MILLENNIUM DEVELOPMENT GOALS NEEDS ASSESSMENT & COSTING 2009-2015 BANGLADESH

General Economics Division
Planning Commission
Government of the People's Republic of Bangladesh

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"Support to Monitoring PRS & MDGs in Bangladesh" is being implemented by General Economics Division, Planning Commission, supported by UNDP, which strengthens the capacity of Government professionals to track and monitor PRS/MDG progress and estimate the costs of achieving MDG targets.

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General Economics Division, Planning Commission hereby extends special gratitude to UNDP Bangladesh for their continuous technical support in finalizing this document through the project titled "Support to Monitoring PRS & MDGs in Bangladesh".

Air Vice Marshal (Rtd.) A. K. Khandker
Minister
Ministry of Planning
Government of People's Republic of Bangladesh

Message

I am happy to learn that the General Economics Division (GED) of the Planning Commission has prepared **' Millennium Development Goals: Needs Assessment and Costing 2009-2015 '** with the technical support from the UNDP.

Bangladesh is committed to achieve the MDGs within stipulated time, i.e. by 2015. MDGs have been integrated into the successive Bangladesh PRSPs and Annual Development Programmes (ADPs). Bangladesh has already initiated actions to prepare Sixth Five Year Plan (2010-2015) that focuses on achieving the MDGs within the stipulated time frame.

Bangladesh has already achieved a commendable niche in attaining the MDGs. The MDGs needs assessment and costing is a very timely exercise and will contribute in the resources requirement estimation for the Sixth Five Year Plan.

The Report has come out with a resources requirement of BDT 7,126.76 billion (USD 104.18 billion) to attain all the MDGs in Bangladesh during 2009-2015. The estimated resource requirement to attain all the MDGs in Bangladesh is a huge amount that would also require mobilization of resources by the development partners of Bangladesh. I would urge our development partners to come forward with the required resources as they pledged in the Millennium Declaration.

I congratulate GED and other Ministries/ Agencies for their cooperation in carrying out this exercise. I would also like to appreciate UNDP for providing necessary technical support to carry out this exercise.

Air Vice Marshal (Rtd.) A K Khandker

FOREWORD

The MDG Needs Assessment and Costing exercise for Bangladesh emanates from a joint effort of the Government of People's Republic of Bangladesh and UNDP to estimate the resources needed for achieving MDGs in Bangladesh by 2015. The focal point for the activities has been the General Economics Division (GED), Planning Commission, through implementing the project titled ' Support to Monitoring PRS and MDGs in Bangladesh' supported by UNDP. The Report has put together the status and trends in progress of achievement of MDGs in Bangladesh, the challenges ahead, the major interventions and targets for MDGs, as well as the resources requirements for attaining MDGs by 2015.

To conduct the MDG Needs Assessment and Costing, five thematic areas were identified based on the UNDP developed templates i.e. poverty and hunger (MDG1), education (MDG2), gender (MDG3), health (MDG 4, 5 and 6) and environment (MDG7). Each thematic area was worked out by a Thematic Working Group (TWG) led by the respective Ministry with members from different Ministries and UN Agencies. All the five thematic reports are synthesized with technical assistance from UNDP Regional Office to prepare the final report **Millennium Development Goals: Needs Assessment and Costing 2009-2015.**

The Report has assessed that BDT 7,126.76 billion (USD 104.18 billion) would be required to attain all the MDGs in Bangladesh during 2009 - 2015. The per capita resources requirement would be BDT 5,115.95 (USD 74.79) in 2009 and BDT 8,289.48 (USD 121.19) in 2015. Thus, according to the estimate, annually about BDT 1,018 billion (USD 14.9 billion) would be required to attain all MDGs in Bangladesh by 2015, implying annual per capita cost of about BDT 6,676 (USD 98).

The estimated resource requirement to attain all the MDGs in Bangladesh is a huge amount that would require mobilization of resources by the development partners of Bangladesh. Rich countries have already committed in the Millennium Declaration to develop a global partnership with the poor countries (MDG 8) to attain MDG goals by 2015.

Prof. Dr. Shamsul Alam
Member
General Economics Division
Planning Commission

ACKNOWLEDGEMENTS

The 'Millennium Development Goals (MDGs): Needs Assessment and Costing Report, 2009-2015' in Bangladesh was prepared by the General Economics Division (GED), Planning Commission with the technical support of the United Nations Development Programme (UNDP).

The Report has been prepared through a highly participatory and consultative process through Five Thematic Working Groups (TWG). Each of the TWGs was lead by the respective lead Ministry for the thematic area. We would like to acknowledge the leadership and the contributions of the lead Ministries of the TWGs. They include General Economics Division (GED), Planning Commission, Ministry of Primary and Mass Education, Ministry of Women and Children Affairs, Ministry of Health and Family Welfare, Ministry of Environment and Forests. Besides, other ministries / agencies and UN bodies as part of the TWGs contributed through a series of consultations.

The MDGs thematic area reports prepared by Dr. Md. Akteruzzaman, Dr. Sadeka Halim, Dr. Habibur Rahman, Ms. Nahid Akter Jahan and Dr. Nepal Chandra Dey formed the backbone of the final report. Coordination of the exercise with consultants and TWGs, and the compilation of the report was done by Mr. Narendra Mishra, Local Development and MDG Localisation Specialist, Support to monitoring PRS and MDGs in Bangladesh, UNDP Bangladesh.

Dr. Yubaraj Khatiawada Senior Economist, MDGI, UNDP Regional Center Colombo, Ms. Menaka Gunwardene, UNDP RCC and Mr. Neil Fernando (formerly UNDP RCC) and other officials of UNDP Regional Center Bangkok and UNDP Regional Center Colombo provided training on use of the costing tools and technical backstopping for the MDG Needs Assessment and Costing exercise.

Dr. M. Golam Sarwar provided the leadership for the 'MDG Needs Assessment and Costing exercise' as National Project Director 'Support to Monitoring PRS and MDGs in Bangladesh' and Mr. Kalyan Raj Pandey, Project Manager, provided necessary managerial support.

TABLE OF CONTENTS

TABLE OF CONTENTS

LIST OF TABLES

LIST OF TABLES

LIST OF FIGURES

ACRONYMS

ADB	Asian Development Bank
AIDS	Acquired Immune Deficiency Syndrome
ANC	Ante Natal Care
AQMP	Air Quality Monitoring Project
ATP	Acceptance Test Procedure
AWG-LCA	Ad Hoc Working Group on Long-term Cooperative Action under UNFCCC
BANBEIS	Bangladesh Bureau of Educational Information and Statistics
BBS	Bangladesh Bureau of Statistics
BDHS	Bangladesh Demographic and Health Survey
BDT	Bangladesh Taka
BGMEA	Bangladesh Garment Manufacturers and Exporters Association
BIDS	Bangladesh Institute of Development Studies
BNFE	Bureau of Non Formal Education
BNWLA	Bangladesh National Women's Lawyers Association
BRTA	Bangladesh Road Transport Authority
BWDB	Bangladesh Water Development Board
CAGR	Compound annual growth rate
CAMPE	Campaign for Popular Education
CBN	Cost of basic needs
CC	Community Clinic
CCA	Common Country Assessment
CEDAW	Convention on Elimination of All Forms of Discrimination against Women
C-EmOC	Comprehensive Emergency Obstetric Care
CFC11	Trichlorofluorometehe
CGE	Computable general equilibrium
CMMU	Construction and Maintenance Management Unit
CNG	Compressed natural Gas
CNS	Child Nutrition Survey
CSBA	Community Skilled Birth Attendant
CSO	Civil society organization
CUS	Center for Urban Studies
DCC	Dhaka City Corporation
DFA	Dakar Framework of Action
DGFP	Directorate General of Family Planning
DGHS	Directorate General of Health Services
DH	District Hospital
DoE	Department of Environment
DOF	Department of Forest
DOTS	Directly Observed Treatment - Short Courses
DPE	Directorate of Primary Education
DPHE	Department of Public Health
DSP	Deep Set Pump
DSW	Department of Social Welfare
DWA	Development of Women Affairs
DWASA	Dhaka WASA
EFA	Education for All
EMIS	Education Management Information System
ETP	Export Trading Policy
EU	European Union
FDI	Foreign Direct Investment
FSSAP	Female Secondary School Assistance Project
FY	Fiscal year
FYP	Five Year Plans

ACRONYMS

GDP	Gross domestic product
GER	Gross Enrolment Ratio
GNI	Gross national income
GoB	Government of Bangladesh
HCFC-22	Chlorodifluoromethene
HIES	Household Income and Expenditure Survey
HNPSP	Health, Nutrition and Population Sector Program
HPSP	Health and Population Sector Program
HRD	Human resources development
ICT	Information Communication Technology
IDEAL	Intensive District Education for All
INFEP	Integrated Non Formal Education Programme
I-PRSP	Interim-PRSP
IFI	International Financial Institutes
IMF	International Monetary Fund
IMR	Infant Mortality Rate
LDC	Least development countries
LGED	Local Government Engineering Department
LPUPAP	Local Partnerships for Urban Poverty Alleviation Project
MCH	Medical College Hospital
MDG	Millennium Development Goal
MICS	Multiple Indicator Cluster Survey
MMR	Maternal Mortality Ratio
MoA	Ministry of Agriculture
MoE	Ministry of Education
MoEA	Ministry of Economic Affairs
MoEF	Ministry of Environment and Forests
MoHFW	Ministry of Health and Family Welfare
MoIC	Ministry of Information and Communications
MOPME	Ministry of Primary and Mass Education
MOWCA	Ministry of Women and Children Affairs
MWTL	Multiple Ways of Teaching and Learning
NASP	National AIDS/STD Program
NER	Net Enrolment Ratio
NFE	Non Formal Education
NFEP	Non Formal Education Project
NGO	Non-government Organization
NHS	National Health Survey
NILG	National Institute of Local Government
NPA	National Plan of Action
NRR	Net Reproduction Rate
NSP	National Strategic Plan
NTP	National Tuberculosis control Program
O3	Ozone
OCC	One Stop Crisis Centre
ODA	Official Development Assistance
ODS	Ozone Depleting Substance
OECD	Organization for Economic Cooperation and Development
PEDP	Primary Education Development Program
PG	Poverty gap
PLCE	Post Literacy and Continuing Education
PPP	Purchasing Power Parity
PRSP	Poverty Reduction Strategy Paper
PWD	Public Works Department

ROSC	Reaching Out of Schools Children
SEQAPE	Secondary Education Quality and Access Enhancement Project
SME	Small & Medium Enterprises
SAM	Social accounting matrix
SEDA	Sustainable Energy Development Agency
SEP	Sustainable Energy Programme
SHD	Sustainable human development
SPG	Squared poverty gap
STW	Shallow Tubewell
SVRS	Sample Vita Registration System
SWAp	Sector Wide Approach
TLM	Total Literacy Movement
TWG	Thematic Working Group
UHC	Upazila Health Complex
UNCT	UN country team
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Education Scientific and Cultural Organization
UNFPA	United Nations Population Fund
UNICEF	United Nations International Children's Education Fund
UNIDO	United Nations Industrial Development Organization
UPE	Universal Primary Education
USC	Union Sub Center
USD	United States Dollar
VAW	Violence Against Women
VGD	Vulnerable Group Development
VGF	Vulnerable Group Feeding
VTI	Vocational Training Institute
WASA	Water Supply Authority
WCEFA	World Conference on Education for All
WFP	World Food Programme
WID	Women in Development
WSC	Women Support Centre

GLOSSARY

Proportion of population below $1 (PPP) per day: Proportion of population below $1 per day is the percentage of the population living on less then $1.08 a day at 1993 international prices.

Poverty gap ratio (incidence multiplied by depth of poverty): Poverty gap ratio is the mean distance separating the population from the poverty line (with the non-poor being given a distance of zero), expressed as a percentage of the poverty line.

Share of poorest quintile in national consumption: Share of the poorest quintile in national consumption is the income that accrues to the poorest fifty of the population.

Prevalence of underweight children under five years of age: Prevalence of (moderately or severely) underweight children is the percentage of children under five years old whose weight for age is less than minus two standard deviations from the median for the international reference population, ages 0-59 months.

Proportion of population below minimum level of dietary energy consumption: Proportion of the population below the minimum level of dietary energy consumption is the percentage of the population whose food intake falls below the minimum level of dietary energy requirements. This is also referred to as the prevalence of under-nourishment, which is the percentage of the population that is undernourished.

Unemployment rate of young people aged 15-24 years, each sex and total: Unemployment rate of young people aged 15-24 years is the number of unemployed people ages 15-24, divided by the labour force of the same age group. Unemployed people are all those who are not employed during a specified reference period but are available for work and have taken concrete steps to seek paid employment or self-employment.

Total Labour Force and Youth Labour Force: The total labour force covers labour force participants 15 years and over while youth labour force refers to age group 15-24 years. The labour force is based on 'extended definition' which includes, in addition to persons employed or unemployed, persons who engage themselves in such household activities as threshing, cleaning, care of livestock and poultry, food processing and similar activities.

Decent work: The ILO describes decent work as 'opportunities for women and men to obtain decent and productive work in conditions of freedom, equity, security and human dignity'. Decent work is fundamental to promoting sustainable development and ensuring poverty reduction in a country like Bangladesh. Decent work can be elaborated in terms of the following six dimensions:

Opportunities for work: All persons (women and men) who want work should be able to find work. In this respect, the underlying concept of work is a broad one encompassing all forms of economic activity including self-employment, unpaid family work and wage employment in both formal and informal sectors.

Work in conditions of freedom: This dimension requires that work should be freely chosen and not forced on individuals, along with the condition that certain forms of work are not acceptable (e.g. bonded labour, slave labour and child labour). Also workers should have the freedom to join workers organizations.

Productive work: It is essential for workers to have acceptable livelihoods as well as to ensure sustainable development and competitiveness of enterprises.

Equity in work: There should be fair and equitable treatment and opportunity in work, absence of discrimination at work and in access to work, and workers should be able to balance work with family life.

Security at work: The conditions should be mindful of the need to help safeguard health, pensions and livelihoods, and to provide adequate financial and other protection in the event of health and other contingencies. This also recognizes a worker's need to limit insecurity associated with the possible loss of work and livelihood.

Dignity at work: Workers should be treated with respect at work, and be able to voice concerns and participate in decision-making about working conditions. Workers' freedom to represent their interests collectively is also an essential ingredient of ensuring dignity.

The first two dimensions relate to the availability and acceptable scope of work, the remaining four dimensions define the quality of employment. Taken together, these dimensions highlight the comprehensive nature of the concept of decent work. In addition, the concept of decent work has

significant gender implications in Bangladesh since women constitute a vast majority of the labour force, particularly youth labour in many sectors (e.g. readymade garments industries), and women are usually the worst victims of failures to ensure decent work conditions.

Proportion of land area covered by forest: The proportion of land area covered by forest areas as a share of total land area, where land area is total surface area excepting water bodies' areas. Forest includes both natural forest and forest plantation.

Ratio of area protected to maintain biological diversity to surface area: The ratio of area protected to maintain biological diversity to surface area is defined as national protected area as a percentage of total surface area of the country.

Energy use (Kg oil equivalent) per $1000 GDP (PPP): The Energy use (Kg oil equivalent) per USD 1,000 GDP (PPP) is commercial energy measured in units of oil equivalent per $1000 of gross domestic product converted from national currencies using PPP conversion factor.

Carbon dioxide per capita emission: The carbon dioxide per capita emission is the total amount of carbon dioxide emitted by a country as a consequence of human activities divided by the population of the country.

Consumption of ozone depleting CFCs (ODP Tons): Consumption of ozone depleting CFCs, is the sum of the consumption of the weighted tons of the individual substances in the group-metric tons of the individual substance.

Proportion of population using solid fuels: The proportion of population using solid fuels is the proportion of the population that relies on biomass (wood, charcoal, crop residues and dung) as the primary source of domestic energy for cooking and heating.

Proportion of population with sustainable access to improved water source: The proportion of population with sustainable access to improved water source is the percentage of the population who use any of the following types of water supply for drinking: piped water, public tap, borehole or pump, protected well, protected spring or rainwater. Improved water sources do not include vendor-provided water, bottled water, tanker trucks or unprotected wells and springs.

Proportion of population with sustainable access to improved sanitation: The Proportion of population with sustainable access to improved sanitation refers to the percentage of the population with access to facilities that hygienically separate human excreta from human, animal and insect contact.

Proportion of population with access to secure tenure: The proportion of population with access to secure tenure is 1 minus the percentage of urban population that lives in slums. Lack of security of tenure is defined as the lack of formal documentation for the residence or perceived risk of eviction.

Jhupri: Jhupri structures are those structures made of temporary materials like; jute stalk, sack, leaves of trees etc.

Kutcha: Kutcha structures are those structures made of bamboo, wood, straw, sun hemp and other semi-durable materials like CI sheet, etc.

Semipucca: Semi-pucca structures are those structures where the wall and floor are made of brick and cement and the roof is made of CI sheet, tiles etc.

Slum: A slum is a contiguous settlement where the inhabitants are characterized as having inadequate housing and basic services. A slum is often not recognized and addressed by the public authorities as an integral or equal part of the city.

Secure tenure is the right of all individuals and groups to effective protection by the state against unlawful evictions.

A slum household is a group of individuals living under the same roof that are lacking in at least one of the components of access to sanitation, access to safe water, secure tenure, durability of housing and sufficient living area (UN Habitat, 2003).

Pucca: The pucca structures are those structures where both walls and roof are made of cement and brick.

EXECUTIVE SUMMARY

Bangladesh's effort towards attainment of the MDGs has thus far been encouraging. It has made good progress in achieving targets, especially those under MDG1 (halving the proportion of population living below poverty line); MDG2 (Net enrollment rate in primary education); MDG7 (sustainable access to safe drinking water and sanitation); and MDG4 (reducing child mortality). It also already achieved some Targets under MDG3 (Gender parity in primary and secondary schooling) by 2005. But Bangladesh faces challenges in many areas, especially in MDGs 4, 5 and 6 (on health). Although it has shown good progress in some of the Targets, sustaining the achievements of the recent past, while giving additional attention to those Targets lagging behind, is a challenge.

The **MDG Needs Assessment and Costing for Bangladesh** is a joint effort of the UN family and the Government of People's Republic of Bangladesh to estimate the resources needed for achieving MDGs in Bangladesh by 2015. The focal points for the activity are the General Economics Division (GED), Planning Commission, Government of Republic of Bangladesh and United Nations Development Programme (UNDP).

Five Thematic Areas were chosen to conduct the MDG Needs Assessment and Costing : Poverty and Hunger (MDG1), Education (MDG2), Gender (MDG3), Health (MDG 4, 5 and 6) and Environment (MDG7). Each thematic area was covered by a Thematic Working Group (TWG) to ascertain the progress achieved in Bangladesh, while assessing the challenges to achieve the Targets by 2015. A list of interventions was then identified to address the challenges remaining within each Thematic Area by the respective TWGs. Costing of interventions was done using nine costing models: Agriculture and Rural Development, Transport, Education, Gender, Health, HIV/AIDS, Environment, Energy, and Water Supply and Sanitation. Trainings on use of these models developed by the Millennium campaign were done for the members of the TWGs by the representatives of UNDP and other relevant UN Agencies. The TWG was lead by the respective thematic area lead Ministry, and consisted of the members from different ministries and UN agencies.

1. MDG 1 Eradicate Extreme Poverty and Hunger

Bangladesh has made significant progress in reducing poverty in recent decades. Estimates from sources such as the Household Income Expenditure Survey (HIES) indicate that the population below the poverty line decreased from 58.8 percent in 1991-92 to 48.9 in the year 2000, and further to 40.0 percent by the year 2005. While the present economic upheavals have impacted the ratio of population below poverty line, but it is evident that Bangladesh has made good strides in reducing poverty and achieving MDG1.

However, variations exist between rural and urban areas and evidence also shows that there are very large regional disparities in virtually all of the MDG1 indicators in Bangladesh. Some of the regional areas such as Barisal, Khulna and Rajshahi Divisions have generally been lagging behind on several of the MDG1 indicators as compared to other Divisions and national averages. However, on average, the rural areas did better than urban areas in reducing the depth and severity of poverty implying growth in rural areas has been pro-poor.

An assessment of the poverty situation based on the farm categories size shows an inverse relation between size of farms and the population below poverty line when with the decreasing farm size, the population below poverty line tends to increase. Most of the farmers/households with farm sizes less than 0.50 hectares were below the national poverty line. Further, on poverty gap ratio, estimates show that poverty gap ratio decreased from 17.2 in 1990 to 12.9 in the year 2000, and to 9.0 in 2005 highlighting an encouraging trend of reduction in the poverty gap ratio by the year 2015.

Prevalence of underweight children under five years has decreased from 67 percent in 1990 to 51 percent in 2000 down further to 39.7 percent in 2005. However, evidence suggests that the proportion of underweight children in Bangladesh is higher than 16 other Asian countries. According to Task Force on Hunger (Millennium Project) 'Poverty is a major cause of hunger'. The prevalence of underweight children in Bangladesh is mostly amongst the poor, yet, about one third of the children from the richest quintile are also suffering from malnutrition. This suggests that factors other than income play an important role in this

phenomenon. In analyses by the Task Force on Hunger and other researchers, the following factors emerged as strongly correlated with high levels of underweight pre-school children in developing countries: poverty, low food production, mothers' lack of education, poor water, sanitation and health facilities, and climatic shocks (Task Force on Hunger, 2003).

The **TWG on Poverty and Hunger** chaired by the GED/Planning Commission, based on analysis of the current situation in Bangladesh of MDG indicators related to poverty and hunger, identified a set of challenges and the major interventions related to poverty and food production. In addition, the TWG also discussed interventions for roads infrastructure to provide better access, and interventions for promoting employment. Accordingly the coverage and targets were set by the TWG in consultation with government documents and PRS-II. The interventions related to mother's education, health facilities are discussed in section on MDGs 4, 5 and 6 (Health); and interventions related to water, sanitation and the climatic shocks are discussed in section on MDG 7 (Environment).

In Bangladesh, agricultural performance in the 1990s has been relatively better with the growth in agricultural GDP estimated at 3.5 percent per year compared to 2.6 percent during 1974-90. Despite yield gains in agriculture, challenges persist in rural areas especially areas that are most remote from markets or who have poor grain storage capacities, etc. The main challenges identified by the TWG are: reducing hunger and malnutrition, creation of youth employment, protecting the vulnerable, promoting pro-poor growth, and expansion of rural infrastructure to ensure access to health and modern facilities, and strengthening the rural-urban market linkages by the poor.

The major interventions identified by the TWG are: increasing agricultural productivity, rural incomes and access to markets, development of road infrastructure, and promoting decent employment.

As mentioned above small scale farming families represent most of the poor/hungry in Bangladesh. Improving their productivity of crops, vegetables, trees and livestock is a major priority to reduce hunger, in addition to the infrastructure required for storages, agro-processing and micro-credit. These interventions areas were considered by the TWG under **agriculture and rural development** in which increasing agriculture productivity and increasing rural income and access to markets were identified as main intervention areas. To increase agriculture productivity the interventions include investments to improve soil health, increase access to use of improved seeds and plant protection, improve and expand small scale irrigation and water management, establish effective agricultural research and extension services and subsidies in agriculture. Bangladesh already provides subsidies in agriculture, but making agricultural inputs available at affordable prices through subsidies in a right mix of support programmes is essential to ensure full coverage of needy farmers.

Properly functioning markets are critical in ensuring that people are able to earn an income, obtain the inputs they need to raise crop yields, and sell their produce at fair prices. To increase rural incomes and market access for the poor the major interventions identified by the TWG are: building storage facilities to reduce post-harvest losses, enhance agro-processing activities; improving access to micro credit; and promoting community mobilization. These interventions in agriculture and rural development are projected to cover all targeted smallholder households each year, since they are important for all smallholder farmers, and are deliverable on a per-farm basis.

The total costs estimated for **agriculture and rural development** interventions using the Millennium Project's Agriculture and Rural Development costing model is estimated to be BDT 1591.07 billion (USD 23.26 billion) for the period 2009-15 with an average per capita cost of BDT 1284.65 (USD 18.78) in the year 2009 increasing to BDT 1684 (USD 24.62) in year 2015.

However, the major contribution of agriculture and rural development will be borne by household contribution (private individuals). Government expenditures during 2009-2015 will relate to mainly to the provision of subsidies costing about BDT 415.55 billion (USD 6.07 billion), and in addition, the government will need to incur the costs of national interventions and a portion of the farm interventions. It is estimated that the Bangladesh government will need to incur an expenditure of about BDT 865.99 billion (USD 12.66 billion) from 2009-2015 for agriculture and rural development.

The TWG also identified the **promotion of decent employment** as an important priority. Interventions to promote decent employment include food for work programs which act as safety nets for food-insecure households; social safety net programs (SSNPs) through employment guarantee schemes; and skill development programmes. It is estimated that the total costs for interventions to **promote decent employment** are around BDT 385 billion (USD 5.63 billion) for the period 2009-2015 with an average per capita cost of BDT 375.09 (USD 5.48) in 2009 decreasing to 349.73 (USD 5.04) in 2015.

In total for agriculture and rural development and for the promotion of decent employment the total estimated costs are BDT 1871.07 billion (USD 27.52 billion) for the period 2009-2015 at an average per capita cost of 1557.46 (USD 22.77) in 2009 to BDT 1934.85 (USD 28.29) in the year 2015.

It is also generally agreed that markets will not develop without public investment in road infrastructure. Interventions for **development of road infrastructure** include construction and maintenance of roads at village, union, upazila, district and national level; and the construction and maintenance of bridges and culverts on village, union, upazila, district and national roads in addition to investments in waterways and railways. The total costs estimated for development of road infrastructure are BDT 336.19 billion (USD 4.92 billion) with an average per capita cost of BDT 321.17 (USD 4.7) in 2009 gradually increasing to BDT 307 (USD 4.49) in 2015.

The total costs estimated for achieving MDG 1 using the costing model within the three categories of agriculture and rural development, development of road infrastructure, and the promotion of decent employment are BDT 2312.26 billion (USD 33.80 billion) for 2009-2015 at an average cost of BDT 330.32 billion (USD 4.82 billion) per annum. Per capita expenditures are estimated to be BDT 1,980.88 (USD 28.96) in 2009, increasing to BDT 2,335.87 (USD 34.15) in 2015.

However as mentioned above, the major contribution for agriculture and rural development would be borne by households, with government expenditures mainly in subsidies, public investment in road and other infrastructure, and safety net programmes. Considering only the government expenditures, it is estimated that the costs for interventions related to and rural development, development of road infrastructure, and promotion of decent employment are BDT 1587.18 billion (USD 23.20 billion) for the period 2009-2015 at an average cost of BDT 226.74 billion (USD 3.31 billion) per annum.

2. MDG2 Achieve Universal Primary Education

Since 1990, Bangladesh has undertaken a number of programmes with a view to achieving the Millennium Development Goal for education (MDG 2). Many of these began following the World Conference on Education for All (EFA) in 1990, and have had activities that deal with both qualitative and quantitative aspects of education. Until recently (before PDEP II that was initiated in 2003), the major focus was on increasing the enrolment rate and bringing about gender parity. These programs

included construction of new classrooms, training of teachers to increase the access to education; free distribution of educational materials, school uniforms, nutritional food for poor students, particularly girls; establishing of Satellite and less expensive community schools nearer the door steps of the children; providing food rations to the families of rural poor children/later cash for education; applying innovative teaching methods, social mobilization, monitoring learning achievement; and recruiting new teachers. These programs have contributed significantly to improving the enrolment and gender situation in the country particularly at the primary level.

The Primary school Net Enrolment Rate (NER) recorded significant improvement from 60.48 percent (1990) to 91.1 percent (2007). A considerable proportion of this improvement may be attributed to faster progress in girls' enrolment (50.76 percent in 1990 to 94.7 percent in 2007) as opposed to that for the boys' (69.43 percent in 1990 to 87.8 percent in 2007). This gives a gender parity index of 1.08 in 2007, which was 1.37 in 1990. Gross Enrolment Rate (GER) has also improved substantially during the same period: 63.26 percent in 1990 to 98.8 percent in 2007 with significant contribution from girls' participation (63.26 percent in 1990 to 104.6 percent in 2007). All these achievements however helped keeping Bangladesh well on track in meeting the first indicator of MDG 2: a 100 percent Net Enrolment Rate and bringing about gender parity particularly at the primary level.

The **TWG on Education** chaired by the Ministry of Primary and Mass Education identified major challenges in achieving MDG2 on Education. Analysis shows that, despite improvements in NER and GER, there is little room for complacency with regard to achieving MDG2 because of the disappointing growth performance in the other two indicators: primary cycle completion and adult literacy rate.

The Primary cycle completion rate or survival rate to grade five has increased by a very low margin: from 40 percent in 1991 to 51.9 percent in 2007. Survival rate is higher for the girls (54.9 percent) than for the boys (48.9 percent). High drop out and repetition rates in grade one through grade four are also found in the 2007 primary school survey. These two rates are lower for the girls than for the boys. Progress in adult literacy situation is also not satisfactory. In 2007 it was recorded at 53.5 percent, with 58.7 percent for men and 48 percent for women. In 1991 this was 35.3 percent, with 44.3 and 25.8 percent respectively for males and females.

In view of the current situation it appears quite challenging to attain 100 percent primary cycle completion rate and 100 percent adult literacy rate within the remaining seven years. The TWG on Education has however identified certain necessary measures, in addition to continuing the existing ones, that aim to improve the present education situation and achieve the goals under MDG2.

Improving the quality of primary education, creating a child friendly atmosphere at the primary schools, creating adequate physical infrastructure provisions, reducing opportunity cost of school attendance, providing incentives for the key players at both demand and supply levels, and building mass awareness are the key areas that need particular attention for achieving the education MDG targets. These interventions also comply more broadly with the National Plan of Action prepared for the improvement of the primary education sector, and the recently prepared Poverty Reduction Strategies "Moving Ahead" for Bangladesh.

The interventions needed to address the time-bound MDGs targets can broadly be categorized as supply side and demand side interventions. Supply side interventions deal with provisions for infrastructure (classrooms, laboratories for secondary schools, sanitation facilities, etc.), provisions for teaching/learning materials, and human resources needs (teachers, trainings, excellence allowance to teachers, etc.). Demand side interventions address the needs of the service recipients (i.e., the students enrolled in different education/literacy programs) and include pro-poor subsidies, school feeding programmes, and stipends.

The interventions considered under MDG2 covered not only Primary Education, but also three other sectors related to pre-Primary (Early Childhood/Pre-Primary Education), post-Primary (Secondary Education), and non-Formal Education.

Using the costing model, total estimated costs for 2009-2015 in **Pre-Primary Education** are BDT 82.2 billion (USD 1.2 billion), at an average per pupil cost of BDT 1739.37 (USD 25.43) in 2009, rising to BDT 3052.8 (USD 44.6) in 2015. The per capita cost would vary from BDT 39.18 (USD 0.57) in 2009 to 123.5 (USD 1.8) in 2015 to achieve the interventions in Pre-Primary education.

Total estimated costs for 2009-2015 in **Primary Education** are BDT 859.69 billion (USD 12.56 billion), at an average per pupil cost from BDT 4,940.68 (USD 72.23) in 2009 to BDT 9,712.8 (USD 142) in 2015. The per capita cost would vary from BDT 531.84 (USD 7.78) in 2009, to BDT 1,123.8 (USD 16.4) in 2015 to achieve the interventions in Primary education.

Estimated costs for 2009-2015 in **Secondary Education** are BDT 60.44 billion (USD 8.83 billion), at an average per pupil cost from BDT 12,117.39 (USD 177.15) in 2009 to BDT 20,143.7 (USD 294.5) in 2015. The per capita cost would vary from BDT 23.08 (USD 0.34) in 2009, to 99.7 (USD 1.4) in 2015 to achieve the interventions in Secondary education.

Estimated costs for 2009-2015 in **Non-Formal Education** are 85.68 billion BDT (USD 1.25 billion), at an average per pupil cost from BDT 1,985.6 (USD 29.03) in 2009 to BDT 3,327.2 (USD 48.6) in 2015. The per capita cost would vary from BDT 7.04 (USD 0.1) in 2009, to 252.11 (USD 3.69) in 2015 to achieve the interventions in non-formal education.

Estimated costs for 2009-2015 in achieving MDG2 related interventions in **education** covering all four sectors (Pre-Primary, Primary, Secondary and Non-Formal Education) are BDT 1,087.97 billion (USD 15.90 billion), at an average per pupil cost from BDT 20,783 (USD 303.85) in 2009, to BDT 36,236 (USD 529.78) in 2015. The per capita cost would vary from BDT 601.14 (USD 8.79) in 2009, to BDT 1,599.31 (USD 23.39) in 2015 to achieve the interventions in education (for all four sectors above). Thus the average cost needed to achieve MDG2 in education, including four sectors mentioned above, is about BDT 155.42 billion (USD 2.27 billion) per annum.

3. MDG3 Gender

Bangladesh has already achieved Gender parity in primary education. This can largely be attributed to the first Primary Education Development Programme (PEDP I), implemented from 1990 and PEDP II (initiated in 2003). Further, women in Bangladesh are becoming increasingly visible in economic spheres. Increasing women's involvement in both agricultural work and in non - farm activities has provided them with increased opportunities for wage work and certain economic independence.

However, despite the large scale involvement of women in economic activities, there remain many challenges for gender parity in Bangladesh. While the country remains broadly on track to ensure gender equity in basic education, there are some significant challenges that need to be addressed. There also still exist regional variations, for instance Barisal Division is yet to achieve gender parity in primary enrollment. Furthermore, post-primary education opportunities for girls also need to be strengthened.

The **TWG on Gender** chaired by Ministry of Women and Children Affairs (MOWCA) discussed the main challenges in achieving and sustaining gender parity. The main challenges identified by the TWG center on: gender parity in education in Primary Education, in Secondary Education, for Adult Literacy; ending Violence Against Women; providing day-care facilities; increasing the number and percentage of women in non-agricultural wage employment and women in Parliament; and finally on gender sensitizing all institutions involved in implementing interventions to promote gender equality.

The main interventions identified by the TWG include a set of initiatives listed below: Awareness programmes for sustaining gender based equality in education through community based awareness and school based awareness programmes; helping girls transition to work through vocational training, school to work programs, and income generating training and credit service; encouraging political participation through training of women candidates for election and support to women elected representatives; ending violence against women through community-based awareness campaigns, building one-stop crisis centers, women support centers, and safe home and shelters; the provision of day care facilities; and addressing systemic issues related to gender mainstreaming.

It is estimated that to achieve the goals under MDG3 on **promoting gender equality and empowering women** approximately BDT 280.90 billion (USD 4.11 billion) would be needed from 2009-15, at an average per capita cost of about BDT 188.81 (USD 2.76 in 2009) to BDT 416.04 (USD 6.08) in 2015. Thus the total costs estimated for achieving interventions to promote gender equality and women empowerment in Bangladesh are approximately BDT 40.13 billion (USD 0.58 billion) per annum, at an average per capita cost of approximately BDT 302.38 (USD 4.42) per annum.

4. MDG 4, 5 and 6 Health

The current Health, Nutrition and Population Sector Program (HNPSP) in Bangladesh outlines activities from 2003-2011. These objectives are aimed at improving health outcomes, reducing health inequities, enhancing the quality of care, modernizing the GoB health sector, and attaining the health-related MDGs. This document has tried to incorporate the MDG (4, 5 and 6) targets, while offering slightly different targets for HNPSP. The Revised Program Implementation Plan (RPIP) of Health, Nutrition and Population Sector Program (HNPSP) 2003-2011, proposed a budget for the whole sector dividing it into four sub-sectors: Health Program (HP), Nutrition Program, Population Program (PP) and Ministry Level Sector Development. Major Reproductive Health (RH) components are under HP and PP.

The **TWG on Health**, chaired by Ministry of Health and Family Welfare, considered the challenges faced by health sector covering MDGs 4, 5 and 6. It was agreed that while issues related to health systems such as infrastructure and human resources are common to all the three goals, the direct interventions (i.e those related to treatment) should be considered separately for the three MDGs.

On reducing child mortality, Bangladesh has achieved remarkable progress in reducing under-five mortality rate (from 133 per 1,000 live births in 1989-1993, to 65 per 1,000 in 2002-2006), and infant mortality rate (from 87 per 1,000 live births in 1993-94 to 52 per 1,000 live births in 2002-2006). The coverage of child immunization has also improved significantly in Bangladesh.

One of the main challenges ahead in achieving the MDG4 is the presently high neonatal mortality, and the proportion of newborns receiving care from trained providers. This situation is still unsatisfactory due to low skilled attendance during delivery. Despite various interventions designed under National Nutrition Project (NNP), low birth weight and malnutrition continue to be important causes of infant mortality and under-five mortality.

Major interventions identified for MDG4 on **reducing child mortality** are: increasing vaccination coverage through expanded programme on immunization; training of health personnel under integrated management of childhood illness programme of the government; treatment of diarrhea, ARI and fever; micronutrient supplementation; and increasing the coverage of skilled birth attendants during delivery and post natal care.

It is estimated that around BDT 322.64 billion (USD 4.71 billion) would be needed under MDG4 on **reducing child mortality** between 2009-15, at an average per capita cost of about BDT 186.8 (USD 2.73) in 2009 rising to BDT 365.3 (USD 5.34) in 2015.

It is evident that some of the interventions to reduce child mortality will also impact on the **improvement of maternal health** (MDG5). The Government of Bangladesh has attached utmost emphasis on rapidly improving maternal health by way of drastically increasing the use of modern health care amongst all segments on population. While it has achieved some progress in reducing maternal mortality from 574 per 100,000 live births in 1991 to 320 per 100,000 live births in 2001, challenges remain. Estimates show that around 85 percent of childbirth takes place at home in Bangladesh, and thus the need for births attended by trained and qualified skilled health personnel is important. Special attention is needed to improve these indicators to achieve the MDG target by 2015.

The TWG identified a set of interventions based on the analysis related to MDG indicators under MDG5. These interventions include: Antenatal care, skilled birth attendance during delivery, basic and comprehensive emergency obstetric care (EmOC), treatment of other maternal complications, family planning, and demand-side financing to increase access to heath care by the poor population.

It is estimated that around BDT 126.45 billion (USD 1.85 billion) would be needed under MDG 5 on **improving maternal health** between 2009-15, at an average per capita cost of about BDT 76.3 (USD 1.1) in 2009 rising to BDT 154.22 (USD 2.2) in 2015.

On **combating HIV/AIDS, Malaria and other diseases** (MDG 6), the limitation of data on HIV/AIDS prevalence is a major obstacle in tracking these MDG targets under MDG6. Further, the social stigma and other cultural barriers contribute to low levels of participation among the general population in HIV/AIDS prevention programs in Bangladesh. The National AIDS committee in Bangladesh was formed in 1985 and the National Policy on HIV/AIDS and STD related issues was adopted in 1996, concentrating mainly on surveillance, testing policy, management and counseling of patients and safe blood. Since the year 2000, there have been a variety of approaches aimed at raising awareness of HIV/AIDS under a new program. However, gender and regional disparities in awareness and knowledge about prevention of HIV/AIDS among citizens still need to be reduced.

While Bangladesh has made good progress in halting the prevalence, and increasing the prevention of Malaria and Tuberculosis, but challenges remain, as malaria prevalence although decreased significantly during 2006, increased again in 2007.

The TWG with the help of the costing model, estimated that around BDT 231.50 billion (USD 3.38 billion) would be needed under MDG6 on **combating HIV/AIDS, Malaria and other diseases** between 2009-15, at an average per capita cost of about BDT 126.37 (USD 1.85) in 2009, and about BDT 327.26 (USD 4.78) in 2015.

The analysis shows that improvement of **health systems** for attaining MDGs 4, 5 and 6 in Bangladesh (including infrastructure and human resources) need urgent attention. Scarcity of skilled health personnel is one of the main challenges. The density of qualified providers including doctors, nurses and dentists in the country is around 7.7 per 10,000 population, while according to WHO, the threshold density of doctors, nurses and mid wives is 22.8 per 10,000 population, below which, coverage of essential interventions to attain the MDGs is not possible (BHW 2007). Further, from the total 13,500 community clinics supposed to be constructed under HPSP, only 11,883 have thus far been constructed. As also recommended by the Task Force report on Health (Millennium Task Force), the highest priority should be given to strengthening the primary healthcare system, from community-based interventions, to first referral-level facilities at which emergency obstetric care (EmOC) is available. This implies a focus on the district level interventions. However, the availability of comprehensive EmOC services in public facilities, especially at district level and below in Bangladesh is not yet up to the target level.

The TWG carried out an assessment of the availability of existing levels of health facilities at three levels: Primary healthcare (Upazila Health complex, Upazila Health and Family Welfare Center, USC and Community Clinics), Secondary health care (District Hospitals) and tertiary health care (medical college hospitals and super

specialized care institutions). Interventions identified for these health systems in Bangladesh involve scaling up of existing facilities in form of up-gradation, the provision of new equipments, new facility construction, and pre-service and in-service training for human resources.

It is estimated that BDT 778.57 billion (USD 11.38 billion) is needed for **health systems** from 2009-2015, at an average per capita cost of approximately BDT 465.12 (USD 6.8) in 2009, to about BDT 902.88 (USD 13.2) in 2015.

The Total Estimated costs for interventions in **health** covering three MDG goals - MDG4 on reducing child mortality, MDG5 on improving maternal health and MDG6 on combating HIV/AIDS, malaria and other diseases including the health systems during the period 2009-2015 are BDT 1,459.15 billion (USD 21.33 billion), at an average per capita costs of about BDT 865.7 (USD 12.6) in 2009, and about BDT 1,774.3 (USD 26) in 2015

The proportion of resources required for direct interventions to improve child health is 22.1 percent, maternal health 8.6 percent, and to reduce burden of HIV/AIDS 12.6 percent, tuberculosis 2.3 percent, and malaria one percent. About 37.6 percent of the resources should be invested on salaries, in-service and pre-service training of health personnel, and 6.2 percent on infrastructure.

In Bangladesh, according to estimates, household expenditure on health is around 65 percent of the total expenditure. Accordingly, costs to be incurred by the government for the period 2009-2015 to achieve the targets under MDGs 4,5 and 6 on health would be much lower than the costs presented above.

5. MDG 7 Environment

In Bangladesh at present, actual forest coverage is 11.32 percent, which is much less than the target set by the government. Bangladesh has less than 0.02 hectares of forest land per person, one of the lowest forest-man ratios in the world. There are 19 Protected Areas in Bangladesh covering an area of 2441.75 sq. km which is 12.7 percent of the total forests areas of the country and about two percent of the country. Government of Bangladesh has recently declared eight areas as Ecologically Critical Area (ECA) under Environmental Conservation Act, 1995.

As a least developing country (LDC) Bangladesh does not have any commitment to green house gas (GHG or CO2 emissions) reduction. Notwithstanding its favorable position, sustained efforts are still being made to actively control major sources of CO2 emissions in order to mitigate the country's impact on global climate.

Output of major Ozone Depleting Substances dropped from 280.68 metric tons in 1995, to 155.14 metric tons in 2007. In 2005, the country programme was updated with financial support of multilateral fund (MLF), under the Montreal Protocol. A national ODS phase-out plan was finalized in 2004 to reduce 85 percent of ODS use by the end of 2007, with the goal of 100 percent reduction by 2010. The National ODS Phase-out Plan is now being implemented by the DOE.

Poor families in urban towns live in slums and squatters' settlements in un-hygienic and unsustainable environments. Basic services like pure drinking water, sanitation, footpaths, drainage are totally absent in these areas. The population density in the slums is 200 times greater than the usual density of Bangladesh. Despite these problems, migrants from rural areas continue to migrate to the cities. There is currently no land title for slum dwellers.

The per capita annual fuel consumption in Bangladesh is only 56 litres of oil, one of the lowest in the world. With a predominantly agro-based population, bio-fuel is the main cooking fuel in the rural sector. Rural Bangladesh is characterised by minimal energy supply, and the country as a whole has the lowest usage of electricity in the world (only 95.85 kilowatt hours (kWh) per capita). 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 rural areas.

The introduction of safe drinking water through tube-wells, higher sanitation coverage and improved primary health care has contributed to a significant drop in mortality rate from diarrhoeal diseases. Water-related diseases however, continue to account for the majority of deaths. Arsenic contamination and bacterial contamination also remain a problem in Bangladesh.

Sanitation programmes have also been implemented since 1970s, but success in improving sanitation coverage has been far less compared to other development sectors, primarily due to a lack of awareness among people of the benefits of improved sanitation. The sanitary condition of urban slums is deplorable. Most slum dwellers have literally no latrines, and only a few have pit or surface latrines. They often defecate on the drains, in open fields, near the roads, or on the riverbanks. The problem is acute for female residents who have to wait till sunset for defecation or use a neighbor's latrine, where available. Unhygienic hanging latrines are still prevalent in urban slums.

The government has targets of safe drinking water and sanitation for all by 2011 and 2010 respectively. The Ministry of Local Government, Rural development and Cooperatives, through the Local Government Division (LGD), and in the association with its NGOs and development partners, have taken the lead to achieve the national sanitation goal.

Based on the above challenges, the **TWG on Environment** chaired by the Ministry of Environment decided on the interventions in three major sub-categories for MDG7: on Environment, on Energy and on Water-supply and sanitation.

The interventions on **Environment** focused on reducing exposure to environmental health impacts; improving Livelihoods (including ecosystem services); reducing vulnerability through improved capacity and investments for disaster management and climate adaptation; and governance, institutional, capacity and systemic issues. To achieve the **Environment** related goals under MDG7, it is estimated that BDT 122.23 billion (USD 1.77 billion) would be required between 2009-2015, with a per capita cost of BDT 99.72 (USD 1.46) in 2009, rising to BDT 122.96 (USD 1.80) in 2015. The average annual costs are BDT 17.46 billion (USD 0.26 billion) per annum for interventions related to environment.

