-type: none"> • Bring all the amber-b and red category industries as classified under Environmental Conservation Rules, 1997 to Environmental Clearance 	<ul style="list-style-type: none"> • Pilot schemes are being carried out to improve environmental management in textile sectors (Beluchi, Narshingdhi), pilot Scheme: Development of Reed based Textile Wastewater Treatment by BEMP • Constituted a Committee 	<ul style="list-style-type: none"> • Enforce strictly the Environment Conservation Act and Rules, and Monitor industrial pollution and make industries take pollution control measures • Turn key private sector-run common effluent treatment plants for industry clusters • Introduce moratorium on industrial 	<ul style="list-style-type: none"> • Introduction of Environmental Management System (EMS) in compliance with ISO 14000 	MoI, MoEF, MoT&J, BSCIC, DOE, Municipalities, NGOs

Strategic Goal	Key Targets	Action taken/ Underway	PRSP Policy Agenda (FY 05–06)	Future Priorities	Responsibilities
(1)	(2)	(3)	(4)	(5)	(6)
	procedure	to identify highly polluted Industries and suggest rectification measures	development in high development zones <ul style="list-style-type: none"> • Set up ponds and construct wetlands for textile industry clusters • Move immediately the tanneries and other polluting industries to environmental management sites 		
8. Improve water quality	<ul style="list-style-type: none"> • Reduce pollution load in water ecosystem • Identify and monitor pollution sources • Establish appropriate regulatory system to combat pollution from non-point sources • Enact and enforce laws to control emissions into water of hazardous/toxic wastes 	<ul style="list-style-type: none"> • Installation of Effluent Treatment Plant in polluting industry has been made mandatory in the ECA 1995. Many industries have installed ETP • A Study on Environmental Pollution due to Ship Breaking • A BEMP study on community based cost effective water treatment plant using reed bed 	<ul style="list-style-type: none"> • Introduce land zoning of industries • strengthen water quality monitoring • Enforce Environment Conservation Act & Rules, Introduction of waste reception and treatment facilities in ports, Clean-up and rehabilitate hot spot areas in Dhaka, Chittagong and Khulna • Ensure reduction of effluent discharges from mechanised vessels in rivers • Provide fiscal and other financial incentives for retro-fitting or for reduction of effluents from industries • Take measures for creating appropriate institutional, technical, human and logistical capacity identification, monitoring and remedial measures 	<ul style="list-style-type: none"> • Study on agro-chemical residues in water, study of bio-accumulation, strengthening capacity to detect oil spillage in the sea, introduction of environmental auditing system • Take appropriate measures for people-centred pollution-free rivers through awareness raising and voluntary labour mobilization • Introduce environmental training courses and certification for industries • Ensure EMP for industries and introduce environmental audit 	MoEF, MoWR, LGD, MoS, DCC, WASA, DOE
9. Integration of climate change issues with other policies, programmes, and projects 10. Address Adverse Effects of Climate Change and Promote Sustainable Development	<ul style="list-style-type: none"> • Sector-specific vulnerability to climate change studied • Preparation of a National Adaptation Plan of Action (NAPA) • Integration of climate change adaptation in all policies, programmes and projects as appropriate 	<ul style="list-style-type: none"> • Inventory of GHG emission done, Country Programme prepared • Under USCSMT, studies undertaken on vulnerability and adaptation to climate change and probable mitigation measures • Under ALGAS, similar studies undertaken • National Adaptation Programme of Action (NAPA) to climate change is under process and will be completed soon 	<ul style="list-style-type: none"> • Finalise NAPA and identify programmes and projects • Mobilise resources for appropriate interventions • Coordinate NAPA with all public, private and community level stakeholders • Provide Policy and Institutional framework for integration of climate change adaptation activities in all relevant public and private investments 	<ul style="list-style-type: none"> • Capacity building for integrating climate change into Water and Agriculture sector planning and implementation • Promote community based adaptation project to address adverse effects of climate change 	MoEF, DOE, Relevant Ministries

Policy Matrix

Strategic Goal	Key Targets	Action taken/ Underway	PRSP Policy Agenda (FY 05-06)	Future Priorities	Responsibilities
(1)	(2)	(3)	(4)	(5)	(6)
		<ul style="list-style-type: none"> • 1st National Communication on Climate Change submitted • Climate change issues incorporated in the Coastal Zone Policy 			

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