The interventions on **Energy** under MDG7 focused on energy costs related to modern fuels for cooking/heating, lighting at household level, and for other institutions including educational institutions, health centers/hospitals, markets, government institutions, agricultural uses, etc. To achieve the **Energy** related goals under MDG7, it is estimated that BDT 897.96 billion (USD 13.13 billion) would be required between 2009-2015, with the per capita costs of BDT 571.91 (USD 8.36) in 2009 to BDT 1117.86 (USD 16.34) in 2015. The annual costs for interventions related to Energy are about BDT 128.28 billion (USD 1.88 billion) per annum.

The interventions under **water supply and sanitation** were divided into urban and rural areas and costs were thus derived. It is estimated that a total of BDT 965.26 billion (USD 14.11 billion) will be required to undertake the interventions on water supply and sanitation for the period 2009-2015, at a per capita cost of around BDT 819.27 (USD 11.98) in 2009 and BDT 947.71 (USD13.86) in 2015. The average annual estimated costs are BDT 137.89 billion (USD 2.01 billion) for water supply and sanitation to meet interventions related to meeting MDG targets.

6. The total costs

According to the above estimates, a total of approximately Total BDT 7,125.76 billion (USD 104.18 billion) is needed to be spent to achieve all MDGs in Bangladesh from 2009-2015. This translates to a per capita cost of BDT 5,115.95 (USD 74.79) in 2009, and BDT 8,289.48 (USD 121.19) in 2015. Annually approximately BDT 1,017.97 billion (USD 14.88 billion) will be needed to achieve MDGs in Bangladesh, at an annual per capita costs of about BDT 6,676.15 (USD 97.60) (Refer Table 1).

In 2004, the Millennium Project conducted an MDG Needs Assessments for Country Case Studies of: Bangladesh, Cambodia, Ghana, Tanzania and Uganda (lead by Jeffery Sachs). According to the study, in order to meet the MDGs, Bangladesh would need to spend a total of USD 66 per capita in 2005, increasing to USD 102 per capita by 2015. This translated into a total investment need of USD 155 billion between 2005 and 2015, equivalent to an average annual per capita need of USD 84.

However the study also notes certain important observations that will have impact on the total costs. The study notes "When interpreting these results, it is important to note the gaps in the current analysis……we have so far not been able to include a number of interventions for each sector or area. In the case of Bangladesh, the missing interventions, which might have the strongest impact on the overall results, are summarized below."

Important cost factors not included in the MDG Needs Assessment and resource estimates for Bangladesh according to the 2004 study by Millennium Project are:

- Prevention and treatment of arsenic poisoning;
- Water storage and transport infrastructure, including large-scale irrigation;
- Improving the lives of slum dwellers;
- Interventions to ensure environmental sustainability;
- R&D expenditures (except for health) and higher education systems;
- Information and communication technologies;
- Ports and railways;
- Large-scale fuel distribution and storage infrastructure; and
- Disaster response and food aid.

However, the current MDG Needs Assessment and Costing done by the Government of Bangladesh and UN family partners, and supported by the "Support of Monitoring PRS and MDGs in Bangladesh" project, has included some of the cost factors mentioned above. These are:

- Prevention and treatment of arsenic poisoning (within the costing for MDG 7 on Environment);
- Improving the lives of slum dwellers (within the costing of MDG7 on environment);
- Interventions to ensure environmental sustainability (within the costing of MDG7 on environment);
- Railways, waterways and transport infrastructure (within costing for Roads Infrastructure); and
- Disaster response and food aid (within the costing of MDG7 on environment)

Given this the estimated costs are different due to the inclusion of additional cost factors mentioned within the current exercise. However these assessments are not too far apart. A summary of the costs is given below for easy reference, while the detailed cost estimates are given in the respective chapters.

Table 1: Total Annual Costs for Achieving MDGs by 2015 in Bangladesh

	2009	2010	2011	2012	2013	2014	2015	Total	Average 2009-2015
MDG 1 - Agriculture and Rural Development including employment generation									
Sub-total in BDT Billion	243.37	255.01	268.81	281.55	294.89	308.87	323.57	1,976.07	282.30
Sub-total in USD Billion	3.56	3.73	3.93	4.12	4.31	4.52	4.73	28.89	4.13
Per capita in BDT	1,659.74	1,714.90	1,782.62	1,841.14	1,901.54	1,964.02	2,028.87		1,841.83
Per capita in USD	24.27	25.07	26.06	26.92	27.80	28.71	29.66		26.93
MDG 1 - Roads Infrastructure									
Sub-total in BDT Billion	47.09	47.41	47.72	48.03	48.34	48.65	48.96	336.20	48.03
Sub-total in USD Billion	0.69	0.69	0.70	0.70	0.71	0.71	0.72	4.92	0.70
Per capita in BDT	321.17	318.80	316.43	314.06	311.70	309.35	307.00		314.07
Per capita in USD	4.70	4.66	4.63	4.59	4.56	4.52	4.49		4.59
MDG 2 - Education including pre-primary, primary, secondary and non-formal education									
Sub-total in BDT Billion	87.01	102.38	120.89	143.64	172.33	209.78	251.95	1,087.98	155.43
Sub-total in USD Billion	1.27	1.50	1.77	2.10	2.52	3.07	3.68	15.91	2.27
Per capita in BDT	601.14	697.34	811.90	951.18	1,125.19	1,350.51	1,599.31		1,019.51
Per capita in USD	8.79	10.20	11.87	13.91	16.45	19.74	23.38		14.91
MDG 3 - Gender parity									
Sub-total in BDT Billion	24.01	29.19	34.36	39.28	46.16	51.49	56.42	280.90	40.13
Sub-total in USD Billion	0.35	0.43	0.50	0.57	0.67	0.75	0.82	4.11	0.59
Per capita in BDT	188.81	225.60	261.36	296.49	345.70	382.67	416.04		302.38
Per capita in USD	2.76	3.30	3.82	4.33	5.05	5.59	6.08		4.42
MDG 4, 5 and 6 - Health Systems including health infrastructure and HR common for MDG 4,5 and 6									
Sub-total in BDT Billion	68.08	80.84	101.26	120.00	133.17	131.27	143.95	778.57	111.22
Sub-total in USD Billion	1.00	1.18	1.48	1.75	1.95	1.92	2.10	11.38	1.63
Per capita in BDT	465.12	540.36	670.32	786.6	855	834.48	902.88		722.11
Per capita in USD	6.8	7.9	9.8	11.5	12.5	12.2	13.2		10.56
MDG 4 - Child Health excluding health systems									
Sub-total in BDT Billion	27.39	38.55	43.71	47.93	52.25	54.59	58.22	322.64	46.09
Sub-total in USD Billion	0.40	0.56	0.64	0.70	0.76	0.80	0.85	4.72	0.67
Per capita in BDT	186.80	259.20	289.80	313.40	337.10	347.00	365.30		299.80
Per capita in USD	2.73	3.79	4.24	4.58	4.93	5.07	5.34		4.38
MDG 5 - Maternal Health excluding health systems									
Sub-total in BDT Billion	11.19	13.29	15.64	17.99	20.68	23.07	24.58	126.45	18.06
Sub-total in USD Billion	0.16	0.19	0.23	0.26	0.30	0.34	0.36	1.85	0.26
Per capita in BDT	76.30	89.40	103.70	117.67	133.43	146.65	154.23		117.34
Per capita in USD	1.12	1.31	1.52	1.72	1.95	2.14	2.25		1.72
MDG 6 - HIV/AIDS, Malaria and TB									
Sub-total in BDT Billion	18.53	23.83	27.08	31.19	36.04	42.66	52.17	231.50	33.07
Sub-total in USD Billion	0.27	0.35	0.40	0.46	0.53	0.62	0.76	3.38	0.48
Per capita in BDT	126.37	160.26	179.6	203.98	232.53	271.21	327.26		214.46
Per capita in USD	1.85	2.34	2.63	2.98	3.40	3.97	4.78		3.14
MDG 7 - Environment									
Sub-total in BDT Billion	14.62	16.07	16.1	18.09	18.47	19.27	19.61	122.23	17.46
Sub-total in USD Billion	0.21	0.23	0.24	0.26	0.27	0.28	0.29	1.79	0.26
Per capita in BDT	99.72	108.05	106.75	118.3	119.1	122.53	122.96		113.92
Per capita in USD	1.46	1.58	1.56	1.73	1.74	1.79	1.80		1.67

Continued..

	2009	2010	2011	2012	2013	2014	2015	Total	Average 2009-2015
MDG 7 - Energy									
Sub-total in BDT Billion	83.93	98.59	111.01	125.07	140.98	158.99	179.40	897.96	128.28
Sub-total in USD Billion	1.23	1.44	1.62	1.83	2.06	2.32	2.62	13.13	1.88
Per capita in BDT	571.51	661.67	734.08	814.84	904.95	1005.53	1117.86		830.06
Per capita in USD	8.36	9.67	10.73	11.91	13.23	14.70	16.34		12.14
MDG 7 - Water Supply and Sanitation									
Sub-total in BDT Billion	120.13	131.48	148.53	131.68	137.93	144.37	151.14	965.26	137.8943
Sub-total in USD Billion	1.76	1.92	2.17	1.93	2.02	2.11	2.21	14.11	2.02
Per capita in BDT	819.27	884.2	984.94	861.13	889.4	918.04	947.71		900.67
Per capita in USD	11.98	12.93	14.40	12.59	13.00	13.42	13.86		13.17
Grand Total for all MDGs									
Total in BDT Billion	745.34	836.63	935.12	1,004.45	1,101.23	1,193.01	1,309.98	7,125.76	1,017.97
Total in USD Billion	10.90	12.23	13.67	14.68	16.10	17.44	19.15	104.18	14.88
Per capita in BDT	5,115.95	5,659.78	6,241.50	6,618.79	7,155.63	7,651.99	8,289.42		6,676.15
Per capita in USD	74.79	82.75	91.25	96.77	104.61	111.87	121.19		97.60

1 USD = 68.4 BDT

Note: Since there would be substantial household (out of pocket) expenditures especially in MDGs 1, 4,5 and 6, the real total expenditures required by Public Financing may be lower. A detailed Financing study is required to realize the requirements through public and private financing, while also recognizing the household (out-of pocket) expenditures occurring.

CHAPTER 1

INTRODUCTION

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The Millennium Declaration (GA Resolution A/54/2000) adopted by all 191 member states of the United Nations commits them to put in place measures necessary to attain peace, security and development. The declaration was further elaborated in the subsequent UN Secretary General's report entitled "A Road Map Towards the Implementation of the UN Millennium Declaration" (GA Resolution A/56/326). Arising out of these two declarations and on the basis of further consultations and agreement reached between the UN, OECD/DAC, World Bank and IMF, eight target-oriented Millennium Development Goals (MDGs) were formulated as a set of quantifiable and time-bound goals for significantly improving human lives by 2015. This commitment by the international community to improve human lives was re-affirmed at the Conference on Financing for Development held in Monterrey, and World Summit on Sustainable Development held in Johannesburg in 2002.

While the Millennium Declaration calls on all development stakeholders to adopt a goal-oriented approach to policy, planning and implementation, it apportions differentiated responsibility to the various parties. It is expected that developing countries will be committed to the practice of good governance and sound use of resources for human development, while developed countries will increase their financial assistance to developing countries up to at least the 0.7 percent of GNI mark. Developed countries are also expected to support a development-friendly international economic system with specific commitments to promote fair trade, reduce the debt burden and promote technology transfer to developing countries.

As the international community's negotiated set of quantifiable and time-bound targets for reducing poverty, the MDGs offer a unique framework to guide development planning, resource allocation, and higher resource mobilization in low income developing countries like Bangladesh. They enable all actors in the development process to shift from asking "how well can Bangladesh do with respect to the MDGs with its given constraints?" to asking: "in order to achieve the MDGs, what does Bangladesh need to do?"

This shift will enable Bangladesh to systematically plan its national strategies around the MDGs, especially those targets that are lagging behind. In order to do so, however, the first step is to conduct a detailed MDG needs assessment and costing that attempts to answer the question of what Bangladesh needs in order to achieve the MDGs, in terms of human resources, infrastructure and financial resources?

The MDG goals are being effectively integrated into the national development planning process. Bangladesh made noteworthy progress in poverty reduction and the attainment of "Millennium Development Goals" during the 1990-2000 period in spite of pitfalls such as instability, inefficiency, leakage, mis-targeting and the erosion of regulatory standards. The observed rate of actual progress achieved by Bangladesh during 1990-2000 is consistent with, or even higher than, the pace of annual progress required for achieving the MDGs by 2015 (set against the benchmark of 1990). A review of the progress at the aggregate level suggests that the country is "on track" in relation to a number of targets such as reduction of infant mortality and child mortality, expansion of primary and secondary education, reduction in many aspects of gender disparity, eradication of hunger (proxies by the prevalence of child malnutrition), and environmental sustainability (proxies by expansion of tree cover).

1.1 Macroeconomic Environment for Pro-poor Economic Growth in Bangladesh

According to the second PRSP 2009-11, 'Moving Ahead', a stable macroeconomic environment characterized by increasing growth rate, a comfortable budget and external sector balance and low employment rate was maintained in 2006-07. In 2007-08 domestic and international shocks disturbed this stability, and the economy experienced lower growth and a higher inflation rate.

The economy has improved its growth performance since 2000-01 from 5.27 percent to 6.21 percent in 2007-08, peaking in 2005-06 at 6.63 percent. Revenue reforms lead to increased revenue/GDP ratio from 9.6 in 2000-01 to 11.2 in 2007-08. However due to an increase in expenditure on SSNPs in 2007-08 to mitigate the impact of Sidr and cushion the poor from increases in price of food grains, the Expenditure/GDP

ratio peaked at 17.3 percent, and remained close to 15 percent during the period 2003-04 to 2004-05. The rate of inflation rose from 1.94 percent in 2000-01 to 9.94 percent in 2007-08. The second PRSP identifies sustaining revenue growth and raising investment to GDP ratio as key challenges. A rising inflation rate also threatens to put back the past gains in poverty reduction. Maintaining export growth also remains a challenge. Furthermore, providing productive employment to the growing labour force, especially among the poor, remains a challenge.

For accelerating growth for poverty reduction, the second PRSP (2009-11) mentions several approaches including promoting growth in the agriculture sector; supporting industry and services focusing on pro-poor segments/sectors; promotion of rural towns; channeling and increasing the share of government expenditure on social and infrastructural sectors; and direct poverty reducing projects/programmes.

The second PRSP, 'Moving Ahead', as with the first PRSP, 'National Strategy for Accelerated Poverty Reduction", maintains pro-poor economic growth as the focus. The impacts of implementation will be relevant for the achievement of MDGs.

As a link to the PRSP, the current joint effort of the Government and the UN family through this report **MDG Needs Assessment and Costing in Bangladesh,** will assess the status and trend in progress of achievement of MDGs through MDG1 to MDG7: the challenges ahead, the major interventions and targets for MDGs and finally the resource needs estimates. To assess the costs/resource needs, costing models were used covering nine investment clusters. A detailed methodology of the process is explained in the next chapter. Given below is introduction to the thematic areas covered during the MDG Needs Assessment and Costing exercise.

1.2 Poverty and Hunger

Incidence of income poverty decreased from 59 percent in 1991 to 49.8 percent in 2000, giving an annual rate of decline of 1.5 percent, which is however lower than the required rate of two percent per annum. A growth of per capita real income of four to five percent per annum is required to achieve the income poverty target. An overall real income growth rate of six to seven percent per annum on a sustained basis, along with a population growth of around 1.5 percent is needed to attain the target per capita income growth and hence reduction in income poverty.

Projections based on past historical trends indicate that Bangladesh may be able to attain most of the MDGs at the aggregate level by 2015. Hence, pro-poor but adequate economic growth is needed to help reduce income-poverty and raise Bangladesh's ability to spend on social needs. Furthermore, this would also generate additional resources for social sector programmes. From this angle, the halving of income-poverty within a reasonable time frame (perhaps by 2020, if not by 2015) appears to be one of the main preconditions for achieving many social goals.

The MDG Mid-Term Progress Report (2007) mentioned that Bangladesh either achieved some MDGs and some were or on track to be achieved. It is found that MDG1 (halving the proportion of population below the national poverty line, and minimum level of energy consumption) is on track to be achieved by 2015. This has been possible largely due to its steady economic growth of nearly five per cent annually on average in the 1990s, and nearly six per cent annually on average in the new millennium. The higher growth will not necessary ensure that the MDG targets are met.

However, the recent dramatic surge in food prices has plunged millions of poor people and many net food importing poor countries like Bangladesh into a food crisis (End Poverty, 2015). Consequently, it has also put at risk their chances of achieving the Millennium Development Goals by 2015. Whilst the focus has been on the impact on the MDG1 of reducing poverty and hunger, given the close inter-connectedness between all eight MDGs, the impact on these sections of the poor on health, education and livelihoods more broadly, cannot be underestimated.

To improve road infrastructure, PRSP-II consulted on the present coverage and targets with RHD, railway and water transport, LGED etc, and here both the PRSP-II targets and after 2011 have been considered, calculated on the basis of the rates made by PRSP-II. The Government operates a large number of social safety net programmes which generate income and employment, help human resource development, create infrastructure and directly reduce poverty of the beneficiaries, and these targets were considered for estimation of required resource needs.

1.3 Education

Getting access to basic education is a fundamental human right of every citizen of a country. This fundamental right has been denied to a large section of the population living below the poverty line in many developing countries of the world including Bangladesh. Acute poverty in their families may be singled out as the major cause behind such a situation. Recognizing the critical importance of transforming them into effective human resources and thereby making them worthy citizens, the Millennium Summit that held in Dakar in 2000 declared 'achieving universal primary education' as one of its major agendas. As set out in the Millennium Declaration this goal, known as MDG2, has the goal of providing access to primary education to all by the year 2015. Bangladesh, as a signatory to the Dakar declaration, expressed a strong commitment towards achieving the goal of universal primary education which has sustainable positive implications for reduction in poverty by significantly large margin.

To fulfill the commitment to the international community, and also to meet the constitutional obligation of ensuring universal and free compulsory primary education to all children, Bangladesh has undertaken several initiatives for the development of primary education and achieving the time-bound MDG targets. Although government initiatives in the area of primary education began in 1981, through a couple of Universal Primary Education projects, more focused initiatives were made in the 1990s following the World Conference on Education for All (WCEFA) that held in Jomtien, Thailand, in 1990. The present study however focuses on the progress made since 1990 towards achieving MDG2 with regard to the set target 'ensure that, by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary education'. Progress with regard to this MDG target and the future potential for achieving the 2015 target has been assessed by analyzing the current status and the trend growth in each of three selected indicators under this target for education namely: net enrolment ratio in primary education, primary school completion rate, and adult literacy rate.

1.4 Gender

In terms of MDG3 there are several areas where women are at a disadvantage and gender gaps are quiet apparent. Therefore, while the country remains broadly on track to ensure gender equity in basic education, there are some significant challenges that need to be addressed. Bangladesh has enhanced the number of laws at the national level to protect equality of rights and opportunities for men and women. The Constitution of Bangladesh grants equal rights to women and men in all spheres of public life (Articles 27, 28(1) 28(2), 28(3), 28(4), 29(1), 29(2) and 29(3), and has been supplemented by a number of Acts and Ordinances that safeguard women's equal rights such the Dowry Prohibition Act of 1980, the Child Marriage Restraint Act (amended in 1984) and the Family Court Ordinance of 1985. At the international level, Bangladesh has ratified the UN Convention on the Elimination of All Forms of Discrimination Against women (CEDAW) agreeing to the optional Protocol in 2000. However, reservations on articles two and 16 pertaining to marriage, divorce and inheritance remain in force.

The Ministry of Women's and Children Affairs (MOWCA) established in 1978 has the mandate for protecting women's interest and further the rights of children and working in 64 districts of the country. At present it consists of the Ministry itself and three implementing agencies: the Department of Women Affairs (DWA), Jatiya Mohila Sangstha (National Women's Council), and Shishu (Children's) Academy. MOWCA is mandated to act as the central motivating agent on issues of women's equality and development and to promote a broader and more consistent response by all government agencies to the needs and priorities of

women. WID (Women in Development) focal points have been established in various ministries. The National Policy for the Advancement of Women was adopted in 1997 and amended (2004, 2008) and includes commitments to eliminate discrimination against women in all spheres. A National Action Plan (NAP) for implementing the policy as well as meeting commitments under the Beijing Platform for Action (PFA) was approved in 1998. Following the PFA, Gender Focal points were appointed in all central government ministries and committees as early as 1990. Bangladesh Poverty Reduction Strategy Paper (PRSP) finalized in October 2005 and PRSP 2 in 2008 also provides comprehensive gender analysis with policy guidelines.

1.5 Health

The first Bangladesh PRSP 'National Strategy for Accelerated Poverty Reduction' (NSAPR 2005) considered in particular the human dimensions of poverty (deprivation of health, education, nutrition, gender gaps), and committed the MoHFW to reach the poor and vulnerable, especially women and children. The second PRSP 'Moving Ahead' (2008) identifies that Health, Nutrition and Population (HNP) are intimately related and complementary to other sectors of the economy.

The current Health, Nutrition and Population Sector Program (HNPSP) outlines activities from 2003-2010, with objectives to improve health outcomes, reduce health inequities, enhance quality of care, modernize the GoB health sector, and attain the health related MDGs. This document has tried to incorporate the MDG (4, 5 and 6) targets, while offering slightly different targets for HNPSP. The Revised Program Implementation Plan (RPIP) of Health, Nutrition and Population Sector Program (HNPSP) 2003-2010, proposed budget for the whole sector by dividing it into four sub-sectors: Health Program (HP), Nutrition Program, Population Program (PP) and Ministry Level Sector Development. Major Reproductive Health (RH) components are under HP and PP.

Although Bangladesh has made significant progress in some health outcomes such as reducing Infant Mortality Rate and Maternal Mortality Rate, however challenges remain. The main challenges identified in the health sector center on the fact that the nutritional status of children and women in Bangladesh is very poor, and require special attention in order to improve the overall health status of the population. Despite various interventions designed under National Nutrition Project (NNP) low birth weight and malnutrition continue to be important causes of infant and under-five mortality. A significant proportion of pregnant women are also iodine deficient and develop night blindness during pregnancy.

In Bangladesh, the improvement in births attended by skilled health personnel is not satisfactory. Rapid training of skilled health personnel, an increase in infrastructure, and cautious monitoring is needed if the country wants to reach the target by 2015.

The availability of comprehensive EmOC services in public facilities, especially at district level and below, are also not up to the target level. One important intervention of the Maternal Health Strategy 2001 was to train medical officers in obstetrics or anesthesia (one year diploma level or four months EmOC training), and placing them in functional teams at District and Upazila facilities. So far 206 obstetricians and 118 anesthetists have been trained. Moreover, only 57 percent of obstetrics and 69 percent of the anesthesia are appointed in designated positions with frequent failure to retain both the obstetric and the anesthesia to perform caesarian sections in a facility due to variety of reasons (MTR 2008). The Government should take steps to overcome this problem with special emphasis on reducing absenteeism in rural areas.

Limitation of available data on HIV/AIDS prevalence is also a major obstacle in tracking the MDG targets. The gender and regional disparities in awareness and knowledge about prevention of HIV/AIDS among citizens should be reduced.

1.6 Environment

Forestry is an important way to sequester carbon, ensure energy security by providing fuel wood; guarantee livelihood security by employing people in forest plantations; generating income through harvesting and trade in forest products; and protecting soil from erosion and landslides, particularly in hilly areas. Actual forest coverage in Bangladesh is 11.32 percent much less than the target set by the government. Bangladesh has less than 0.02 hectares of forest land per person, one of the lowest forest-man ratios in the world. Intensive afforestation and reforestation programme can improve the forest coverage for meeting MDGs target.

Water pollution is a major problem in most parts of Bangladesh. Surface water pollution affects the health of poor people. Waterborne diseases are the major cause suffering for the poor people living in rural and urban areas. Surface water scarcity in the dry period, water logging, groundwater pollution by arsenic, water resource management are also some key challenges.

Air pollution is more acute in urban areas than in rural areas. In urban areas, the main sources of air pollution are emission of harmful gases from vehicles, industrial sectors, construction, and the open dumping of garbage. In rural areas, the main sources are brick kilns and wood and biomass consumption. Automobiles on the road are often very old, overloaded and poorly maintained, and emit smoke far exceeding the prescribed limit. Industrial development is another major source of air pollution. Most industries in Bangladesh are situated in major urban areas. The food industry emits the greatest amount of pollutants, followed by cement, pulp and paper industry and textiles. Among the food industry, most of the pollutants come from sugar mills.

Rising use of pesticides has led to fears of adverse health consequences and of water contamination. A major portion of the urban waste of Bangladesh is composed of organic materials, which produce methane (CH4) as they decompose. The unit contribution of methane to global warming as well climate change is much higher than that of carbon dioxide.

Soil salinity, land degradation, improper water resource management, river bank erosion, and vulnerability to natural disasters threaten the lives of many people in Bangladesh. Polluted soil builds-up persistent toxic compounds, chemicals, salts, radioactive materials, or disease causing agents in soils that have adverse effects on plant growth and animal health.

Expanded energy services are essential to meet the MDGs for reducing hunger and poverty, improving health care and educational opportunities, and addressing gender equity. In addition, energy is central to all aspects of sustainable development, including access to water, agricultural and industrial productivity, health care, educational attainment, job creation and climate change impacts. Affordable, accessible and reliable energy supply is critical for uplifting the poor, as well as for economic growth of a country.

Migration of people to urban cities from rural areas has become a common phenomenon in Bangladesh over the last several decades. Poor families in urban towns live in slums, squatters' settlements in un-hygienic and unendurable environment. Basic services like pure drinking water, sanitation, footpaths, and drainage are totally absent in these areas. The population density in the slums is 200 times greater than the usual density of Bangladesh. Despite the problems, migrants from rural areas continue to migrate to the cities. There is currently no land title for slum dwellers.

1.7 The MDG Needs Assessment and Costing for Bangladesh

Based on the discussion above it is imperative that a MDG Needs Assessment is done based on a situation analysis of the national development record in achieving MDGs from 1990 to identify the trends and major challenges for achieving the targets by 2015. Finally, selecting major interventions to achieve the Targets, and Costing these interventions for each of the MDGs is a major activity of this report. This report will enable Bangladesh to plan MDG-based national strategies and focus especially on those targets that are lagging behind, while sustaining the good achievement in those that are on-track or have been achieved. A detailed methodology is discussed in Chapter 2.

CHAPTER 2

METHODOLOGY

METHODOLOGY

CHAPTER 2

2.1 The Process

The purpose of the MDG needs assessment and costing in Bangladesh is intended to identify interventions and assess comprehensively the financial, human and institutional infrastructure resources needed for the attainment of the MDGs in the country. The specific objectives of the MDG Needs Assessment (NA) and Costing are to:

- Take stock of the country's development record on each MDG from 1990 to present;
- Analyze the existing policy frameworks and strategies that contribute to the achievement of MDGs;
- Identify the major challenges for the government/s to meet the attaining MDGs;
- Identify a set of integrated interventions that will enable Bangladesh to meet the MDGs by 2015;
- Identify the necessary infrastructure, human, and financial resources required to support a scale-up of interventions through to 2015.

2.2 Formation and Training of MDG Thematic Working Groups (TWGs)

In order to undertake the Needs Assessment and Costing analysis, Five **Thematic Working Group (TWGs)** were set-up with participation from relevant sectoral ministries and UN agencies:

1. TWG1 on Poverty and Hunger covering MDG1 was lead by the General Economic Division (GED) under Planning Commission, Ministry of Planning, Government of Bangladesh.
2. TWG2 on Education covering MDG2 was lead by Ministry of Primary and Mass Education (MOPME)
3. TWG3 on Gender covering MDG3 was lead by Ministry of Women and Children Affairs (MOWCA)
4. TWG4 on Health covering MDG4, 5 and 6 was lead by Ministry of Health and Family Welfare (MoHFW)
5. TWG5 on Environment covering MDG7 was lead by Ministry of Environment (MoE)

The Task Force works were supported by short-term national experts and by UNDP's MDG/PRS Project's national and international representatives. The main activities of the TWGs and its members were to undertake the following functions:

- reviewing of existing plans, programmes/ projects, data and setting the base line;
- developing a comprehensive list of interventions;
- specifying coverage target for each intervention (e.g. percent of population to be targeted by each intervention);
- estimating unit costs and resource requirements for each intervention;
- refining targets, improving cost estimates, accounting for synergies and trade-offs, and addressing cross cutting issues;
- consulting different stake holders through the NA process;
- Preparing Thematic (sectoral) Task Force Reports;

Overall Responsibility

The GED of Planning Commission, the executing agency of UNDP MDGs project, undertook the overall responsibility of liaison with other concerned ministries to form the TWGs. UNDP provided technical support for overall coordination and facilitation, including training for the MDG Needs Assessment and Costing exercise. For the composition of the MDG Needs Assessment TWGs (see Annexure).

In order to undertake the needs assessment and costing exercise the **MDG Needs Assessment and Costing** methodology adopted the UN Millennium Project interventions-based approach, of identifying a

comprehensive range of relevant interventions (goods, services and infrastructure) that serve as the fundamental basis for estimating the resource needs for MDGs achievement. The Costing exercise was undertaken with the help of nine costing tools/investment clusters for which training was provided by UNDP Regional Center in Colombo (UNDP RCC).

Training to the TWG Members on Costing Tools

The TWG members, including the NA Consultant, were provided with in-depth training on the methodology of the NA and costing, developed by the UN Millennium Project and UN agencies in other countries in the region. The estimations of resource requirement needs were done by using pre-developed spread sheet-based models to project the gradual scaling up of investments and resource requirements. The nine costing tools for the investment clusters that were used for the costing exercise are:

1. Agriculture and Rural Development
2. Transport
3. Education
4. Gender
5. Health
6. HIV/AIDS
7. Environment
8. Energy
9. Water supply and sanitation

Use of Costing Tools for Needs Estimates and Costing

Based on the situation analysis, the existing data for the base years was entered into the costing tools while the targets for interventions were discussed and decided with the TWG members. The Unit costs were derived from existing national planning documents, project budgets, national expenditure reviews and other planning documents. In cases where existing unit costs appeared uncharacteristically low (e.g. salaries for civil servants), a more competitive and realistic figure was used. These costs were applied to the targets to get the total cost of the interventions, per annum. In cases where it was not possible to calculate the resources required for each individual intervention, more aggregate estimates from other studies (e.g PRSP and MTEF cost estimates were used). However, in view of data quality constraints, some unit costs are crude estimates and will need to be readjusted over time to arrive at more realistic figures.

As such, the NA and costing, and supporting documents and worksheets will require constant updating and fine tuning. For each intervention specific targets were set after assessing the current coverage and projecting future coverage. In terms of target setting, in keeping with the advice of the Millennium Project, the TWG have been quite ambitious in setting targets. This was then used as the basis for calculating the resources required to meet the MDG after a linear scaling up of interventions and investments over the years from the baseline year of 2006 up to 2015. As advocated in the Millennium Project approach, costing here include both recurrent and capital expenditures. This is particularly pertinent to Bangladesh, where extremely high levels of capital investments have invariably high associated recurrent expenditure costs, that rise exponentially and absorb a large part of future development budgets.

2.3 Estimating the Trend Growth Rates

Growth rate is estimated by a liner equation, $r = (P_1-P_0)/P_0 \times t$, where, P_0 is initial value, P_1 is final value, t is the duration (year). For projecting the time-path of the different MD outcomes to 2015, linear and sometimes logarithmic equations are followed. Missing data are estimated by regression equation based on available data collected from different sources. Target values of some indicators are not set and in that case new target is set based on projection value from the regression equation.

2.4 Data Sources

Poverty and Hunger

This costing report is based on national documents and surveyed data. Data was collected from several visits and reports of the Government of Bangladesh. These include the Yearbook of Statistics, Household Income and Expenditure Surveys (HIES), Labour Force Survey, Child Nutrition Survey (CNS) conducted by the Statistical Yearbook of Bangladesh, Bangladesh Bureau of Statistics, Multiple Indicator Cluster Survey (MICS) survey conducted by UNICEF and BBS. Research reports from different research organizations such as BARI, BRRI, BLRI, BFRI and BAU were also used. The policy documents such as PRSP-I, IPRSP and draft PRSP-II, different reports published from GED, Planning Commission have been consulted.

Education

The analysis in the current study has been done based on secondary data. Reports and documents published by the government, national and international agencies, development journals, have been the key sources of data which includes, among others, MOPME, DPE, BBS, National Plan of Action, BANBEIS, UNESCO, MICS, CAMPE.

Gender

The data for the coverage and costing have been gathered from the following ministries and departments : MOWCA, Ministry of Labour and Employment, Ministry of Primary and Mass Education, Ministry of Education, Ministry of Law, Justice and Parliamentary Affairs. Local Government Enginering Department (LGED) and Youth and Employment, National Institute of Local Government (NILG), Department of Primary and Mass Education, Department of Secondry education and Bangladesh Public Administrastion Training Centre (BPTAC).

Health

An intensive literature review was conducted by collecting various reports/articles on performances of health sector of Bangladesh. The trend analysis of the health related MDGs mainly used the secondary data available from the survey reports of BDHS, SVRS, and MICS. Information was also taken from serological surveillance report/annual report of NASP and NTP.

Information from government's plans and strategies, (e.g. HNPSP, PRSP, National Strategic Plan for HIV/AIDS), played a key role in identifying interventions and setting targets. Review of these documents helped to analyze current programs and future plans for improving maternal and child health, and reducing the burden of tuberculosis, malaria and HIV/AIDS.

Data was collected also using key informant/stakeholder interview for the costing exercise. The data, which was not available in the reports, plans, strategies, and, government documents, was collected directly from services providers and policy makers. Collected data was cross checked with others and also discussed in the TWG meeting.

Environment

This analysis report is prepared based on data collected from several survey reports of the Government of Bangladesh as well as primary data collected from expert panel discussions. Data, relevant reports, departmental publications were collected from the Department of Environment, Forest Department, Department of Public Health Engineering (DPHE), Local Government Engineering Department, Bangladesh Power Development Board (BPDB), Rural Electrification Board (REB), Bangladesh Demographic and Health Survey (BDHS), Bangladesh Bureau of Statistics (BBS), Multiple Indicator Cluster Survey (MICS) conducted by UNICEF and BBS, Bangladesh Water Development Board (BWDB), Chemical Engineering Department of BUET. The policy document such as PRSP, different reports published from GED, Planning Commission have been reviewed.

2.5 Limitations

It is important to note that the results and simulations presented in this report may give an impression of precision. They should be treated as indicative of possible broad trends, and could usefully be complemented with other analyses using different methodological approaches.

Results are no better than data. It is important to note that some of the data were generated from guesstimates which form a crucial limitation of this report. The guesstimates were taken into consideration in some cases with previous year's data, and some were taken with discussions with relevant stakeholders. By its very nature, such data either over-emphasizes or under-emphasizes, such as households practicing relevant technologies, level of adoption, and access to infrastructure.

CHAPTER 3

POVERTY & HUNGER

MDG Goal 1

Eradicate Extreme Poverty and Hunger

MDG Goal 1 - Eradicate extreme Poverty and Hunger

Summary Statistics: MDG Goals, Targets, Indicators and Achievements

GOAL	TARGET	INDICATOR	BASE YEAR 1990-95	2005	TARGET 2015	STATUS OF PROGRESS
Goal 1: Eradicate extreme poverty and hunger	**Target 1(a):** Halve, between 1990 and 2015, the proportion of people whose income is less than one US dollar a day	Halving proportion of population below national poverty line from 58.8 percent in 1990 to 29.4 percent by 2015	58.80	40.00	29.40	ON-TRACK
		Poverty gap ratio	17.20	9.00	8.60	ON-TRACK
		Share of poorest quintile in national income	6.50	5.30	n/a	-
	Target 1(b): Achieve full and productive employment and decent work for all, including women and young people	Employment to population ratio	-	34.57	for all	NEEDS ATTENTION
	Target 2: Halve, between 1990 and 2015, the proportion of people who suffer from hunger	Prevalence of underweight children under five years of age	67.00	47.80	33.00	ON-TRACK
		Proportion of population below minimum level of dietary energy consumption (1800 kcal)	28.00	19.50	14.00	ON-TRACK

Source: CNS 2007

3.1 Overview of Development Progress

3.1.1 Economy of Bangladesh and Agriculture

Bangladesh is one of the most densely populated countries in the world with a population of about 140 million. The population of Bangladesh is growing at the rate of about 1.42 percent per annum, and is expected to reach 150 million by 2010 and 200 million by 2030 (BBS, 2006). Agriculture is the most significant source of economic growth and has a fundamental role to play in the fight against poverty. Agriculture benefits the poor most and it is central to the livelihoods of the rural poor who account for the majority (or around 75 percent) of the country's population (BBS, 2006). 21 percent of the Gross Domestic Product (GDP) comes from agriculture and this sector involves 48 percent of labour force (BBS, LFS 2005-06). During the 1980s agricultural contribution to GDP was more than 30 percent, with over 60 percent of the labour force (MOF, 2007). Though the contribution of the agriculture to the national economy and employment is diminishing, it remains the single largest contributor to income and employment generation. The poverty situation of the country requires greater efforts on sustainable agricultural production for the food and nutrition security of all people, particularly the rural poor. The country has a total land surface of approximately 14.4 million hectares of which nine million hectares are used for agricultural purpose (BIDS,

2001). The natural environment is generally favourable for crop production and it is a vital element in the country's challenge to achieve self-sufficiency in food production, which will, consequently, help reduce rural poverty and promote economic growth. Although there are some positive trends in agriculture in respect to productivity and overall economic growth, this sector is facing numerous problems such as the incidence of increasing small, marginal and landless farmers; unequal land distribution; and a lack of skills and education (Huq, 2000 and Hoque, 1999). Currently, Bangladesh is a food-deficit country and does not have readily available resources to make up the shortfall. Thus importing food grains every year is the only solution to feed an enormous population, making the country a net food importing country from rest of the world.

The country is particularly vulnerable to the exogenous shocks such as for instance, sudden floods, cyclones and drought. Natural disaster is an almost regular phenomena for Bangladesh and thus for agriculture. Naturally occurring adversity like heavy rainfall or drought can cause severe fluctuations in agricultural production specially food grains, which affects the market price and even national GDP growth. The economic structure has a rapid movement away from agricultural predominance. The transformation of sectoral shares of GDP in the Bangladesh economy is shown in Table 3.1. Agriculture share of GDP declined from 62 percent in 1975 (Ahmed and Karim, 2006) to 21 percent in 2007 (MOF, 2007), but the employment share has not declined as quickly (78 percent in 1975 and 48 percent in 2006). This declining share of agriculture in GDP does not reflect a diminishing role of agriculture in the overall economic growth or in poverty reduction. Still, agriculture is a direct vehicle to reduce poverty (Klytchnikova and Doip, 2006). Remarkably, the industrial sector (including agricultural processing and especially Ready Made Garments (RMG) industries) has expanded at a rapid pace during last few decades of economic revolution (Ahmed, 2006), agricultural growth has followed almost the same rate since the 1980s. In comparison, industrial growth reached nearly double when compared to the early years of eighties (about 5.13 percent in 1980-81 and 9.51 percent in 2006-07 (Table 3.1)). In relation with industrial expansion, the overall GDP growth rate also followed the same trend.

Table 3.1: Sector wise GDP and growth rate (Base year: 1995-96)

	Year						
	1980-81	1985-86	1990-91	1995-96	2000-01	2005-06	2006-07
Contribution to GDP (%)							
Agriculture	33.07	31.15	29.23	25.68	25.03	21.84	21.11
Industry	17.31	19.13	21.04	24.87	26.20	29.03	29.77
Service	49.62	49.73	49.73	49.45	48.77	49.13	49.12
Growth rate (%)							
Agriculture	3.31	3.31	2.23	3.10	3.14	4.94	3.18
Industry	5.13	6.72	4.57	6.98	7.45	9.74	9.51
Service	3.55	4.10	3.28	3.96	5.53	6.40	6.74
Overall GDP	3.74	3.34	3.28	4.47	5.41	7.02	6.77

Source: MOF (Bangladesh Economic Review), 2007

In order to achieve the six to seven percent growth rate of GDP per year, agriculture must grow by at least four percent (MOA, 2007). The National Agriculture Policy (NAP) indicated that agricultural land has been declining by one percent per year and land quality also degrading due to the reducing soil fertility, soil erosion and salinity. Small farms dominate the agriculture sector in Bangladesh. Around 53 percent of the farms are marginal (less than 0.20 ha), while 33 percent are small (less than 1 ha), nine percent of farms are medium (less than three ha) and only one percent of farms are large (more than three ha) in agricultural production (BBS, HIES 2005). Therefore, there is a need to increase agricultural growth through the intensification of agricultural production, diversification and value addition to achieve food security and poverty reduction.

The agriculture sector is the sum of crops, forests, fisheries and livestock where crop sub-sector alone contributes 71 percent of the total agricultural GDP (MOF, 2007). In terms of contribution to country's GDP, within the broad agriculture sector, the contribution of agriculture and forestry and fisheries are estimated at 16.38 percent (crop 11.72 percent, livestock 2.90 percent and forestry 1.76 percent and 4.73 percent respectively in FY 2006-07 (MOF, 2007). Main agricultural commodities include rice, wheat, jute, tobacco, sugarcane, pulses, oilseeds, spices, potato, some vegetables and tropical fruits. In FY 2006-07, the export earnings from agricultural products stood at USD 1,070 million, which is 10.05 percent of total export earnings. Though Bangladesh has comparative advantage on some agricultural production like HYV (High Yielding Variety) rice but because of food insufficiency and higher transfer costs it is not possible to export rice. Bangladesh is net food importing country in agriculture sector. Yet now the country depends upon imports for about 14 percent of its food requirement (BBS, 2005). In FY 2006-07, the overall food grains import reached at 2.43 million metric tons of which rice is 0.72 million metric tons and wheat 1.71 million metric tons (MOF, 2007).

However, the crop sector still dominates in terms of area and manpower used in production systems, especially rice. Production of rice increased from 9.7 million tons in 1971-72 to 26.0 million tons in 2005-06, although the area under rice increased marginally from 9.3 to 10.3 million ha with a decrease in area form 10.8 million ha in the beginning of this century (BBS, 2006). It implies the average rate of production growth is 7.6 percent per year which is much faster than the growth of population. Development and diffusion of high-yielding rice varieties and minor irrigation through shallow tube wells and power pumps was the main driving force behind this growth (Hossain, 1988; Hossain et al., 1994). Almost half of the land is now irrigated and around 70 percent of the rice areas (Table 3.2) are under the cultivation of the high yielding rice varieties (MOA, 2005). Food grains production in Bangladesh is still dominated by the subsistence farmers. Only a small percentage of total production follows commercial way. The study by Raihan and Razzaque (2007) noted that the poor peoples are mostly dependent on cereals (rice and wheat) for their livelihood.

Table 3.2: Number of smallholder HH, average farm sizes and coverage of practiced interventions, 2006

Parameters	Divisions						Bangla-desh
	Dhaka	Chittagong	Rajshahi	Khulna	Sylhet	Barisal	
Percent smallholder farmers in rural population	82.00	76.00	80.00	77.00	73.00	79.00	78.83
Average farm size (ha)	00.43	0.38	0.49	0.53	0.89	0.51	0.54
% of area under HYV rice	69.00	78.00	70.60	67.00	61.28	78.00	70.65
% irrigated area	50.56	40.13	65.60	46.29	36.03	9.13	48.32

Source: BBS, 2006

3.1.2 Linkages to PRSP

Government of Bangladesh has prioritized the agriculture sector to meet the domestic food demand and to make the sector commercially profitable. The first Poverty Reduction Strategy Paper (PRSP) for Bangladesh "Unlocking the potential: National strategy for accelerated poverty reduction" was prepared by the government in collaboration with the World Bank and the International Monetary Fund (IMF) where the agriculture sector was highlighted as the topmost priority sector for rapid poverty reduction. The National Agriculture Policy of 2007 also mentioned that to reduce rural poverty and improve the rural livelihood, it is necessary to extend the existing agricultural production system into a more dynamic, diversified and commercial sector. In addition, investment in road and infrastructure in the western region will help improve household characteristics and livelihood of the poor suggested by PRSP-II (GoB, 2008).

The second PRSP for Bangladesh "Moving Ahead" has also now been prepared under full government ownership and direction. Twelve sectors were identified and an equal number of thematic groups set up by the Government to coordinate the preparation of the various thematic background papers. A mapping of the sectors indicates that most sectors address MDG1 by focusing on poverty eradication. The PRSP-II already emphasizes the importance of agricultural and rural development in increasing productivity, and employment generation in rural areas. To increase foreign remittances, the skills-oriented manpower export from the youth labour force is suggested as a key target and the policy matrix has been suggested accordingly. To this end, the Government has also reinvigorated its pro-poor bias, allocating from FY08 an increased annual pro-poor spending of one percent of GDP. This pro-poor bias is illustrated by, for example, the guaranteed employment scheme for two million pro-poor people, providing employment for 100 days at the rate of Taka 100 per man-day. For this programme, BDT 20 billion which was allocated in the national budget of FY 08/09. The link between national budgeting and MDG1 was also clearly stated in the Finance Minister's budget speeches of FY 08 and FY09.

3.1.3 Situation of Poverty in Bangladesh

Bangladesh has made a significant improvement in poverty reduction in recent decades. Available estimates indicate that Bangladesh succeeded in reducing poverty on an average one percent per year during 1990s and nearly two percent in first half of the current decade. According to the HIES report, the poverty head count ratio declined from 58.8 percent in 1991-92 to 48.9 percent in 2000, and to 40.0 percent in 2005. Immediately after independence, Bangladesh's poverty level was estimated at 88.15 percent (1972-1975). Compared with this, the current figures suggest that Bangladesh has achieved a substantial reduction in the incidence of poverty over the last three decades (Ahmed and Sattar, 2004).

Bangladesh has enjoyed steady growth in per capita income over the past two decades. An increase in rice productivity through improved seeds varieties, and through improved fertilizer and irrigation technologies and use, has contributed to an increase in farmers' income. A large expansion in the RMG sector, as well as increasing remittances and a liberalized trading environment also had a large impact on income levels (Arndt et al., 2002). Structural changes in the agricultural sector in the early 1990s through the liberalization of the import of irrigation equipment and the fertilizer market, led to a significant increase in rice productivity in Bangladesh (Klytchnikova and Doip, 2006). Increasing rice production has been associated with a decrease in price of approximately 25 percent. Analysis results show that the net effect of increased rice production and lower market price mostly benefited poor households. Large producers of rice were the principal losers due to lower market prices. Since net buyers are poorer than net sellers in the rural areas, agricultural trade liberalization has tended to benefit the poor most.

Liberalization also favourably contributes to output growth, market size, size of the private stock, seasonality as well as declining real rice prices. National import dependency for food grains fell from 12 percent in 1980 to 5.5 percent in 2004. This might reflect movement towards self sufficiency in food grain production, but the average volume of import is still more than previously because of the higher demands of an increasing population. The size of the market surplus of rice over the last two decades grew at twice the rate of output growth. This can be attributed to increasing productivity due to the adoption of modern rice varieties (Hossain et al., 2003), better market development, and infrastructural development. Liberalization led to complete replacement of the public imports by the private sector. Because of low entry barriers, trading became extremely competitive. Evidence showed that due to liberalization there has been an increase in competition, and at the same time, an increase in the rate of growth of during the reforms period (Krisna and Mitra, 1998). Real price of food grains decreased remarkably. Seasonal fluctuation was also reduced between the 1980s and 2000s, and there was greater spatial market integration following liberalization (Chowdhury et al., 2006).

Adopting MV (Modern Variety) rice technology, combined with other non-rice crops as well as non-crop agriculture like poultry, livestock and fisheries have a significant contribution to the household income level, which in turn helping to escape from poverty (Sen, 2003). Privatization of irrigation system and agricultural input market through reducing import barriers providing incentives to the private sector import since 1980s

helped for the adoption of MV in 1990s (Hossain et al., 2003). Findings show that 50 percent of households have experienced direct positive impact from the adoption of MVs through higher yields and higher farm incomes. It is argued that although profitability is comparatively less due to the lower output price, the lower price has largely poor households by achieving food security and reducing vulnerability. Evidence also suggests that the real wage increased about 4.8 percent per year, from 1987 to 2000.

There is also impressive progress in the diffusion of improved agricultural technology, which has helped the country to sustain the food-population balance. This consequently has contributed to a decline in the real price of food grains to the benefit of the rural landless and the urban poor (Hossain, 1996). The author also mentions that technological progress took place when government reforms were transforming agricultural policies and changing public sector control to the private sector for the procurement and distribution of fertilizer and irrigation and elimination of subsidies on agricultural inputs. The major changes happened in agricultural production from the spread of minor irrigation following the removal of the ban on private sector imports of irrigation equipment and a reduction in import tariffs. This policy reduced the irrigation cost through increased competition which helped to reduce water charges, and helped with the adoption of new modern varieties of rice. Policy reforms in trade and the marketing of inputs have an effect through influences on price mechanisms.

3.2 Progress in Achieving the MDG 1

The experience of the last few decades indicates that, on average, economic growth in Bangladesh has been associated with reductions in income poverty and hunger, and faster reductions in non-income poverty and hunger. Poverty and hunger reduction, however, has not proceeded at the same rate as growth of income in different sub-periods. The rate of poverty and hunger reduction varied in different sub-periods. It may be noted that a simple measure of pro-poor growth is given by the growth elasticity of poverty, defined as the ratio of the percentage change in the poverty headcount ratio to the percentage change in the growth rate. The higher the growth elasticity of poverty, the more pro-poor the economic growth. The need for a pro-poor growth strategy emerges out of the fact that poverty and hunger are not only disgraceful to the poor but also a barrier to development since they limit economic demand, squeeze human capability and hamper social cohesion and the political stability of a society. A pro-poor growth strategy is thus a precondition for the more sustainable and stable development of a society especially where there is the enormous magnitude of poverty and hunger as in Bangladesh.

Target 1(a): Halve, between 1990 and 2015, the proportion of people whose income is less than one US dollar a day

To achieve MDG1, Bangladesh must reduce by 2015 the proportion of population with an income less than one US dollar (PPP) a day from 58.8 percent in 1990 to 29.4 percent.

3.2.1 Poverty reduction

The proportion of population below national poverty line in 2005 was 40.0 and the extrapolated value was 47.2 in 2007 though the price hikes on general commodities increased proportion of the population below poverty line (by some estimates it could be as much as more than 8.50 percent) (Table 3.3).

Table 3.3: Proportion of population below national poverty line

Year		Rural	Urban	National
1990		61.20	44.90	58.80
1995		55.30	29.50	51.00
2000		52.30	35.20	48.90
2005		43.80	28.40	40.00
2007*	Normal	42.30	27.60	38.66
	If 8.50% additional added due to price hikes in 2007/08	50.80	36.10	47.20
2015		30.60	22.50	29.40

Source: i) Mid-term progress report of MDG, 2007, ii) HIES 2000, 2005 iii) BBS 2006

The poverty situation varied in different periods of time, as well as between urban and rural areas. The rate of poverty reduction was found higher during 2000-05 (Table 3.4). The plausible reason for higher growth of poverty reduction during this period could be due to productions of all major crops which include rice, wheat, jute, pulses, oilseed, and sugarcane, which account for approximately 79 percent of total cultivated area and which increased steadily during the first PRS. Policy support in the form of liberalization of equipment imports, deregulation, rationalization of subsidy and restructuring of agricultural research-extension-farmers' linkages and public-private partnership approach, buttressed by private sector investment in production, seed production (especially hybrid seeds), chemical and blended fertilizers, and agro-processing enterprises has facilitated the progress in the crop sector (Draft PRS-II, 2008). On the other hand, the flood in 1997 and 1998 seriously affected human life and crops and animals were severely damaged.

Table 3.4: Annual rate of poverty reduction (%) over 1990-2007

Period	Rural	Urban	National
1990-95	1.93	6.86	2.65
1995-00	1.08	3.86	0.82
2000-05	3.25	3.86	3.64
2005-07	1.71	1.41	1.63
1990-2007 (Normal existing rate)	1.82	2.27	2.01
Required rate (Normal)	1.46	0.64	1.16
Time required to achieve targets (yrs) (normal rate since 2007)	6.43	2.25	4.63
Status	On-track	On-track	On-track

The rate of poverty reduction was also higher in the urban areas during 2000-05 due to rapid expansion of private sector involvement in the sectors like textile, ICT, telecommunication, hydrocarbon, electricity, air transport, tourism, railway and banking and insurance. In the recent years, private sector activities have expanded significantly in diverse economic fields. The private sector acts as the engine of growth in a market oriented economy. At present it accounts for about 80 percent of GDP, 90 percent of employment, 77 percent of investment, 93 percent of domestic saving, 74 percent of consumption expenditure, and 72 percent of domestic credit in Bangladesh (Draft PRS-II, 2008). Rural non-farm (RNF) households grew at 5.0 percent per annum, compared with only 1.5 percent per annum growth in the number of farm holdings, from the

mid-eighties to the mid-nineties (Draft PRS-II, 2008). Non-farm activities (NFA) including rural paved roads, markets, river jetties, warehouses, rural electrification facilitated production, storage and marketing; multipurpose credit societies developed and are providing fund for NFA.

The reduction of poverty remains lower in rural areas and a relatively higher rate of reduction is required to achieve the target within the stipulated timeframe. But if the existing rate prevails there is marginal scope to achieve the targets by 2015 in rural areas, while urban areas have a better scope. It was found that if the existing rate of poverty reduction prevails it will take another six years to reach the targets in rural areas, and more than 2 years in urban areas, while on an average approximately five years is required to achieve the target by 2015. This shows that the indicators are on the right track to reduce by half poverty by 2015. However of the additional population below poverty line is considered (added as a result of price hikes in 2007/08) then the achievement is far from the target needed by 2015 and it will take another 20 to 27 years to achieve the target from 2007. Thus, there remain some challenges to achieve the targets, discussed in the following section.

Poverty situations have also varied at regional levels. Large variations of poverty among the regions can be noted (based on data observed for years 2000 and 2005). For instance, it was found that Rajshahi and Barisal are far behind the national poverty level (Table 3.5). This means that these areas remain undeveloped. In urban areas the proportion of poverty was 28.40 in 2005, against 35.20 in 2000. This is still lower than in rural areas where the poverty level was 43.80 in 2005 and 52.30 percent in 2000.

Table 3.5: Proportion of population below national poverty line by divisions

Divisions	2000			2005		
	Total	Rural	Urban	Total	Rural	Urban
Barisal	53.10	55.10	32.00	52.00	54.10	40.40
Chittagong	45.70	46.30	44.20	34.00	36.00	27.80
Dhaka	46.70	55.90	28.20	32.00	39.00	20.20
Khulna	45.10	46.40	38.50	45.70	46.50	43.20
Rajshahi	56.70	58.50	44.50	51.20	52.30	45.20
Sylhet	42.40	41.90	49.60	33.80	36.10	18.60
BANGLADESH	48.90	52.30	35.20	40.00	43.80	28.40

Source: i) BBS, 2006 ii) HIES, 2000 iii) HIES, 2005

In the case of regional variance, an investigation has been made to explore whether specific lagging regions will ultimately achieve the targets or not. It has been found that the rate of reduction over 2000-05 was higher in Dhaka, Chittagong and Sylhet while the condition was worse in Rajshahi, Khulna and Barisal even in urban areas of Rajshahi (Table 3.6). This may be partially a result of rural people of Rajshahi division migrating to urban slums, where they become poorer due to less work opportunities in the monga (off-peak) season.

Table 3.6: Annual rate of poverty reduction over 2000-05 by divisions

Divisions	Rate of reduction over 2000-2005			Required rate of poverty reduction to achieve targets by 2015	Time required (years)	
					Based on required rate	Based on existing rate Since 2005
	Total	Rural	Urban	Total	Total	Total
Barisal	0.41	0.36	5.25	4.35	5.20	**55.12 (Off-track)**
Chittagong	5.12	4.45	7.42	1.35	3.40	0.90 (On-track)
Dhaka	6.30	6.05	5.67	0.81	3.20	0.41 (On-track)
Khulna	0.27	0.04	2.44	3.57	4.57	**61.26 (Off-track)**
Rajshahi	1.94	2.12	0.31	4.26	5.12	**11.24 (Off-track)**
Sylhet	4.06	2.77	12.50	1.30	3.38	1.08 (On-track)
BANGLADESH	3.64	3.25	3.86	2.65	4.00	2.91 (On-track)

In PRSP-II, "Moving Ahead", it has been mentioned that there exists statistically significant difference in some of the covariates of the households between the eastern (Dhaka and Chittagong divisions) and the western regions (Barisal and Khulna divisions). Households in the eastern region have more assets comprising house, land, business assets and durable goods compared to those in the western region. The persistence of these differences is attributable to the emergence of two growth poles, namely Dhaka and Chittagong, in the eastern region and easier access of people living in this part of the country to these cities. Growth of these cities is also spreading in nearby rural areas. People in the western part of the country have less access to the growth poles because of lesser connectivity. Faster poverty reduction in this region of the country can be achieved through investment in infrastructure, especially road infrastructure, and bridges especially over the Padma to increase connectivity. Another policy would consist of investment in human capital and improvements in employment opportunities which will improve household characteristics. Table 3.6 above shows the number of years required to achieve the targets on poverty reduction and as evident, in Khulna, Barisal and Rajshahi, there is less chance to achieve the targets within the next decades if the existing rate of poverty reduction prevails. The recommendations emerging from these findings is that MDG localization at the Divisional level is crucial to achieve MDG1 in Bangladesh.

In addition, extreme poverty is observed in some of the pockets of Bangladesh. The persistence of extreme poverty in some identified areas of the country has been a stark reality in Bangladesh (Annex Table A1-A2). People living in remote char areas with little assets and a lack of employment opportunities during particular periods of the year, are common victims of extreme poverty. Further, people living in remote areas of the hill tracts region and ethnic people are also victim of extreme poverty. Investment in infrastructure, creation of employment opportunities during the lean period, and increased coverage of SSNPs will improve the poverty situation.

An assessment of national poverty situation based on farm categories found that as the farm size increased, the proportion of population below poverty line decreased. The situation was far better in 2005 compared to 2000 (Table 3.7). It is shown that most farms above 0.50 acres had lower poverty levels than the target set for 2015.

Table 3.7: Proportion of population below national poverty line by farm size

Farm size (acre)	2000			2005		
	Total	Rural	Urban	Total	Rural	Urban
Landless	46.60	69.70	36.60	46.30	66.60	40.10
Less than 0.05	57.90	63.00	38.30	56.40	65.70	39.70
0.05-0.49	57.10	59.30	27.30	44.90	50.70	25.70
0.50-1.49	46.20	47.50	27.40	34.30	37.10	17.40
1.50-2.49	34.30	35.40	10.20	22.90	25.60	8.80
2.50-7.49	21.90	22.80	9.10	15.40	17.40	4.20
7.50 and above	9.50	9.70	0.00	3.10	3.60	0.00
BANGLADESH	48.90	52.30	35.20	40.00	43.80	28.40

Source: i) BBS, 2006 ii) HIES, 2000 iii) HIES, 2005

Table 3.8 below explains the time required for achieving the target by 2015 in different farm categories. It has been found that the urban landless will never achieve the targets while the rural landless would take another 39 years from 2005 to achieve the targets. Thus, the situation for landless as well as farm owners having less than 0.05 acres of land remains grim as shown below. Poverty reduction for such sections should be done either through an effective land reform or by giving massive ceiling incentives. Ministry of Food could take responsibility for addressing this issue.

Table 3.8: Annual rate of poverty reduction over 2000-05 by farm sizes

Farm size (acre)	Rate of reduction over 2000-2005			Required rate to achieve targets by 2015	Time required (years) Since 2005		
	Total	Rural	Urban	Total	Total	Rural	Urban
Landless	-0.36	-0.93	1.75	-1.69	128.61	38.67	-10.08
Less than 0.05	-0.53	0.82	0.71	-2.70	50.76	-42.71	-24.39
0.05-0.49	-5.43	-3.39	-1.25	-1.55	2.85	5.92	2.57
0.50-1.49	-6.94	-5.61	-11.49	-0.49	0.71	1.16	-0.44
1.50-2.49	-9.96	-7.66	-3.18	0.65	-0.65	-0.65	-4.31
2.50-7.49	-8.44	-6.21	-23.33	1.40	-1.66	-2.13	-0.78
7.50 and above	-41.29	-33.89	0.00	2.63	-0.64	-0.80	0.00
BANGLADESH	-4.45	-3.88	-4.79	-1.06	2.38	3.40	1.23
Notes:		Never possible			Possible out of target period		
		Already achieved targets			Possible within target period		

3.2.2 Poverty gap

To achieve MDG1, the poverty gap ratio must be reduced to halve by 2015. Trends in the poverty gap show a drop from 17.2 in 1990 to 12.9 in 2000 and 9.0 in 2005. The target by 2015 is 8.6. This suggests that even among the poor, greater numbers of people are now closer to the poverty line than at the beginning of the 1990s. It is worth noting however, that the distributional sensitive measures (PG, SPG) declined relatively more rapidly than the poverty headcount rate. On average, rural areas did better than urban areas in reducing the depth and severity of poverty, which implies that growth in rural areas was more pro-poor than in urban areas. The urban poverty gaps stood at 9.5 percent in 2000 and 6.5 percent in 2005 (Table 3.9).

Table 3.9: Poverty gap ratio during 1990-2005

Year	Rural	Urban	National
1990	18.10	12.00	17.20
2000	13.80	9.50	12.90
2005	9.80	6.50	9.00
2015	9.05	6.00	8.60

Source: i) Mid-term progress report of MDG '07, ii) Bangladesh Economics Review '07

Trends in the poverty gap show a rate of change of 2.50 and 6.05 percent during 1990-2000 and 2000-05. The overall rate was 3.18 during 1990-2005 (Table 3.10). The additional requirement will be less than the existing rate which will result in early achievement of these targets irrespective of rural and urban areas. It has happened due to the impact of privatization and deregulation which stimulated good economic performance during 2000-05.

Table 3.10: Annual rate of reduction of poverty gap ratio over 1990 to 2015 and time required for achievement of target

Period	Rural	Urban	National
1990-2000	2.38	2.08	2.50
2000-05	5.80	6.32	6.05
1990-2005 (existing rate)	3.06	3.06	3.18
Required rate	0.77	0.77	0.44
Time required in existing rate (years)	0.25	0.16	0.13
Time required in required rate (years)	0.97	0.65	0.52
Status of progress	**On-track**	**On-track**	**On-track**

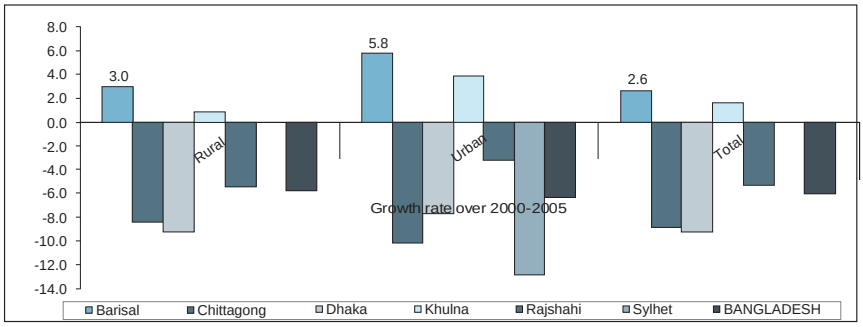
There was also large variation of poverty gap between the regions. Like poverty, the poverty gap ratio was found to be higher in Khulna, Barisal and Rajshahi, where the poverty gap was 10.8, 15.5, and 11.9 respectively in 2005 (Table 3.11). The growth of the poverty gap (Figure 3.1) suggests that the poverty gap may not be eradicated by 2015 in Barisal and Khulna Divisions mainly because the access to roads and infrastructure is comparatively lower than in other areas.

Table 3.11: Poverty gap ratio by region in 2005

Divisions	2000			2005		
	Rural	Urban	Total	Rural	Urban	Total
Barisal	14.20	8.30	13.70	16.30	10.70	15.50
Chittagong	11.20	11.40	11.30	6.50	5.60	6.30
Dhaka	15.90	6.50	12.90	8.60	4.00	6.90
Khulna	10.00	10.30	10.00	10.40	12.30	10.80
Rajshahi	16.50	13.60	16.20	12.00	11.40	11.90
Sylhet	9.00	12.50	9.20	7.60	4.50	7.20
BANGLADESH	13.80	9.50	12.90	9.80	6.50	9.00

Source: i) HES, 2005 ii) BBS, 2006

Figure 3.1: Growth of poverty gap ratio over 2000-2005



3.2.3 Income inequality

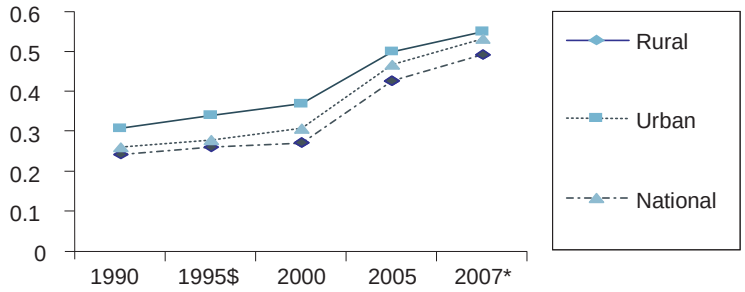
Bangladesh has been able to lower the overall incidence of poverty at the rate of one percentage point per year. Bangladesh has experienced good economic growth, and this has contributed much to the progress. This was achieved despite a rise in inequality during the nineties with overall Gini coefficient rising from 0.259 in 1990 to 0.306 in 2000, 0.467 in 2005 (Table 3.12) and 0.530 in 2007 by applying the method of extrapolation (Figure 3.2). Further, the income is more unequally distributed in urban areas compared to rural areas during 1990-2005. The growth-poverty link underlying the observed poverty trends show that Bangladesh has moved from a situation of lower growth with equity having a smaller impact on poverty reduction in the nineties, to a situation of higher growth with inequality having a larger impact on poverty reduction in the twenties. This implies that the latter is later clearly a better alternative than the former, however, the policy challenge lies in bringing about a sharper pro-poor orientation to the growth process.

Table 3.12: Gini index of inequality

Year	Rural	Urban	National
1990	0.24	0.30	0.25
1995	0.26	0.34	0.28
2000	0.27	0.36	0.30
2005	0.42	0.49	0.46

Source: i) Mid-term progress report of MDG, 2007 ii) Bangladesh Economics Review, 2007

Figure 3.2: Gini-ratio during 1990-2007



The inequality in Bangladesh is explained by the fact that the lowest quintile represented only 6.5 percent of the national income in 1990, which decreased to 5.30 percent in 2005. In rural areas, the lowest quintile share to total national income was relatively better than the urban areas (Table 3.13). The share of the poorest in national income in rural areas was better than the urban poor, indicating that the situation of the poorest in urban areas was worse in severe poverty than the rural poor. Rich people in urban areas are becoming richer than the rich people in rural areas. During the last two decades, the Government of Bangladesh (GOB) has been pursuing a number of Social Safety Net Programmes (SSNPs). As records shows, there are at least 47 well-recognized SSNPs which have been implemented by different ministries or agencies (Draft PRS-II, 2008) and 26 percent of the national budget is allocated for those programs. Even though there are several complaints against the delivery systems of SSNPs but the impact was found more pro-poor in the rural areas. The SSNPs for the urban poor is suggested in addition to strengthening the rural pro-poor programmes.

Table 3.13: Share of poorest quintile in national income

Year	Rural	Urban	National
1990	6.74	6.40	6.50
1995	6.49	5.12	5.71
2000	7.09	5.04	6.15
2005	5.88	4.84	5.30
Growth rate over 1990-2005	-0.85	-1.63	-1.20

Sources: i) BBS, 2000 ii) Statistical year book of Bangladesh, BBS, 2006 iii) HIES, 2000 & 2005

Target 1(b): Achieve full and productive employment and decent work for all, including women and young people.

3.2.4 Growth rate of GDP

The GDP growth rate for the nation as a whole, per capita GDP growth rate and per employed person GDP growth rate has been estimated. It is found from Figure 3.3 that the national GDP growth rate was higher than the per employed person GDP growth rate. This means that the employed person contributed considerably to the national GDP. The situation together increased per capita GDP growth since 2004-05. The relative share of agriculture to GDP is declining (Table 3.14) and labour absorption also decreasing (Table 3.15), though labour absorption was much higher than the other sector. It is found that the industrial sector's share of GDP increased from 20.78 per cent to 29.77 per cent while the share of agriculture decreased from 29.52 to 21.11. Agriculture was a promising sector even though the labour absorption decreased from 63.10 per cent to 51.69 per cent and the replaced labour neither engaged in manufacturing sector nor other sectors. There may be plausible cause of either unemployed or job in abroad.

Table 3.14: Sector wise share in GDP (%)

Year	Service	Industry	Agriculture	Total
1989-90	49.70	20.78	29.52	100.00
1994-95	48.70	24.78	26.52	100.00
1999-00	48.72	25.70	25.58	100.00
2005-06	49.12	29.77	21.11	100.00

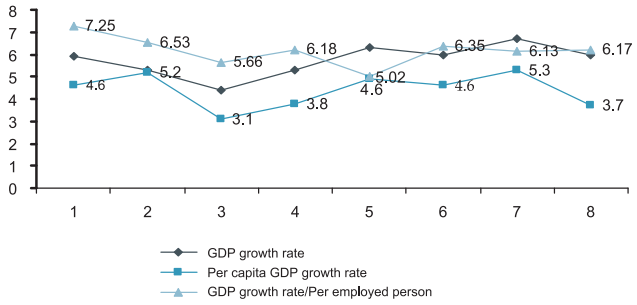
Source: Seminar paper, 2008. Financing growth and poverty reduction: options and Challenges in Bangladesh, Planning Commission, Dhaka.

Table 3.15: Sector wise labour absorption (%)

Year	Manufacturing	Agriculture
1990-91	12.70	65.10
1995-96	9.80	63.20
1999-00	9.49	50.77
2002-03	9.74	51.69

Source: Seminar paper, 2008. Financing growth and poverty reduction: options and Challenges in Bangladesh, Planning Commission, Dhaka.

Figure 3.3: Growth of GDP



3.2.5 Employment to population ratio

The employment to population ratio is the measure of human poverty for nations. In Bangladesh it was found that both the numbers of total population and the employment population were increasing (Table 3.16). The female contribution to total employment population was increasing at a very high rate (Table 3.17). About 48 million people were employed which was approximately one third of total population. Yet of these, only 11.30 million women were employed in 2005-06, amounting to only 17.43 percent of the total female population.

Table 3.16: Employment as percent of total population in Bangladesh

Year	Total population (mn)	Employment population (mn)		Employment as % of total population
		Total	Self employed	
1995-96	119.96	34.80	15.80	29.01
1999-00	124.36	39.00	18.23	31.36
2002-03	133.41	44.30	19.80	33.21
2005-06	137.10	47.40	19.86	34.57

Source: LFS, 2002/03, LFS 2005/06, BBS, 2006

Table 3.17: Employment to population ratio by sex and residence

Year	By residence (mn)		By sex (mn)	
	Rural	Urban	Male	Female
1995-96	26.90	7.90	29.80	5.00
1999-00	30.30	8.70	31.10	7.90
2002-03	33.60	10.70	34.50	9.80
2005-06	36.30	11.10	36.10	11.30

Source: LFS, 2002/03, LFS 2005/06, BBS, 2006

The growth of population over 1995/96 to 2005/06 was slightly higher than one percent. The employment rate increased at the rate of 3.62 percent indicating that employment was experiencing a better situation (Table 3.18) during 1999/00 to 2002/03. The growth of employment of females also increased at a higher rate (12.60 percent) than males, similarly and also in urban areas compared to rural areas. It is implied that the government program on female secondary school assistance program (FSSAP) had a direct impact on increasing female employment. This is further taken up in Chapter 3: of this report on gender.

Table 3.18: Growth of population, employed population by sex and residence

Year	Employment Growth rate by residence		Employment Growth rate by sex		Growth rate	
	Rural	Urban	Male	Female	Population	Employed population
1995/96-1999/00	3.16	2.53	1.09	14.50	0.92	3.02
1999/00-2002/03	3.63	7.66	3.64	8.02	2.43	4.52
2002/03-2005/06	2.68	1.25	1.55	5.10	0.92	2.33
1995/96-2005/06	3.49	4.05	2.11	12.60	1.13	3.62

On the regional variation of employment as per Division, a marginal increase in the employed population over ten years was found in some Division, while a large decrease was found in Barisal over 19995/96 to 2002/03 (Table 3.19). Employment in different sectors was examined and found that around 52 percent of the labour force was engaged in agriculture (Table 3.20). Further, labour employment (irrespective of sector) has increased. Labour employment growth though increased, but a lower rate was observed in agriculture (Table 3.21) compared to manufacturing and other sectors.

Table 3.19: Percentage change of labour force aged 15 years and over by regions

Division	1995/96	2002-03	% change over 1995/96-2002/03
	Percent	Percent	
Barisal	11.90	8.10	-3.80
Chittagong	17.50	18.60	1.10
Dhaka	27.20	28.30	1.10
Khulna	12.90	14.00	1.10
Rajshahi	24.40	24.90	0.50
Sylhet	6.10	6.00	-0.10

Source: LFS, 2002/03, 2005/06, BBS, 2006.

Table 3.20: Employment in different sector over 1995-96 to 2005-06

Year	Agric.	Manufacturing	Other sectors	Total
	mn	mn	mn	mn
1995-96	17.00	3.50	14.30	34.80
1999-00	20.00	3.70	15.30	39.00
2002-03	22.90	4.30	17.10	44.30
2005-06	22.80	5.20	19.40	47.40

Source: LFS, 2002/03, 2005/06, BBS, 2006

Table 3.21: Growth of employment in different sector

Period	Agric.	Manufacturing	Other sectors	Total
1995/96-1999/00	4.41	1.43	1.75	3.01
1999/00-2002/03	4.83	5.41	3.92	4.53
2002/03-2005/06	-0.14	6.98	4.48	2.33
1995/96-2005/06	3.41	4.86	3.57	3.62

3.2.6 Unemployment of youth labour

The study examines the present status and future challenges relating to the unemployment rate of youth labour (aged 15-29 years in the case of Bangladesh). The proposed decent work indicator by the ILO, however, emphasized that there is a need to arrive at a new set of indicators that better cover the different dimensions of decent work. This would require further refinements in the light of relevant features of the collected data.

Employment of youth labour increased from 18.0 million in 1995/96 to 19.50 million in 2005/06 (Table 3.22). The growth of youth employment is mostly accounted for by the increasing rural youth (5.78 percent compared to decline at the rate of 1.19 percent during the same (Table 3.23)). Youth employment however declined in urban areas but a small incremental was observed for the whole period. The participation of youth labour force increased from 1995/96 to 2005/06 in rural areas, attributed to government efforts on reducing gender and regional disparities as reflected in PRSP-I and will also be considered in PRSP-II.

Table 3.22: Youth (15-29 years) employment to population by residence

Economic category	Rural			Urban			National		
	1995-96 (mn)	2002-03 (mn)	2005-06 (mn)	1995-96 (mn)	2002-03 (mn)	2005-06 (mn)	1995-96 (mn)	2002-03 (mn)	2005-06 (mn)
Youth population	20.10	26.41	25.50	8.90	8.88	8.81	29.00	35.29	34.31
Youth labour force	11.00	14.95	16.80	4.20	4.40	3.60	19.20	18.99	20.40
Employed	10.28	13.75	16.22	3.72	4.03	3.28	18.00	17.78	19.50
Unemployed	0.72	1.20	0.58	0.48	0.37	0.32	1.20	0.83	0.90

Source: LFS, 2002/03, 2005/06, BBS, 2006

Table 3.23: Growth of youth (15-29 years) employment to population by residence

Economic category	Rural			Urban			National		
	1995/96-2002/03	2002/03-2005/06	1995/96-2005/06	1995/96-2002/03	2002/03-2005/06	1995/96-2005/06	1995/96-2002/03	2002/03-2005/06	1995/96-2005/06
Youth population	4.48	-1.14	2.69	-0.03	-0.26	-0.10	3.09	-0.93	1.83
Youth labour force	5.13	1.77	5.27	0.68	-2.60	-1.43	-0.16	1.06	0.63
Employed	4.82	5.99	5.78	1.19	-6.20	-1.18	-0.17	3.22	0.83
Unemployed	9.52	-17.22	-1.94	-3.27	-4.50	-3.33	-4.40	2.81	-2.50

Since the poorest of the poor are typically employed as agricultural labourers, it is worthwhile to look at trends in agricultural wages. The trends in the agricultural daily wage rate are shown in Table 3.24. Real wage rates (based on price per kg rice) of agricultural male labourers were higher in 2000 and 2005 than the years of 1990 and 1995. The real wage decreased again in 2007 due to price hikes of common foods, by which the rice based wage rate decreased and welfare of the poor decreased. Thus, the government should continue subsidies or price support programs for producers as well as for consumers for the welfare of the poor people.

Table 3.24: Nominal and real agricultural daily wage rate, 1990-2007

Year	Nominal wage rate (Taka/day)		Rice price (BDT/kg)	Rice wage rate (kg/day)	
	Male	Female		Male	Female
1990	42.95	28.50	12.33	3.48	2.31
1995	46.22	31.58	13.75	3.36	2.30
2000	61.10	47.94	14.25	4.29	3.36
2005	84.04	61.05	17.39	4.83	3.51
2007	103.00	76.00	24.43	4.22	3.11

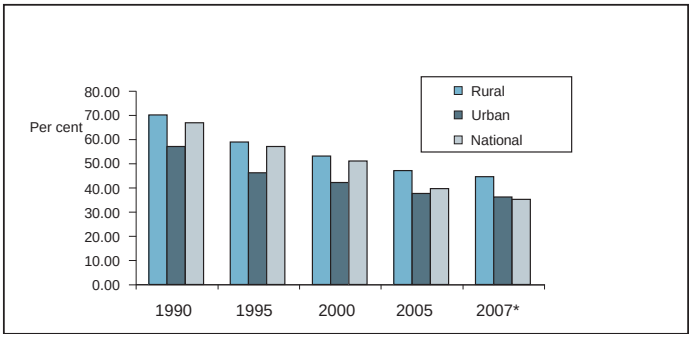
Source: i) Statistical Bulletin Bangladesh, BBS, June 2007
ii) A strategy for poverty reduction in the lagging regions of Bangladesh, Planning Commission, GoB, 2008

Target 2: Halve, between 1990 and 2015, the proportion of people who suffer from hunger.

3.2.7 Prevalence of underweight children below 5 years

The proportion of underweight children in Bangladesh is 16 percent higher than 16 other Asian countries at similar levels of per capita GDP (GoB, 2005). Nearly half of all children in Bangladesh are underweight. This suggests that children in Bangladesh suffer from short-term acute shortfalls in food intake, as well as longer-term under-nutrition. Much remains to be done in this vital area. There are also large differences in child malnutrition rates across economic groups. Child malnutrition is pervasive among the poor. More than 60 percent of children 6-71 months old suffering from stunting, belong to the bottom consumption quintile (Figure 3.4). Contrary to expectation however, nearly a third of the children from the richest quintile also suffer from malnourishment. This suggests that factors other than income play an important role. Such factors include per capita household food intake; infant feeding practices; maternal schooling and hygiene practices; access to safe drinking water, sanitation and health facilities, quality of village infrastructure and protection against natural disasters. The presence of NGOs and public relief programs has been found to have strong correlation to reduction in child malnutrition in the lowest consumption quintile.

Figure 3.4: Prevalence of underweight children under five years age



The prevalence of moderately underweight children (6-71 months) has declined noticeably from 67 percent in 1990 to 51 percent in 2000, and 39.70 percent in 2005. The severely underweight children of the same age group have been halved from 25 to 13 percent during roughly the same period. Further, the proportion of underweight children decreased from 70.0 to 53.0 percent during 1990 to 2000 in rural areas, while the rate was 57.0 to 42.0 during 1990-2000 in urban areas. The reduction of malnourished children was higher in urban areas. This may be due to government efforts of mother and child health programs more effectively implemented in urban areas than in rural areas. Given the annual reduction rate of 2.4 percent (Table 3.25), then it would take another eight years for rural and six years for the urban areas since 2000 to achieve the targets. However, the achievement is still far behind that targeted for 2015. Thus, it remains a challenge, particularly for rural areas, to achieve the target.

Table 3.25: Prevalence (%) of underweight children under five years of age

Year	Rural	Urban	National
1990	70.00	57.00	67.00
1995	59.00	46.00	57.00
2000	53.00	42.00	51.00
2005	47.00*	38.00*	39.70
2007*	44.60	36.40	35.20
2015	35.00	29.00	33.00
Annual reduction rate (%) during 1990-2000	2.43	2.63	2.39
Time required (yr.) in existing growth rate since 2000	7.82	5.42	7.40

Note: *- Calculated by extrapolation
Source: i) A future within the reach 2005. Reshaping institutions in a region of disparities to meet the MDGs in Asia and the Pacific, UNDP
ii) Mid-term progress report of MDG, 2007.

3.2.8 Population below minimum level of dietary energy consumption

The number of people falling below the hardcore poverty mark (consume 1805Kcal/day) is shown in Table 3.28. It is found that the population below the hardcore decreased from 28.3 million in 1990 to 17.6 in 2007. The population below the hard core poverty mark was 24.6 million and 20.0 million respectively in 1995 and 2000 which clearly demonstrates a sharp decrease. At the existing rate of reduction (Table 3.26) the status of progress is 'Off-track' for absolute poverty in both urban and rural areas, and 'Off-track' for hard core poverty in rural areas.

Table 3.26: Proportion of population below minimum level of dietary energy consumption

(DCI method in mn)

Year	Absolute poverty (2122 Kcal/person/day)			Hard core poverty (1805 Kcal/person/day)		
	National	Rural	Urban	National	Rural	Urban
1990	47.50	47.60	46.70	28.30	26.30	28.00
1995	47.50	47.10	49.70	24.60	27.30	25.10
2000	44.30	42.30	52.50	20.00	18.70	25.00
2005	40.40	39.50	43.20	17.90	24.40	19.50
2007*	36.80	36.80	36.10	17.60	24.20	19.30
2015	23.80	23.80	23.30	14.20	14.10	13.20
Rate of reduction During 200-2005	1.00	1.34	0.50	2.15	0.48	2.03
Required yrs to achieve target at the above reduction rate	16.66	13.83	39.80	1.50	21.38	3.11
Status of progress	**Off-track**	**Off-track**	**Off-track**	**On-track**	**Off-track**	**On-track**

Note: *- Calculated by extrapolation
Source: i) BBS, 2006 ii) HIES, 2005.

3.3 Challenges and Opportunities in Reducing Poverty and Hunger

Much will need to be done to achieve the MDG1 target of halving the proportion of poor whose income is less than one dollar a day, and halving the proportion who suffer from hunger and malnutrition. Bangladesh has nearly 140 people, of whom 75 per cent live in rural areas and 63 million are poor (the third largest poor population in any country after China and India). Bangladesh also has one of the highest rates of child malnutrition in the world. One third of the population lives in extreme poverty, and nearly half of Bangladesh's children are underweight. Demographic changes in upcoming years are likely to affect poverty and hunger in adverse ways. Achieving the MDG1 by 2015 will require Bangladesh to develop and implement more ambitious and effective strategies. The primary challenges and actions needed to address them are summarized below.

Challenge 1: Reducing hunger and malnutrition: Comprehensive programme of integrated actions on many fronts.

Agricultural growth as an indicator of economic development is necessary for rural poverty alleviation (Ravallion and Datt, 1996; Odhiambo and Nyangito, 2005). Recent research shows that a one percent increase in agricultural yields reduces the number of people living on less than USD 1 per day by between 0.6 and 1.2 percent. No other economic activity generates the same benefits for the poor (Irz et al., 2001). In Bangladesh, agricultural performance in the 1990s has been relatively better as compared to the previous two decades. During 1990s, the growth of agricultural GDP was estimated at 3.5 percent per year compared to 2.6 percent during 1974-90. At the same time, national income grew at 5.3 percent compared to 4.1 percent in the previous two decades (BBS, 2000). Agriculture is the economic activity mostly dependent on land resources. Bangladesh is an extremely densely populated country, with approximately five percent of households classified as landless, and approximately 55 percent of households are having less than 0.2 ha of land (BBS, HIES 2005). Furthermore, another 30 percent of households have less than one ha, and only ten percent of households have more than one ha of land. According to HIES 2005, on an average around 29 percent of household income comes from agricultural sources in rural areas. The share is six percent in urban areas (HIES, BBS, 2005).

A BIDS-IRRI survey conducted in 2000 estimated that the average land size of poor household in rural areas is 0.29 ha and per capita income per year is USD 46, much lower than the overall rural average of USD 100. Both are less than the rural poverty line of USD 141 per person per year (Hossain, 2004). Therefore, limited land size leads households to seek the other income generating activities like non-farm activities to escape poverty. In terms of expenditure, more than half of rural household expenditure is for food consumption (BBS, HIES 2005). The national average food consumption as a share of total expenditure is 54 percent (BBS, HIES 2005). The bottom 40 percent of households are spending approximately 67 percent of their total expenditure on food, whereas upper income groups are spending proportionately less. Therefore, the challenge is to increase the food supply while keeping food prices within an affordable limit so that low income poor people can achieve food security.

In Bangladesh, recent growth of agricultural incomes was accelerated mainly by the expansion of non-crop agriculture sectors particularly livestock and fisheries. These sub-sectors had significant increase in physical

output, as well as favorable prices compared to the crop sector. Thus, agriculture has become much more diversified than it was at the time of independence (Ahmed and Chowdhury, 2000).

Privatization of minor irrigation systems and a reduction in import duties helped to adopt modern variety rice in the 1990s, and the upper 50 percent households have directly benefited in the form of increased yields, reduction in per unit cost, and average farm incomes (Hossain et al., 2003). On the other hand the increased productivity leads to reduced output market prices which have caused limited income gains for producers. Although not highly profitable, indirectly there have been positive impacts to the both poor and rich households in the form of reduced real prices of rice, improved food security and reduced vulnerability. Further, the rice equivalent wage has increased about 4.8 percent per year from 1987-2000 (Hossain et al., 2003).

The development of agriculture also contributed to reductions in poverty in an indirect way. The expansion of non-farm sector (which is vertically integrated with agriculture) has also been contributing to increases in the income of poor households. Infrastructural development with roads and transportation system have also created employment opportunities in transporting surplus agricultural produces from rural to urban areas as well as trading with rice, vegetables, fruits etc. Many NGOs are supporting marginal and landless farmers to generate income through raising livestock, poultry, and small trading by providing logistic and micro-credit support.

Improvement of the growth performance of the agriculture sector with various sub-sectors calls for a comprehensive multi-sectoral approach to address all aspects of agricultural production focusing on food production (cereals and non-cereals), food security, employment, and income generating activities (IGAs). Bangladesh faces tremendous challenges in doing this. Some of the important challenges are as follows:

- In the face of decreasing farm sizes, degrading soil quality and limited water resources, the main challenge for the country is to maximize production in order to improve food availability from domestic sources;
- With the present production technology package approaching a limit, one major challenge is to harness productivity gains by making breakthroughs in yield frontier technology (i.e., hybrids/crossbreds, biotechnology, genetic engineering in crop, livestock, fisheries and forestry);
- Against the backdrop of decreasing water resources and increasing irrigation costs due to rising fuel/energy prices, an emerging challenge is to improve water use efficiency in rice production and to shift to water-efficient food crops;
- The growing competition in global markets due to trade liberalization has, without doubt, created opportunities as well as constraints for Bangladeshi small holders (in horticulture, dairy, poultry, shrimp, fish and wood products) who account for four-fifths of all farm holdings. They have to be given effective support to allow a level playing field for them to compete with others, and to reap the benefits of a globalized world;
- With 63.0 million people living below the poverty line, Bangladesh has a formidable challenge to strike a balance between ensuring adequate incentives for the numerous small producers (rice, poultry, dairy, fish, nursery etc.) on the one hand and keeping food prices low for poor consumers on the other;
- With economic growth, income inequality in rural areas is also on the rise, which brings forth a challenge to escalate income generating programmes and accelerate poverty reduction in rural areas;
- While there has been an overall improvement in food availability at the household level, intra-household food entitlements between men and women (especially lactating women), and between adults and children remains an issue to be addressed;
- The already vulnerable food security situation worsens when food production (crops, livestock and fisheries) drops due to natural disasters. This means that the country needs to bolster its capacity in agriculture production to guarantee food security, especially in vulnerable disaster-prone areas;
- With the increase in population, increases in the production of fish, milk, meat and eggs, and self-employment of fishermen and livestock-rearing farmers are important to supply balanced food for a growing population, possibly through encouraging small holders and private sector promotion in poultry, dairy and fisheries sub-sectors;

- Coping with the effects of climate change, maintaining ecological balance and conserving biodiversity for the growing population is a key challenge for Bangladesh;
- To meet these challenges, the overriding task is to mobilize resources for the agriculture sector including adequate financial support from internal and external sources, and to strengthen cooperation between countries in the region in the fields of science, technology and knowledge sharing.

Challenge 2: Youth unemployment

The challenge in the case of youth labour (which is likely to reach a level of nearly 30 million in 2015), is to create employment at a much faster rate compared with other segments of the labour force. For example, if the target is to reduce the youth unemployment rate to the same growth rate of labour force in 2015, then Bangladesh will have to generate more than 11 million jobs specifically for the youth population.

There are two important issues to be considered here. First, the problem of unemployment mostly affects youth labour in Bangladesh. The economy therefore needs to accelerate the generation of employment opportunities for the youth. Second, the large majority of the educated youth remain unemployed due to a mismatch between supply and demand in the labour market, inappropriate and inadequate skills, and the slow pace of job creation, particularly in the formal sector. In order to meet the challenge of the growing youth labour market, Bangladesh will need to rapidly expand the productive and skill-intensive formal and informal sectors. Reforms in the education sector to match these emerging priority demands of the labour market is desirable.

Global partnerships can contribute by providing new formats and strategic directions in creating decent and productive employment for youth. Although domestic investment is the main driver of growth and foreign direct investment (FDI) flows are yet to rise rapidly in Bangladesh, development dimensions of the youth can be made an integral part of the country's FDI policy through global partnerships in transferring technology, upgrading skills and management capabilities of the youth labour force in ways that not only attract more FDI but that also support higher productivity.

Challenge 3: Protecting the vulnerable: Supporting effective and sustainable safety net programmes for the vulnerable in poor areas

The persistence of disparities in poverty and hunger warrants the evaluation of social safety net options that target particular groups and areas. Some groups of the poor and hungry are chronically vulnerable, and some face vulnerabilities that are regional or seasonal in nature. Targeted interventions need to be designed and prioritized taking into account their financial sustainability and the country's other demands for pro-poor spending. Tradeoffs between reaching the poorest and the not-so-poor, and the distinctions between short-term palliatives and long-term measures to enhance the prospects for poverty reduction, must be recognized.

Types of targeted interventions that should be introduced include:

- Identifying and promoting infrastructure investment projects with high expected impacts on employment, growth, and market access in poor (especially rural) areas.
- Supporting safety nets for protection against natural disasters and the associated hardships in disaster-prone areas.

Challenge 4: Reaching the poor: Promoting pro-poor growth

The initial level of inequality of income and ownership of assets and its possible further deterioration will determine the poverty outcome. Pro-poor growth, therefore, needs to be promoted so that the positive impact of economic growth on poverty reduction is increasingly larger than the adverse impact of income

inequality, and the poor are able to participate more actively in the growth process and derive increasingly higher benefits from it. The creation of more jobs and opportunities for entrepreneurship and self employment by the poor will need to be speeded up aggressively, so as to address the massive backlog of underemployment, as well as the large annual addition to the labour force on account of demographic factors. Income growth in rural areas has proven to be pro-poor in Bangladesh, and its continuation will need to be promoted proactively. Pro-poor policy reforms are suggested, and the coordinated actions will be required in areas such as:

- Building the income-generating capacities of the poor by pursuing social sector programmes and policies that develop their human capital. This should include improving poor people's access to the essential health service packages (ESP), addressing the problem of child malnutrition, and undertaking a comprehensive programme to improve the coverage and quality of education and skill development. These are covered in later section on health and education.
- Enabling the poor to participate more actively in economic activities through initiatives to facilitate their access to markets for credit, land, and labour.
- Enhancing cooperation and partnership among Government, the private sector, and civil society in scaled-up efforts to implement the PRSP.

Challenge 5: Expansion of rural infrastructure to ensure access to health and modern facilities, and also to strengthen the rural-urban market linkages by the poor

- Upgrading and construction of paved secondary or district roads.
- Upgrading and construction of small paved roads connecting villages and farmers to the nearest district road.
- Extension and improvement of footpaths connecting individual rural farmers to feeder roads.
- Institutional structure and funding arrangements for adequate road maintenance.
- Investments in supply and distribution systems for bicycles and motorized vehicles.
- Deregulation of transport market to increase competition.
- Support to small-scale transport entrepreneurs to reduce barriers to market entry.

Challenge 6: Creation of job opportunities to the urban poor

The urban population and the urban labour force experiences accelerated growth due to natural increases, rural-urban migration, and the reclassification of rural as urban areas. As the large majority of the urban labour force will belong to the youth labour category, the formal sector will be required to provide employment to a progressively larger segment of the youth labour force. This has direct implications for ensuring decent work to meet the dual role of employment in terms of both generating income and fulfilling the individual's social functions. In the situation analysis it was found that the urban poor were worse off than the rural poor. Thus, there remains a challenge to create job opportunities for the urban poor.

3.4 Major Interventions and Targets for MDG1

3.4.1 Agriculture and Rural Development

Agriculture has been and will continue to be the life line of the Bangladesh economy representing about 21 percent of total GDP. Agriculture continues to be the most important sector in a sense that it plays significant role in the production of food, employment and income in the rural areas for improving the well-being of the poor. As one of the largest private enterprises, crop production contributes about 12 percent to the GDP (MOF, 2007) and is a major supplier of raw materials in agro-based industries.

The agriculture sector is the sum of crops, forests, fisheries and livestock where only crop sub-sector contributes 71 percent of the total agricultural GDP (MOF, 2007). In terms of contribution to country's GDP, within the broad agriculture sector, the contribution of agriculture and forestry and fisheries are estimated at

16.38 percent (crop 11.72 percent, livestock 2.90 percent, forestry 1.76 percent and fisheries 4.73 percent respectively in FY 2006-07 (MOF, 2007).

To meet the challenges in agriculture and rural development, the overriding task is to mobilize resources for increasing agriculture productivity, increasing rural incomes, and access to markets. These two interventions for agriculture and rural development are discussed below in detail:

a) Increasing Agricultural Productivity

The investment in agriculture is aimed at increasing agricultural productivity of smallholder farmers, as they often do produce levels required for subsistence. Food grain production was 27.8 and 28.4 million metric ton respectively in 2005-06 and 2006-07, while the food deficit and imported were 2.56 and 2.43 million metric ton. To meet the food deficit, the government allocated BDT 1100 and BDT 2000 core in FY 2005-06 and 2006-07 respectively.

The interventions which are essential in addressing agricultural productivity to the smallholders are discussed below.

i. Investments in soil health

This intervention is critical for increasing yield as depleted levels of nitrogen in the soil can severely curb agricultural production. Use of additional use chemical fertilizers and manures are treated here for improving soil health which ultimately increased crop productivity. The percentage of households using chemical and organic fertilizers are varied 60-90 percent irrespective of region. The use of chemical fertilizers decreased recent years due to its price hike and lack of availability

ii. Improved seeds

Investments in improved seeds, in combination with greater soil nutrients, are essential for increasing agricultural productivity of smallholder farmers. The intervention encourages farmers to grow improved crops include crop seed, vegetable seed and fodder crop production, vegetative propagation, tree nurseries, and seed delivery. The use of improved seed increased one-two percent each year, with variance from region to region.

iii. Plant protection

Plant protection is mainly done by using pesticides. The flood protection and drainage has been planned to cover an area of 4.621 million hectares within the year 2010-11, with an incremental area of 0.1 million hectares which will ensure an additional food grain production of 0.4 million metric tons. Recently, the integrated pest management is being practiced by a large proportion of farmers using pesticides in crop production.

iv. Small scale irrigation and water management

Policies towards deregulation and market liberalization have encouraged private sector participation in minor irrigation systems. Public sector irrigation systems are being rationalized for improvement of performance and cost recovery. Expansion of irrigation facilities to 5.35 million hectares of land is undertaken by operating different modes of irrigation equipment. Emphasis has been given to minor irrigation for efficient use of ground water. The suggested interventions include facilitating tube wells for lifting ground water irrigation in crop production. The number tube well increased dramatically increased after the mid nineties due to trade

liberalization and it is expected that the number will be 400,000 to 450,000 during 2009-20015 while the number of pumps will be decreased from 25,000 to 20,000 during 2009-2015.

v. Agricultural research

Along with production and delivery, research is also an important component of supplying farmers with improved seeds. The UN Millennium Project recommends allocating around two percent of agricultural GDP for agricultural research. In Bangladesh, currently, this amounts to around two percent of agricultural GDP and expected to increase three percent by 2015. The agricultural research institutions are BRRI, BARI, BJRI, BLRI, BFRI, BSRI, BTRI, BFRI with coordination by BARC.

vi. Extension services of DAE, DLS and DoF

Increasing agricultural productivity depends on a strong extension system that is participatory and reaches up-to-date knowledge of soil health, small-scale water management, improved seeds, high value niche products and other ecologically sound products. Extension services in the country are supported by DAE, DLS and DoF. About 24,000 extension workers are working on best practice production methods, tools and demonstration plots, among others. The livestock and fisheries services especially, need strengthening in terms of manpower, resources and policy support. These two sectors have only 12,000 extension workers, and need to be increased. Emphasis will be given to facilitate partnership of DAE, DLS, DoF and BRDB cooperatives with the private sector and NGOs, and which have developed many successful approaches to disseminating promising technologies. DLS is also trying to increase livestock production by delivering best practices of updated knowledge to farmers. Farmers are also very much aware about the best methods of production required to produce different species of livestock and poultry. Similarly, the DoF is supplying the delivery and services of best practicess for production of different species of fish.

vii. Subsidy in agriculture

Bangladesh has increased subsidies for agricultural inputs. Indeed, the main challenge for the Government is to maintain the right type and mix of support programmes and to prioritize the implementation strategy, so that the support package may contribute to productivity gains as well as benefit poor farmers most. At this moment, about BDT 45 billion is used to subsidize fertilizers while diesel costs are also subsidized by the government (cost of BDT 2.50 billion in 2007-08). The pump owners rebate 20 percent of electricity bills for irrigation purposes. It is expected that the subsidization policy will not be increased due to budgetary constraints, but efficient delivery and coverage from 70 percent to 100 percent smallholders are targeted.

The Millennium Project developed costing model was used to calculate the costs of farm, community and national-level interventions in the agricultural sector, as well as the cost of roads and infrastructure using the Excel spreadsheets.

In some cases, the current coverage data was not available. In these cases, they have been considered with some previous micro level studies and/or through the key informant discussions and interviews in addition to the discussions in the Thematic Working Group (TWG) members (Table 3.27).

Table 3.27: Coverage target of farm interventions in Bangladesh agriculture

Parameters	Divisions											
	Dhaka		Chittagong		Rajshahi		Khulna		Sylhet		Barisal	
	Cover-age	Target	Cover-age	Target	Cover-age	Target	Cover-age	Target	Cover-age	Target	Cover-age	Target
Percent smallholder	64.00	74.00	62.00	72.00	62.00	72.00	63.00	73.00	60.00	70.00	65.00	75.00
Average farm size (ha)	0.43	0.33	0.38	0.29	0.49	0.38	0.53	0.41	0.89	0.69	0.51	0.39
Percent of rural population	28.00	na	18.00	na	27.00	na	13.00	na	6.00	na	8.00	na
% of area under HYV rice	73.00	90.00	80.00	100.00	86.00	100.00	45.00	75.00	55.00	80.00	33.00	58.00
% irrigated area	50.56	60.56	40.13	50.13	65.60	75.60	46.29	56.29	36.03	46.03	9.13	19.13
Average coverage and target	61.78	75.00	60.06	75.00	75.80	75.00	45.65	75.00	45.52	75.00	21.07	75.00

Source : BBS. 2006
Note : na is not appropriate, many cases trends were taken into consideration

b) Rural incomes and access to markets

In addition to increasing agriculture productivity, improved access to credit, storage facilities, processing, and value added technologies can help raise incomes. Access to markets, farmer cooperatives/associations, and physical market spaces are also beneficial. Interventions to increase rural incomes and access to markets are discussed below:

i. Building storage facilities to reduce post-harvest losses

Promoting farmers associations and cooperatives to improve economies of scale and bargaining. Promoting value added food processing for smallholders is also important for access to fair prices to the farmers. About 4 percent of the total households are using the existing 2700 storage facilities especially for cold storage where one storage facility is used on an average by 300 households. It is expected that the storage facilities' usage will increase by 10 percent and while on an average 200 households will use each storage facility that will reduce post harvest losses and help in getting fair price to the farmers.

ii. Agro-processing Activities

Agri-business and agro-processing are given top priority as thrust sectors to promote value addition to crops, livestock, fish and horticultural products. Increased budgetary allocations will be made for supporting agro-processing activities, which remain predominantly in the private sector. The private sector will also get support for technical training, technology development, and improvement of hygienic standards, handling and packaging of processed products. It is important to recognize that without compliance with international standards for food safety, sanitary and phyto-sanitary measures, exports are unlikely to become significant. For agro-processing, the existing rice mills numbering 22,000 units have been considered with increased coverage from 90 to 100 percent by 2015.

iii. Access to Micro Credit

NGOs operate a large number of micro credit programmes which generate income and employment, and which directly reduce poverty among beneficiaries. As of December 2006, as many as 611 NGOs were operating micro-credit programmes with the total number of beneficiaries standing at approximately 30.8 million, of whom 3.8 million were male and 26.9 million were female. Ventures like small poultry farms, seed production, processing and marketing, fruit orchard development, marketing of quality fruits, vegetable production and group marketing, shrimp hatcheries, fish farming, shrimp processing and marketing and processing of fruits at farm level (such as preparation of jam, jelly, chatny, dry vegetable etc.) can be supported through ensuring credit in agriculture sector in PRS II period for fostering the reduction of poverty. From FGD with civil society organizations, it is expected that the use of micro credit will shift from 48.0 percent to 68.0 percent across the total number of rural households by 2015, by which agro-based production and entrepreneurship should be developed.

3.4.2 Development of transport infrastructure

In PRSP-II, it is mentioned that the interventions on improving rural access would be directed at achieving the target of reducing the proportion of the rural population living more than an hour's walk from the nearest road to less than 20 percent. There are three main modes of transport in Bangladesh: road, rail and waterways with an increasing emphasis on roads. Both the quality and quantity of the railways and waterways has declined over recent decades.

The key challenge in the transport sector is to expand the country's relatively new and small roads network. The major interventions include the expansion of national, district and feeder roads (including bridges and culverts), where necessary. It is expected that interventions on roads and transports will increase access of communities to socio-economic development, thus reducing poverty and facilitating the achievement of MDG1. The government has recently placed increased emphasis on roads and transport. However, despite investment in the system, the cost of transport, construction and maintenance remain high due to topographical obstacles such as the extensive river system, periodic flooding and poor soil conditions (BIDS, 2004).

The development of the provisions for an efficient transport system facilitates generation of economies of scale, expansion of competitive markets, reduction of transportation costs, urbanization and exports growth which will exert beneficial effects on the economy. The provisions of transport services improved significantly in the past few years along with the construction of rural roads and key major highways. The development of the transport network and the provision of better services facilitate movement of raw materials and goods from the place of origin to the place of destination at cheaper costs.

Status of transport sector in Bangladesh

Bangladesh witnessed rapid growth in the transportation sector since independence. The road network has expanded rapidly to 182,286 km, covering national and other categories of roads to provide nation wide transport services to all (Table 3.28). The 159,853 km of the road network in rural areas had significant impact on ensuring affordable transport services in the rural sector and improving the living conditions of the rural poor.

Table 3.28: Status of transport sector in Bangladesh during 2006-07

Road Type	Route in kilometer	Bridge & culvert in meter
National highway	3,570	24,200
Regional highway	4,323	
District highway	13,678	
Upazila road	36,168	48,296
Union road	42,328	44,656
Village road-A	94,059	53,133
Village road-B	77,276	23,905
Rail: Broad gauge	659	3,452
Meter gauge	1,831	

Source: RHD Database 2008, LGED Database 2008 and Railway handbook 2008

The role of government is to promote, regulate and provide facilities particularly to those areas where the required services are not forthcoming. Strategies for improvement of service delivery in the transport sector include: (a) develop a comprehensive master plan for transportation of passengers and goods by different modes of transports; (b) develop an efficient road network connecting major cities with secondary towns by up-gradation of roads; (c) develop a viable public transportation in districts and cities connecting surrounding growth centers; (d) expand and intensify railway operations connecting ports and towns; (e) develop an effective railway time-table with an eye on public requirement; (f) develop and maintain road, rail and waterways on routine basis; (g) promote commercialization of all public transportation; (h) build and strengthen public-private partnerships in rail and road transportation; and (i) develop a sustainable transportation system with complete awareness of the potential social, environmental and economic impact.

Major interventions for development of transport infrastructure

- Construction of village, union, upazila, district and national roads
- Maintenance of village, union, upazila, district and national roads
- Construction and maintenances of bridges and culverts on village, union, upazila, district and national roads
- Strengthen railroads

The PRSP been strongly addressed the construction and maintenance of road infrastructure for reducing poverty. It is principally local government and the engineering department that are playing a significant role in this. In addition, RHD and Bangladesh Railway can also play a role. In FY 2006-07, it was found that 138.08 million man-days were utilized in the construction and maintenance of the road infrastructure in Bangladesh. It has been also found that due to road access, villagers were using 92 percent higher fertilizer, the price of fertilizer was 12 percent lower in villages with good access to road areas, labor costs were 12 percent lower, crop production was 32 percent higher, and there was 71 percent higher use of modern rice varieties. Thus, the intervention of construction and maintenance of road infrastructure increased poverty reduction in lagging regions.

It is estimated that the total length of rail roads and bridges will increase at a very slow rate because the government has placed less emphasis due to the high costs of construction (Table 3.29). National roads which consist of national highways, regional highways and district highways are targeted to increase by 8-14 percent by 2015 depending upon categories. In the case of the feeder roads that are maintained by LGED and consist of village roads, union and upazila have been targeted to increase by ten percent during the period of 2009-2015. The feeder roads directly help for improving rural livelihood.

Table 3.29: Current coverage and targets for the transport infrastructure in Bangladesh

Road Type	Route in kilometer		Bridge & culvert in number	
	Coverage in 2006	Target as 2015 (additional)	Coverage in 2006	Target as 2015 (additional)
Railway roads	2,835	165	3,452	48.00
National highway	3,570	430	6,000	650.40
Regional highway	4,323	677	8,000	1,127.60
District highway	13,678	1,322	10,200	869.90
Upazila road	36,168	3,620	48,296	483.00
Union road	42,328	4,200	44,656	446.60
Village road-A	94,059	9,000	53,133	531.30
Village road-B	77,276	7,500	23,905	239.10

3.4.3 Promoting Decent Employment

With the current growth (3.32 percent), labour force will grow to 58.28 million in 2010-11, resulting in an incremental labour force of 5.44 million during 2009-11. With the prevailing employment growth, total employment will increase to 55.75 million in 2010-11 with an incremental employment of 5.17 million. This means that, including the backlog of 1.88 million unemployed, 7.32 million additional jobs will have to be created during 2009-11, requiring an employment growth rate of 4.67 percent. Besides this, the underemployed will amount to 26.58 million during 2009-11, and if productive employment is to be created for at least 75 percent of them, 27.26 million additional jobs will need to be created during 2009-11. This indicates the challenge of employment generation to absorb a large and growing labour force. Several approaches can be adopted to ease the employment problem: (i) introducing policies for making growth more employment-friendly; (ii) increasing overseas migration of workers; and (iii) undertaking special schemes for job creation (especially through micro-credit) and employment-based safety nets through public works programs. Support for off-farm income-generating activities includes the following:

a) Food for work programs

This program is a means to provide rations for the food insecure and at the same time improve the access of remote and isolated households to educational, health and agricultural services. The government must continue these programs as they act as a safety net for food insecure households, especially the rural landless, and contribute to improving access of isolated communities to socioeconomic services. It is targeted that in each year this program will be maintained to improve the pro-poor people for poverty reduction. Moreover, 138 million man-days were used in 2006-07 for construction of roads and infrastructure of roads infrastructure.

b) Social safety net through employment guaranteed scheme

This intervention package provides smallholder farmers and landless households with opportunities to access alternative sources of income as a safety-net. The Government operates a large number of social safety net programs which generate income and employment, help human resource development, create infrastructure and directly reduce the poverty of the beneficiaries. The existing programs cannot guarantee a minimum amount of jobs and income security to the poor. The government is planning to introduce guaranteed employment program in the FY2008-09 for rural people during lean season. The main aim of this new program is to guarantee 100 days of work in a year for 20 million people at the rate of Taka 100 per day. If the government fails to provide work, it would compensate the persons during the lean season with cash.

c) Skill development

There exists a skills mismatch in the labor market generated by shift of labor from non-tradable to tradable sector, as well as by the educational system turning out graduates whose supply exceeds demand. Skills training, imparted through public sector and private sector polytechnic institutes, some specialized institutes, private sector institutions, public sector technical schools and colleges (TSCs), Technical Training Centers (TTCs) and Department of Youth should be expanded and diversified and the quality and content of vocational training would be upgraded and reoriented in general to cater to the emerging needs of the economy. In particular, for skills upgrade of workers in the unorganized sector, flexibility in the duration, training and location of training courses should be introduced. Skills of entrepreneurship, management and marketing will be introduced as part of training courses. Skill development from the Ministry of Labor under BMLD was arranged a substantial number of skill training for working at country and abroad.

Overseas employment has greatly contributed to the absorption of a growing labor force in the country. Annual flow of migrant workers has increased from 6,087 in 1976 to 8, 21,223 in 2007, a 17.14 percent trend rate of growth. The long-term strategies for expanding overseas employment include the search for new markets, skills development training, export of human power from Monga areas (the area with less opportunities for work), welfare program, controlling the works of recruiting agencies, bringing about transparency in the migration process, increasing the flow of remittance and ensuring their proper use and special initiatives for sending women workers. It is estimated that about 500,000 human resources should be trained up as semi skilled and skilled labour where the training cost per person is estimated Taka 7,000 per year.

d) Financial support to urban poor

The urban poor are worse off than the rural poor. Given this, some financial based sub-interventions should be introduced. It has been proposed to provide financial support to urban poor to work abroad with easy terms and conditions. Moreover, the skilled or semi-skilled oriented training should be facilitated by arranging long term based micro-financing to urban poor people. This should help them to engage themselves in self-employment based small trading. In the spreadsheet model, it is assumed that the 500,000 poor people per year those who are residing in the unfavorable agro ecological zone should be supported with free interest rates (about 11.50 percent on average) when they will decide to work in abroad.

3.5 Resource Needs Estimates for MDG1

The total amount of resources required for the period 2009-2015 for interventions in the agriculture and rural development cluster amounts to approximately BDT 1591.07, equivalent to 23.26 billion US dollar. Of this, around three fourths are intended for recurrent expenditures and one fourth for capital expenses. From the requirement of approximately BDT 188.37 billion in 2009, the annual costs rise to BDT 226.55 billion in 2012, and BDT 268.57 billion in 2015 (Table 3.30).

3.5.1 Agriculture and Rural Development

About 69 percent of the total cost or approximately BDT 1095.81 billion is required for farm interventions to increase agricultural productivity. Around one fourth will be needed for the cost of subsidy in agriculture during 2009-2015. The overall resource needs for this cluster are shown in Table 3.30. Details of each intervention, its coverage and costing, as calculated by the Agriculture Rural Development Model are available with the Project. Rural credit forms a critical element for the success of some of the interventions mentioned above, and access to affordable micro-finance schemes, particularly for poorer and vulnerable households should be enhanced. Similarly, enhancing other rural income generation opportunities such as creation of facilities of mass storages, community mobilization, agro-processing and adaptive research will require policies that support the development of small and micro intermediaries and economic facilities.

Table 3.30: Resource needs estimates for agriculture and rural development

Area	2009-15		% of total
	Billion BDT	Billion USD	
Farm intervention	1,095.81	16.02	68.87
Community intervention	29.61	0.43	1.86
Small scale irrigation	48.83	0.71	3.07
National intervention	1.27	0.02	0.08
Subsidy in agriculture	415.55	6.08	26.12
Total	1,591.07	23.26	100.00

1 USD = 68.40 BDT

In order to successfully achieve the MDG1 related to poverty and hunger, economic growth must have a stronger pro-poor orientation with the overall macroeconomic policy and budgetary should focus on the successful implementation of the proposed poverty alleviation interventions, including focused and targeted poverty interventions. It is especially crucial that higher growth rates for the agriculture sector are stimulated through increased allocation of resources and investments in policies on agricultural subsidies (BDT 415.55 billion) and national extension and research (BDT 1.27 billion) over 2009-15. Thus approximately BDT 450.44 billion (one third of the total cost of agricultural and rural development) is required to be borne mainly by the government, of which subsidies account for 26.12 percent of the total cost.

3.5.2 Transport Infrastructure

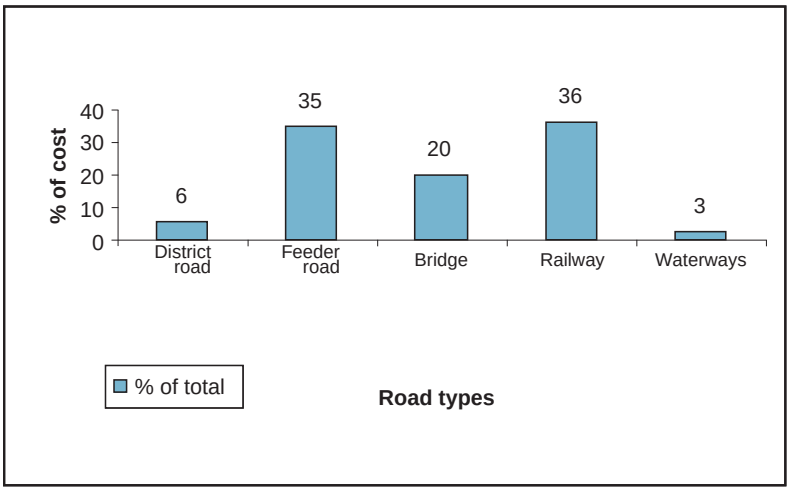
Improving rural access for the economic growth of Bangladesh, will require road construction in rural areas and the maintenance of transport infrastructure. Long-term strategies will address poverty by developing infrastructure to improve the living standards of the poor. There is a need to effectively address the growing rural-urban migration trends that have serious implications for the emergence of poverty. In addition, possibilities should be explored to develop appropriate compensation schemes for farming communities. Food security and rural income generation interventions need to be improved through the development of roads infrastructure. Table 3.31 depicts the cost estimates for construction of roads infrastructure and found that LGED can make feeder roads play a vital role in market access and in minimizing rural-urban migration by improving livelihoods in lagging regions. The estimated cost during 2009-15 was BDT 336.24 billion of which feeder road alone requires approximately BDT 117.47 billion which is about 35 percent of the total cost (Figure 3.5).

Table 3.31: Resource needs estimates for transport infrastructure

Infrastructure type	2009-2015		% of total
	BDT billion	USD billion	
District road	19.64	0.29	5.84
Feeder road	117.47	1.72	34.94
Bridge	67.40	0.99	20.05
Railway	122.60	1.79	36.47
Waterways	9.10	0.13	2.71
Total	336.24	4.92	100.00

1 USD = 68.40 BDT

Figure 3.5: Share of cost in roads infrastructure



Feeder roads can contribute significantly to access by rural smallholders to markets and make migration costs lower for them, thus reducing poverty by earning additional income from seasonal migration. The RHD is reluctant to construct new district roads and are rather optimistic about the maintenance of already constructed roads.

3.5.3 Promoting decent employment

Prevailing conditions of unemployment, under employment and overseas employment have been considered for coverage and target, and is accordingly estimated at approximately BDT 385 billion (Table 3.32).

Table 3.32: Resource needs estimates for Promoting Decent Employment

Parameters	2009-15		% of total
	Billion BDT	Billion USD	
VGD	105.00	1.54	27.27
Employment guaranteed scheme	140.00	2.05	36.36
Skill development for unemployment and overseas employment	35.00	0.51	9.09
Financial support to urban poor	105.00	1.54	27.27
Total	**385.00**	**5.63**	**100.00**

1 USD = 68.40 BDT

Table 3.33: Total Resource Needs Estimate for MDG1 during 2009-15

(BDT Billion)

Interventions	2009	2010	2011	2012	2013	2014	2015	Total 2009-2015
A. Agriculture & Rural development								
Farm intervention	129.06	137.16	147.27	156.17	165.48	175.22	185.45	1095.81
Community intervention	2.59	3.01	3.49	4.05	4.69	5.45	6.33	29.61
Small scale irrigation	5.40	5.86	6.36	6.89	7.47	8.09	8.77	48.83
National intervention	0.11	0.13	0.15	0.17	0.20	0.23	0.27	1.27
Cost of subsidy	51.21	53.85	56.54	59.27	62.05	64.88	67.75	415.55
Sub-total in BDT Billion	**188.37**	**200.01**	**213.81**	**226.55**	**239.89**	**253.87**	**268.57**	**1591.07**
Sub-total in USD Billion	2.75	2.92	3.13	3.31	3.51	3.71	3.93	23.26
Per capita in BDT	1284.65	1345.03	1417.89	1481.48	1546.88	1614.29	1684.00	
Per capita in USD	18.78	19.66	20.73	21.66	22.62	23.60	24.62	
B. Roads Infrastructure								
District roads	2.81	2.81	2.81	2.81	2.81	2.80	2.80	19.64
Feeder roads	16.60	16.66	16.72	16.78	16.84	16.90	16.96	117.47
Bridges	9.35	9.44	9.53	9.62	9.71	9.80	9.90	67.36
Water ways	1.30	1.30	1.31	1.31	1.31	1.31	1.31	9.14
Railways	17.03	17.19	17.35	17.51	17.67	17.83	17.99	122.57
Sub-Total in billion BDT	**47.09**	**47.41**	**47.72**	**48.03**	**48.34**	**48.65**	**48.96**	**336.19**
Sub-total in USD Billion	0.69	0.69	0.70	0.70	0.71	0.71	0.72	4.92
Per capita in BDT	321.17	318.80	316.43	314.06	311.70	309.35	307.00	
Per capita in USD	4.70	4.66	4.63	4.59	4.56	4.52	4.49	
C. Promoting Decent Employment								
VGD program	15.00	15.00	15.00	15.00	15.00	15.00	15.00	105.00
Employment guaranteed scheme	20.00	20.00	20.00	20.00	20.00	20.00	20.00	140.00
Skill development for unemployment & overseas employment	5.00	5.00	5.00	5.00	5.00	5.00	5.00	35.00
Financial support to urban poor	15.00	15.00	15.00	15.00	15.00	15.00	15.00	105.00
Sub-total in BDT Billion	**55.00**	**55.00**	**55.00**	**55.00**	**55.00**	**55.00**	**55.00**	**385.00**
Sub-total in USD Billion	0.80	0.80	0.80	0.80	0.80	0.80	0.80	5.63
Per capita in BDT	375.09	369.87	364.73	359.66	354.66	349.73	344.87	
Per capita in USD	5.48	5.41	5.33	5.26	5.19	5.11	5.04	
Grand Total in BDT Billion	**290.46**	**302.42**	**316.53**	**329.58**	**343.23**	**357.52**	**372.53**	**2312.26**
Yearly total cost in USD Billion	4.25	4.42	4.63	4.82	5.02	5.23	5.45	33.80
Per capita in BDT	1980.88	2033.77	2099.06	2155.22	2213.27	2273.36	2335.87	
Per capita in USD	28.96	29.73	30.69	31.51	32.36	33.24	34.15	

1 USD = 68.40 BDT

The total resource needs estimates above (Table 3.33) indicates that the total requirement of the three sub-interventions are BDT 2312.26 billion during the period of 2009-15, of which BDT 1591.07 billion (USD 21.67 per capita per year) is for agricultural and rural development; BDT 336.20 billion for transport infrastructures (USD 4.59 per capita per year); and BDT 385.00 billion (USD 5.26 per capita per year) for promoting decent employment in Bangladesh. Thus, the average cost for the interventions is approximately 4.83 billion USD per year (USD 31.52 per capita per year) of which a large portion will be borne for capital expenditure. Out of the total cost, subsidy and national intervention would be completely borne by government, and a portion of the total cost also would come from government (Table 3.34). It is estimated that about one third of the community and farm interventions would also be made by government from country's domestic resource and/or from donors.

Table 3.34: Resource needs estimates for MDG1 during 2009-15 excluding private sector investment

(BDT Billion)

Interventions	2009	2010	2011	2012	2013	2014	2015	Total 2009-2015
A. Agric. & rural development	105.84	111.58	117.45	123.44	129.57	135.84	142.25	865.99
B. Transport Infrastructure	47.09	47.41	47.72	48.03	48.34	48.65	48.96	336.19
C. Promoting Decent Employment	55.00	55.00	55.00	55.00	55.00	55.00	55.00	385.00
Total in BDT Billion	**207.93**	**213.99**	**220.17**	**226.47**	**232.91**	**239.49**	**246.21**	**1587.18**
Yearly total cost in USD Billion	3.04	3.13	3.22	3.31	3.41	3.50	3.60	23.20
Per capita in BDT	1,418.04	1,439.08	1,460.05	1,480.95	1,501.89	1,522.85	1,543.81	
Per capita in USD	20.73	21.04	21.35	21.65	21.96	22.26	22.57	

1 USD = 68.4 BDT

CHAPTER 3

CHAPTER 4

EDUCATION

MDG GOAL 2

Achieve Universal Primary Education

MDG Goal 2 - Achieve Universal Primary Education

Summary Statistics: MDG Goals, Targets, Indicators and Achievement

GOAL	TARGET	INDICATORS	BASE YEAR 1990-95	2005	2007	TARGET 2015	STATUS OF PROGRESS
GOAL2 ACHIEVE UNIVERSAL PRIMARY EDUCATION	**TARGET 3** ENSURE THAT, BY 2015, CHILDREN EVERYWHERE, BOYS AND GIRLS ALIKE, WILL BE ABLE TO COMPLETE A FULL COURSE OR PRIMARY SCHOOLING	NET ENROLMENT RATIO IN PRIMARY EDUCATION	60.50	87.20	91.10	100	ON-TRACK
		PROPORTION OF PUPILS STARTING GRADE 1 WHO REACH GRADE 5	43.00	52.90	51.90	100	NEEDS ATTENTION
		LITERACY RATE OF 15-24 YEAR OLDS	36.90	51.50	53.50	100	NEEDS ATTENTION

Source: DPE 2006, MDG Mid-Term Progress Report 2007

4.1 Overview of the Primary and Adult Education

Bangladesh sustains one of the largest primary education systems in the world with as many as 81,434 institutions of ten different kinds namely, GPS, RNGPS, NRNGPS, experimental schools, community schools, kindergartens, NGO schools, ebtedaee madrashas, primary sections of high madrashas, primary sections of high schools. According to the School Survey Report 2008, GPS, RNGPS, Experimental and community schools constitute 75 percent of the total institutions. These four categories of institutions are providing primary education to 81.9 percent of the total primary school enrolled children of over 16.3 million.

The proportions of boys and girls enrolled at the primary level are 49.3 percent and 50.7 percent respectively. A total of 364,494 teachers are engaged in primary teaching in all the ten categories of institutions comprising 40.4 percent female and 59.6 percent male. The proportion of female teachers in GPS, RNGPS, PTI and community schools is 50.2 percent, 32.2 percent, 39.0 percent and 73.6 percent respectively, and the pupil-teacher ratio is 51.4, 44.7, 48.1 and 43.35 respectively. NGOs in the country have been making significant contribution to the education sector. Currently around 500 NGOs are running 48,855 learning centers providing primary education to 10,24,495 girls and 6,06,802 boys in Bangladesh (CAMPE, 2007).

A total of 518 NGOs are engaged in education programs, of which more than 450 have adult literacy programs integrated into NFE. These NGOs are providing adult education to 1,19,277 females and 26,193 males through 6,574 learning centers (CAMPE, 2007). Some of the major NGOs in the country offering adult education are BRAC, Proshika, Dhaka Ahsania Mission, FIVDB, Action Aid, Swanirvar Bangladesh. BRAC is the largest NGO in the country operating the largest non-formal education program. It runs 34,000 NFPE schools serving 1.02 million un-enrolled and drop out children from marginal families.

Although the focus of this study is primary and non-formal education, pre-primary and secondary education has also been covered on certain logical grounds. Effectiveness of Pre-Primary education in increasing enrolment at the primary level has been well established. It prepares the potential primary-age group children for attendance at primary education institutions. Secondary education creates strong awareness among the parents about the necessity and importance of education for their children, supplies human resources for most MDGs, and realizes certain returns to education particularly for girls. Moreover, non-formal education has been covered here to deal with Indicator -3: Adult Literacy Rate. The non-formal education system plays a considerable part in covering the school drop-out group, the hard to reach group, and illiterate adults in the society.

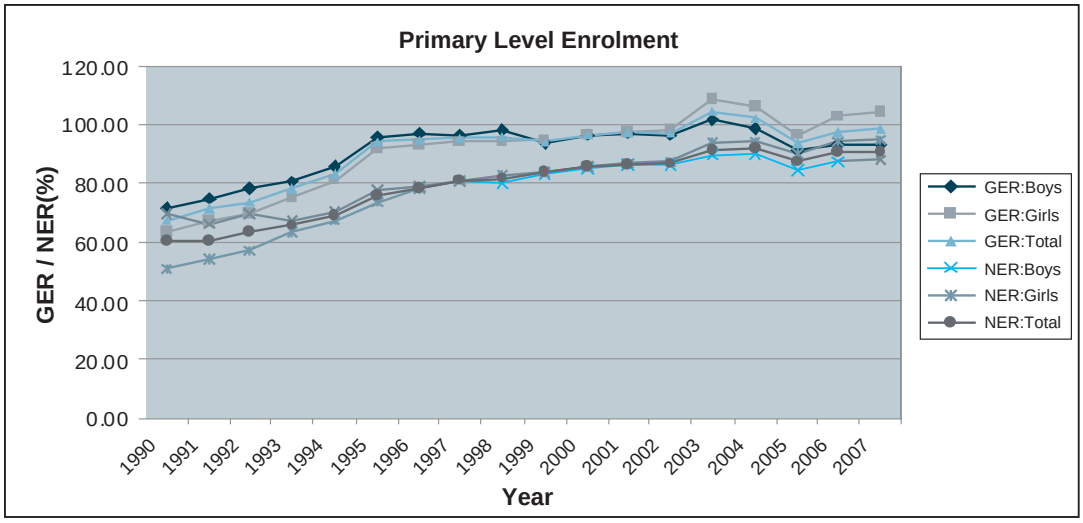
4.2 Progress in Achieving MDG2

4.2.1 Enrolment Ratio in Primary Education

The accessibility situation at the primary education levels is generally assessed using two common indicators - Gross Enrolment Rate (GER) and Net Enrolment Rate (NER).

The Gross Enrolment Rate (GER) calculation considers all children or young people enrolled in a given education level regardless of age, while the Net Enrolment Rate (NER) takes into account only the primary school age group children (6 - 10 years).

Figure 4.1: Primary School Enrolment



Source: DPE, 2008

Net Enrolment Rate (NER)

Net Enrolment Rate refers to the number of pupils in the official school age group in a grade, cycle or level of education in a given school year, expressed as percentage of the corresponding population of eligible official age group. Although the gross enrolment rate has wider coverage, NER gives a concrete picture of the proportion of the specific age group children (e.g., 6-10 age group) actually enrolled at the primary level.

Status and Trend

Achievement in bringing primary school age children to schools has so far been quite satisfactory. According to the School Survey Report 2008, net enrolment rate in the year 2007 is 91.1 percent (with 94.7 percent for the girls) which was 60.48 percent in 1990. In 2005 the baseline survey NER was 87.2 percent (with 90.1 percent for the girls). However, the growth in NER picked up in the early 1990s following the World Conference on Education for All. In the first half of the 1990s average annual growth rate was estimated to be approximately five percent. An important feature of the improvement in NER growth is faster and relatively consistent growth in girls' enrolment compared to that for boys. In the year 2006 net enrolment for boys and girls was estimated at 87.60 percent and 94.50 percent respectively, which was 69.43 percent for boys and 50.76 percent for girls in 1990.

The recent NER scenario for boys and girls however demonstrated the attainment of gender parity at the primary level. The rate of growth of NER for girls picked up in 1993 and resulted in a situation when the proportion of boys was overtaken by girls in 1997. The increase in girls' enrolment resulting in reduction in gender gap may be attributed to certain initiatives by the government that include the stipend program, media outreach, satellite and village-based schools, and the recruitment of female teachers (Kalene, 2005).

Increase in the growth momentum in NER in general may be attributed to the focused and substantial initiatives made by the government in the 1990s through a number of programs undertaken to meet the Dakar Framework of Action commitment. The major three programs undertaken during this period which have made a significant contribution to the development of primary education in Bangladesh have been The General Education Project; Primary Education Development Program; and the Food for Education Program (later replaced by Cash for Education program) (NPA II, 2007). Running multiple shifts in three roomed schools and hiring an increased number of teachers contributed largely to the increase in primary enrolment (Latif, 2004).

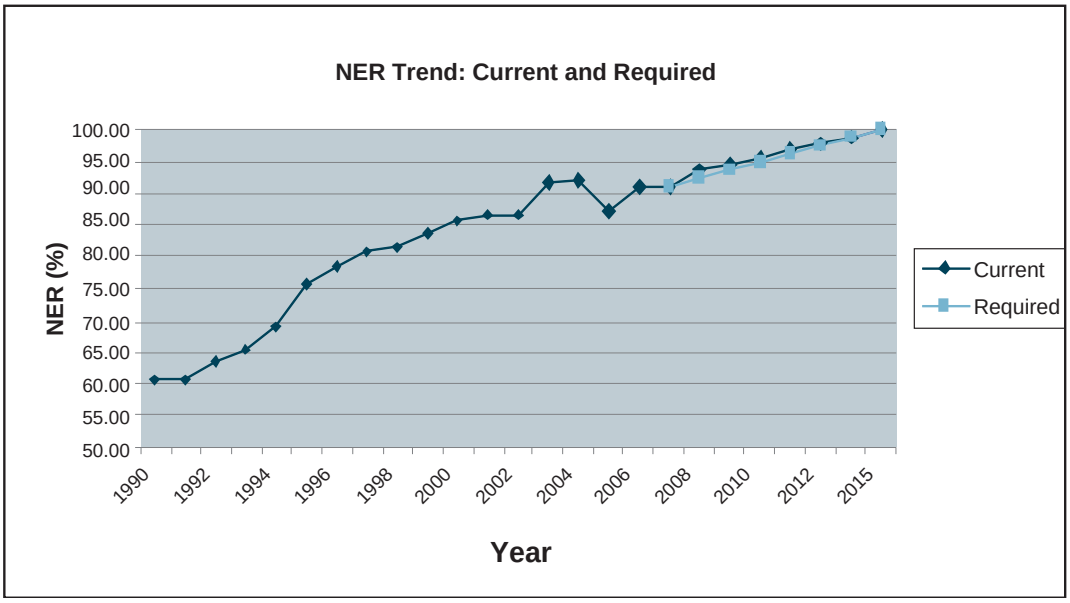
A multivariate analysis carried out under the World Bank study (2005) found a strong and highly significant association between Net Enrolment Rate (NER) and the Food for Education and VGD programs of the government. Moreover, free distribution of textbooks, scholarships examinations in primary schools, and stipends for primary school children from poor families have been considered as the major interventions that contributed significantly to the increase in enrolment rate at the primary level.

Detailed information on different aspects of primary education in the country and, in particular, the enrolment situation has been provided for the first time by the baseline survey conducted in 2005 by the MIS cell under the Directorate of Primary Education (DPE). Recently, two school survey reports (2006 and 2007) by the same directorate were conducted and are in process of publication. According to the 2007 survey report the NER for boys has increased in 36 districts and decreased in 26 districts over the baseline figures collected in 2005. Across all 64 districts, Jamalpur recorded the highest NER of 98.6 percent for the boys while Sylhet and Sunamganj had the highest NER for the girls with 99.7 percent. On the other hand, NER for the boys and the girls was the lowest in Cox's bazar (69.0 percent) and Netrokona (79.1 percent) of districts respectively.

Target achievement in Net Enrollment Rate (NER)

Achievement of Bangladesh in enrolling primary school age children has so far been quite satisfactory. The trend growth rate of net enrolment since 1991 has been estimated at 1.97. The rate of growth gathered momentum in the first half of the 1990s when the major programs for development of the primary education sector were initiated. At the current rate of growth 100 percent net enrolment target will be achieved before the stipulated timeframe implying that the country is well on track in this area. To achieve the target by the year 2015 a sustained 1.40 percent average annual growth rate of enrolment in the remaining years will be required (Figure 4.2). For this to happen, appropriate supportive measures that are currently in place need to be continued in the future years

Figure 4.2: Trend in Net Enrolment Rate (NER)



Source: DPE 2008

Gross Enrolment Rate (GER)

Gross Enrolment Rate is defined as the total enrolment of students in a grade or level of education, regardless of age, expressed as percentage of the corresponding eligible official age-group population in a given school year.

Status and Trend

According to the latest available database (DPE, MIS 2008), overall GER is calculated to be 98.8 percent with 93.4 percent for boys and 104.6 percent for girls. Gross enrolment rate attained high growth in the first half of the 1990s - the period immediately after the WCEFA declaration. Theoretically, faster growth can be achieved in the initial years of intervention which continues up to a certain high level. After that the growth rate slows down. The growth in GER reached a peak of 12.79 percent in 1995. But in the second half of the same decade, the growth rate slowed down and fell to less than one percent a year over the next few years. It also recorded negative growth rates in some years. Fluctuations in the GER have also been observed (it reached 104.77 percent in 2003 and then dropped down to 93.71 percent in 2005). This has however picked up in the last couple of years. Faster growth in girls' enrolment than boys' is observed which may be attributed to special incentives provided to girls by the government. (refer Figure 4.1 above).

According to the school survey of 2007, GER increased in 29 districts and decreased in 31 districts over the 2005 baseline survey findings. The highest GER for boys was found in Magura (114.9 percent) followed by Narail (109.5 percent), Tangail (109.2 percent) and Jhalkathi (107.5 percent). For the girls the highest GER was also recorded in Magura (119.5 percent) followed by Mymensing (117.3 percent) Barisal (117.2 percent) and Sylhet (115.9 percent).On the other hand, Netrokona (73.8 percent) recorded the lowest GER followed by Cox's Bazar (77.6 percent) and Nawabganj (78.6 percent). For the girls Netrokona (84.6 percent) is at the bottom followed by Sherpur (85.3 percent) and Sirajgonj (89.5 percent).

Target achievement in Gross Enrollment Ratio (GER)

Although there was no target set for GER under MDG2, the National Plan of Action II suggested targets for 2005, 2010 and 2015 as 103, 108 and 110 respectively. Comparing these targets with the current GER growth trend it can be concluded that with a little acceleration in the current growth rate will put the country close to the EFA target of 110 by the year 2015. It should also be mentioned that when the NER increases and reaches at universal level, the GER is expected to drop, and the gap between GER and NER become narrower, before finally converging.

4.2.2 Proportion of Pupils Starting Grade I who reach Grade V

Primary school completion rate, measured as the number of pupils starting grade I and completing grade V, has been one of the three indicators for attaining the target set for achieving universal primary education i.e., MDG2. The target set for this indicator is 100 percent by the year 2015.

Status and Trend

In comparison with progress in other fronts of primary education (such as net and gross enrolment rate) achievement in the area of primary cycle completion has not been quite satisfactory. Data on completion and drop out rate is available only for a few years with no gender level dis-aggregation. However, in the first half of the 1990s the growth in completion rate was 7.5 percent per annum which slowed down to 5.8 percent in the second half of the decade. Compared to other indicators the baseline completion rate figure was very low (only 40 percent in the year 1991). Since 2000 the rate became virtually stagnant at 67 percent. Moreover, in 2005, the survival rate to grade five and the drop out rate are calculated at 52.9 percent and 47.2 percent respectively. Both are however significantly higher than earlier figures. In the last two school surveys (2006 and 2007) survival rate is found to have fluctuated a bit: 50.2 percent in 2006 and 51.9 percent in 2007.

The potentially low primary cycle completion rate, and a very high drop out rate, is manifest in all three survey findings. Survival rates of primary level students to grade five (i.e. 4 years of primary schooling) is also important for a sustainable level of education. Before 2005, completion rate was calculated based on the sample survey conducted in Dhaka, using only the reconstructed cohort method. Since 2005, completion and drop out rates have been calculated based on the data collected from GPSs and RNGPSs. The pupils who left these two categories of schools and joined other schools are not taken into account. As a result, the drop out rate is considered to be slightly overestimated because transfer of pupils is treated as dropouts (DPE 2008).

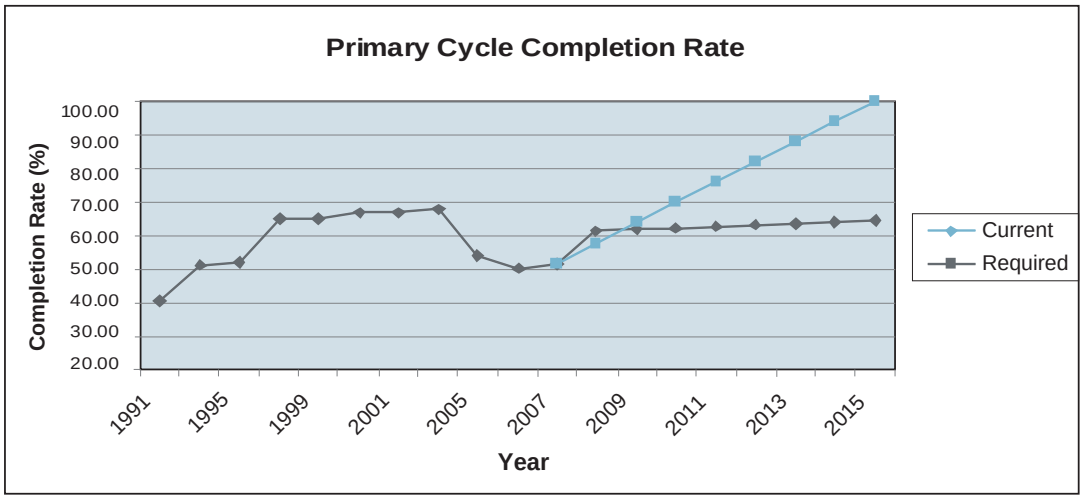
Several reasons behind the low primary completion rate or high drop out rate at the primary level have been identified. Among these, poverty in the family has been identified by several studies as the major one. This, however, leads to student absenteeism in general in schools due to high opportunity costs and other hidden costs. The 2007 baseline survey data estimated 20 percent rate of absenteeism in the three major categories of schools (GPS, RNGPS, and community schools). Overcrowded classrooms and a lack of facilities at schools are generally considered to be responsible for low school attendance rates (Chowdhury, 2002).

A World Bank study (2005) on the progress of the MDGs in Bangladesh revealed a positive correlation between enrolment rate and household living standards. The underlying logic may be the same in the case of high drop out rates as the poor face a higher opportunity cost when sending their children to school. The study also found positive correlation between consumption expenditure per capita and primary completion rate. This finding is consistent with the perception that poverty in the family causes drop out in general.

Target Achievement in Primary School Completion Rate

The current trend growth rate of primary school completion has been estimated at as low as 0.47 percent. If this growth trend is sustained till the end of the scheduled time Bangladesh would be able to achieve only 65 percent completion rate, which is well below the 100 percent target set for the year 2015. As shown in (Figure 4.3) the gap between the required and actual completion rate is predicted as widening further as time progresses. However, to achieve the target by the year 2015, the required growth rate to be attained is 11.6 percent per year on an average. Achieving such high level of growth in completion rate appears to be highly challenging for a country like Bangladesh that had a very low value of 40 percent in 1991. It may be mentioned here that high growth rate had been achieved in the first half of the 1990s because of the major interventions for improving the completion rate that were initiated during this period.

Figure 4.3: Primary School Completion Rate - Current and required trend



Source: DPE (2008)

The Programs undertaken by Government of Bangladesh for achieving the MDG targets in Primary Education since 1990s

Following the World Conference on Education for All in 1990, several initiatives were undertaken to achieve primary education goals. A number of NGOs also extended their support to the government in this regard. The major initiatives of the government towards development of primary education in the country include the following:

The **General Education Project** was undertaken for a period of six years from 1990 to 1996 with an estimated cost of USD 310.2 million. The major activities of the project include, among others, construction and reconstruction of classrooms; Satellite Schools Pilot Program with training of teachers towards increasing the access to education; training of teachers; upgrading facilities at the PTIs; and curriculum and textbook development towards improving the quality of education.

School Attractiveness Program: This was initiated in ten Upazilas of five Divisions in the country under the General Education Project. The program aims at motivating students to go to school regularly by making schools more student friendly. An important feature of this program was the provision of educational

materials, school uniforms, sports equipment and occasionally nutritive food to poor students, particularly girls. About 400,000 children benefited from this project. The rates of enrolment and attendance in these schools increased, and rates of dropouts decreased remarkably in the project areas.

Satellite schools have been established to bring the schools nearer to the doorsteps of the children who cannot travel to the main school. A total of 194 schools were established experimentally under the General Education Project. Then another 5000 schools were set up by 2001. After completing grade two from these schools, students are admitted to mother primary schools. Rate of attendance of the students in such schools is almost 100 percent.

Under the General Education Project, the government established less expensive community schools in areas with no school. School buildings were constructed on land donated by local people, and necessary facilities were provided by the government.

Establishment of the Ministry of Primary and Mass Education in 1992: The major objective of establishing a separate ministry was to universalize primary education as well as elimination of gender and poverty gaps. The Bureau of Non-formal Education was established in 2003.

Enactment of the **Compulsory Primary Education Act** in 1990: A National Plan of Action for Education for All was prepared with the major objective of increasing access to primary education and reducing poverty. This act provided five year primary education free for all in the government run schools, and free education up to grade eight for girls in rural areas. In addition, textbooks at the primary level are free for students in all government and registered non-government schools.

The government-financed **Food for Education Program** was introduced in 1993 to compensate opportunity costs of poor parents when sending their children to school. It provided food rations to 20 percent of poor primary school age children in specifically targeted rural areas. This helped increase enrolment and school attendance and prevented child labour. About 2.2 million disadvantaged students were taken under the "Food for Education Program". In July 2002, the Cash for Education Grant replaced the Food for Education Program which provides stipend to the poor children targeting an estimated of 5.5 million beneficiaries.

Primary Education Development Program (PEDP I) was designed and implemented by the government between 1998 and 2003 with an estimated total cost of USD2.7 billion. The project had a particular focus on improving the quality and efficiency of the school system, while continuing to improve equitable access to quality primary schools in underserved areas. PEDP I had ten major components and sub-components (out of the total 26) intended to enhance access and improve quality of primary education. Nine of the projects were dedicated to improving the quality.

Intensive District Approach to Education for All (IDEAL) project, created by the UNICEF and devoted to the development of primary education in Bangladesh, has been implemented by the DPE under the PEDP I. It was started in 1996 and continued up to 2004. The project had four major components to achieve its goal: (a) local level planning, management and monitoring; (b) school quality; (c) social mobilization and communication; and (d) monitoring of learning achievement. An innovative teaching method was developed based on Multiple Intelligence theory called "Multiple Ways of Teaching and Learning (MWTL)" under the project to make the teaching-learning method more child-centered, participatory and joyful for the children. Because of its very attractive nature this program has been able to create considerable amount of interest among the teachers and the children (DPE, 2003).

An important feature of this program was taking up micro-level planning through the coordinated efforts of the management committees, teachers, students and guardians. By the year 2003, the project had covered 36 districts and over 9.8 million primary school students. Evidence suggests that the initiatives undertaken under the IDEAL project made a significant contribution to improvements in the quality of education in the IDEAL schools in comparison to the non-IDEAL schools (IER, 2002).

PEDP II was initiated in 2003 at an estimated cost of USD 1,815 million. The key objectives of the program are increasing schools access, participation and completion in accordance with the government's EFA, MDGs and PRS commitments. It covers 83 percent of the primary level students mainly through four types of schools namely GPS, RNGPS, community schools, and experimental schools attached to PTIs. Infrastructure support is provided to the GPSs only while free text books are supplied to all the four types.

Of the four components of PEDP II, components two and four are attributable directly to improving the quality and access to primary education in particular. Component two focuses especially on the quality improvement in schools and classrooms. Over 45,000 new and existing teachers have received one year C-in-Ed training with another 19,000 undergoing this training out of a target of 90,000 resulting in better trained teachers placed in schools. Component four focuses on equitable access to quality education for those who have never attended formal school or who have dropped out before completing class five. Under this component under the GOB stipend project, approximately 4.8 million children (comprising around 40 percent of the poorest children) from all eligible schools in rural areas have received stipend support.

4.2.3 Literacy Rate of 15+ years (Adult Literacy Rate[1])

Adult Literacy and Non Formal Education programs offer not only instruction in reading, writing, and calculation but also provide information and skills to assist participants in obtaining employment, improving their productivity and achieving a better quality of life. These skills also helped participants to adapt to new workplace environments. Survey results of different countries suggest that a basic education can cause adults to reconsider and improve their use of land, water, crops and financial resources. Learners gain the skills needed to work in groups, to communicate effectively, and learn leadership, management and accounting skills.

Status and Trend

As envisaged in the data for Bangladesh provided by the UNESCO, adult literacy rate in the year 2007 is 53.5 percent with 58.7 percent for the male and 48 percent for the female. In the first half of the 1990s adult literacy rate grew at an average rate of about two percent per annum which continued until the end of the decade. During 2000-05 the growth rate increased considerably (4.5 percent) which slowed down again in the last couple of years. During 1991 to 2007, the growth rate for females (5.4 percent) was much faster than that for males (2.0 percent). NGOs have historically demonstrated their interest in this particular area. In the 1990s, the support of DNFE enhanced NGO involvement towards achieving the millennium target. But with the abolition of DNFE, for reasons of administrative convenience, in 2003, public sector investment on basic literacy programs particularly for adults have been abandoned[2] . In the absence of government involvement, NGO activity in adult literacy and adult education has drastically declined.

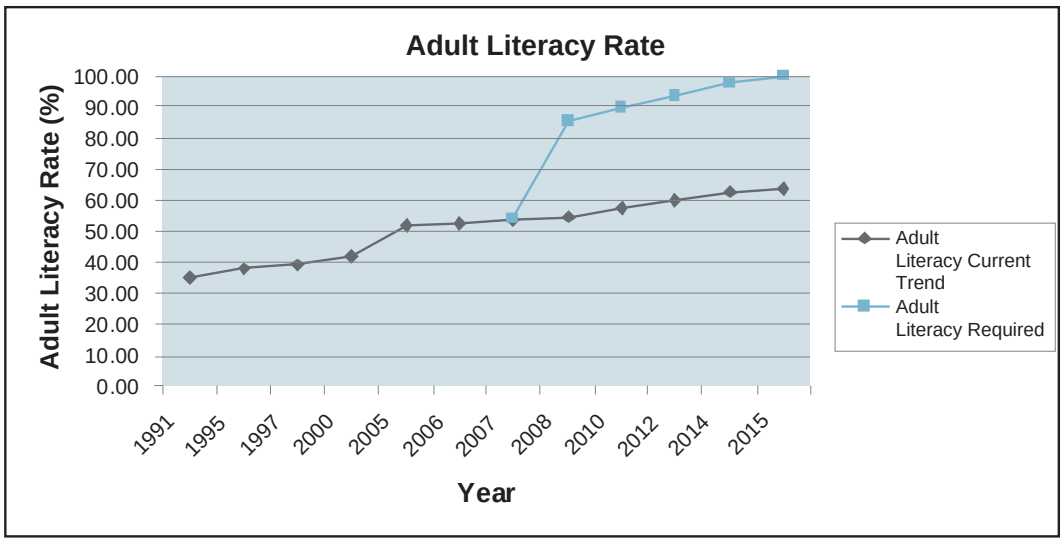
The major adult literacy programs in Bangladesh such as Total Literacy Movement (TLM) had very little impact on improving the literacy status of the population (CAMPE, 2003). NGOs, who are the key players in providing services in this area, pointed to a number of difficulties in implementing their programs including, the lack of community ownership of the programs; lack of sufficient motivation and guidance among the concerned staff; lack of interest among learners due to absence of immediate results, and a perceived lack of utility and community acceptance (World Bank, 2007). All these factors contributed to a very sluggish growth progress in improving the adult literacy rate in Bangladesh, making the MDG target extremely difficult to achieve within the specified timeframe. Despite such overall slow growth performance, there has been progress particularly in the area of gender parity. As demonstrated by the Gender parity index data[3] , adult women literacy rate recorded significant improvement over the years. As compared to 0.58 in 1991, the index reached to 0.80 in 2005 and 0.82 in 2007.

[1] Adult literacy rate is defined as the population of men or women who can read and write with understanding a short simple statement on their everyday life
[2] Bureau of Non Formal Education (BNFE) was established in April 2005.
[3] Gender Parity Index (GPI) value of 1 indicates parity between the two sexes

Target Achievement in Adult Literacy Rate

Currently, the estimated trend growth rate of adult literacy is only 1.3 percent. If this rate continues the adult literacy rate at the end of the MDG target year will be about 63.8 percent meaning a huge shortfall of 36.2 percent from the targeted 100 percent rate. (Figure 4.4) To achieve the target by the year 2015 the required average annual growth rate over the remaining years is estimated to be as high as 10.7 percent. Given the existing pace of growth resulting from the initiatives undertaken so far it appears such a rate will quite demanding within the remaining about seven years time. Nevertheless, more effective initiatives have to be designed and implemented based on earlier experience which would lead the country to get closer to target rate though not achieve it fully within the stipulated timeframe.

Figure 4.4: Current Trend and Required Growth in Adult Literacy Rate



The Programs undertaken for achieving the MDG targets in Adult and non-formal education

Major initiatives of the government towards the development of Adult and non-formal educations in the country include the following:

Integrated Non Formal Education Program (INFEP) was launched in 1991 for the period until 1997 had the target population of 300,000 of the 15-45 years age group. The major objective of this program was to institutionalize a comprehensive non-formal education system in the country. This program provided support to 2.47 million people against a targeted 1.67 million. The Directorate of Non Formal Education was established in 1995 as a permanent infrastructure for primary and mass education with the responsibility of execution of policy decisions and plans relating to non-formal education. The project was aimed at introducing pre-primary education for the four-five year age group (targeting 75,000 children); basic non-formal education for the six-ten year age group (targeting 150,000); basis non-formal education for the adolescents of 11-14 year age group (targeting 300,000); adult education with special emphasis on the 15-45 year age group; and life-long continuing education for all these groups (targeting 11,400,000).

Total Literacy Movement (TLM) had been initiated in the Lalmonirhat and Chuadanga districts. A total of 192 NGOs were involved in the implementation of the non-formal education that includes adult literacy programs. Some of the important achievements of this program was the generation of huge inspiration among people in different parts of the country, and a spirit of volunteerism among local communities; necessary skills and experience in undertaking and implementing NFE on a wider scale; developing and

extending areas of cooperation between the government and NGOs; experience and skills in implementing post literacy programs and material development (Rashid, Harun. 2003).

Based on the experiences of the INFEP some non-formal education projects were undertaken namely, NFEP 1, 2, 3, 4. **NFPE 1** was formulated with the major objectives of reducing poverty and improving the status of women. This program, implemented between 1996-2001 included only illiterate young adults aged 15-24 years, estimated to be approximately 2.95 million people. The program started in 32 of the 64 districts selected based on below 45 percent literacy rate criteria. The estimated total cost of the project was BDT 2,208.90 million composed of GoB, World Bank, ADB and SDC funding.

NFPE 2 was implemented during 1995-2002 with a target population of 5.88 million falling in the group aged 11-45 years. A special feature of the program was large scale mobilization and motivation of non-literates and adults educated with a view to developing sense of belonging among them. The program was implemented through the three delivery modes: TLM, CBA, and NFE through books. Terminal evaluation of the program undertaken in Lalmonirhat indicated a 94 percent success rate and a drop out rate of three percent (Haque, 1997).

NFPE 3 was targeted to the Hard to Reach urban children of the age group of 8-14 years living in the six metropolitan cities of the country. The project was implemented during 1996 to 2004 following Centre Based Approach covering 35 thousand slum, street, floating and working children. The course duration was two years targeting 270,000. The estimated total cost of the project was BDT805.5 million with financial assistance from the GoB, SIDA, UNICEF and DFID.

NFPE 4 was undertaken for those in the age group of 11-45 years and who could not be covered under other non formal education projects. This project was implemented in 448 Upazilas of 62 districts with an estimated cost of BDT 6,829.96 million during 1997 and 2003. The major objectives of these programs were to provide literacy to 22.89 million people, and to create employment opportunities for the educated and unemployed young male and female following TLM approach.

PLCEHD-1, a five-year project, was implemented by the government during January 2001 to December 2007, supported by the World Bank and Swiss Agency for Development Cooperation with the fundamental objective of consolidation of literacy followed by application of literacy skills in skill training for income generation. The coverage of this program is 1.3626 million neo neo-literates in 230 upazilas of 32 districts. The target achievement of the project is about 72 percent (i.e., only 0.973 million people have been provided post literacy and continuing education).

PLCEHD-2, similar to the above, supported by ADB, SDC and DFID that came into operation at the field level in May 2008 and due to be completed in 2011 has a coverage of 1.60 million neo-literates of age group 11-45 years in 210 Upazilas of 29 districts.

PLCEHD-3, a pilot project, was designed with support from the IDB to cover 63,000 neo-literates who have dropped out of schools and/or graduated from TLM, in two Upazilas in the age group of 11-45 years.

Reaching Out of Schools Children (ROSC) project is currently under implementation (2004-2009) with an estimated cost of about USD 63 million. The major objective of this project is promoting primary education through a non-formal community managed approach targeting a total of 500,000 children during the project period. This project is being implemented in 60 Upazilas. ROSC develops interventions to encourage out of school children to attend school, and to retain these children by improving the quality of education in these schools.

The Basic Education for Hard to Reach Urban Children Project (BEHTRUC) was implemented during 1997-2003 with the major objective of providing non-formal education (including basic education up to grade three as well as life skills) to poor and under-privileged working children in the age group of 8-14 years, often engaged in hazardous jobs. The total budget for the project, as of March 2004, was BDT 805.799

million comprising of BDT 778.592 million donor and BDT 27.207 million GoB contribution. The project was designed to provide education to 351,000 working children two years of schooling (two hours a day) in six divisional head quarters. UNICEF provided technical support while funds were drawn from DFID, SIDA, UNICEF and the Government of Bangladesh. The project offered a 24 month course on literacy and numeracy and skill development. The terminal evaluation report prepared in 2004 revealed that the project benefited 346,000 children across the six divisional cities and successfully attained gender equity in terms of numbers.

Basic Education for Hard to Reach Working Children (BEHTRUWC) Project Second Phase is designed for an implementation period of five years, begun in October 2004. This is in fact a formal approach in a non-formal way. A total of 8000 centers are to be set up under this project for serving about 200,000 working children aged 10-14 years, comprising 60 percent girls in six divisional cities of the country. The learners are selected from children engaged in hazardous and exploitative occupations without access to education. Of the target 200,000 children, 20,000 are to be selected for livelihood skills training (of the age 13 years and above) and 5,000 of them would be provided with livelihood skills training by the project.

4.2.4 Overview of Early Childhood Care and Education (ECCE) and Secondary Education

Although the focus of this study is primary and non-formal education but pre-primary and secondary education has also been covered on certain logical grounds. Effectiveness of Pre-Primary education in increasing enrolment at the primary level has been well established. It prepares the potential primary-age group children for attendance at primary education institutions. Secondary education creates strong awareness among the parents about the necessity and importance of education for their children, supplies human resources for most MDGs, and realizes certain returns to education particularly for girls. Moreover, non-formal education has been covered here to deal with Indicator on Adult Literacy Rate. The non-formal education system plays a considerable part in covering the school drop-out group, the hard to reach group, and illiterate adults in the society.

Early Childhood Care and Education (ECCE)

For pre-school aged children, preschool or early childhood education can contribute to human capital development especially among poor children (Danzinger and Waldfogel, 2000). In line with EFA goals, NPA I proposed an Early Childhood Education Development Programme, covering the four-five year old children. NPA II also envisages that by 2015, all pre-school children, aged three-five, will be attending ECCE programs of some kind and will have access to programmes of health, nutrition, social, physical and intellectual development, and initiated into formal education.

In Bangladesh although Early Childhood Care and Development is a relatively new concept several initiatives have already been undertaken by the government, NGOs, and development partners. BRAC, DAM, Save the Children USA, Plan International, UNICEF can be named as some of such organisations working in this area with a number of innovative programs which are mostly at their pilot stage and are running on a relatively small scale. These initiatives include, 'baby classes' within and outside primary schools, need-based school preparedness skills programmes, pre-school programmes for the disadvantaged, 'baby classes' in satellite schools, pre-reading, pre-writing and pre-numeracy skills programmes, introduction of play groups and kindergarten classes in English medium schools, pre-primary religious education in maktabs, and literacy skills training in day care centres (UNESCO-IBE, 2006). The target groups for these programmes are mothers, facilitators, community monitors.

The Integrated Non Formal Education Program began ECCE in 1993 in 69 thanas implemented by NGOs with support of the government and UNICEF. The major objective of this program was to prepare children in poor, rural households for primary schooling. Ministry of Women and Children Affairs started an ECD project in 2001 (up to 2004) which was implemented by Bangladesh Shishu Academy. Advocacy, caregivers' education, school readiness, and networking and capacity building had been the major activities of this project.

Ministry of Religious Affairs has been undertaking programs (2006-08) to provide pre-primary education to 1,620,000 children through 18,000 education centers (mosques) at an estimated cost of BDT 2,160 million. They also have future targets aimed at covering 3,600,000 children through 24,000 centers during 2009-13. Another program that is currently underway (2006-08) of the ministry is to provide pre-primary education to 80,610 children through 2,687 temples at an estimated cost of BDT 75.7 million. Further extension of this project (2009-10) will cover 161,220 children through the same number of temples.

BRAC and NGO has initiated its own program of one year pre-primary class. As of 2005, 16,025 pre-primary centers are in operation with 400,625 children (25 in each class).

Secondary Education

At the secondary level three categories of schools are in operation across the country (Junior secondary, public secondary and private secondary schools). According to BANBEIS data of 2005, the total number of secondary schools in the country is 18,500 comprising 4,322 Junior secondary schools, 317 Public Secondary schools and 13861 Private Secondary schools. About 20 percent of these schools are exclusively for the female students. Approximately 86 percent of these schools are located in the rural areas. The total number of teachers working in these schools is 238,158 with 20.28 percent female. The average teacher-student ratio is 1:33. The proportion of trained teachers is much high in the public schools (73.08 percent) than in the private schools (53.53 percent). On average, female enrolment (52.28 percent) is higher than that for males. But the issue that needs special attention is the consistently low rate of completion at the secondary level. In 2005, the completion rate is estimated at a mere 19.98 percent (23.46 percent male and 16.71 percent female).

During the last decade the government has undertaken a number of programs aimed at improving access to, and increasing the quality of, secondary education, as well as reducing the drop out rate, and increasing female enrolment and survival rate at the secondary level. Developing and expanding physical infrastructure, the construction of new buildings, supplying computer and other office equipments, providing financial support to the female students through the stipend program, imparting training to the teachers and the head teachers to improve their efficiency have been the major activities under these initiatives. These projects are supported by the government and development partners. The programs include the following:

- Improvement of Selected Madrashas (government and non-government) Project (1997-2004) at an estimated cost of BDT 1,997.5 million funded by the government;
- Improvement of Selected Secondary Schools (government and non-government) Project (1997-2007) at an estimated cost of BDT 5,200 million and funded by the GoB.
- Extension of the existing buildings of the Selected Education Institutions Project (1999-2006) with an estimated cost of BDT 4,830.7 million funded by the GoB
- Construction and re-construction of the Education Institution Buildings Project (1998-2006) with an estimated cost of BDT 5,000 million funded by GoB
- Secondary Education Sector Improvement Project (1999-2006) funded by GoB and ADB at an estimated cost of BDT 4,902 million
- Female Secondary Stipend Project - Phase II (2005-08) at a cost of BDT 5,029.86 million from GoB sources
- Female Secondary School Assistance Project - Phase II (2001-07) at a cost of BDT 7,662.68 million funded by IDA
- Female Secondary Education Stipend Project - Phase III (2004-06) at an estimated cost of BDT 209.96 million funded by NORAD
- Teaching Quality Improvement in Secondary Education Project (2005-11) at an estimated cost of BDT 6,301.9 million funded by GoB, CIDA, and ADB

4.3 The Challenges ahead in achieving Universal Primary Education

Although there has been satisfactory progress in certain areas in achieving the goal of universal access to education, there are still many challenges that must be met to fully realize the MDG2 target. Some of the major challenges facing basic education are mentioned below.

4.3.1 Primary Education

Although the MDG target for net enrolment rate has been set 100 percent by the year 2015, and the current progress that the country is well on track for achieving the target, in reality it may be difficult to achieve this target fully for several reasons. One of the reasons is an anticipated slow down of the rate of growth as it approaches the 100 percent target. Indeed, it has been empirically demonstrated that, once countries attain a NER of say 90 to 95 percent, it usually becomes very challenging and costly to reach the last five-ten percent of children who, for various reasons, are difficult to cover (nomadic, marginal populations, populations living in remote and land-locked areas, the poorest, and sick or disabled children, ethnic minorities having difficulties in understanding Bangla, etc.) (UNESCO, 2005).

Bangladesh is currently running one of the largest primary education sectors in the world. Yet the organizational capacity needed to run such a huge primary education system would be a big challenge for any country in the world. Insufficient instructional time, inadequate number of classrooms and teaching staff, low teacher effectiveness, lack of sufficient teaching-learning materials, and a lack of adequately trained manpower to manage such a large education system are identified as some of the major constraints facing the country's primary education system (DPE, 2006).

Government expenditure on education in Bangladesh is still low compared to other countries in South Asia. Although about 39.51 percent of the annual budget is dedicated for primary education it accounts for only 2.28 percent of the country's GDP. The proportion needs to be enhanced to four-five percent to effect efforts towards achieving the MDG targets.

Despite satisfactory achievements in providing access to primary education, a large part of the population (especially the physically and mentally challenged, geographically, socially or economically hard to reach children) remain out of the facility. A large proportion of the tribal/indigenous populations, living mainly in the Chittagong and Sylhet divisions, and in remote parts of the north of the country, have not yet been adequately reached by the primary school expansion of the government (ADB, 2005)

Eradicating the high incidence of poverty has been one of the biggest challenges on the way of achieving the MDG2 targets. Low incentives for attending schools vis-à-vis acute poverty in the families keep the children away from the schools as they have to engage in wage-earning for a living. This contributes to a low attendance rate and a high drop-out rate.

Linkages between infrastructure and education have already been established. Improved roads and transportation have major implications for enrolment ratios, especially for girls' enrolment and attendance rates (particularly those living in rural areas), Many government schools are too far away or too crowded, discouraging the parents from sending their children to school. It is especially true in the case of girl students in rural areas.

Current progress in net enrolment and the gender situation gives a strong indication that the country is well on track in achieving the respective targets (100 percent net enrolment and gender parity in primary schools) well ahead of the stipulated time frame. The current trend growth rate for net enrolment rate at the primary level is estimated at 1.97 percent. If this growth continues the target will be achieved by the year 2012. Nevertheless, there is no scope for complacency from sustaining the current rate of growth in enrolment and gender ratio with the ongoing initiatives at the primary level.

On the other hand, progress in primary school completion or the survival rate to grade five poses a big challenge in achieving the education MDG. The trend growth rate for primary cycle completion is estimated to be 1.3 percent during 1990 and 2005. This growth performance is way below the warranted growth rate for achieving the 100 percent target due the low completion rate (40 percent) in the initial year. In 2007 the achievement in this area is only 51.9 percent. If current growth trend continues in the remaining years only about 80 percent completion rate will be achieved by the year 2015. At this situation achieving the target by the year 2015 requires an average annual growth rate about 11.5 percent. This indeed appears to be quite challenging from the Bangladesh perspective because of certain realities such as high incidence of poverty and resource constraints. However, interventions to deal with these issues are suggested in this study which would help in improving the situation greatly and achieving the MDG target.

4.3.2 Adult Literacy

In the case of adult literacy the situation is even worse. During 1991 and 2007 adult literacy rate increased from as low as 35.3 percent to 53.5 percent. Although female literacy rate during this period has increased at an average annual rate of 5.4 percent that for the male recorded two percent growth per annum. The trend growth rate for this indicator, estimated at 1.3 percent, suggests that only 63.8 percent literacy rate will be achieved by the year 2015. This situation however warrants special attention in view of the MDG target. Creating adequate opportunities for the adults is vitally important for addressing this issue despite the challenges posed by the prevailing poverty situation. Continuity of adult literacy programs for longer periods with wider coverage through increasing the number of learning centers can contribute to increasing the adult literacy rate by a significant proportion. This initiative can really take the country much closer to the 100 percent target by the end of the MDG target period.

As seen above, although the progress in achieving the targets has been commendable in Bangladesh, challenges remain especially in primary cycle completion rates and adult literacy. This issue is really a great cause of concern for the government as well as for the development partners who are taking part in the initiatives in Bangladesh. It is imperative that current efforts be carried on and new initiatives introduced focused especially on retaining enrolled pupils for the full five years of the primary education cycle, and on providing teaching to an increased percentage of the adult population. This study, however, makes an attempt to assess the current situation and identify the needs for meeting the Millennium Summit commitment. Based on these needs, the study also attempts to estimate the resource requirements (physical, human and financial) for achieving universal access to primary education by the year 2015.

4.4 Major Interventions and Targets for MDG2

In view of the current situation however, it appears quite challenging to attain 100 percent primary cycle completion rate and 100 percent adult literacy rate within the remaining seven years. This study has however identified certain necessary measures, in addition to existing ones, to improve the current situation and achieve the education MDG. These measures or interventions have been identified through a wide range of consultations within and outside the education thematic working group. The education thematic working group comprises representatives from relevant ministries, government departments and agencies, and development partners. Consultation also made with NGO professionals, and academics. In addition, relevant research, policy and other documents have also been reviewed.

Improving the quality of primary education, creating a child friendly atmosphere at the primary schools, creating adequate physical infrastructure provisions, reducing opportunity cost of school attendance, providing incentives for the key players at both demand and supply levels, and building mass awareness have been the key areas that need particular attention for achieving the millennium targets. These interventions, however, have strong theoretical and practical backing as having successful test results from different countries of the world including Bangladesh. These interventions also largely comply with the National Plan of Action prepared for the improvement of the primary education sector and the recently prepared Poverty Reduction Strategies of the government thereby meeting the MDG target.

The interventions that address the requirements for achieving the time-bound targets can broadly be categorized as supply side and demand side interventions. Supply side interventions deal with provisions for infrastructure and human resources needs. On the other hand, demand side interventions address the needs of the service recipients (i.e., the students enrolled in different education/literacy programs). The recommended interventions, along with the current and future coverage targets for each of the four education sectors considered under this study, are discussed below separately.

4.4.1 Primary Education

Infrastructure provisions: Creating adequate accommodation for primary school aged children is important from both enrolment and completion perspective. Although success in net enrolment has been quite remarkable, primary cycle completion remains a major challenge with regard to achieving the 100 percent target by the year 2015. High pupil -teacher ratio (54:1) and low contact hours have been identified as the areas that require special attention. In Bangladesh about 90 percent of primary schools, particularly in the public sector, are run on two shifts following the staggering system. Therefore, increasing the contact hours will require all the existing double shift schools to convert to single shift systems. In this system there will be an increased requirement of classrooms and other rooms for conducting the learning activities. Classroom requirement in a single shift school system has been estimated in this study based on a standard class size (one classroom per 40 children). The study proposes, in line with the National Plan of Action, provision of nine rooms in each school which includes five classrooms for primary section, one classroom for Pre-primary section, one library, one staff room, and one computer room. However currently, the classroom-staff room ratio stands at 6:1.

Adequate sanitation facilities for all enrolled children (separate toilets for the boys and the girls) and the teachers have been proposed in this study. These two interventions are expected to contribute significantly to increasing enrolment and also the primary cycle completion rate. The cost of construction that includes classrooms, office rooms, laboratories and other rooms is estimated at, on an average, BDT 210,000 and construction cost of toilets is estimated at BDT 50,000.

Human resource provision and its development: Human resource provisions include supply of required number of teachers. The requirement for new teachers is determined based on the standard pupil-teacher ratio of 40:1. The targeted proportion of trained teachers (or skilled) for the year 2015 is set at 100 percent which is currently 72 percent. Adequate financial provisions for a variety of skill development training for all teachers (including subject-based training and monthly refreshers training) has been made while estimating the cost and assessing the human resource needs in light of achieving the MDG2. The estimated per teacher cost of these trainings together approximately stands at ten percent of teachers' salary per annum.

Teaching - Learning Materials: Textbooks for children and teaching manuals for the primary level are proposed to be provided free to children and teachers. Free distribution of these two categories of teaching-learning materials is already in place at both primary and non-formal levels. However, the life span for the textbooks and teaching guides has been estimated at one year and five years respectively.

Other Supply side Interventions: Other supply side interventions, in the current study, include programs to be initiated at the primary level in general. Enhancing salaries of the primary school teachers by approximately 20 percent, and giving excellence allowances to stimulate better performers are the two other major supply side interventions that might contribute significantly to motivating the teachers to provide quality teaching with regular attendance and adequate levels of sincerity. The amount of this award is estimated to be approximately BDT 3,500 (one month's basic salary) each to 1,000 teachers every year.

Demand side interventions: Demand side interventions are those that have been proposed in the current need assessment and costing exercise for the service recipients (i.e., the primary school attending children). The interventions such as school feeding program have been the tested cases with quite encouraging results in increasing the enrolment rate. Currently the program is in place covering two percent of the total

enrolled population. The study proposed that coverage be extended to 20 percent of the total primary school enrolled children, targeting in particular the poorest section (comprising approximately 40 percent who are currently living below the poverty line).

Pro-poor subsidies in the form of cash incentives have been considered here as a demand side intervention. This is undertaken as a compensation for the opportunity costs of poor children attending primary schools. An average amount of BDT 125 per month may be given to the parents of the enrolled children with 30 percent coverage across the country.

In addition to the above mentioned provisions, other support, equivalent to an estimated BDT 500 per year has been created for each child. This includes health cards, remedial classes, and examination fees etc. Moreover, BDT 1,000 worth of additional support may be provided to each primary class per annum for buying teaching-learning materials such as mats, chalk, duster, and sports materials etc.

4.4.2 Secondary Education (General and Technical):

Infrastructure provisions: Infrastructure provisions including the required number of classrooms, toilets for adequate sanitation facilities, and laboratories and other rooms have been determined based on the standard ratio. Classrooms requirement is estimated based on the suggested student-classroom ratio of 40:1. Moreover, three laboratories (approximately 20 percent of classrooms) have been suggested for each school for conducting practical classes properly.

For technical education classroom requirement is determined based on a student to classroom ratio of 20:1. As lessons in technical education are more practical oriented compared to general education, the requirement targets for laboratory and other rooms have been set at 50 percent and 15 percent respectively of the total number of classes.

Human resource: Provisions for human resources are estimated based on the standard student-teacher ratio. The requirement of teachers at the secondary level is determined based on the student-teacher ratio of 40:1 (with an attrition rate of five percent). For teacher development in-service training should continue for all categories of teachers. As an effective measure of human resource development regular in-service training that includes monthly subject-based refresher training for the teachers is suggested.

In technical education, due to its specialized nature, the majority of teachers (90 percent target) are required to be well trained in their respective fields. To make lessons more interactive, and effective, the student-teacher ratio target for secondary level technical education is set at 20:1. In addition to the teaching staff, a considerable proportion of supervisory staff (target: 30 percent of teaching staff) is required to support the teachers in conducting practical classes. Moreover, clerical and other staff requirement target is set at 20 percent (of the total teaching staff).

Demand side interventions: To increase enrolment and the secondary completion rate, pro-poor subsidies in the form of stipends are already in place. But the current coverage is only two percent of the total enrolled students. The coverage may be extended to 20 percent by the year 2015. The amount of stipend may also be increased to BDT 150 from the existing rate of BDT 125 on the average.

4.4.3 Non-Formal Education

The major intervention in increasing enrolment in non-formal education programs targeted for illiterate adults or youth could be increasing the number of learning centers. These learning centers are to be located generally close to the work places of the learners, and the programs are to be run with flexible timing

Facilitators and supervisors at the field levels are directly engaged in implementing these programs. Currently two non-formal education programs exist, namely Post Literacy and Continuing Education for Human Development Phase II (PLCEHD 2) and Basic Education for Hard to Reach Urban Working Children (BEHTRUWC). The capacity of each learning center is 25 for PLCEHD, and 30 for BEHTRUWC programs. One facilitator takes care of each center. One supervisor is in charge of every 10 centers. However, the increasing enrolment-adult literacy rate requires an increased number of learning centers to accommodate the proportion of the population who are illiterate. The number of facilitators and supervisors required to conduct these programs on a larger scale is based upon the currently maintained proportions. As a measure for teacher development, there will be regular in-service training programs for all the teachers/facilitators and for that, an estimated cost equivalent to ten percent of the total individual salary is required per teacher.

Although there is no cash incentives for attending the literacy programs, provision is made for providing all necessary learning materials such as books, writing pads, pencils etc free to all the program participants.

4.4.4 Early Childhood / Pre-primary Education

To run the pre-primary/early childhood education program NPA 2 has already suggested for constructing an extra classroom in each government primary school. Since the pre-primary education program will be run using the public primary school infrastructure and there will be no requirement for any separate infrastructure facility. For this program, the pupil-teacher and pupil-classroom ratio has been set at 35:1 in each case.

4.5 Resource Needs Estimates for MDG2

Resource requirements have been estimated in light of the interventions identified for addressing the challenges associated with achieving the universal access to primary education. In doing this, the year 2005 has been used as the base year as most of the relevant data is available for this year. Infrastructure and human resource requirements that include number of classrooms, laboratories, toilets and other infrastructure facilities, teachers, etc are determined following the guidelines of the national policy documents. In other cases (e.g., in the area of demand side and other supply side interventions), estimation bases are finalized through consultation with the education thematic working group members (comprising representatives from relevant ministries, government departments, development partners), professionals working in the relevant areas and review of different research documents. The resource requirements for primary, secondary, non-formal and early childhood education are provided separately in the following.

Further, the tables presented below provide a snapshot of capital, recurrent and per pupil cost for the period 2005 through 2015 separately for all the four programs (pre primary, primary, secondary and adult literacy) studied for achieving the MDG for universal access to primary education in Bangladesh. Capital costs comprise new construction of classrooms, laboratories, staff rooms and other rooms, toilets etc. Buying equipments for the teaching/learning activities is also considered under this head of expenditure. On the other hand, recurrent costs cover all the day to day expenses of the programs that include staff salaries, textbooks, teaching guides, rental cost, training costs, and costs incurred by any demand side interventions considered in the cost estimation.

4.5.1 Primary Education

Primary education has been the major focus of the current exercise as MDG2 deals largely with universal access to primary education. Therefore, creating greater access, as well as retaining the current success in enrolment, and also dealing with the major problem of low rate of primary cycle completion, a number of interventions in terms of physical infrastructure, human resource, and other demand and supply side supports have been proposed. The physical and financial requirements for achieving the MDG in the area of primary education are given below.

Physical Infrastructure Requirement

The Table 4.1 provides information on the infrastructure requirements of government primary schools including classrooms (including one extra room for pre-primary section), staff rooms, library and one computer room. Total number of toilets required has also been estimated for each year up to 2015 taking into consideration separate toilet facilities for boys, girls, and teachers. The figures for the year 2005 provide the existing situation at the primary schools. For the year 2015 the total number of classrooms required is estimated at 455,705. In addition 227,852 toilets will be required to provide adequate sanitation facilities for children (separate facilities for boys and girls) and teachers.

Table 4.1: Physical Infrastructure (Primary)

	2005 (Base year)	2009	2010	2015
Classroom	198,785	278,049	300,903	455,705
Staffroom	9,549	46,341	50,150	75,951
Other rooms	241,740	33,366	36,108	54,685
Toilets	121,983	139,024	150,451	227,852

The unit construction cost for all types of new rooms and the toilets have been estimated at an average of BDT 210,000. Therefore, the total construction cost for the year 2015 stands at approximately BDT 66.11 billion.

Human Resources Requirement

Government primary schools in general do not have any non-teaching staff. The head teacher with support of the other teachers does the necessary administrative work besides their regular teaching. To address the existing high pupil-teacher ratio (54:1) the teacher requirement has been estimated base on a standard ratio of 40:1 as suggested in the National Plan of Action. The total teacher requirement for the year 2015 is estimated at 455,705. (Table 4.2) In the base year the proportion of trained teachers is 73 percent which is targeted at 100 percent by the year 2015.

Table 4.2: Teacher Requirement

		2005 (Base year)	2009	2010	2015
Teacher	Trained	180,781	271,204	296,781	455,705
	Untrained	66,846	52,416	46,308	0
	Total	247,627	323,620	343,089	455,705

Remuneration of the teachers for the year 2015 is estimated at BDT 60.96 billion. This includes basic salary, house rent and medical allowance. Moreover, teacher development costs that include monthly refresher training, and subject based training for each teacher is estimated at ten percent of a teacher's remuneration. The total in-service training cost for the year 2015 is estimated at approximately BDT 6.10 billion.

Teaching-learning materials

Teaching-learning materials comprise basically text books and teachers' guides. There are five textbooks and one teacher's guide at the primary level. These materials are provided by the government free to both pupils and teachers. Because of the quality of paper, the life span for a textbook and teacher's guide is fixed at one year and five years respectively. The total requirement of textbooks and teachers' guides is estimatedat 91,140,966 and 91,141 respectively for the year 2015 (Table 4.3).

Table 4.3: Textbooks and Teaching Guides (Numbers)

	Life span	2005 (Base year)	2009	2010	2015
Textbook (5)	1 year	67,461,985	77,911,996	80,085,263	91,140,966
Teaching guide (1)	5 years	49,525	64,724	68,618	91,141
Total		67,511,510	77,976,720	80,153,880	91,232,107

Unit costs for textbook and teaching guides are estimated at BDT 15 and BDT 50 respectively. The total costs for these two categories of materials stands at approximately BDT 3.55 billion and BDT 120 million respectively for the year 2015.

Demand side Interventions

Three kinds of demand side interventions have been suggested in this study namely: cash incentives for the families of the enrolled children, school meals, and school uniforms. The coverage targets for these interventions are fixed at 30 percent for pro-poor subsidy (cash incentive) and 20 percent for school feeding. Total number of beneficiaries for pro-poor subsidies and school meal programs are estimated at BDT 5,468,458 and BDT 3,645,639 respectively (Table 4.4).

Table 4.4: Demand side interventions, targets and coverage

Interventions	Target for 2015	Coverage (number of enrolled pupils)		
		2009	2010	2015
Pro-poor subsidy (cash incentive for the families)	30% of the enrolled	3,739,776	4,004,263	5,468,458
School feeding program	20% of the enrolled	1,246,592	1,601,705	3,645,639

Cash incentive of BDT 100 for each ultra poor family sending their children to school has been allocated. The total amount required for this pro-poor subsidy is estimated at BDT 6.01 billion and BDT 820 billion respectively for 2010 and 2015.

The coverage target for school meals is set at 20 percent of primary school enrolled pupils in the year 2015. BDT 10 per child has been estimated as the cost of this meal per day. It is also estimated that BDT 2,000 will be required per pupil as the possible number of school days in a year is approximately 200. The total amount required for this program is estimated at BDT 3.20 billion and BDT 7.29 billion for the years 2010 and 2015 respectively.

In addition to the above interventions financial provision of BDT 500 per child per annum has also been made for enrolled children for health care, remedial classes, sports materials etc.

Considering the importance of proper motivation for imparting teaching with sincerity, provision has been made for annual salary adjustment for dealing with the rise in general price level. A two percent salary stabilization index with scaling up provision up to 22 percent in the year 2015 has been used while estimating the financial resource requirements for paying the teachers' salaries. Moreover, provision of excellence allowance for the teachers has also been recommended as a supply side intervention which will help motivating the teachers in imparting quality teaching with high degree of sincerity. A total of 1,000 best performing teachers will be selected every year for this allowance which is equivalent to one month's basic

salary. The amount is estimated to be approximately BDT 3,500 for each teacher on an average. The total financial resource requirement for this intervention is estimated at BDT 3.5 million per annum.

Capital, Recurrent and Per Pupil Costs for Primary Education

The (Table 4.5) provide a snapshot of capital, recurrent and per pupil cost for the period 2005 through 2015 to achieve the MDG for universal access to primary education in Bangladesh.

Table 4.5: Recurrent, Capital and unit costs for Primary Education

	2005	2008	2009	2010	2014	2015
Primary education (public) (million BDT)	45,086.90	66,680.60	76,987.70	88,860.00	158,680.70	177,048.50
Recurrent costs (million BDT)	30,656.10	47,093.50	53,517.70	60,679.70	98,579.40	110,937.10
Construction & other investments (million BDT)	14,430.80	19,587.10	23,470.00	28,180.30	60,101.30	66,111.40
Unit cost	3,342.00	4,401.00	4,941.00	5,548.00	8,924.00	9,713.00
Teacher salaries as % of recurrent total	55%	54%	54%	54%	55%	55%
Non-teacher recurrent as % of recurrent total	45%	46%	46%	46%	45%	45%

Capital costs comprise of the costs for construction of new classrooms, laboratories, staff and other rooms, and toilets etc. Buying equipment for teaching-learning activities is also considered under this head of expenditure. As well, recurrent costs that cover all day-to-day expenses for running the programs (including staff salaries, textbooks, teaching guides, rental cost, training costs, and costs incurred by any demand side interventions) are considered in this cost estimation.

Implementing the interventions identified for the primary education sector towards achieving the education MDG requires an estimated cost of BDT 76.99 billion for the year 2009 and BDT 177.05 billion for the year 2015. Recurrent cost for these two years is estimated at 68 percent and 63 percent respectively. Teachers' salaries comprise the major part of the recurrent costs, and are estimated at 54 percent and 55 percent in 2009 and 2015 respectively. Cost per pupil for these two years is estimated at BDT 4,941 and BDT 9,713 respectively.

4.5.2 Secondary Education

To create greater access in general secondary education, several measures have also been taken. These measures include the construction of new classrooms, laboratories and other rooms, recruiting new teaching and other staff, providing teaching-learning materials, financial incentives for compensating opportunity cost, and raising teacher salaries etc. The resource requirements and estimated costs for meeting them are presented in the following:

Physical Infrastructure Requirement

To bring down the current (2005) student-classroom ratio from 45:1 to 40:1, new classrooms need to be constructed. The estimated classroom requirement to meet the increased number of students at the above standard ratio for the years 2010 and 2015 are 5,518 and 10,874 respectively at government secondary schools. Requirements of laboratory and other specialized rooms is approximately 40 percent of the total

number of classrooms. For the year 2015 a total of 4,350 laboratories will be required for the public secondary schools. (Table 4.6)

Table 4.6: Infrastructure requirements (General and Technical Schools)

Infrastructure	Education category	2005 (Base year)	2009	2010	2015
Classroom	General	4,986	4,733	5,518	10,874
	Vocational	498	2,801	4,142	21,863
Laboratory and other specialized rooms	General	1,956	1,893	2,207	4,350
	Vocational	320	1,400	2,071	10,932
Other rooms	General	1,210	1,183	1,379	2,719
	Vocational	256	420	621	3,280

For secondary technical schools, the student-classroom ratio has been proposed at 20:1 (current ratio is 36:1) as the course is more practical oriented in nature. Based on this ratio the total number of classrooms required for the years 2010 and 2015 are estimated at 4,142 and 21,863 respectively. The laboratory and other specialized room requirements for technical schools are estimated at approximately 50 percent of the total number of classrooms.

An estimated total cost of all new construction (general and technical schools together), at the unit cost of BDT 200,000, for the years 2010 and 2015, is BDT 1.55 billion and BDT 6.11 billion respectively.

Human Resource

The requirement of teachers has been estimated based on the standard student-teacher ratio of 40:1 for general secondary public schools. The total teacher requirement for the years 2010 and 2015 is estimated at 7,828 and 14,499 respectively.

For the technical schools teacher requirement is determined based on the student - teacher ratio of 20:1. Thus, the total teacher requirement for the years 2010 and 2015 is estimated at 5,798 and 21,863 respectively. (Table 4.7)

Table 4.7: Teaching and non-teaching staff

Staff	Education category	2005 (Base year)	2009	2010	2015
Teacher	General	7,452	6,796	7,828	14,499
	Vocational	498	4,144	5,798	21,863
Supervisory staff	General	0	0	0	0
	Vocational	192	1,622	2,277	8,745
Clerical and other staff	General	1,796	1,662	1,922	3,625
	Vocational	512	3,054	3,850	6,559

Teacher wages (that include basic salary, house rent, medical allowance and two festival allowances a year) stands at an average of BDT 8,750 per month. Total remuneration for the required number of both general and technical secondary school teachers together amount to BDT 1.86 billion for the year 2010 and BDT 6.39 billion for the year 2015.

To improve teaching quality several teacher development in-service training programs are already in place. However, improving these programs and making them more effective, week-long subject-based training, along with monthly refresher training programs, need to be organized regularly. For this purpose an average an amount equivalent to ten percent of a teacher's annual salary is allocated per teacher. Given this, the total amount required for conducting in-service training programs in the year 2010 and 2015 is estimated at BDT 230 million and BDT 730 million respectively.

Teaching - learning materials

The number of textbooks used in general public secondary schools is 12 and the life span for each text book is considered to be two years. On the other hand, 11 books are used in the technical schools; the life span for these is also considered as two years. (Table 4.8)

Table 4.8: Number of Textbooks and Teaching Guides

Materials	Education category	Life span	2005 (Base year)	2009	2010	2015
Textbook	General (12)	2	1,331,322	1,217,715	1,403,679	2,609,794
	Vocational (11)	2	54,802	455,947	637,902	2,404,969
Teaching guide	General (1)	5	1,490	1,359	1,566	2,900
	Vocational (1)	5	100	829	1,160	4,373

Unit costs for textbooks and teaching guides is estimated at BDT 28 and BDT 40 respectively. The total cost for the textbooks is estimated at BDT 88 million for 2010 and BDT 327 million for 2015. Total costs for teaching guides stands at BDT 180,000 for 2010 and BDT 750,000 for the year 2015.

Demand side Intervention

The only demand side intervention recommended for secondary schools is the pro-poor subsidy (student stipend). Although currently in place, the coverage is limited to only two percent of girls enrolled. This study however, proposes to extend the coverage to ten percent of total enrolled students belonging to the ultra poor section of the population with no gender discrimination. A student stipend is introduced as a compensatory measure to reduce the opportunity costs of attending school. The expected number of beneficiaries of this program is 18,214 for the year 2010 and 78,018 for the year 2015 (Table 4.9). The amount of BDT 150 per student is allocated for this program, and the total amount stands at BDT 350 million and BDT 140 million in 2010 and 2015 respectively.

Table 4.9: Demand side Intervention

Interventions	Target for 2015	2005	Coverage (number of enrolled Students)		
			2009	2010	2015
Pro-poor subsidy (Stipend program)	10% of the students enrolled @ BDT150/ month/student	2% of the girls enrolled	12,551	18,214	78,018

Capital, Recurrent and Per Pupil Costs for Secondary Education

The estimated total cost for implementing these programs is BDT 3.34 billion for the year 2009 and BDT 15.71 billion for the year 2015 (Table 4.10). Recurrent cost comprises 66 percent and 61 percent of the total cost in 2009 and 2015 respectively. Per student cost at the secondary level (technical and general secondary public schools together) is estimated at BDT 12,117 and BDT 20,144 respectively for the years 2009 and 2015.

Table 4.10: Recurrent, Capital and unit costs for Secondary Education

	2005	2008	2009	2010	2014	2015
Secondary (public) (million BDT)	1,266.70	2,492.90	3,341.00	4,442.60	13,237.70	15,715.60
Recurrent costs (million BDT)	1,221.20	1,663.50	2,205.80	2,889.00	7,681.20	9,603.50
Construction & other investments (million BDT)	45.40	829.40	1,135.20	1,553.60	5,556.50	6,112.10
Unit cost	5,463.00	11,024.00	12,117.00	13,324.00	19,880.00	20,144.00
Teacher salaries as % of recurrent total	69%	65%	65%	64%	66%	67%
Non-teacher recurrent as % of recurrent total	31%	35%	35%	36%	34%	33%

4.5.3 Early Childhood / Pre-primary

Physical Infrastructure

To run the early childhood/pre-primary education programs there is no need to create extra physical infrastructure facilities. Government-run programs will be run using the existing facilities at the four types of public primary institutions (GPS, RNGPS, PTI Experimental schools and Community Primary schools). Moreover, infrastructure provisions that include classrooms, toilets and other infrastructure facilities have been created in the government primary schools for running pre-primary programs (Table 4.11) (suggested in the National Plan of Action II).

Table 4.11: Classroom requirement

	Basis	2005 (Base year)	2009	2010	2015
Classroom	Pupil / Classroom = 30	43,105	101,587	118,005	212,589

Human resource

Pre-primary education program are run in some of the government primary schools using the existing infrastructure and human resource facilities. One teacher takes care of one baby class in the GPS comprising about 30 children. The Ministry of Religious Affairs has its own pre-primary education programs which are run in the mosques and temples. One Imam or Purohit conducts the classes which comprise 30 learners with equal number of boys and girls. Therefore, increasing the number of pre-primary learning centers will result in requirement for proportionate increase in the number of teachers in the future years (Table 4.12). NPA II recommends the class size for this kind of program to be 30 children.

Table 4.12: Teacher requirement

	Basis	2005 (Base year)	2009	2010	2015
Teacher / Facilitator	1 Teacher in each center (30 learners)	43,105	101,587	118,005	212,589

An amount of BDT 1200 per month is paid to each teacher taking care of each center other than baby classes run in the GPS. The total remuneration for teachers required for the years 2010 and 2015 is estimated to be BDT 2,360 million and BDT 5890 million respectively. In-service teacher development programs cost 20 percent of a teacher's annual salary. BDT 470 million and BDT 1,780 million have been estimated as the total cost of the teacher development programs for the years 2010 and 2015 respectively.

Teaching-learning materials

One book for the children and one teaching guide for the teachers have been the major teaching-learning materials for pre-primary classes (Table 4.13). These books are provided free to learners and teachers. In addition, school bags, slates, and pencils etc, are provided free to each children participating in the program which is equivalent to approximately BDT 500 per child per annum. In addition, each class is supplied with mats, colorful posters, toys and other small learning materials which will cost approximately BDT 500 per annum. These two supports together cost approximately BDT 3.12 billion in 2010 and BDT 8.55 billion in 2015.

Table 4.13: Teaching - learning materials

	Number of materials	2005 (Base year)	2009	2010	2015
Textbook	1 per student	1,443,830	3,260,685	3,746,410	6,377,671
Teaching guide	1 per teacher	43,105	101,587	118,005	212,589

Demand side Intervention

School meals are the only demand side intervention proposed in this study as an incentive for attending the government pre-primary education programs. This program is estimated to cover 20 percent of total children enrolled. The expected number of beneficiaries of this program is 1,275,534 for the year 2015 (Table 4.14). An allocation of approximately BDT10 per day per child has been made for the children enrolled in the four types of public primary schools. Total cost for the school meal program for the years 2010 and 2015 is estimated at BDT 0.75 billion and BDT 2.55 billion respectively.

Table 4.14: Demand Side Intervention, Target and Coverage

Interventions	Target for 2015	2005	Coverage (number of enrolled students)		
			2009	2010	2015
School meal (BDT 10/child/day)	20% of the enrolled	Nil	260,855	374,641	1,275,534

Capital, Recurrent and Per Pupil Costs for Pre-primary / Early Childhood Education

Total cost comprising both recurrent and capital costs (construction and other investments) is estimated at approximately BDT 5671.5 million for the year 2009 and BDT 1,9470 million for the year 2015 (Table 4.15). Recurrent costs for these two years are estimated at 96 percent and 97 percent respectively. The reason for low capital cost is due to the fact that construction cost is almost absent for this sector. Cost per pupil for these two years is estimated at BDT 1,739 and BDT 3,053 respectively.

Table 4.15: Recurrent, Capital and unit costs for Pre-primary Education

	2005	2008	2009	2010	2014	2015
Pre-primary (public) (million BDT)	1,625.70	4,375.20	5,671.50	7,199.60	16,299.25	19,470.00
Recurrent costs (million BDT)	1,552.50	4,214.60	5,469.00	6,947.00	15,733.00	18,847.10
Construction & other investments (million BDT)	73.20	160.60	202.50	252.60	566.30	622.90
Unit cost	1,126.00	1,569.00	1,739.00	1,922.00	2,799.00	3,053.00
Teacher salaries as % of recurrent total	40%	36%	35%	34%	32%	31%
Non-teacher recurrent as % of recurrent total	60%	64%	65%	66%	68%	69%

4.5.4 Non-formal Education

Currently two government programs namely Post Literacy and Continuing Education for Human Development (PLCEHD 2) and Basic Education for Hard to Reach Working Children (BEHTRWC) are in operation to address the educational needs of adults and hard to reach working children. These programs are being implemented through a number of NGOs.

Post Literacy and Continuing Education for Human Development II (PLCEHD 2)

In PLCEHD 2 the size of enrolment is 63,240 with equal proportion of male and female participation covering the age group 11-45 years. Each learning center/class comprises 30 learners and is taken care of by one facilitator. This program is being implemented by a total of 2108 learning centers. Enrolment in this program is expected to increase by approximately 66.5 percent for males and 71 percent for female learners to achieve 100 percent literacy rates by 2015 with an enrolment target of 7,062,496 learners by the year 2015.

A total of 2108 facilitators are currently imparting literacy training. One supervisory staff is responsible for every ten centers. There are also 18 clerical and other staff involved in this program.

Monthly remuneration for a teacher and a supervisor are BDT 1500 and BDT 2500 respectively. Total remuneration required for teachers in this program are estimated at BDT 666.31 million for 2010 and BDT 12,683.83 million for 2015. Total remuneration required for the supervisors and other staffs engaged in this program are estimated at BDT 169.62 million in 2010 and BDT 4141.99 million for the year 2015 respectively. An amount equivalent to ten percent of a teacher's salary is spent on programs undertaken for a teacher's quality development.

A number of learning materials and teaching guides are provided free to the learners and teachers participating in the program, the estimated cost of which is BDT 328.10 million and BDT 7275.91 million for 2010 and 2015 respectively.

On an average BDT 100 is spent per learner every year for other supports that include writing pads, pens, other learning materials, and buying fuel, etc. An estimated amount for this support stands at BDT 139.61 million and BDT 3096.13 million for 2010 and 2015 respectively.

PLCEHD is run generally in rented rooms or spaces. BDT 10,500 is spent annually for rental purpose for each learning center.

Basic Education for Hard to Reach Working Children (BEHTRWC)

This program was undertaken to address the educational needs of the working children who are basically dropped out of the formal system. Although the target age group for this program is 11-14 years, this program will contribute to increasing the adult literacy rate in the country. This program is currently being implemented through 2000 learning centers with a total enrolment of 20,000 male and 30,000 female learners. Enrolment in each center is 25 and is taken care of by one facilitator. The enrolment rate is targeted to increase by 15 percent through increasing the number of learning centers.

A total of 2000 facilitators are providing non-formal education to the working children. There is one supervisory staff for every ten centers. Monthly remuneration of a teacher and a supervisor is BDT 1500 and BDT 2500 respectively. Total amount required to pay teachers and supervisors in the years 2010 and 2015 are estimated at BDT 117 million and BDT 326 million respectively. Like the earlier programs an amount equivalent to ten percent of a teacher's remuneration is spent for teacher development in-service training programs annually.

Total costs for learning materials that include books (unit cost BDT 75) and teachers' guides (unit cost BDT 100) is estimated at BDT 25 million and BDT 82 million respectively for the years 2010 and 2015.

On an average BDT 100 is spent per learner every year for other supports that include writing pads, pens, other learning materials, and buying fuel, etc. An estimated amount for this support stands at BDT 6.47 million and BDT 20.98 million for 2010 and 2015 respectively.

Capital, Recurrent and Per Pupil Costs for Non Formal Education (Adult Education)

Non formal education programs are implemented without involving any construction or other investment programs. The total estimated cost of the programs is BDT 1,019.37 million and BDT 39,716.94 million for the years 2009 and 2015 respectively (Table 4.16). Estimated per learner cost is BDT 1,986 and BDT 3,327 respectively for these two years.

Table 4.16: Recurrent, capital and unit cost for Literacy programs

	2005	2008	2009	2010	2014	2015
Literacy programmes (million BDT)	89.06	554.04	1,019.37	1,875.93	21,559.58	39,716.94
Recurrent costs (million BDT)	89.06	554.04	1,019.37	1,875.93	21,559.58	39,716.94
Construction & other investments (million BDT)	0.00	0.00	0.00	0.00	0.00	0.00
Unit cost	1,408.00	1,822.00	1,985.65	2,163.88	3,052.68	3,327.23
Teacher salaries as % of recurrent total	39%	37%	36%	36%	33%	32%
Non-teacher recurrent as % of recurrent total	61%	63%	64%	64%	67%	68%

Total Costs for MDG2

Total Capital, Recurrent and Unit costs to implement the interventions towards achieving MDG2 in different years are provided in the (Table 4.17) Total costs for pre-primary, primary, secondary and non-formal education together has been estimated at BDT 87,010.61 million and BDT 251,951.07 million for the years 2009 and 2015 respectively. Recurrent cost, however, accounts for 65-70 percent of the total cost. Per student cost stands at BDT 20,783 and BDT 36,237 for these two years respectively when all the sectors are added together.

Table 4.17: Total Resource Needs Estimates for Education Interventions

	2009	2010	2011	2012	2013	2014	2015	Total
Pre-Primary Education								
Pre-primary (million BDT)	**5,671.54**	**7,199.6**	**8,989.66**	**11,076.07**	**13,497.85**	**16,299.26**	**19,469.99**	**82,203.97**
Pre-primary (million USD)	**82.92**	**105.26**	**131.43**	**161.93**	**197.34**	**238.29**	**284.65**	**1,201.82**
Recurrent costs (million BDT)	5,469.01	6,946.99	8,677.41	10,693.00	13,030.84	15,732.99	18,847.09	79,397.33
Recurrent costs (million USD)	79.96	101.56	126.86	156.33	190.51	230.01	275.54	1160.77
Capital Costs (million BDT)	202.52	252.61	312.24	383.07	467.01	566.27	622.90	2806.62
Capital Costs (million USD)	2.96	3.69	4.56	5.60	6.83	8.28	9.11	41.03
Per Pupil cost (BDT)	1,739.37	1,921.73	2,117.57	2,328.11	2,554.71	2,798.90	3,052.84	
Per Pupil cost (USD)	25.43	28.1	30.96	34.04	37.35	40.92	44.63	
Per Capita Cost (BDT)	39.18	49.04	60.37	73.35	88.13	104.93	123.59	
Per Capita Cost (USD)	0.57	0.72	0.88	1.07	1.29	1.53	1.81	
Primary Education								
Primary education (million BDT)	**76,987.67**	**88,860.02**	**102,578.71**	**118,487.72**	**137,011.82**	**158,680.71**	**177,048.50**	**859,655.20**
Primary education (USD)	**1,125.55**	**1,299.12**	**1,499.69**	**1,732.28**	**2,003.10**	**2,319.89**	**2,588.43**	**12,568.06**
Recurrent costs (million BDT)	53,517.65	60,679.73	68,665.36	77,570.35	87,501.79	98,579.42	110,937.07	557,451.40
Recurrent costs (million USD)	782.42	887.13	1,003.88	1,134.07	1,279.27	1,441.22	1,621.89	8,149.88
Capital Costs (million BDT)	23,470.02	28,180.3	33,913.34	40,917.37	49,510.03	60,101.30	66,111.43	302,203.80
Capital Costs (million USD)	343.13	411.99	495.81	598.21	723.83	878.67	966.54	4,418.18
Per Pupil cost (BDT)	4,940.68	5,547.84	6,234.10	7,013.42	7,902.93	8,923.93	9,712.89	
Per Pupil cost (USD)	72.23	81.11	91.14	102.54	115.54	130.47	142.00	
Per Capita Cost (BDT)	531.84	605.26	688.92	784.62	894.58	1,021.56	1,123.85	
Per Capita Cost (USD)	7.78	8.85	10.07	11.47	13.08	14.94	16.43	
Secondary Education								
Secondary (million BDT)	**3,341.03**	**4,442.64**	**5,869.99**	**7,718.39**	**10,115.79**	**13,237.72**	**15,715.64**	**60,441.20**
Secondary (million USD)	**48.85**	**64.95**	**85.82**	**112.84**	**147.89**	**193.53**	**229.76**	**883.64**
Recurrent costs (million BDT)	2,205.81	2,889.03	3,741.99	4,798.23	6,096.47	7,681.23	9,603.50	37,016.26
Recurrent costs (million USD)	32.25	42.24	54.71	70.15	89.13	112.30	140.40	541.18
Capital Costs (million BDT)	1,135.21	1,553.62	2,128.00	2,920.16	4,019.32	5,556.49	6,112.14	23,424.94
Capital Costs (million USD)	16.60	22.71	31.11	42.69	58.76	81.24	89.36	342.47
Per Pupil cost (BDT)	12,117.39	13,323.99	14,666.79	16,176.53	17,895.02	19,880.29	20,143.70	
Per Pupil cost (USD)	177.15	194.80	214.43	236.50	261.62	290.65	294.50	
Per Capita Cost (BDT)	23.08	30.26	39.42	51.11	66.05	85.22	99.76	
Per Capita Cost (USD)	0.34	0.44	0.58	0.75	0.97	1.25	1.46	

Continued...

	2009	2010	2011	2012	2013	2014	2015	Total
Adult Literacy								
Literacy Programs (million BDT)	**1,019.37**	**1,875.93**	**3,452.92**	**6,356.92**	**11,705.70**	**21,559.58**	**39,716.94**	**85,687.36**
Literacy Programs (million USD)	**14.90**	**27.43**	**50.48**	**92.94**	**171.14**	**315.20**	**580.66**	**1,252.75**
Recurrent costs (million BDT)	1,019.37	1,875.93	3,452.92	6,356.92	11,705.70	21,559.58	39,716.94	85,687.36
Recurrent costs (million USD)	14.9	27.43	50.48	92.94	171.14	315.20	580.66	1252.75
Capital Costs (million BDT)	0	0	0	0	0	0	0	0
Capital Costs (million USD)	0	0	0	0	0	0	0	0
Per student cost (BDT)	1985.65	2163.88	2358.17	2569.98	2800.9	3052.68	3327.23	
Per student cost (USD)	29.03	31.64	34.48	37.57	40.95	44.63	48.64	
Per Capita Cost (BDT)	7.04	12.78	23.19	42.10	76.43	138.80	252.11	
Per Capita Cost (USD)	0.10	0.19	0.34	0.62	1.12	2.03	3.69	
Total Education Costs								
Total Cost (million BDT)	**87,010.61**	**102,378.19**	**120,891.28**	**143,639.10**	**172,331.16**	**209,777.27**	**251,951.07**	**10,879.79**
Total Cost (million USD)	**1,272.22**	**1,496.76**	**1,767.42**	**2,099.99**	**2,519.47**	**3,066.91**	**3,683.50**	**15,906.27**
Recurrent Cost (million BDT)	62,211.84	72,391.68	84,537.68	99,418.50	118,334.80	143,553.22	179,104.60	759,552.30
Recurrent Cost (million USD)	909.53	1,058.36	1,235.93	1,453.49	1,730.05	2,098.73	2,618.49	11,104.58
Capital Costs (million BDT)	24,807.75	29,986.53	36,353.58	44,220.60	53,996.36	66,224.06	72,846.47	328,435.40
Capital Costs (million USD)	362.69	438.39	531.48	646.50	789.42	968.19	1,065.01	4,801.68
Per student cost (BDT)	20,783.09	22,957.44	25,376.63	28,088.04	31,153.56	34,655.80	36,236.66	
Per student cost (USD)	303.84	335.65	371.01	410.65	455.46	506.67	529.77	
Per Capita Cost (BDT)	601.14	697.34	811.90	951.18	1,125.19	1,350.51	1,599.31	
Per Capita Cost (USD)	8.79	10.20	11.87	13.91	16.46	19.75	23.39	

Note: 1 USD = 68.4 BDT

CHAPTER 5

GENDER

MDG GOAL 3

Promote Gender Equality and Empower Women

MDG Goal 3 - Promote Gender Equality and Empower Women
Summary Statistics: MDG Goals, Targets, Indicators and Achievements

GOAL	TARGET	INDICATORS	BASE YEAR 1990-95	2005	TARGET 2015	STATUS OF PROGRESS
GOAL 3: PROMOTE GENDER EQUALITY	**TARGET 4** ELIMINATE GENDER DISPARITY IN PRIMARY AND SECONDARY EDUCATION PREFERABLY BY 2005 AND TO ALL LEVELS OF EDUCATION NO LATER THAN 2015	RATIO OF GIRLS TO BOYS IN PRIMARY EDUCATION	45:55	53:47	50:50	ACHIEVED
		RATIO OF GIRLS TO BOYS IN SECONDARY EDUCATION	34:66	50:50	50:50	ACHIEVED
		RATIO OF WOMEN TO MEN IN TERTIARY EDUCATION	25:75	36:64	50:50	NEEDS ATTENTION
		RATIO OF LITERATE FEMALES TO MALES OF 15-24 YEAR OLDS	42:65	46:65 (2002)	100:100	NEEDS ATTENTION
		SHARE OF WOMEN IN WAGE EMPLOYMENT IN THE NON-AGRICUL TURAL SECTOR	19.10	20.00	50 %	NEEDS ATTENTION
		PROPORTION OF SEATS HELD BY WOMEN IN NATIONAL PARLIAMENT	12.73	19.00 (2009)	33 %	-

5.1 Overview

Women in Bangladesh are becoming increasingly visible in economic spheres, and in practically in all spheres of the development women are contributing to the growth of economy. Women's increasing involvement in both agricultural work and in non -farm activities has provided increased opportunities for wage work and certain economic independence. Yet, despite the large scale involvement of women in economic activities "women are ignored socially, politically, deprived legally, exploited economically." It is against this that the situation of the girl's and women's socio-economic and political status needs to be understood.

In terms of MDG3 there are several areas where women are at a disadvantage and gender gaps are apparent. While the country remains broadly on track ensuing gender equity in basic education, there are some significant challenges that need to be addressed. These include the strengthening opportunities through increased awareness to effectively sustain post-primary education for girls, the weak transition of girls to tertiary level education and the workplace, high levels of female youth unemployment and underemployment, involve more women in productive income generating activities, providing women with child care, low levels of female participation in political and high public office, reduction of violence and mainstreaming of gender.

Bangladesh has enhanced a number of laws at the national level to protect the equality of rights and opportunities. The Constitution of Bangladesh grants equal rights to women and men in all spheres of public life (Articles 27, 28(1) 28(2), 28(3), 28(4), 29(1), 29(2) and 29(3) and has been supplemented by number of Acts and Ordinances to safeguard women's equal rights such the Dowry Prohibition Act of 1980, the Child

Marriage Restraint Act (amended in 1984) and the Family Court Ordinance of 1985. At the international level, Bangladesh has ratified the UN Convention on the Elimination of All Forms of Discrimination Against women (CEDAW) agreeing to the optional Protocol in 2000. However, reservations on articles 2 and 16 pertaining to marriage, divorce and inheritance remain in force.

The Ministry of Women's and Children Affairs (MOWCA) established in 1978 has the mandate for protecting women's' interests, and further the rights of children. It is presently working in 64 districts of the country. At present it consists of the Ministry itself and three implementing agencies: the Department of Women Affairs (DWA), Jatiya Mohila Sangstha (National Women's Council), and Shishu (Children's) Academy. MOWCA is mandated to act as the central motivating factor on issues of women's equality and development and to promote a broader and more consistent response by all government agencies to the needs and priorities of women. WID (Women in Development) focal point has been established in various ministries. The National Policy for the Advancement of Women was adopted in 1997 and amended (2004,2008) includes commitments to eliminate discrimination against women in all spheres. A National Action Plan (NAP) for implementing the policy as well as meeting commitments under the Beijing Platform for Action (PFA) was approved in 1998. Following the PFA Gender Focal points were appointed in all central government ministries and committees as early as 1990. Bangladesh Poverty Reduction Strategy Paper (PRSP) finalized in October 2005 and PRSP 2 in 2008 also provides comprehensive gender analysis with policy guidelines.

5.2 Progress of achieving MDG3

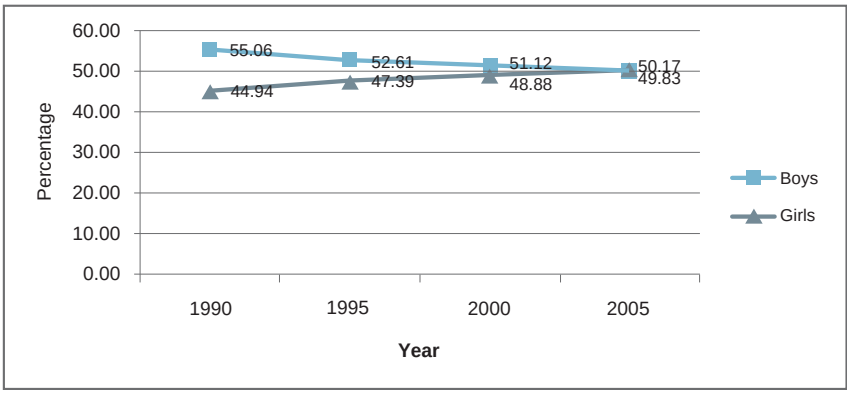
It is against the evaluation of the performance of indicators of MDG3 that the current status has been evaluated. The relevant challenges have been identified based on a review of relevant programmes and discussions with the TWG members.

5.2.1 Gender and Primary Education

The MDG target was set for 2005 to achieve gender parity in primary enrollment and it has been achieved. During the last 15 years, the primary school enrollment has increased 1.4 times from 11.9 million in 1990 to 16.2 million in 2005. Total primary education enrollment was 11.9 million in 1990 with 6.6 million boys and 5.4 million girls and it has reached 16.2 million in 2005, of whom half of the enrollment was girls. Gender parity in primary enrollment was attained in 2005.

Girls' enrollment in primary education in 1990 was 45 percent and reached 47 percent in 1995. The trend shows that in the subsequent five years a gradual increase in the girls enrollment happened which was 49 percent in 2000 while gender parity has been achieved in 2005 (Figure 5.1). The achievement is largely the result of The First Primary Education Programme (PEDP-I) implemented in 1990 and the Second Primary Education Development Programme (PEDP II) between 2004 and 2009 through several projects.

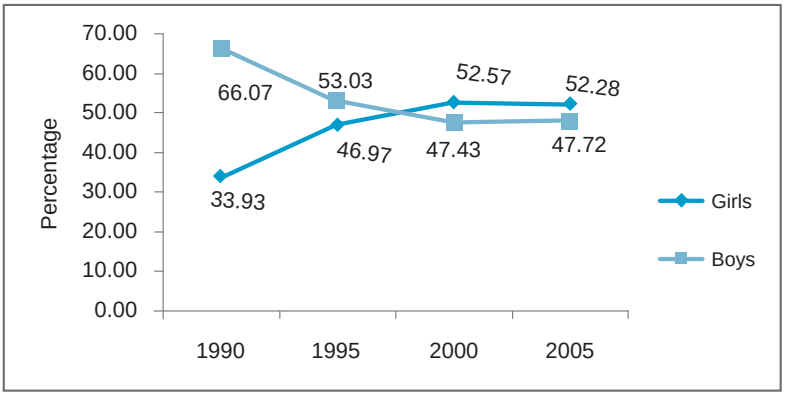
Figure 5.1: Trends in primary education enrollment (by gender), 1990-2005



5.2.2 Gender and Secondary Education

The secondary education enrollment of girls in rural areas has increased gradually, from 46 percent to 53 percent during 1995 to 2000, whereas it has declined to 52 percent by the next five years. Boy's enrollment has declined gradually from 54 to 47 percent between 1995 to 2000. However, it has increased by one percent in the next five years as shown in Figure 5.2.

Figure 5. 2: Trends in secondary education (excluding Intermediate) enrollment (by gender), 1995-2005



The share of secondary education (excluding intermediate) enrollment in urban areas by sex shows a positive trend for girls' enrollment from 49 to 52 percent during 1995 to 2005. On the other hand the enrollment rate of boy's has declined from 51 percent 48 percent during the same period. The annual growth rate of secondary enrollment shows a declining trend for both the boys and girls during two time periods, namely 1995-2000 and 2000-2005. However, the relative share of declining growth has been less pronounced for girls than that for boys: the annual average growth for girls has declined from 5.04 percent in 1995-2000 to 2.38 percent in 2000-2005, the same for the boys has been 3.76 and 1.28 percent respectively.

The secondary education system in Bangladesh consists of two levels: secondary education (grades six-ten, of which six-eight is junior secondary), and higher secondary education (grades 11-12). Excluding the intermediate between 1990 and 2000, the secondary education enrollment for female students depicts sharp increase (34 percent in 1991, 47 percent in 1995) whereas the enrollment of boy students substantially decreased (from 66 percent in 199 to 53 percent in 1995). In 2000, girls' enrollment surpasses than boys (51 percent for girls and 49 percent for boys). The similar pattern of enrollment for both sexes was seen in 2005.

This impressive enrollment rate of girls in secondary school is the consequence of a government initiative, the Female Secondary School Assistance Program (FSSAP), launched in late 1980's and nationally covered in early 1990's. Under the FSS, the government provides a cash incentive or stipend to secondary school girls to cover a large portion of direct school expenses incurred by girls in grades six-ten. The FSS programme also provides tuition assistance, though this part of the financial assistance is paid to the school where the girl is enrolled, rather than to girls directly. The coverage of other costs rise with grade because extra incentive is needed in the upper grades to reduce high dropout rates.

The program, with twin objectives, seems to be successful in increasing the number of female students entering secondary school, and in keeping them in school until graduation. Thus this type of stipend

programme which is pioneer in South Asia need to be continued for increasing secondary enrollments and in addressing narrowing gender disparities at the secondary level. This is discussed in the earlier chapter (see section 4.5.2).To maintain gender parity, government secondary education projects need to be continued. In addition, to ensure good quality education, improvements in the course curricula and support for the learning needs of diverse groups of students (taken as actions in PRSP II, pg 400) need to be effectively implemented.

However, gender parity at tertiary education levels are still low and will need considerable improvement. The target was set to achieve no later than 2015; unfortunately only 24 percent has been reached by 2005. During the last ten years, the enrollment of students at the tertiary level has increased 4.5 fold from 62,125 in 1997 to 280,516 in 2006. During 1997-2005, female enrollment in tertiary has increased 2.6 times and male 3.6 times. This implies low rate of tertiary enrollment among females as compared to that of the males.

There are several factors which could be attributed to the decline growth of girl's enrolment. Social and cultural attitudes still reinforce girl's /women's subordinate position in the society. Various forms of violence , acid throwing, sexual harassment on the street and in educational institutions, early marriage (despite The Child Marriage Restraint Act, 1984 which raised the legal age of marriage of girls from 15 to 18) are hindering girl's to take opportunities to continue education smoothly.

5.2.3 Gender and Adult Literacy

By 2015 adult literacy rate of 100 percent is to be achieved for both male and female. The rate of male literacy is 58 percent and 48 percent for female in 2005, as shown in Table 5.1.

Table 5.1: Adult Literacy Rate of population 15+ years and over

Year	Adult literacy rate	Male	Female	Rural	Urban
1991	35.30	44.30	25.80	NA	NA
1992	NA	42	65	NA	NA
1994	47.30	55.60	38.10	NA	NA
1995	45.30	55.60	38.10	42.90	63.50
1998	52.60	59.40	42.50	48.20	68.30
1999	52.70	60.70	42.80	48.40	68.90
2000	52.80	61.00	43.20	48.70	69.30
2002	49.60	55.50	43.40	45.30	66.50
2003	50.30	56.30	44.20	46.10	67.10
2004	51.60	57.20	45.80	47.40	68.30
2005	52.30	57.60	47.90	48.60	68.30
2006	52.80	58.20	48.40	49.30	69.40

Source: BBS report on Registration System, BBS-2006

The adult literacy rate (15 years and above) has increased from 35.3 percent in 1991 to 52.8 percent in 2006. In 1991 the rate was 44.3 percent for males and 25.8 percent for females (i.e; 18.5 percentage points less for females). In 2006, this rate increased to 48.4 percent for females, the gap being 9.8 percentage points against females. Therefore, despite the general improvement in school enrollments, a large disparity continues to exist between adult-male and adult-female literacy rates. While no data for 1990, 1993, 1997 and 2001 is available for the suggested global indicator (ratio of literate females to males of 15-24 year olds) literacy rates by age cohorts help to give an indication of the youth literacy rates. The literacy rate of 15 and over shows a substantial increase with male rates at 66 percent to 68 percent between 2002-2006, and

female 43 percent to 48 percent. From 1998-2002 the adult literacy rate was 53 percent however from 1998 onwards the gap between male and female literacy has increased from 16 to 18 percent.

5.2.4 Violence Against Women

Although VAW (Violence Against Women) has not been considered as one of the indicator nonetheless to achieve true empowerment for women this component need to be taken into consideration. The country must address the issue of domestic and other forms of VAW. VAW could be associated with broader problem of the low social and economic status of women. The worst form of manifestation of discrimination, deprivation, devaluation and injustice takes place in terms of VAW. Such violence takes place both in public space and within the household. The occurrence of family violence is endemic and cuts across ethnicity, religion and class groups. In most cases the incidence of domestic violence often goes unreported therefore it is difficult to obtain statistics on this. Many more cases are known to go unreported due to fears of social stigma, emotional and financial insecurity and the lack of support mechanisms.

5.2.5 Women in Non-Agricultural Wage Employment

Another major area of concern is low female engagement in non-agricultural wage employment. The situation of women in non-farm employment depicts a discouraging situation. However this report has taken into consideration the total number of women working in BGMEA regard to projection of women in non-agricultural sector. The projection of women in non-agricultural employment (using 1995 as base year) shows much discouraging situation (Table 5.2). The share of women in non-agricultural employment has declined from 23.7 percent in 2002-03 down to 20 percent in 2005-06. The emergence of the feminization of poverty in both rural and urban areas is possibility if the above issues are not addressed proactively and through effective gender mainstreaming. This declining share of women in non-agricultural employment implies that in order to ensure further improvement in the livelihoods and empowerment of women, their share in non-agricultural employment, especially in various income generating activities and wage employment should be pursued by the public and private sectors as proposed in the PRSP II and in the National Policies for the Advancement of Women 2008.

Table 5.2: Women in Non-Agricultural Wage Employment (Age 15 Years+)

Year	Total	Male	Female	% Male	% Female
1995-1996	19,089,000	14,747,000	4,342,000	77.30	22.70
1999-2000	21,236,000	15,992,000	5,244,000	75.30	24.70
2002-2003	23,558,000	17,986,000	5,572,000	76.30	23.70
2005-2006	26,631,000	21,299,000	5,332,000	80.00	20.00

Source: Report on Labour Force Survey in Bangladesh, BBS, 1996, 2004, 2008

During the last ten years population aged 15 years and above engaged in non-agricultural employment has increased 1.4 fold, from 19,089,000 in 1995-96 to 26,631,000 in 2005-06. During the same ten years the increase in male engagement has been 1.5 fold, while the same for females has not been changed and remained at low level.

The male-female ratio of engagement in non-agricultural employment has been 77:23 in 1995-96 which went up to 80:20 in 2005-06, implying relative decline of females share in the non-agricultural employment. The more revealing anti-female bias is evident in the annual growth rate: for males the annual growth rate in engagement of non-agricultural employment has increased from 0.88 percent during 1995-99 to 2.07 percent during 1999-2005, to the contrary, for females this has decreased from 2.05 percent to 0.12 percent during above two periods. Therefore, in order to expedite the process of women employment it is imperative to undertake vigorous economic empowerment efforts for the females.

5.2.6 Women in Parliament

The situation of women empowerment and gender equality is most deplorable when one looks into the share of women in the highest policy making elected body - the National Parliament. During 1991-2001, there have been 30 out of 330 seats in the National Parliament reserved for women. (Figure 5.3 & 5.4) The other (non-reserved) seats (300) are those where either men or women can contest the election. The situation of women in the National Parliament in terms of their numbers in the parliament shows a low-level static situation with only 42 seats (out of 330 including 30 reserved seats) in 1991, 43 in 1986, and 41 seats in 2001 (Table 5.3). In fact women's share of seats in the National Parliament depicts a downward trend during the last three governments of parliamentary democracy with 12.7 percent in 1991-95, 13 percent in 1996-200, and 12.4 percent in 2001-06. Attaining gender equality in the National Parliament will mean increasing the number of elected women parliamentarians from 11 to 150, about a 14-fold increase. This is a subject of unprecedented political awakening for women's participation in politics and parliamentary reform in future Bangladesh.

Table 5.3: Proportion of female member in the parliament

Year	Female member	Total seats	Percentage
1991	(30+12) = 42	330	12.73
1996	(30+13) = 43	330	13.03
2001	(30+11) = 41	330	12.42

Figure 5.3: Proportion of female member in the parliament

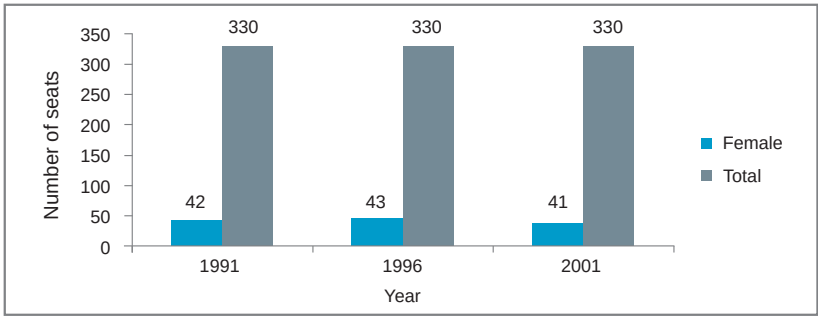
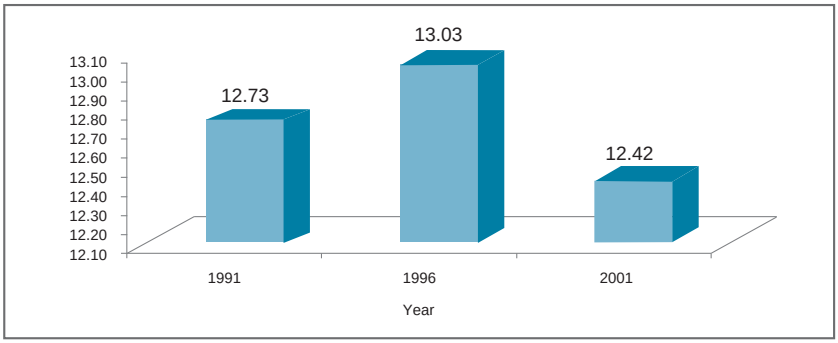


Figure 5.4: Share of female member in the Parliament



5.3 Challenges in promoting gender equality and empowerment of women

5.3.1 Challenges in Education

Although primary and secondary education is free in the country, increase enrolment in the tertiary sector is yet to reach the desired level of gender parity. Attaining the target of full gender parity at tertiary level seems improbable and requires serious attention if the country is even to come close to realizing it. Lower levels of female enrolment at the higher secondary and tertiary levels, and thereby weaker educational attainments and lower tertiary levels, also explains to some extent, the prevailing gender gaps in representation in politics, public office and the civil service.

National level primary enrolment shows that Bangladesh has achieved gender parity by 2005. However, regional variation in terms of primary enrolment exists; Barisal is yet to achieve the desired position while negative growth for Rajshahi and Khulna exists. Thus more concentration is required to strengthening - primary education projects, programmes in above mentioned divisions. In addition, it is also vital to strengthen opportunities for post-primary education for girls while meeting commitments to universal education.

Increased girls' enrolment in secondary schools has been a significant phenomenon in Bangladesh. The challenge is to sustain the twin objectives of the FSSAP in keeping increasing number of girl students in secondary schools and retain them until graduation. Regional and urban -rural variation in terms of secondary enrollment requires special attention. To maintain the impressive enrollment of girls in secondary school effective continuation of secondary education projects are required.

The accelerated attainment of gender parity in secondary through successful implementation of FSSAP and SEQAEP suggests that in regard to achieving such success at tertiary levels, the major challenge is to effectively continue such programmes to reach gender parity by 2015. A major challenge is the need for greater effort towards attaining gender parity at the tertiary education levels by 2015. This is an area has been highlighted in the MDG Progress Report 2005 as requiring critical attention. Concerted efforts will be required to address the particular challenges of easing the transition of females from the secondary through the continuation to tertiary levels and thereafter to the workplace; reducing their dropout after the completion of secondary education and promoting greater enrolment into technical, professional and vocational institutions.

Despite many improvements in primary and secondary school enrollments a large disparity exits between male and female literacy rates more in rural areas, and divisions like Sylhet. The challenge is to narrow the gap through intensive public and private initiatives. Extensive social mobilization programme need to be as well implemented.

5.3.2 Challenges in Encountering Violence Against Women and Protecting Women

The other important matter of concern is VAW. Physical assault, sexual assault and acid throwing are common in Bangladesh. In addition, trafficking, death due to dowry are also reported. Most of the affected women and children are poor. Poverty, dowry, early marriage, superstition, social attitude among many are the major causes of violence against women. Violence affects children's health, education and overall wellbeing. To combat such violence, well articulated policy interventions are required. The PRSP II has given due importance in this regard and demanded for ensuring 100 percent reporting of VAW incidence. Moreover the target has also been fixed to reduce the rate of incidence to 50 percent violence.

5.3.3 Challenges for Women in Non-Agricultural Wage Employment

The situation of women in non agricultural employment depicts a discouraging situation. The challenge is to involve women more in to productive income generating work to ensure improvement in livelihoods to empower them. Further, actions in regard to women's employment mentioned in PRSPII need to be effectively implemented.

5.3.4 Challenges in Providing Day Care Facilities

Early childhood care and development is not well advanced in Bangladesh, though many national NGOs have started to provide pre-school education programmes linked to primary education. On the other hand, traditional child rearing practices and indigenous knowledge are also disappearing from the society, due to changes in family members' roles, family patterns, rural to urban migration and an increase in restlessness and tension. Daycare facilities are necessary for women's overall socio-economic enhancement. Further, for a child to develop and learn in a healthy and normal way, it is important not only to meet the basic needs for protection, food and health care, but also to meet the basic needs for interaction, stimulation, affection, security and learning through exploration and discovery.

5.3.5 Challenges on Women in Politics

Women's engagement in political leadership is also not encouraging. In the national arena, majority women's network lobbied throughout the 2003 for direct elections for women to Parliamentary seats. Mobilisation around the issue took great impetus after the existing provision for women members (allowing for 30 women to be nominated by elected members of parliament) lapsed in 2001. However, women demand for direct election was turned down and 45 seats have been given to women through selection by the majority in the parliament. The other factor hindering women's effective participation in politics is limited leadership positions; there is still limited involvement of women in party hierarchical structures. Female members are conveniently used during election campaign, organizing meetings, rallies, etc. The challenge is to have farsighted policy interventions. Therefore awareness, and mobilization programmes to encourage the direct involvement of women in mainstream politics is needed. Holistic policy interventions may include subjective changes of the decision makers, amendment of laws, promoting women candidates nominations by political parties.

5.3.6 Challenges on Gender Sensitizing all Institutions Involved in Implementing Interventions for Promoting Gender Equality

Another major challenge is the weakness of institutional mechanisms set out to implement women's development activities. MOWCA and DWA are yet to have effective planning, implementation and monitoring units to administer the programmes effectively. Intersectional and inter-ministerial cooperation and the function of the WID focal point is also inadequate. There is no sufficient linkage between government agencies and NGOs, women's organizations and research institutes for the exchange of information and sharing of experiences. The WID focal points have been established as active agents of mainstreaming women's development in each sect oral ministry. This mechanism

was set up from the realization that looking after women's interests and progress is the responsibility of all development sectors. However, there is still scope for strengthening networking and linkages and the capacity development of WID focal points. (Country Briefing Paper...Women in Bangladesh)

Overcoming the situation of the major gender gaps in female participation in national parliament, public office and civil service represents a significant challenge in itself. The ground realities must conform to, and reflect the spirit of, gender equality and non-discrimination that is inherent in the Constitution. This is however, constrained by a general lack of awareness among government employees, the judiciary, police and the private sector on gender equality and the lack of clarity of existing policy measures aimed at preventing gender discrimination against women. The situation is further complicated by the lack of in-depth understanding of the various causal factors and conditions that create these significant gender gaps. In other areas of decision-making such as the bureaucracy and high level jobs, which entail visibility and exercise of authority, women's presence is negligible[4] .

5.4 Major Interventions and Targets for Achieving MDG 3

5.4.1 Community Based Awareness for Sustaining Gender-based Equality

The broad intervention suggested to sustain gender equality in education is community based awareness. The sub-intervention gender based equality would be achieved through community based awareness. To ensure equity and equality in education at the primary/secondary level community based awareness is suggested to strengthen opportunities for primary and post primary education for girls while meeting commitment to universal education. The major activities to achieve interventions are as follows: workshop/dialogue/seminars, training, meetings, uthan boithoks, and TV/Radio campaign.

To ensure increased enrolment in secondary girls, the stipend programme FSSAP, SEQAEP and the other need to be continued. To maintain the impressive enrolment of girls in secondary school effective continuation of secondary projects are required. Sustenance of girls at the secondary level will be enhanced through continuing awareness on the provisions of adequate facilities such as stipend/scholarships. Continuing focus on stipend/scholarships facilities to target needy students, both girls and boys, to reduce the gender gap.

5.4.2 Helping Girls Transition to Work

The progress of gender parity in tertiary education remains discouraging in comparison to primary and secondary levels. This suggests that in order to achieve such success in tertiary level of education the major challenge is to facilitate the unemployed dropped out female for gainful employment/self employment providing vocational/skill development training. The broad activities chalked under this intervention include the following: i) create more opportunities at the vocational level to help girls/women who are unable to continue with school to learn skills to enable them to get employed ii) facilitating programmes to familiarize graduates with available job opportunities. The major activities to achieve the target are: professional training, vocational training (includes computer basic course, electronics, live stock poultry, fishery & agriculture, modern office management, dress making, wool knitting, hair dressing, housekeeping communicative english, etc) and to initiate school to work programme . The objective of above mentioned trainings is to involve the young females in socio-economic development activities like literacy programme, disaster management, primary health care, environmental improvement, resource conservation and awareness building against anti-social activities, drug abuse, AIDS/STD etc.

[4] Millennium Development Goals: A people's progress report, BANGLADESH, Overview, September 2005

The other sub interventions under this broad intervention aim to increase the share of women in wage employment in non-agricultural sector will be effectively enhanced through: providing women with productive IGA, (Income Generating Activities) Micro credit. The low share of women in non-agricultural employment implies that in order to ensure further improvement in the livelihood of women and to economically empower them, their share in non-agricultural employment, especially in various income generating activities and wage employment should be pursued by the public and private sector as proposed in the PRSP II and in the National Policies for the Advancement of Women 2008.

5.4.3 Encouraging Political Participation

While there is a highly supportive legal and policy in the development sector to encourage women's participation in development activities and in decision making, women are still poorly represented in the legislative, judiciary and executive branches of government Therefore women encounter greater difficulties in changing their realities in their favour. To influence decisions in favour of women, full women's participation in political decision-making process is essential.

Increasing the proportion of elected women by encouraging their political participation will be effectively promoted through the following interventions: i) promotion related activities primarily through training/support/awareness for women candidates contesting for election, holding relevant workshops, dialogue to motivate and prepare them for effective participation in politics, ii) providing training/support for elected female parliaments. The aim of the major intervention encouraging political participation aims at increasing the number of women parliamentarians in the national parliament. Increasing the proportion of elected women by encouraging their political participation will also be effectively also promoted through mass media campaign.

5.4.4 Ending Violence Against Women

Although Bangladesh Constitution mentioned earlier guarantees equality and equal protection for all citizens, the principle is often curtailed with respect to women's right. It is necessary to reduce various forms of violence to ensure girls' productive and reproductive role. Furthermore, women's security needs to be ensured while taking opportunities of primary/secondary and post secondary education and employment. As the issue of domestic violence has not been addressed in the past on an institutional basis, there is very little capacity and experience in the country to deal with this effectively. As such, promoting relevant remedial measures such as encouraging women and child friendly police and court services, taking care of affected women, raising awareness through community, safe homes and mass media programmes is needed. Also effective implementation of activities which are hampered by a lack of professional and institutional capacity is important. Therefore, following interventions are seen to be significant.

- Prevention-related activities promoted primarily through Community-based Awareness Campaigns including mass media campaigns; holding relevant workshops, seminars, trainings and orientation programmes; undertaking relevant research and dissemination of research findings; building network and linkages involving relevant NGOs; building partnerships at the grassroots etc.
- Curative services provided through One Stop Crisis Centres (OCC) established in six administrative divisions under the auspices of public medical colleges hospitals. These OCCs provide legal, medical and social services.
- Violence prevention cells exists at the DWA and Jatio Mahila Sangtha (National Women Organization). The government and NGOs, although largely inadequate, have also established shelter homes for abused and tortured women. Both preventive and curative service activities are provided through Women Support Centre (WSC). The WSC in forty areas provides among others, training and legal services.
- Department of Social Welfare has Safe Home for children under 16 to provide protection . Further BNWLA (Bangladesh National Lawyers Women's Association) also has safe home for shelter victims which provides medical care, counseling , repatriation and reintegration services to the victims of trafficking.

5.4.5 Day Care

The other intervention is to provide women with Day Care facilities to enable women to seek gainful employment. Day Care is essential to facilitate women workers to participate in various income generating activities with young children. This facilitates breast-feeding and enables parents to have peace of mind about their children's care during working hours. Day Care assists women to acquire the management skills they need in order to compete with men and "move-up" in their workplace.

5.4.6 Systemic Issues (Gender Mainstreaming)

The relevant interventions to address various systemic issues are: to provide support to for capacity development of focal points in line ministries to mainstream gender, sensitization campaigns covering judges and judiciary officials including registrars, civil servants, police officers and Registration officers to effectively address various women's issues. Sensitization campaign/training for officials, judges and others is necessary to effectively implement gender related programmes.

5.4.7 Expected Outcomes of Interventions

Gender disparity is a reflection of complex social, economic and cultural issues. While some achievements have been acquired in education, health, labour employment and democratic participation however, in Bangladesh meaningful empowerment is still a distant goal. Therefore, if the above mentioned interventions are effectively implemented substantial women's socio-economic and political development is not far away.

5.5 Coverage and Resource Needs Estimates for MDG 3

Estimates of coverage and costs by specific interventions have been done using the computerized programme designed for this purpose by UNDP. This programme requires input data on three broad areas, namely national demographic, coverage rate (by specific intervention), and relevant costs. The national demographic data were needed to identify the relevant denominator against specific intervention, the

coverage data by specific interventions were needed to estimate the current coverage rate (for 2005 and 2008-as year-of-start) as well as the expected rate for 2015 (the terminal year of MDG); the costs data by specific interventions were needed to understand the existing cost-pattern as well as to work out costs for 2015. All these data input have been identified for each year between 2005 and 2015.The current coverage rate by specific interventions have been estimated based on in-depth review and assessment of the existing programmes (by specific interventions).The coverage rate for the terminal year, 2015 has been identified based on thorough discussion with the relevant persons of the Thematic Working Group (TWG) and different ministries mentioned below. In accomplishing these rates (especially the terminal year's rate), key emphasis was given on the relevant MDG goals and targets by indicators.

The data for the coverage and costing have been gathered from the following ministries and departments: MOWCA, Ministry of Labour and Employment, Ministry of Primary and Mass Education, Ministry of Education, Ministry of Law, Justice and Parliamentary Affairs. Local Government Engineering Department (LGED) and Youth and Employment, National Institute of Local Government (NILG), Department of Primary and Mass Education, Department of Secondary education and Bangladesh Public Administration Training Centre (BPTAC).

The costs estimates by specific interventions have been done based on critical review of the existing programmes (by specific sub-interventions). The cost estimate for the terminal year, 2015 has been done based on repeat discussions with the relevant persons of the concerned ministries /departments and representatives from TWG. Repeat run of the cost model has been done to ensure that the trend is in line with the national budget (development and revenue). Accordingly, in some cases, re-work of existing cost was needed, which was done in consultation with the knowledgeable informants of the TWG. The costs estimation has been worked out for both capital and recurrent costs. In addition, for supplementary interventions and sub-interventions, both coverage and cost estimations have been accomplished.

The MDG 3 will have seven broad interventions with 15 different sub-interventions. Appropriate coverage rates for all interventions have been worked-out in line with the MDG-3 indicators, and costs estimates have been done accordingly.

5.5.1 Coverage and Costs: Community Based Awareness Programs

The coverage target of Community Based Awareness Programs (CBAP) will be increased to about 30 percent by 2015 from current level nine percent in 2008. In 2005 less than one percent was covered. The target for 2015 has been set to 30 percent to substantially address MDG goal to sustain gender based equality in education and paved the way for girls/women's development. (Table 5.4)

Table 5.4: Coverage and Target for Community based awareness

Interventions		2005	2008	2015
Community Based Awareness Program				
To sustain gender based equality in education	Community based awareness coverage rate	0.08 %	9.00 %	30.00 %
School based awareness program	Primary school coverage rate	20.00 %	38.00 %	80.00 %
	Secondary school coverage rate	13.00 %	27.00 %	60.00 %

On the basis of these coverage levels to be attained, the interventions to facilitate community based awareness to continue effectively schooling are expected to cost BDT 56,852 million during 2008-2015 period with BDT 759 million in 2005, BDT 4379 million in 2008, and further to BDT 9885 million in 2015.The cumulative cost of Community Based Awareness Program intended to facilitate girls education will constitute 39 percent of the total cost of MDG3 interventions. The Community Based Awareness Programme has two broad sub-interventions namely, Sustaining Gender Based Equality and School Based Awareness programme. Estimates show that people reached by CBAP will increase from 11.3 million in 2008 to 40.7

million in 2015. "Secondary School Students reached through CBAP "will increase from 4.64 million in 2008 to 10 million in 2015. Accordingly, the estimated cost of sub-intervention "Sustaining Gender based Equality' will increase from BDT 2921 million in 2008 to BDT 6828 million in 2015, and that of "School Based Awareness Programme" from BDT 1,457 million in 2008 to BDT 3,056 million in 2015 (terminal year of MDG). (Table 5.5)

Table 5.5: Community Based Awareness Programs -Coverage and Costs

Interventions	Coverage in physical #		Cost (in BDT Million)	
	2008	2015	2008	2015
To sustain gender based equality				
Implied # of people reached by Community Based Awareness Program	11,300,077	40,684,930	2,921	6,828
Implied # of Community Based Awareness Program	133,256	369,863		
Implied # of trainers	173,232	739,726		
Implied # of Staff	306,488	1,109,589		
Implied # of Materials	133,256	369,863		
School Based Awareness Programs				
Implied # of primary school students reached	6,485,937	13,204,355	1,457	3,056
Implied # of secondary school students reached	4,647,215	10,023,164		

5.5.2 Coverage and Costs: Helping Girls Transition to Work

The coverage target will be to increase female enrolment in vocational training institutes to about 30 percent (2015) from current levels of ten percent (2008) of the total enrolment. The other intervention is to increase the girl's school to work programme from six percent in 2008 to 20 percent in 2015. The coverage target will be to provide income generating training to two percent (2008) to five percent (2015) of the total adult female population. Similarly, credit coverage will be increased from one percent to 30 percent to benefit women economically. To effectively rise the number of females other trainers/staff and materials strength have also been scaled up accordingly (Table 5.6).

Table 5.6: Coverage and Target for helping girls transition to work

Interventions		2005	2008	2015
Helping girls transition to work				
Vocational training	Coverage of out of school secondary girls	1 %	10 %	30 %
School to work program	Coverage of secondary school girls graduates	1 %	6 %	20 %
Empowerment of women (non-farm)	Income generating training	0.04 %	2 %	5 %
	Credit Service	0.033 %	2 %	5 %

On the basis of these coverage levels to be attained, the interventions to facilitate the transition of girls to work are expected to cost BDT 82,728 million during 2008-2015 period with BDT37 million in 2005, BDT 4,168 million in 2008, and BDT 17,361 million in 2015. The cumulative cost of "Helping Girls Transition to Work" involved to facilitate employment opportunities will constitute 28 percent of the total cost of MDG intervention.

Helping Girls Transition to Work has three broad interventions namely, Vocational training and School to work programme. Estimates show that girls reached by vocational training will increase from 0.41 million in 2008 to 1.15 million in 2015. Under the second intervention (i.e. Secondary school girls graduated will increase from 0.015 million in 2008 to 0.069 million in 2015). Accordingly, the estimated cost of sub-intervention "Vocational Training"' will increase from BDT 386 million in 2008 to BDT 858 million in 2015, and that of "School to Work Programme" from BDT 1.1 million in 2008 to BDT 3.6 million in 2015 (terminal year of MDG). Similarly, the estimated cost of sub-intervention "Empowerment of Women (non-farm)" will increase from BDT 3,781 million in 2008 to BDT 16,500 million in 2015 (Table 5.7).

Table 5.7: Helping Girls Transition to Work - Coverage and Costs

Interventions	Coverage in physical #		Cost (in BDT Million)	
	2008	2015	2008	2015
Vocational Training				
Implied # of girls reached by vocational training	405,787	1,155,502	385.00	858.00
Implied # of vocational training Program	11,272	23,110		
Implied # of Materials	11,272	23,110		
Implied # of trainers	21,417	92,440		
Implied # of Staff	29,307	92,440		
School to work Programs				
Implied # of secondary school girl graduates reached	14,929	68,768	1.10	3.60
Empowerment of women (non-farm)				
Implied # of adult female reached income generating training	622,092	2,672,029	3,781.00	16,500.00
Implied # of adult female reached credit	3,673,560	16,032,173		

5.5.3 Coverage and Costs: Encouraging Political Participation

The current (2008) coverage rate of the female candidates standing for office is 16 percent which is expected to reach about 50 percent of the female candidates contested/standing for the election by 2015 (Table 5.8). The current (2008) 15 percent of the women elected representatives getting training/support is projected to reach 25 percent by 2015 through training and mass media campaigns. The interventions towards promoting greater political participation and representation of women are projected to cost total of BDT 242 million between 2008 and 2015 with BDT 5.2 million in 2005, BDT 34 million in 2008, and BDT 30 million in 2015. The cumulative cost of encouraging political participation is 0.1 percent of the total cost of MDG3 interventions.

Table 5.8: Coverage and Target for encouraging political participation

Interventions		2005	2008	2015
Encouraging political participation				
Training of Women Candidates for Election	Coverage of awareness of female candidate standing for office	1 %	16 %	50 %
Support to women elected representatives	Coverage of women elected representatives	11 %	15 %	25 %

Encouraging political participation has two broad interventions namely, (i) Training of women candidates for election, and (ii) Support to women elected representative. Estimates show that women candidates reached by training are 8,045 in 2008 and will increase to 27,133 candidates in 2015. Under the second intervention, "Support to women elected representative" the physical number will increase from 378 in 2008 to 638 in 2015. Accordingly, the estimated cost of sub-intervention "Training of Women Candidate for Election"' will decrease from BDT 34 million in 2008 to BDT 30 million in 2015, and that of "Support to Women Elected Representative" from BDT 0.046 million in 2008 to BDT 0.047 million in 2015 (Table 5.9).

Table 5.9: Encouraging Political Participation - Coverage and Costs

Interventions	Coverage in physical #		Cost (in BDT million)	
	2008	2015	2008	2015
Training of Women Candidates for Election				
Implied # of candidates reached training	8,045	27,133	34.00	30.00
Implied # of Programs	2,174	2,713		
Implied # of Materials	2,174	2,713		
Implied # of trainers	2,174	2,713		
Implied # of Staff	2,174	2,713		
Support to women elected representatives				
Implied # of women elected representatives reached	378	638	0.046	0.047
Implied # of support programs	28	32		
Implied # of Materials	28	32		
Implied # of trainers	28	32		
Implied # of Staff	28	32		

5.5.4 Coverage and Costs: Ending Violence against Women

The Government of Bangladesh in collaboration with civil society including the relevant NGOs is committed to put all-out efforts toward ending violence against women (for details see PRSP II). The current (2008) coverage rate of the community-based awareness campaign programme is five percent of which is expected to reach about 15 percent of the adult population by 2015. The one stop crisis centers currently cover less than three percent (2008) of the total female population which is expected to cover ten percent of the eligible population by 2015. Women support centers are to address and reduce domestic violence. Shelter home cover two percent in 2008 and expected to cover five percent under 16 years of age by 2015. The current rate of domestic violence among adult female population is 42 percent. It is planned to radically improve the activities under women support centre to ultimately reduce the prevalence of domestic violence to ten percent by 2015 (Table 5.10). The interventions towards reducing violence against women are projected to cost a total of BDT 58,338 million during 2008- 2015 period with BDT 34.5 million in 2005, BDT 4,440 million in 2008, and BDT 9,216 million in 2015. The cumulative cost of ending violence against women is 19.5 percent of the total cost of MDG3 interventions.

Table 5.10: Coverage and Target for ending violence against women

Interventions		2005	2008	2015
Ending violence against women				
Community Based Awareness Program	Community based awareness coverage rate	0.05 %	5 %	50 %
One stop crisis centre (OCC)	Coverage of OCC	0.003 %	3 %	10 %
Women Support Centre (WSC)	Domestic violence prevalence rate	42 %	32 %	10 %
	Shelter coverage rate	0.013 %	2 %	5 %
Safe Home and Shelter	Shelter coverage rate	0.003 %	2 %	5 %

Ending Violence against Women has four sub interventions namely, Community based awareness programme, One stop Crisis Center (OCC), Women's Support Center, and Safe Home. Estimates show that women covered by community based awareness is 14.7 million in 2008 which will increase to 55.6 million in 2015. Under the second intervention, OCC women reached by OCC programmes is 2.24 million in 2008 and will reach 8.2 million in 2015. The third intervention by WSC women reached by shelter 0.20 million in 2008 will reach to 0.27 million in 2015. The fourth intervention i.e. Children under 16 reached by Safe Home are 0.72 million in 2008 will reach to 2.2 million in 2015. The National Forensic DNA Profiling Laboratory (NFDPL) was established at Dhaka Medical College in 2006. There are five divisional DNA Laboratories in five medical college hospitals. Substantial numbers of women are getting benefit from DNA test.

Accordingly, the estimated cost of sub-intervention "Community Based Awareness Programme"' will increase from BDT 299 million in 2008 to BDT 598 million in 2015, and that of "OCC" from BDT 386 million in 2008 to BDT 928 million in 2015, WSC from BDT 754 million in 2008 to BDT 397 million in 2015, and Safe Home from BDT 3.0 billion in 2008 to BDT 7.29 billion in 2015 (terminal year of MDG) (Table 5.11).

Table 5.11: Ending Violence Against Women- Coverage and Costs

Interventions	Coverage in physical #		Cost (in BDT million)	
	2008	2015	2008	2015
Community Based Awareness Programs				
Implied # of people reached	14,696,847	55,617,755	299	598
Implied # of awareness Programs	341,787	1,112,355		
Implied # of Materials	341,787	1,112,355		
Implied # of trainers	341,787	1,112,355		
Implied # of Staff	888,647	4,449,420		
Implied # of vehicles	1,025	3,337		
One Stop Crisis Centre (OCC)				
Implied # of female reached	2243054	8,138,752		
Implied # of OCC	19,505	54,258	386	928
Implied # of OCC Programs	15,003	27,129		
Implied # of Staff	34,508	81,387		
Implied # of required infrastructure	19,504	54,258		
Women to support centre				
Implied # of women in need of shelter	13,190,960	5,344,058		
Number of women reached by shelter	199,065	267,203	754	397
Implied # of shelters	3,462	3,563		
Implied # of materials to shelters	5,213	7,125		
Implied # of infrastructure units to shelters	4,501	92,630		
Implied # of staff to shelters	7,963	10,688		
Safe Home and shelter				
Number of children reached by shelter	723,562	2,207,544	3001	7295
Implied # of shelters	10,049	22,075		
Implied # of materials to shelters	20,099	44,151		
Implied # of infrastructure units to shelters	13,064	44,151		
Implied # of staff to shelters	251,237	551,886		

5.5.5 Coverage and Costs: Systemic Issues (Gender Mainstreaming)

The various systemic issues to address gender mainstreaming effectively are: to active 44 focal points in various ministries/organizations during 2008-2015 period. To achieve gender mainstreaming adequately enhance coverage of judges from 15 percent (2008) to 50 percent (2015); civil servants from 29 percent in 2008 to 60 percent in 2015; police 16 percent in 2008 to 50 percent in 2015, and registration officials from 7 percent in 2008 to 20 percent in 2015. To adequately sensitize the above mentioned government officials', the trainers/staff and material per sensitization programme will also be substantially increased (Table 5.12).

Table 5.12: Coverage and Target for day care center

Interventions		2005	2008	2015
Day Care Centre	Children in Day care	0.016 %	2 %	5 %
	Awareness program for women/mother	20 %	26 %	40 %

The interventions towards strengthening systemic issues are projected to cost a total of BDT 81,457 million during 2008- 2015 period with BDT19 million in 2005 ,BDT 4,477 million in 2008, and BDT 16,199 million in 2015.The cumulative cost to address the proposed systemic issues is 27 percent of the total cost of MDG 3 interventions.

Systemic issues have four sub-interventions: i) strengthening women's ministries ii) institutional support to gender mainstreaming iii) sensitization and awareness iv) and registration system. Estimates show that number of focal points in 2008 is 44 and will remain same in 2015. Under "Sensitization and Awareness Programme" total number of programmes are 2,888 in 2008 and will reach to 4,907 in 2015. In the other intervention "Registration Systems" the number of women with identity cards is 2.2 million in 2008 and will reach to 8.2 million in 2015.

Accordingly, the estimated cost of sub-intervention "Strengthening Women's Ministry"' will increase from BDT 4,338 million in 2008 to BDT15,948 million in 2015. That of "Systematic support to Gender Mainstreaming" will remain same at BDT 6160 million throughout. The cost of "Sensitization Programme" will in increase from BDT 134 million in 2008 to BDT 244 million in 2015, and that for "Registration System" from BDT5.4 million in 2008 to BDT 6.3 million in 2015 - terminal year of MDGs (Table 5.13).

Table 5.13: Ending Violence Against Women- Coverage and Costs

Interventions	Coverage in physical #		Cost (in BDT million)	
	2008	2015	2008	2015
Strengthening Women's Ministries			4,338	15,948
Systemic support to Gender Mainstreaming				
Implied # of ministries with focal points	44	44	0.0061	0.0061
Implied # of focal points	44	44		
Sensitization and Awareness Programs				
Implied # of judges reached by Sensitization and Awareness Programs	173	720		
Implied # of Sensitization and Awareness Programs	47	72		
Implied # of civil servants reached by Sensitization and Awareness Programs	27,143	57,626		
Implied # of Sensitization and Awareness Programs	899	1,441		
Implied # of police officers reached by Sensitization and Awareness Programs	19,438	65,250	134	244
Implied # of Sensitization and Awareness Programs	1,906	3,263		
Implied # of registration officials reached by Sensitization and Awareness Programs	481	2,637		
Implied # of Sensitization and Awareness Programs	37	132		
Total number of Sensitization Programs	2,888	4,907		
Implied # of materials	3,755	9,814		
Implied # of trainers	2,888	4,907		
Implied # of staff	2,888	4,907		
Registration Systems				
Implied number of women with identity cards	2,220,947	8,165,491	5.40	6.30

5.5.6 Coverage and Costs: Day Care

To enable women to participate effectively in the workforce the Day Care facilities is of immense importance. The coverage target of children in daycare would be increased from 2 percent in 2008 to 5 percent in 2015. The awareness to encourage women with children to inform them about daycare facilities would be enhanced from 2 percent in 2008 to 40 percent in 2015. (Table 5.14)

Table 5.14: Coverage and targed for systematic issues

Interventions		2005	2008	2015
Systemic issues				
Institutional Support to Gender Mainstreaming	Coverage rate of focal points (%)	100	100	100
Sensitization and awareness program	Coverage of judges (%)	0.15	15	50
	Coverage of civil servants (%)	15	29	60
	Coverage of police officers (%)	1	16	50
	Coverage of registration officers (%)	1	7	20
Registration Systems	Issuance of ID documents coverage (%)	0	3	10

Day Care is projected to cost a total of BDT 6,351 million during 2008- 2015 period with BDT 472 million in 2008, BDT 1,110 million in 2015. The cumulative cost of Day Care is 4.38percent of the total cost of MDG 3 interventions.

The Day Care has two sub-interventions: Number of children in daycare; and Awareness for mothers to keep children in daycare. Accordingly, the estimated cost of sub-intervention "Cost of Children" will increase from BDT 226 million in 2008 to BDT.669million in 2015, and that of "Awareness for Women" is BDT 472 million in 2008 to BDT 1,110 in 2015 (Table 5.15).

Table 5.15: Day Care Centre -Costs

In million BDT.

Day Care Centre	2008	2015
Cost for children	226	670
Cost for women (for awareness)	212	428
Total	438	1,098

5.5.7 Total costs

Table: 5.16: Capital & Recurrent Costs for achieving MDG3

In million BDT

Cost items	2009	2010	2011	2012	2013	2014	2015	2009-2015
Capital	2,000.28	1,926.07	1,813.77	1,553.86	1,501.11	1,351.13	871.74	11,017.96
Recurrent	21,477.24	26,645.92	31,835.89	36,932.58	43,732.21	49,130.63	54,453.40	264,207.86
Total (BDT million)	24,005.24	29,186.34	34,355.54	39,278.40	46,156.61	51,492.47	56,422.41	280,897.02
Total (USD million)	350.95	426.70	502.27	574.25	674.80	752.81	824.89	4,106.68

The Table 5.17 given below depicts annual cost summary for MDG 3 during 2009-2015 by each intervention.

Table 5.17: Cost summary for MDG 3 on Gender during 2009-2015

(BDT million)

	2009	2010	2011	2012	2013	2014	2015	Total	AVERAGE
Community Based Awareness Programs									
Total Capital Cost	1,225.03	1,171.75	1,119.69	1,010.83	960.98	916.44	876.54	7,281.26	1,040.18
Total Recurrent Cost	3,922.13	4,759.91	5,612.09	6,448.99	7,293.90	8,146.89	9,008.02	45,191.93	6,455.99
Total cost	5,147.16	5,931.66	6,731.78	7,459.82	8,254.88	9,063.33	9,884.56	52,473.19	7,496.17
Helping Transition of Girls to Work									
Total Capital Cost	119.82	105.52	93.28	82.74	73.60	65.64	58.66	599.26	85.61
Total Recurrent Cost	5,524.60	7,101.41	8,759.90	10,341.29	13,533.45	15,397.56	17,302.58	77,960.79	11,137.26
Total cost	5,644.42	7,206.93	8,853.18	10,424.03	13,607.05	15,463.20	17,361.24	78,560.05	11,222.86
Encouraging Political Participation									
Total Capital Cost	4.90	3.30	2.37	1.79	7.41	1.19	0.98	21.94	3.13
Total Recurrent Cost	24.23	25.09	25.70	26.17	28.09	28.4	28.65	186.33	26.62
Total cost	29.14	28.39	28.08	27.96	35.50	29.58	29.62	208.27	29.75
Ending Violence Against Women									
Total Capital Cost	605.24	601.13	554.43	414.55	414.97	323.34	-	2,804.19	400.60
Total Recurrent Cost	4,913.38	5,837.44	6,645.25	7,420.13	8,142.07	8,809.99	9,325.73	51,093.99	7,299.14
Total cost	5,518.62	6,438.57	7,199.68	7,834.69	8,557.04	9,133.32	9,216.26	53,898.18	7,699.74
Systemic Issues									
Total Capital Cost	45.28	44.38	43.99	43.95	44.15	44.52	45.03	311.30	44.47
Total Recurrent Cost	5,974.92	7,561.50	9,190.59	10,863.30	12,580.73	14,343.91	16,153.90	76,668.85	10,952.69
Total cost	6,020.20	7,605.88	9,234.58	10,907.25	12,624.87	14,388.43	16,198.93	76,980.14	10,997.16
Supplementary Intervention									
Total	527.72	614.35	705.89	791.97	923.29	1,010.71	1,097.27	5,671.20	810.17
Total Supplementary	527.72	614.35	705.89	791.97	923.29	1010.71	1097.27	5,671.20	810.17
Total Capital Cost	2,000.27	1,926.08	1,813.76	1553.86	1,501.11	1,351.13	871.74	11,017.95	1,573.99
Total Recurrent Cost	20,359.26	26,645.92	31,835.89	36,932.58	43,732.21	49,130.63	54,453.40	263,089.89	37,584.27
Total BDT million	**24,005.24**	**29,186.34**	**34,355.54**	**39,278.40**	**46,156.61**	**51,492.47**	**56,422.41**	**280,897.01**	**40,128.14**
Total USD million	**350.95**	**426.70**	**502.27**	**574.25**	**674.80**	**752.81**	**824.89**	**4,106.68**	**586.67**
Per Capita BDT	**188.81**	**225.60**	**261.36**	**296.49**	**345.70**	**382.67**	**416.04**		**302.38**
Per Capita USD	**2.76**	**3.30**	**3.82**	**4.33**	**5.05**	**5.59**	**6.08**		**4.42**

CHAPTER 6

HEALTH

MDG GOAL 4
Reduce child mortality
MDG GOAL 5
Improve maternal health
MDG GOAL 6
Combat HIV/AIDS, malaria and other diseases

MDG Goal 4 - Reduce child mortality

Summary Statistics: MDG Goals, Targets, Indicators and Achievements

GOAL	TARGET	INDICATORS	BASE YEAR 1990-95	2005	2006	TARGET 2015	STATUS OF PROGRESS
GOAL4 REDUCE CHILD MORTALITY	**TARGET 5** REDUCE BY TWO-THIRDS, BETWEEN 1990 AND 2015, THE UNDER-FIVE MORTALITY RATE	UNDER-FIVE MORTALITY RATE	151	82	62	50	ON-TRACK
		INFANT MORTALITY RATE	94	56	45	31	ON-TRACK
		PROPORTION OF 1 YEAR OLD CHILDREN IMMUNIZED AGAINST MEASLES	54	69	87	100	ON-TRACK

Source: MDG Mid Term Progress Report, SVRS, BBS, Estimates

6.1 Overview of the health, nutrition and population sector

Bangladesh is the most densely populated country in the world with a population of 142 million people, 40 percent of whom live in poverty (BBS 2007a, HIES 2005). The Bangladesh National Strategy for Accelerated Poverty Reduction (NSAPR 2005) considers in particular the human dimensions of poverty (deprivation of health, education, nutrition, gender gaps) and commits the MoHFW to reach the poor and vulnerable, especially women and children. The Health and Population Sector Strategy (HPSS), which commenced in 1998, sets the stage to develop the SWAp and for the development of the Health and Population Sector Program (HPSP) which adopted some reforms to ensure improved and efficient service delivery. The main sectoral objectives of the HPSS were to maintain the momentum of efforts to lower fertility and mortality rates; reduce maternal mortality and morbidity; and reduce the burden of communicable diseases.

The current Health, Nutrition and Population Sector Program (HNPSP) outlines activities from 2003-2011, with objectives to improve health outcomes, reduce health inequities, enhance quality of care, modernize the GoB health sector, and attain the health related MDGs. This document has tried to incorporate MDGs (4, 5 and 6) targets, while offering slightly different targets for HNPSP. The Revised Program Implementation Plan (RPIP) of Health, Nutrition and Population Sector Program (HNPSP) 2003-2011, proposed a budget for the whole sector by dividing it into four sub-sectors: Health Program (HP), Nutrition Program, Population Program (PP) and Ministry Level Sector Development. Major Reproductive Health (RH) components are under HP and PP.

The Bangladesh Health and Family Planning Program is well-established with a vast network of infrastructure spread down to union and village level. Over a hundred thousand field staff of Health and Family Planning Program have been trained and are being re-oriented/retrained through decentralized in-service training program. There are mainly three levels of public health facilities which are: primary health care facilities located up to Upazila level; secondary healthcare facilities at District level; tertiary health care facilities including Medical College Hospitals (MCH); and super specialized care (specialized institutions). Despite this organized health systems the utilization of healthcare is still not up to the mark and challenges remain.

Health service delivery in Bangladesh basically involves three types of health care providers: public, for-profit private and not-for-profit private providers. At present the public sub-sector overwhelmingly dominate the sector and supply side financing has so far been the main strategy for improving the access of poor and vulnerable people to health services. Despite the availability of free or subsidized public health services universal access to modern healthcare could not be ensured. The country spends 3.2 percent of GDP on health and the per capita health expenditure is USD 12 and 65 percent of the total health expenditure is out-of-pocket spending by the households (NHA 2000).

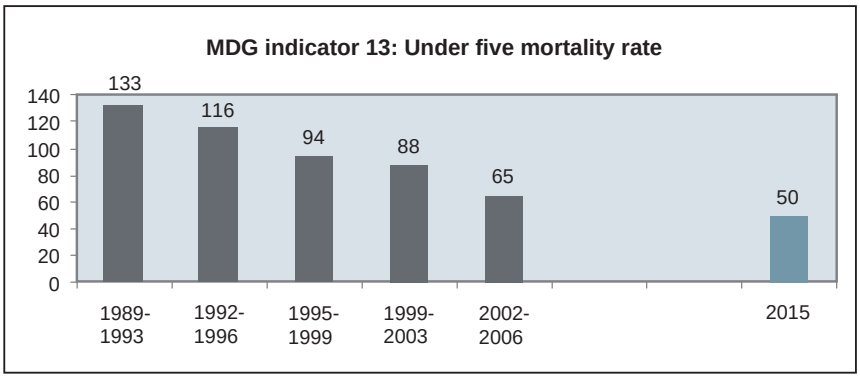
6.2 Progress in Achieving MDG 4

6.2.1 Under-five mortality rate

Bangladesh has achieved remarkable progresses in reducing the under-five mortality rate and infant mortality rate in the last two decades. The under five mortality decreased significantly from 133 to 94 per 1000 live births between 1989 and 1999 (BDHS 2007). The most common diseases among children under five were common cold/URI (19 percent), influenza (14 percent), diarrhea (13 percent), acute cough/bronchitis (10 percent) and fever (9 percent). A total of five percent of the children also suffered from immunizable diseases like measles, whooping cough, tuberculosis, poliomyelitis and tetanus (BBS 1999).

The reduction in under-five mortality rate from 2000 to 2003, compared to the earlier period, was not satisfactory (Figure 6.1). In these years the major causes of deaths among the children under five were possible serious infections[5] (31 percent), acute respiratory infection (21 percent), birth asphyxia (12 percent), diarrhea (7 percent) and prematurity/low birth weight (7 percent) (BDHS 2004).

Figure 6.1: Under Five Mortality Rate (per thousand live births)



Source: BDHS, SVRS

During 2003-2006 the under-five mortality rate reduced from 88 to 65 at a momentous rate of 4.3 percent per year. Given this situation, the under-five mortality rate will have to reduce at the rate of only 2.6 percent per year to attain the MDG target level, which is 50 per 1000 live births[6] , in 2015. Given this, Bangladesh is on track towards meeting the under-five mortality MDG target.

Table 6.1 indicates that for the period of 1986-1996 and 1993-2003 on average, male under-five mortality rates were higher than female under five mortality rates as male infants are naturally more vulnerable than female infants. However, during 1983-1993 and 1989-1999 the average under-five mortality rate was higher for girls than for boys possibly indicating the relative nutritional and medical neglect of female children (BDHS 2004).

The disaggregated data shows that the under-five mortality rate is considerably higher in rural areas than in urban areas. This might be due to poor access to health services in rural areas compared to urban areas. The rural urban variation was highest during 1983-1993 and gradually reduced afterwards (Table 6.1).

[5] Possible serious infections include ARI and diarrhea.
[6] According to SVRS the under five mortality was 151 per 1000 live births in 1991 and as it should reduce by two third by 2015, the MDG target is 50 per 1000 live births.

Table 6.1: Trends in under-five mortality by gender and location of the household

Gender/ Residence	Data Source (Reference Period)				
	BDHS 1993-94 (1983-1993)	BDHS 1996-97 (1986-1996)	BDHS 1999-00 (1989-1999)	BDHS 2004 (1993-2003)	BDHS 2007
Male	149.00	128.00	108.00	102.00	NA
Female	150.00	127.00	112.00	91.00	NA
Urban	114.30	96.20	96.70	92.00	NA
Rural	153.20	130.90	112.60	98.00	NA
National	**133.00**	**116.00**	**94.00**	**88.00**	**65**

Source: BDHS

There is also regional disparity in the under-five mortality rate. Sylhet division has experienced highest under-five mortality rate followed by Chittagong in all the survey periods apart from BDHS 1999-2000. Khulna division has the lowest under-five mortality rate in all reference periods (Table 6.2).

Table 6.2: The trends in under-five mortality by division (last ten years)

Division	Data Source (Reference Period)			
	BDHS 1993-1994 (1983-1993)	BDHS 1996-1997 (1986-1996)	BDHS 1999-2000 (1989-1999)	BDHS 2004 (1993-2003)
Barisal	146.50	119.50	108.70	92.00
Chittagong	166.70	131.30	109.90	103.00
Dhaka	157.10	130.70	115.10	99.00
Khulna	111.80	86.80	79.10	78.00
Rajshahi	134.70	126.20	100.90	86.00
Sylhet	NA	179.10	161.90	126.00
National	133.00	116.00	94.00	88.00

Source: BDHS

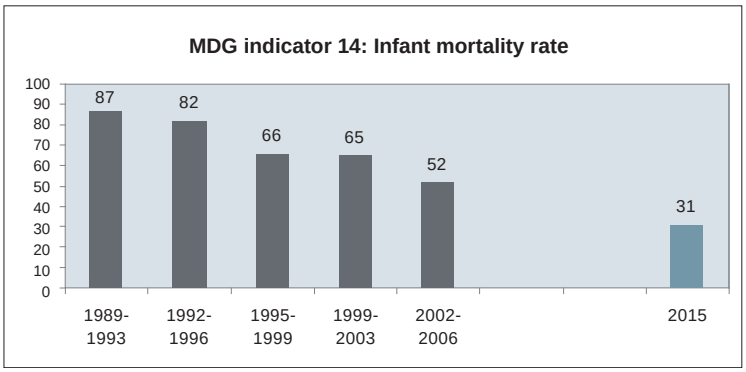
The under-five mortality rate is also associated with some high risk fertility behavior such as the mother's age, birth spacing and number of children in a family. Evidences show that under-five children have a higher probability of dying if they are born to mothers who are too young or too old, if they are born after a short birth interval, or if they are born to mothers with high parity (BDHS 2004).

A significant proportion of children in Bangladesh are still severely malnourished. This is an important determinant of under-five mortality. Among all children under five 43 percent of children were stunted and 16 percent severely stunted according to BDHS 2007. Evidences also show that 17 percent of children were wasted and three percent severely wasted. Weight for age results illustrate that 41 percent of the children were under weight, with 12 percent severely under weight (BDHS 2007).

6.2.2 Infant mortality rate

The Infant mortality rate (defined as mortality between zero to one year olds per thousand live births), in Bangladesh, like under-five mortality rate, also has decreased impressively from 1990 to 2006. Data on infant mortality is available from two sources, BDHS and SVRS. The infant mortality rate was 87 per 1000 live births in BDHS 1993-94 and it reduced to 66 per 1000 live births in BDHS 1995-1999 (Figure 6.2). General diseases among infants were the common cold (22 percent), diarrhea (16 percent), fever (12 percent), and influenza (11 percent). About seven percent of the infants were suffering from immunizable diseases and more than five percent has had measles (BBS 1999).

Figure 6.2: Infant Mortality Rate (per thousand live births)



Source: BDHS, SVRS

During 1995-2003 the infant mortality rate remained almost constant. The major causes of death among infants in this period were acute respiratory infection (ARI), diarrhea, birth asphyxia, and premature birth/LBW. A significant number of infants also died because of congenital abnormality and neonatal tetanus (BDHS 2004).

Similar to the trend of under-five mortality rate in Bangladesh, the infant mortality rate improved considerably in the period 2002-2006. Data from SVRS 2006 show that the infant mortality rate was 45 per 1000 live births in 2006, indicating that the trend of infant mortality rate is well on track to achieve MDG target of 31 per 1000 live births[7], in 2015.

[7] According to SVRS the infant mortality rate in Bangladesh was 94 per thousand live births, which should reduce by 67 percent between 1991 and 2015. Therefore the MDG target is 31 per thousand live births.

The data disaggregated by gender shows that, as expected, male children are more likely to die in infancy than female children. In all reference periods infant mortality rates were higher for boys than for girls (Table 6.3). The rural-urban variation in infant mortality rate is also evident from the analysis. The differences in infant mortality rate amongst divisions are large. Khulna division has the lowest levels of infant mortality rates while Sylhet division has the highest levels of infant mortality rates in all years. However the gap between the highest and lowest infant mortality decreased from 63 per 1000 live births in 1992-1996 to 39 per 1000 live births in 1999-2003 (Table 6.4).

Table 6.3: Trends in infant mortality rate by gender and location of the household

Gender/ Residence	Data Source (Reference Period)			
	BDHS 1993-94 (1989-1993)	BDHS 1996-97 (1992-1996)	BDHS 1999-00 (1995-1999)	BDHS 2004 (1999-2003)
Male	107	95	82	80
Female	93	84	77	64
Urban	81	73	75	72
Rural	103	91	81	72
Total	**101**	**90**	**80**	**NA**

Source: BDHS

Table 6.4: The trends in infant mortality rate by division

Division	Data Source (Reference Period)			
	BDHS 1993-94 (1989-1993)	BDHS 1996-97 (1992-1996)	BDHS 1999-00 (1995-1999)	BDHS 2004 (1999-2003)
Barisal	102	86	76	61
Chittagong	103	77	69	68
Dhaka	106	91	84	75
Khulna	89	75	64	66
Rajshahi	95	95	76	70
Sylhet	NA	138	127	100
Total	101	90	80	NA

Source: BDHS

The infant mortality rate, as the under-five mortality rate, is also highly correlated to mother's age, birth spacing and number of children in a family. Infant mortality is likely to be higher if the mothers are less than 18 years of age or over 34 years of age at the time of delivery. Birth spacing is negatively related to infant mortality rate and birth order is positively associated with infant mortality rate (BDHS 2004).

6.2.3 Child immunization against measles

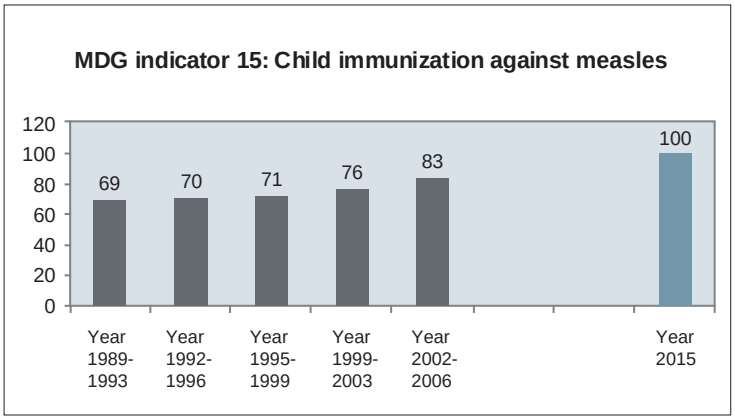
Bangladesh has improved significantly in childhood vaccination coverage, which is crucial for reducing infant and child morbidity and mortality. Under the government's Expanded Program on Immunization (EPI), children under one year of age should receive immunization for six vaccine-preventable diseases (tuberculosis; diphtheria, pertussis, and tetanus (DPT); poliomyelitis; and measles). Recently a Hepatitis B vaccine was also recommended as part of the immunization schedule in Bangladesh. This program has been highly successful in increasing the immunization coverage from less than one percent in 1981 to 84 percent in 2006 (MICS 2006).

The data shows an increasing trend of childhood vaccination coverage in the country from 1990 to 2006 except for the period 1992-96. The decline in the percentage of children age 12-23 months who received all vaccinations between BDHS 1993-94 to BDHS 1996-97 was due to drop in the polio vaccination from 67 in 1993-94 to 62 percent in 1996-97. 82 percent of Bangladeshi children aged 12-23 months[8] were fully immunized during 2002-2006, most of them by 12 months as recommended while 2 percent received no vaccination.

There are also significant regional variations in the proportion of childhood immunization. In the Barisal and Khulna divisions around 90 percent of children received all vaccines, while in Sylhet only 71 percent children were immunized in 2002-2006.

According to MDG indicator 15, all children should be immunized against measles by 2015. Evidence shows that there has been significant improvement in immunization against measles in recent years. The proportion of children vaccinated to protect against measles increased from 76 percent during 1999-2003 to 83 percent during 2002-2006 (Figure 6.3).

Figure 6.3: Child immunization against measles



Source: BDHS

Evidence shows that the proportion of children immunized against measles is higher in urban areas than in rural areas for all years from 1989 to 2006 but that this urban-rural disparity is improving over time (Table 6.5).

Table 6.5: Trends in percentage of children age 12-23 months who have received vaccination for measles by gender and location of the household

Residence	Data Source (Reference Period)				
	BDHS 1993-1994 (1989-1993)	BDHS 1996-1997 (1992-1996)	BDHS 1999-2000 (1995-1999)	BDHS 2004 (1999-2003)	BDHS 2007 (2002-2006)
Male	72.50	71.90	73.20	75.60	82.10
Female	65.10	67.80	68.20	75.70	84.00
Urban	77.90	79.70	80.70	82.80	87.60
Rural	67.80	69.10	68.90	73.90	81.60
Total	**69.00**	**70.00**	**71.00**	**76.00**	**83.00**

Source: BDHS

[8] Both the BDHS and MICS collected data on vaccination coverage of children aged 12-23 months. However no data is available for the children less than one year. The TWG decided to use the BDHS data.

Data disaggregated by division shows that Barisal (90 percent) experienced the highest rate of childhood immunization against measles, followed by Khulna (89.6 percent). On the other hand only 73 percent of children received immunization against measles in the Sylhet division (Table 6.6).

Table 6.6: The trends in percentage of children age 12-23 months who have received vaccination for measles by division

Division	Data Source (Reference Period)				
	BDHS 1993-1994 (1989-1993)	BDHS 1996-1997 (1992-1996)	BDHS 1999-2000 (1995-1999)	BDHS 2004 (1999-2003)	BDHS 2007 (2002-2006)
Barisal	81.20	77.50	70.20	77.30	90.20
Chittagong	63.20	65.50	77.20	77.10	79.60
Dhaka	60.70	64.80	65.90	72.00	83.30
Khulna	85.40	87.10	81.00	86.60	89.60
Rajshahi	77.30	74.90	70.40	77.00	86.10
Sylhet	NA	56.00	58.20	66.30	73.10
Total	**69.00**	**70.00**	**71.00**	**76.00**	**83.00**

Source: BDHS

6.3 The challenges ahead in achieving MDG 4

- The nutritional status of children and women in Bangladesh is very poor and needs special attention in order to improve the overall health status of the population. Despite various interventions designed under National Nutrition Program (NNP), the low birth weight and malnutrition continue to be important causes of infant and under-five mortality. Significant proportions of pregnant women are also iodine deficient and develop night blindness during pregnancy.

- According to BDHS (2007) the under five mortality was 65 per thousand live births during 2002-2006, and the neonatal mortality was 37 per thousand live births in the same period. Clearly, under five mortality can be reduced significantly if the country can reduce the high neonatal mortality, which is one of the major challenges of current health sector strategies against specific causes of neonatal deaths, for example birth asphyxia or neonatal infection.

- Safe delivery is very important for reducing child mortality. But the proportion of institutional delivery and births attended by skilled health personnel is very low in the country.

- Drowning is an important cause of childhood mortality in Bangladesh and strategies should be developed to reduce the incidence of injuries and drowning among children.

6.4 Major Interventions and Targets for attaining MDG 4

This section describes the key interventions for reducing child mortality in Bangladesh.

6.4.1 Expanded Program on Immunization (EPI)

The specific objectives of this Program were to increase the vaccination coverage with full series of routine EPI vaccines to 90 percent by 2010; to achieve neonatal tetanus elimination in all districts; and to reduce the prevalence of HepB chronic infection by 80 percent by 2010 among three to five years old children compared to pre-vaccination era (MIS 2007). According to BDHS, the vaccination coverage for BCG was 97 percent, DPT was 91 percent, Polio was 91 percent, Hepatitis B was 83 percent, and Measles was 83 percent during 2002-2006. The coverage in 2007, calculated using the trends and the corresponding figures, were 98 percent, 94 percent, 93 percent, 84 percent, and 85 percent respectively. It is expected that the Hib vaccine will be provided with DPT and HepB (pentavalent vaccine) from 2009 (EPI data 2008). The target set by the TWG was 100 percent coverage for all vaccines by 2015 (Table 6.7).

6.4.2 Integrated Management of Childhood Illness (IMCI)

To reduce infant and under five child mortality, the government has started the Integrated Management of Childhood Illness (IMCI)[9] programme in 2001 in three Upazilas. In 2007, the IMCI was expanded to 274 Upazilas. The main objectives of this program were to reduce morbidity and mortality associated with major causes of diseases in under-five children and to promote healthy growth and development by preventing diseases and promoting healthy practices (MIS 2007). Under the Program, clinical management training is provided to doctors and paramedics. Other interventions under this program included: facilitator training for the doctors; IMCI training for basic health workers and village doctors; training on Control of Diarrhoeal Diseases (CDD) and Acute Respiratory Infection (ARI) in the non IMCI area; and counseling training for community-based health volunteer. So far, 1704 doctors, 4510 paramedics, 1600 basic health workers and 1800 village doctors have been trained under this program (MIS 2007). The Second PRSP suggested increasing the use of IMCI at union level.

6.4.3 Treatment of Diarrhea and ARI

Dehydration from diarrhoea is an important contributing cause of childhood mortality. The estimated number of deaths due to diarrhea was about 250,000 per year in the late 1980s. The innovation and widespread use of ORT (Oral Rehydration Therapy) with either oral rehydration salts (ORS) or home fluids have greatly reduced the diarrhea-related mortality and the number of deaths due to diarrhea was 45,000 in 2004 (HNPSP 2008). The coverage of ORT was around 80 percent in 2007 (BDHS). The target set by the study/TWG was 100 percent coverage by 2015.

6.4.4 Treatment of ARI and fever

Data from BDHS 2007 also show that about 40 percent of children under-five had fever and around 21 percent suffered from acute respiratory infection. The current coverage of ARI is only 20 percent. About 70 percent of the ARI cases can be managed by the community-based case management through an increase in early detection and modern treatment. Thus the coverage should be increased to 50 percent by 2011 (HNPSP 2008). The National Task Force for MDGs 1, 4 and 5 in Bangladesh also set target of 50 percent coverage for 2015. The TWG used the target coverage of 50 percent for the costing exercise.

6.4.5 Micronutrient Supplementation

The objective of the micronutrient supplementation program is to reduce the micronutrient deficiencies of vulnerable groups like children, women and adolescent. The vitamin A is an important micronutrient and high levels of vitamin A deficiency can cause night blindness among children as well as increase severity of other illnesses like measles and diarrhea. Under the Nutrition Blindness Prevention Programme (NBPP) children under one year are provided high potency vitamin A capsule during measles vaccination. Children aged on

[9] WHO and UNICEF have developed the strategy of Integrated Management of Childhood Illness (IMCI) in the early nineties and promoted in more than 100 developing countries to reduce childhood morbidity and mortality and for promoting healthy growth and development.

to five years are also given vitamin A capsule supplementation twice a year through national event (MIS 2007). Vitamin A supplementation program in Bangladesh has been highly successful for the children aged one to five years and the coverage of this group was about 91 percent in 2007. However, vitamin A supplementation among children age 9-11 months was only 47 percent (BDHS 2007). The TWG decided to attain universal coverage of vitamin A supplementation, for both the groups, by 2015.

6.4.6 Skilled birth attendant during delivery and postnatal care

Only 18 percent of newborns received care from a trained provider within two days of birth, and the coverage should increase substantially to reduce the incidence of birth asphyxia, low birth weight (LBW)/prematurity of the newborn, and sepsis (BDHS 2007). The MDG target is to increase the coverage to 50 percent by 2015 and the TWG used the same target in the costing exercise.

6.5 Resource Needs Estimates for MDG 4

The study used the "Integrated Health Systems Model" developed by the UN Millennium Project to estimate the resource requirement of attaining MDGs 4, 5 and 6, including health systems. Costs of direct interventions, including expenditure on drugs and medical supplies, were calculated for child health, maternal health, tuberculosis, malaria and HIV/AIDS separately. Costs of indirect interventions, including costs of infrastructure and human resources (health systems), were estimated jointly for MDGs 4, 5 and 6.

To conduct the costing exercise 2007 was selected as the base year by the TWG as most data were available for that year. Data on the coverage/utilization of the direct interventions in 2007 among the target/coverage population were taken from survey reports, plans, strategies and journal articles. Information was also collected through health personnel and other stakeholders' interview. As already mentioned in section 6.4 the targets for the interventions were set following the MDG targets, HNPSP and PRSP targets for 2011, and Action Plan of National Task Force on MDGs 4 and 5. In some cases, it was discussed and decided in the TWG meeting (Table 6.7).

Table 6.7: Coverage, target and unit cost of major interventions for attaining MDG 4

Interventions	Coverage in 2007 (%)	Target coverage in 2015 (%)	Unit/Average cost (BDT)
Childhood immunization and nutrient supplementation			
BCG	98	100	8
DPT	94	100	36
Polio	93	100	30
Measles	85	100	18
Hepatitis B	84	100	60
Vitamin A	90	100	7.5
Treatment of diarrhea - children < 1 yr	82	100	130
Treatment of diarrhea - children > 1 yr	86	100	100
Treatment of ARI - children < 1 yr	22	50	1,460
Treatment of ARI - children > 1 yr	30	50	2,000

For the MDG4 (specifically on direct costs), the coverage population for the group of interventions improving child health was the total number of children aged one to five years (13,803,507) and total number of children age less than one year (2,792,678) in 2007 (BBS 2007). The corresponding coverage, in 2015, will be 18,057,358 and 3,123,376 respectively.

Table 6.8 shows the yearly resource needs estimates to reduce child mortality by specific interventions. Here the interventions are mainly divided into two groups, one for the children aged less than one year and the other for the children aged 1-5 years. According to the model a total of BDT 322,639 million should be invested on child health interventions during 2009-2015. Most of the resources are needed for the primary and referral care of ARI, diarrhea and fever among the children aged less than one year and one to five years.

The total number of children aged one to five years was almost seven times higher than the total number of children aged less than one year, and consequently, as according to the Integrated Health Model, about 15 percent of the fund should be spent to improve the health of the children aged less than one year and 85 percent on the children aged one to five years. The results show that the estimated allocation needed for ARI is BDT 48,877 million, diarrhea is BDT 92,971 million, fever is BDT 109,722 million, and bacterial infection is BDT 14,091 million (Table 6.8).

Table 6.8: Yearly resource needs estimates for attaining MDG 4 by specific interventions

(in million BDT)

Interventions	2009	2010	2011	2012	2013	2014	2015	Total	% of total
Child Health (1-5 years) -Primary care									
ARI	2,236	3,306	3,761	3,851	3,941	4,033	4,242	25,370	7.80
Diarrhea	5,782	7,924	8,277	8,474	8,674	8,876	9,336	57,343	17.80
Fever	6,502	9,971	11,666	13,437	15,281	15,637	16,446	88,940	27.50
Measles	408	645	769	900	1,036	1,179	1,240	6,177	1.90
Ear infection	1,012	1,442	1,553	1,705	1,825	1,949	2,136	11,622	3.60
Malnutrition	1,323	1,804	2,110	2,377	2,654	2,830	2,976	16,074	4.90
Anemia	432	580	713	851	996	1,145	1,339	6,056	1.90
Child Health (1-5 years) -Referral care									
ARI	1,734	2,812	3,544	3,671	3,774	3,879	4,093	23,507	7.30
Diarrhea	1,314	1,848	2,016	2,148	2,275	2,407	2,582	14,590	4.50
Fever	1,265	2,111	2,596	3,110	3,654	3,848	4,198	20,782	6.40
Malnutrition	291	406	485	559	637	693	744	3,815	1.20
Anemia	81	124	171	227	292	367	446	1,708	0.50
Child Health (<1 years) -Primary care									
Bacterial infections	1,345	1,507	1639	1,820	1,967	2,123	2,353	12,754	3.90
Diarrhea	1,765	1,868	1976	2,136	2,304	2,431	2,585	15,065	4.60
Feeding problems (Low birth weight)	915	1,083	1175	1,274	1,377	1,487	1,647	8,958	2.80
Child Health (<1 years) -Referral care									
Bacterial infections	113	148	176	181	211	237	271	1,337	0.40
Diarrhea	584	665	750	844	948	1,039	1,143	5,973	1.80
Childhood immunization and nutrient supplementation	286	309	334	365	402	427	445	2,568	0.80
Total (in BDT)	**27,390**	**38,548**	**43,714**	**47,929**	**52,247**	**54,589**	**58,224**	**322,639**	**100.00**
Total (in USD)*	**400.40**	**563.50**	**639.10**	**700.70**	**763.80**	**798.10**	**851.20**	**4,716.90**	
Per capita (in BDT)	186.80	259.20	289.80	313.40	337.10	347.00	365.30		
Per capita (in USD)*	2.73	3.78	4.24	4.58	4.93	5.07	5.34		

* 1 USD = 68.4 BDT

The required per capita expenditure on drugs and other supply related interventions for improving child health is USD 2.73 in 2009. The per capita resource invested on child health need to be increased gradually to USD 5.34 in 2015 as both the coverage population and the target utilization rate will increase, during 2009-2015, to attain the MDG4 targets and indicators (Table 6.8).

The estimated resource needs are much higher than current spending on child health. The estimated allocation for 2008-2011 under HNPSP is BDT 9,574 million. According to the Second Revised Program Implementation Plan 2003-2011, the estimated allocation for 2008-2011 is BDT 216 million for IMCI; BDT 335 million for CDD; and BDT 5,845 million for routine EPI. However, these figures represent only public expenditure on health and exclude the huge household healthcare expenditure, which is about 65 percent of the total health expenditure in Bangladesh.

MDG Goal 5 - Improve maternal health
Summary Statistics: MDG Goals, Targets, Indicators and Achievements

GOAL	TARGET	INDICATORS	BASE YEAR 1990-95	2001	2006	TARGET 2015	STATUS OF PROGRESS
GOAL5 IMPROVE MATERNAL HEALTH	**TARGET 6** REDUCE BY THREE QUARTERS, BETWEEN 1990 AND 2015, THE MATERNAL MORTALITY RATIO	MATERNAL MORTALITY RATIO	574	320	290	143	NEEDS ATTENTION
		PROPORTION OF BIRTHS ATTENDED BY SKILLED HEALTH PERSONNEL	5	12 (2005)	20	50	NEEDS ATTENTION

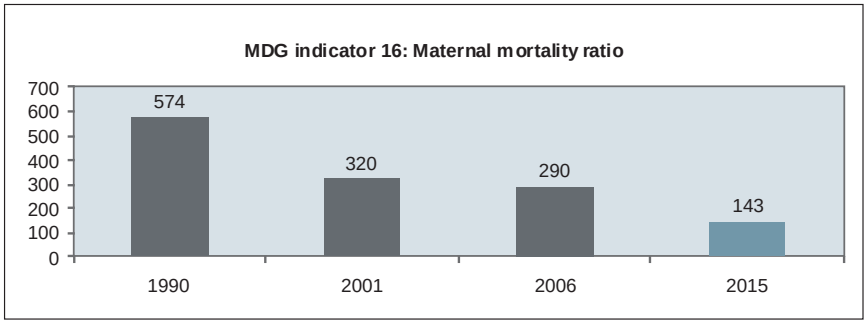
Sources: MDG Mid term Progress Report 2007, BBS, BDHS, SVRS

6.6 Progress in Achieving MDG5

6.6.1 Maternal Mortality Ratio

The government of Bangladesh has attached the utmost emphasis to rapidly improve maternal health, by way of drastically increasing use of modern health care among all segments of the population. Reflecting this priority, there has been some success in making progress on some of the MDG indicators. According to MDG5, the maternal mortality ratio should be reduced by three-quarters between 1990 and 2015. In Bangladesh maternal mortality ratio has reduced from 574 per 100,000 live births in 1991 to 320 per 100,000 live births in 2001 (Figure 6.4). In 2006 the estimated maternal mortality ratio was 290 per 100,000 live births (UNFPA). However, currently the maternal mortality ratio is expected to be higher than 290 because of recent floods and cyclones. Further, this rate also does not include the abortion related deaths.

Figure 6.4: Maternal mortality ratio (per 100,000 live births)



Source: SVRS, BDHS, UNFPA

Yet the trend in the maternal mortality ratio shows that the country is more or less on track to meet the target of 143 per 100,000 live births, by 2015.The decrease in maternal mortality ratio between 1990 and 2006 might be due to the increase in the rate of pregnant mothers receiving antenatal care and tetanus toxoid vaccine from 1990 to 2006 as this reduces the risks for the mother and child during pregnancy and at delivery. The proportion of pregnant mother who received at least one ANC and who received it from medically trained providers (doctor/nurse, trained midwife) almost doubled (28 percent in 1989-92 to 49 percent in 2002-06) in this period. The mothers, who received two or more tetanus toxoid vaccines during pregnancy increased from 49 percent in 1990-93 to 64 percent in 2002-06.

The most common maternal complications experienced by the pregnant mothers are prolonged labour, hemorrhage/excessive bleeding, foul-smelling discharge with fever, convulsion/eclampsia and retained placenta. The results of the BDHS 2004 and BDHS 2007 show that the proportion of women with at least

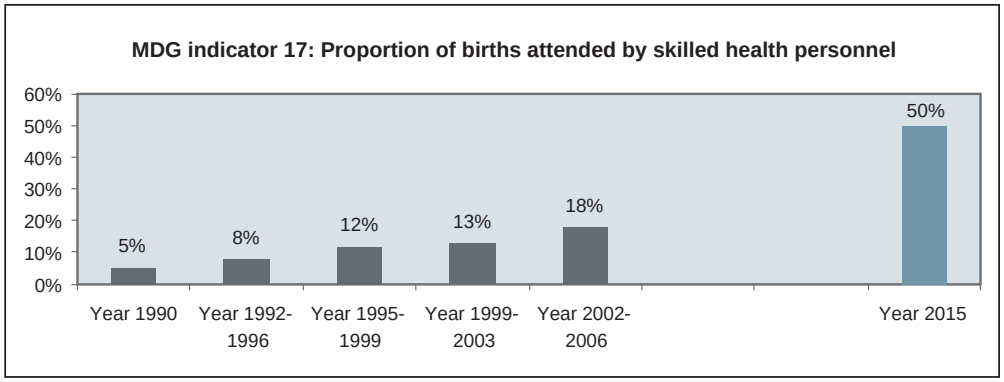
one of the above complications around the time of delivery reduced significantly from 26 percent in 2004 to 14 percent in 2007.

6.6.2 Births attended by skilled health personnel

Approximately 85 percent of childbirth delivery takes place in the home in Bangladesh. The proportion of births delivered at health facility increased from four percent in 1989-93 to 15 percent in 2002-2006. Institutional deliveries in Bangladesh increased significantly in the last three years compared to the progress in earlier years. However, there are high rural-urban variations and regional disparities in institutional deliveries. According to BDHS 2007 the birth delivered at facilities was three times higher in urban area than that in rural area. The proportion of institutional deliveries was highest in Khulna followed by Dhaka and Chittagong.

Proportion of assistance during delivery by medically trained providers was only five percent in 1990 and it increased to 18 percent in the period 2002-2006, at an annual average rate of 16.25 percent. This is still considerably lower than the MDG target, which is 50 percent, in 2015 (Figure 6.5).

Figure 6.5: Proportion of births attended by skilled health personnel



Source: BDHS

If the proportion of deliveries attended by skilled health personnel increases at the current rate then Bangladesh will not be able to achieve the MDG target. The required annual average growth rate is equal to 19.75 percent. Moreover, in addition to qualified doctors, the medically trained providers include trained nurses, midwives, paramedics, family welfare visitors (FWV), and CSBAs; who are not trained to prevent many of the obstetric complications. In Bangladesh steps should be taken to significantly increase institutional deliveries in order to improve maternal health to a satisfactory level.

The statistics show that the proportion of deliveries assisted by skilled health personnel is considerably higher in urban areas than that in rural areas. 35 percent of deliveries were attended by medically trained providers in urban area and only seven percent in rural area during 1991 to 1993. In the period of 2002-2006 the corresponding figures were 37 percent and 13 percent respectively. It indicates an improving trend in number of deliveries attended by skilled health personnel in rural area as compared to urban area while also recognizing that the numbers are still low in both areas (Table 6.9).

Table 6.9: The trends in percentage of delivery assisted by medically trained personnel by location of the household

Residence	Data Source (Reference Period)				
	BDHS 1993-94 (1991-1993)	BDHS1996-97 (1992-1996)	BDHS1999-00 (1995-1999)	BDHS 2004 (1999-2003)	BDHS 2007 (2002-2006)
Urban	34.70	34.70	33.00	29.40	36.60
Rural	6.70	5.60	8.00	9.20	13.20
Total	**9.80**	**8.00**	**12.10**	**13.20**	**18.00**

Source: BDHS

Table 6.10 shows the trends in percentage of deliveries assisted by medically trained personnel by the divisions. The regional disparity is very high in terms of assistance during delivery. The proportion of births attended by skilled health personnel in Khulna division is 26.6 percent which is about 2.5 times higher than that in Sylhet division having only 10.9 percent childbirth delivery assisted by medically trained personnel. Further, only 13.4 percent childbirth deliveries in Barisal division and 15.4 percent childbirth deliveries in Rajshahi division are assisted by medically trained providers.

Table 6.10: The trends in percentage of delivery assisted by medically trained personnel by division

Division	Data Source (Reference Period)				
	BDHS 1993-94 (1991-1993)	BDHS1996-97 (1992-1996)	BDHS1999-00 (1995-1999)	BDHS 2004 (1999-2003)	BDHS 2007 (2002-2006)
Barisal	7.20	8.50	10.50	11.40	13.40
Chittagong	8.20	7.80	11.80	11.70	18.50
Dhaka	13.10	9.10	12.30	14.90	19.80
Khulna	11.80	14.30	19.20	21.20	26.60
Rajshahi	6.00	4.90	10.30	10.60	15.40
Sylhet	NA	5.20	9.30	11.10	10.90
Total	**9.80**	**8.00**	**12.10**	**13.20**	**18.00**

Source: BDHS

6.7 The challenges ahead in achieving MDG5

- Despite various initiatives undertaken by the Government, improvement in number of births attended by skilled health personnel is not satisfactory. About 85 percent of deliveries still take place at home and the proportion of those receiving assistance during delivery by medically trained providers was only 18 percent in the period 2002-2006. Rapid training of skilled health personnel, increase in infrastructure and cautious monitoring are needed if the country is to reach the MDG target by 2015.

- The availability of comprehensive EmOC services in public health facilities, especially at district level and below, is also not up to the target level. One important intervention of the Maternal Health Strategy 2001 was to train medical officers in obstetrics or anaesthesia (one year diploma level or four months EmOC training) and place them in functional teams at District and Upazila facilities. So far 206 obstetricians and 118 anaesthetists have been trained. Moreover, only 57 percent of the obstetricians and 69 percent of the anaesthetists are appointed in designated positions. There is also frequent failure to retain both the obstetricians and the anaesthetists to perform caesarian

sections in a facility due to variety of reasons (MTR 2008). The Government should take steps to overcome this problem by giving special emphasis to reducing absenteeism in rural areas.

- The lack of reliable data on maternal morbidity and the low level of care seeking increase the burden of maternal complications and unsafe delivery. The problem is exaggerated by high cost of treatment of fistula which is an important cause of lifelong disability if not treated properly.
- Misperceptions regarding the need for care and social barriers contribute to low levels of demand for maternal and child care in Bangladesh. Effective health education programs are needed to increase the demand for modern healthcare.
- About 64 percent of total healthcare expenditure in Bangladesh is out-of pocket expenditure by households. This huge household spending is mainly related to expenditure on drugs, diagnostic tests and transport to facilities. Demand side financing schemes, which subsidize these costs, can increase the utilization of healthcare by women and children, who are usually the non-earning members in the family, and also by the poor.

6.8 Major Interventions and Targets for attaining MDG5

This section describes the key interventions for improving maternal health in Bangladesh.

6.8.1 Antenatal Care

Antenatal care is an essential intervention for reducing risk of morbidity and mortality during pregnancy and vital to the health and well-being of pregnant mothers and their infants. WHO recommends a minimum of four antenatal visits during pregnancy with care provided by skilled health personnel (doctors, nurses, or midwives). In Bangladesh, skilled health personnel include doctors, nurses/midwives, community skilled birth attendants (CSBAs) or medical assistants/SACMO (BDHS 2007). According to the WHO guidelines, the content of the antenatal care visits should include blood pressure measurement, urine testing for bacteriuria and proteineuria, blood testing to detect syphilis, severe anemia and weight/height measurement (optional) (UN 2008). The proportion of pregnant mothers seeking at least one antenatal care visit has gradually increased from 26 percent in 1991-1993 to 52 percent in 2002-2006. Only 21 percent of women made four or more antenatal visits in 2007, far below the target of universal coverage. The UN Joint Maternal and Neonatal Health (MNH) Program has set a target of 60 percent antenatal coverage (four visits) for 2011(HNPSP 2008). The research used the same target for 2011 and then increased the target gradually to 100 percent coverage in 2015.

6.8.2 Skilled birth attendance during delivery

Assistance by medically trained personnel during delivery is a key intervention for reducing both maternal and neonatal mortality. Only 18 percent of births in the country were attended by skilled health personnel during 2002-2006. This very low level of trained provider assisted delivery is one of major obstacles in attaining MDG5 and coverage should increase substantially for safe home delivery and appropriate referral care. The target set in the second PRS is to increase coverage of skilled birth attendants during delivery to 35 percent in 2011. The MDG target is to increase the coverage to 50 percent by 2015 and the study/TWG used the same targets to estimate resource requirements of this essential intervention.

6.8.3 Basic and Comprehensive emergency obstetric care (EmOC)

Availability of basic and comprehensive emergency obstetric care at the facility level is also very important for achieving MDG5. According to the guideline jointly developed by WHO, UNICEF and UNFPA, there should be four facilities offering basic[10] and one facility offering comprehensive emergency obstetric care[11] for every 500,000 people (UNFPA 2008). Currently, CEmoc is provided at district and upper level facilities with very limited access in Upazila level. The government should strengthen the existing facilities to provide EmOC and increase coverage in public and not-for-profit private health facilities, specially in all UHCs, in order to achieve MDG 4 and 5.

6.8.4 Treatment of other maternal complications

The results of the national maternal mortality survey show that maternal complications like haemorrhage and eclampsia are the major causes of maternal deaths in Bangladesh (NIPORT 2003). Proper and timely treatment of these maternal complications can significantly reduce maternal mortality ratio in Bangladesh. During 2002-2006, only 43 percent of the women, who suffered from haemorrhage around delivery time, sought care from a medically trained provider. The treatment coverage for eclampsia and prolonged labor was 56 percent and 51 percent respectively during the same period (BDHS 2007). The target coverage of these treatment interventions of maternal complications was set at 100 percent in 2015.

6.8.5 Family planning

The contraceptive prevalence rate for currently married women in Bangladesh was about 56 percent in the period of 2002-2006. The most common methods of family planing were oral pills (28.5 percent), injectables (7 percent), female sterilization (5 percent) and male condom (4.5 percent) (BDHS 2007). The HNPSP aims to reduce total fertility rate (TFR) from 3.3 to 2.2 per women and to increase CPR from 56 percent to 72 percent by 2011 (HNPSP 2008). The study/TWG set the same target for 2011 and slightly increased the target to 80 percent in 2015.

6.8.6 Demand Side Financing (DSF)

Some major constraints for improved maternal healthcare is the cost of delivery, the fear of costs (especially for a complicated delivery), and the inability to find money when needed. The Health, Nutrition and Population Sector Program (HNPSP) identified demand side approaches as a means to increase access of the poor to health services particularly maternal health services. With this aim the Ministry of Health and Family Welfare (MOHFW) has embarked on piloting a DSF scheme initially in 21 Upazilas and recently the pilot has been expanded to 12 more upazilas. Under this scheme, eligible pregnant women (means tested) are entitled to receive 3 ANC (BDT 150), safe delivery (BDT 750) including c-section (BDT 6000) and complication management (BDT 2000) and 1 PNC (BDT 50). In addition cash benefits are provided including BDT 500 for transport, BDT 500 for nutritious food and other items and BDT 500 for referral. Designated providers get reimbursed upon providing the designated services to the voucher holders (MIS 2008 and DGHS).

[10] Basic emergency obstetric care (BEmOC) includes administration of antibiotics, oxytocics, and anticonvulsants, manual removal of placenta, removal of retained products following abortion, and assisted vaginal delivery (UNFP 2008).
[11] Comprehensive emergency care (CEmOC) includes caesarean section and safe blood transfusion in addition to all BEmOC.

Coverage and Targets for Major interventions for attaining MDG5 are shown in Table 6.11.

Table 6.11: Coverage, target and unit cost of major interventions for attaining MDG 5

Interventions	Coverage in 2007	Target coverage in 2015	Unit/Average cost (BDT)
Antenatal care (four visits)	21%	100%	500
Skilled attendance at birth	18%	50%	1200
Postpartum care	18%	50%	1500
Prolonged labor	51%	100%	2500
Forceps or vaccume assisted delivery	80%	100%	1500
Cesarean section	70%	100%	3500
Postpartum hemorrhage	43%	100%	1500
Maternal puerperal sepsis	50%	100%	1200
Eclampsia/convulsion	56%	100%	1000
Post abortion complications	43%	100%	1200

6.9 Resource Needs Estimates for MDG 5

As explained in Section 6.5 above the 'Integrated Health Systems model' used for the costing of health related interventions to achieve MDGs 4, 5 and 6. For MDG-5, specifically on direct costs, the number of currently married women was 28,265,608 in 2007 and this was the coverage population for the set of interventions on improving maternal and reproductive health. As estimated the coverage will increase to 33,192,662 in 2015.

The results of the study show that a total of BDT 126,450 million should be spent on a range of interventions for improving maternal health during 2009-2015. The disaggregated data on resource needs estimates for each of maternal health interventions show that the major expenditure items are family planning (BDT 21,093 million), skilled birth attendance during delivery (BDT 11,247 million), postpartum care (BDT 13,853 million), and treatment of STDs (Table 6.12).

In case of all the drug and supply related interventions aiming to improve maternal and reproductive health, except for the long-term family planning methods, the estimated per year expenditure flow show increasing trend in resource requirements during the period of 2009 and 2015. The length of use of the long term family planning methods usually is more than three years and therefore, the yearly estimated cost of it is lowest (BDT 277 million) in 2012 (Table 6.12).

The required per capita expenditure on maternal and reproductive health interventions is USD 1.1 in 2009 and it will slowly go up to USD 2.2 in 2015 to achieve the MDG 5 targets and indicators (Table 6.12).

Table 6.12: Yearly resource needs estimates for attaining MDG 5 by specific interventions

(in million BDT)

Interventions	2009	2010	2011	2012	2013	2014	2015	Total	% of total
Family planning - short term methods	1,848	2,103	2,386	2,655	2,970	3,208	3,426	18,596	14.70
Family planning - long term methods	301	328	357	277	345	372	517	2,497	1.90
Antenatal care (exl. IPT)	631	816	1,013	1,222	1,445	1,681	1,987	8,795	6.90
Antenatal care - IPT for malaria	152	192	251	314	383	457	536	2,285	1.80
Skilled attendance at birth	964	1,097	1,338	1,592	1,896	2,089	2,271	11,247	8.90
Postpartum care	1,181	1,417	1,673	1,945	2,241	2,558	2,838	13,853	10.90
Prolonged labor	339	357	410	466	527	586	624	3,309	2.60
Forceps or vaccume assisted delivery	113	122	132	142	153	163	170	995	0.80
Cesarean section	286	317	351	387	425	444	463	2,673	2.10
Postpartum hemorrhage	122	130	152	177	208	243	267	1,299	1.00
Maternal puerperal sepsis	139	142	160	179	200	222	245	1,287	1.00
Eclampsia/convulsion	42	43	47	53	59	66	76	386	0.30
Post abortion complications	83	86	100	118	135	152	172	846	0.70
Obstetric fistula	597	704	743	719	681	575	476	4,495	3.50
Urinary track infection	425	510	597	695	796	818	834	4,675	3.70
Mastitis	91	117	144	174	205	237	268	1,236	0.90
Gonoria	679	843	1,015	1,205	1,404	1,610	1,647	8,403	6.60
Syphilis	1,494	1,855	2,233	2,651	3,088	3,543	3,624	18,488	14.60
Trichomonas	688	854	1,028	1,221	1,423	1,632	1,669	8,515	6.70
Pelvic Inflammatory disease	1,012	1,255	1,510	1,795	2,095	2,409	2,471	12,547	9.90
Total (in million BDT)	**11,191**	**13,291**	**15,643**	**17,992**	**20,681**	**23,068**	**24,584**	**126,450**	**100.00**
Total (in million USD)*	**163.61**	**194.31**	**228.70**	**263.04**	**302.35**	**337.25**	**359.42**	**1,848.68**	
Per capita (in million BDT)	76.30	89.40	103.70	117.67	133.42	146.64	154.22		
Per capita (in million USD)*	1.10	1.30	1.50	1.70	1.90	2.10	2.20		

* 1 USD = 68.4 BDT

The estimated resource need for drug and supply related interventions for achieving the MDG 5 is also much higher than the current allocation of resources for the same sub-sector. The estimated allocation for 2008-2011 under HNPSP is BDT 3096 million for reproductive health under ESP, BDT 4,020 million for clinical contraception service delivery, BDT 7,845 million for family planning health service delivery, and BDT 4994 million for maternal, child and reproductive health services under DGFP (HNPSP 2008). However, these figures only include the public health expenditures and exclude the significant household out-of-pocket spending.

MDG Goal 6 - Combat HIV/AIDS, malaria and other diseases
Summary Statistics: MDG Goals, Targets, Indicators and Achievements

GOAL	TARGET	INDICATORS	BASE YEAR 1990-95	2005	2007	TARGET 2015	STATUS OF PROGRESS
Goal 6 Combat HIV/AIDS, malaria and other diseases	**TARGET 7:** HAVE HALTED BY 2015 AND BEGUN TO REVERSE THE SPREAD OF HIV/AIDS	HIV PREVALENCE (PER 100,000 POPULATION)	0.005	0.173	0.319	HALTING	LOW PREVALENCE
		CONDOM USE RATE OF CPR	4.30 (1999)	4.20 (2004)	4.50	-	LOW USE
	TARGET 8: HAVE HALTED BY 2015 AND BEGUN TO REVERSE THE INCIDENCE OF MALARIA AND OTHER MAJOR DISEASES	PREVALENCE OF MALARIA(PER 100,000 POPULATION)	43.00 (2000)	34.00	35.00	HALTING	ON-TRACK
		PREVENTION OF MALARIA (DEATH) (PER 100,000 POPULATION)	0.37 (2000)	0.34	0.17	HALTING	ON-TRACK
		PREVALENCE OF TB(PER 100,000 POPULATION)		406	391	HALTING	ON-TRACK
		PREVENTION OF TB (DEATH)(PER 100,000 POPULATION)		47.00	45.00	HALTING	ON-TRACK

Sources : MDG Mid term Progress Report 2007, BBS, BDHS, SVRS

6.10 Progress in Achieving MDG 5

6.10.1 HIV/AIDS prevalence rate

The first case of HIV/AIDS in Bangladesh was detected in 1989 and the estimated total number of HIV positive people was 7,500 in 2006. With a population of 142 million the HIV/AIDS prevalence has remained at less than 0.01percent for many years (NASP 2007b). But what is alarming is that HIV/AIDS prevalence among some of the high-risk groups is gradually increasing. The HIV prevalence among IDUs in Dhaka city increased from 1.4 percent in 2000 to 7 percent in 2007 (NASP 2007a). The number of workers migrating abroad is increasing in the country and neighboring countries like India and Myanmar have higher HIV/AIDS prevalence rates.

In Bangladesh, there have been various efforts to prevent HIV/AIDS transmission. Both the government and non governmental organizations are providing public health education through the media and program activities, especially with the high risk groups, which are IDUs, female sex workers, male sex workers, MSM and hijras. The total number of population belonging to these different risk groups is available from different sources. There were 54000-90000 female sex workers, 40000-150000 male sex workers/MSM, and 20000-40000 IDUs in the country in 2005 (NASP 2007). The number of returnee migrants were 268,000-536,000, clients of female sex workers were 1,882,080 -3,136,800 and transgender (hijras) was 10,000 -15,000 (UNGASS 2006).

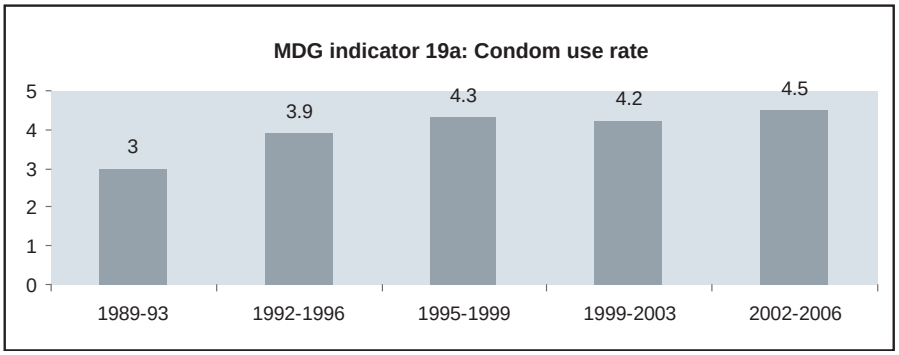
The National AIDS committee was formed way back in 1985 and the National Policy on HIV/AIDS and STD related issues was adopted in 1996, which concentrated mainly on surveillance, testing policy, management and counseling of patients and safe blood. Since 2000 there have been a variety of approaches to raising awareness of HIV/AIDS under a new program. The sources of information are TV, radio, newspaper, and educational packages targeting specific groups at the community level.

In Bangladesh, the level of knowledge on HIV/AIDS and its prevention among the population is increasing, but 85 percent of men and only 67 percent of women have heard of AIDS showing gender inequality in awareness regarding HIV/AIDS (BDHS 2007). This varies largely among ever married women by place of residence, level of education and divisions. Seventy eight percent women in Khulna and 55 percent women in Sylhet had some knowledge about HIV/AIDS. The disparities among the women by level of education are even higher. Ninety nine percent of the women with secondary or above level of education knew about HIV/AIDS, but only 42 percent of women with no education did so (BDHS 2007).

6.10.2 Condom use rate

Overall, 55.8 percent of currently married women are using a contraceptive method, with only 4.5 percent using condoms. Use of condom increased slowly from 3 percent in 1989 to 4.5 percent in 2006 (Figure 6.6). However, the condom use rates among different HIV/AIDS high risk groups are considerably higher than the national condom use rate.

Figure 6.6: Condom use rate



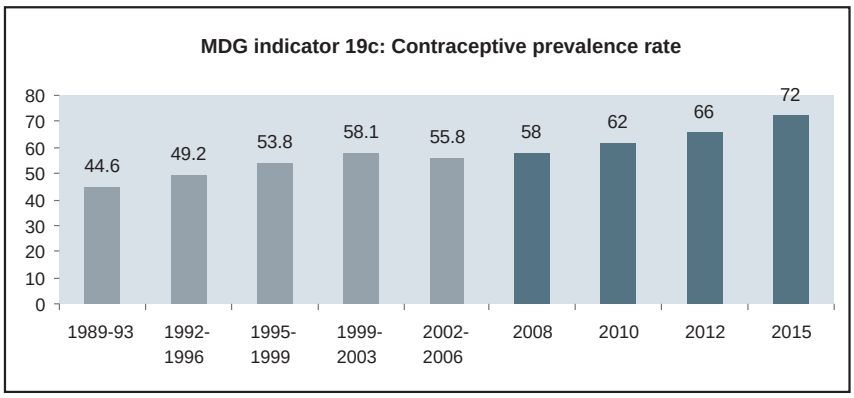
Source: BDHS

The condom use rate varied significantly among different high risk groups in the last few years. There has been marked increase in condom use among the IDUs and female sex workers from 2004 to 2007. The reported condom use rate among the injectors more than doubled from 21 percent to 44 percent during this period. The results of the Behavioral Surveillance Surveys show that hotel based sex workers reported lower rates of condom use (48 percent) than the brothel based sex workers (70 percent) or street based sex workers (76 percent) during this period. However, there has been a sharp decline in the condom use by MSM, from 49 percent in 2004 to 30 percent in 2007 (UNGASS 2008).

6.10.3 Contraceptive prevalence rate

The contraceptive prevalence rate in Bangladesh increased from 44.6 percent in 1993-94 to 55.8 in 2006 at an annual average rate of 1.56 percent. However, the contraceptive prevalence was 58.1 percent in BDHS 2004 and it reduced to 55.8 in BDHS 2007 (Figure 6.7). There was no decline in use of modern methods, but use of traditional method declined in this period without adversely affecting the TFR, which declined from 3.0 in 2004 to 2.7 in 2007.

Figure 6.7: Contraceptive prevalence rate



Source: BDHS

6.10.4 Prevalence and prevention of Malaria

Malaria is one of the major public health problems in Bangladesh and about 26 million people are at risk of malaria, of which 14.7 million live in 13 border districts belonging to the high-risk malaria zone. Over 98 percent of all malaria cases in the country are concentrated in these districts. In 2007, there were 50,634 reported cases of malaria and 239 deaths due to malaria. The case fatality ratio was 472 per 100,000 in the same year (Table 6.13).

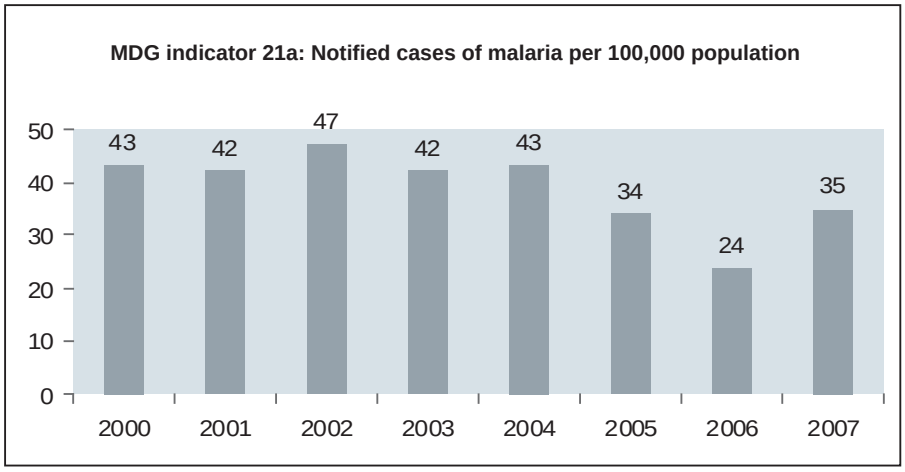
Table 6.13: Malaria cases and deaths by year

Year	Cases	Deaths	Case fatality ratio (per 100,000)
2000	55,599	468	841
2001	55,646	470	846
2002	63,516	589	927
2003	55,909	577	1,032
2004	59,514	498	837
2005	49,537	470	948
2006	34,346	442	1,287
2007	50,634	239	472

Source: WHO, IEDCR (personal communication)

The trend of the malaria cases per 100,000 shows that the disease's prevalence increased from 43 in 2000 to 47 in 2002, which is the highest prevalence in the period of 2000 and 2005. After 2002, it reduced to 42 and remained almost same in 2003 and 2004. Then, the prevalence of malaria reduced drastically in 2006 to 24 cases per 100,000 populations, but increased sharply again to 35 cases per 100,000 population in 2007 (Figure 6.8).

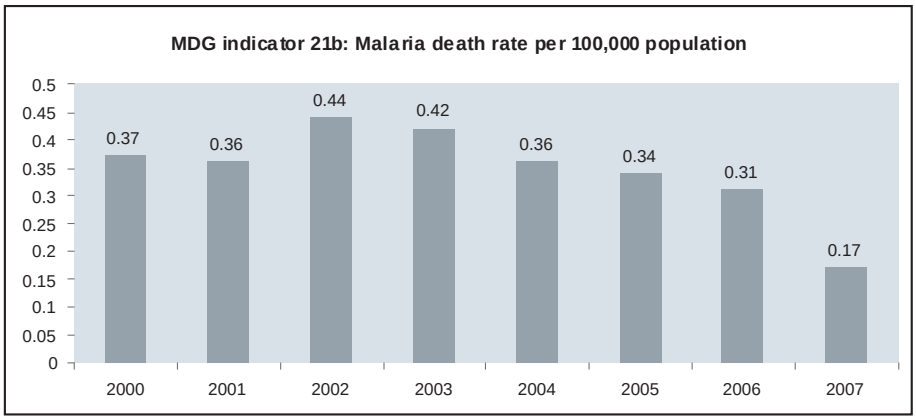
Figure 6.8: Notified cases of malaria per 100,000 population



Source: WHO, SEARO and WHO, IEDCR

Changes in the malaria death rate per 100,000 population shows similar trend as the trend in reported cases of malaria from 2000 to 2006. However the data show that it sharply declined to 17 death cases per 100,000 population in 2007. Malaria mortality rate was highest (0.44) in 2002 during this period (Figure 6.9).

Figure 6.9: Malaria mortality rate per 100,000 population



Source: WHO, SEARO and WHO, IEDCR

The statistics indicate that Bangladesh has achieved success in treatment of malaria and reducing deaths due to malaria markedly in recent years. However, challenges still remain in halting and reversing the spread of malaria because of the rise in malaria prevalence during 2006-2007.

Despite this unusual rise in 2007, the overall trend shows that between the period of 2002 and 2007 the malaria prevalence decreased at average annual rate of 9.22 percent. If the country maintains the rates of reduction consistently, then it will be on track to achieve the MDG targets by 2015[12] .

[12] The status and trends of prevention of malaria could not be analyzed due to limitation of the available data.

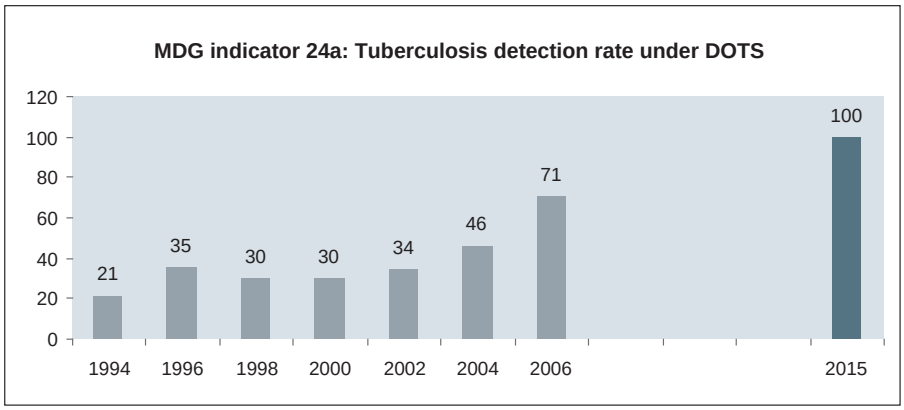
6.10.5 Prevalence and prevention of Tuberculosis

The country has made significant progress in halting and reversing the spread of tuberculosis (TB). In Bangladesh during the last two decades, TB services were mainly curative and based in TB clinics and TB hospitals before the Second Health Population Plan (1980-86). During this plan, TB services were expanded to 124 UHCs and were operationally integrated with plan for leprosy during the Third Health and Population Plan (1986-91). The National Tuberculosis Control Program (NTP) adopted the DOTS Strategy during the Fourth Population and Health Plan (1992-1998), and it was integrated into Essential Service Package (ESP) under the Health and Population Sector Program (HPSP) in 1998. Under the current Health, Nutrition and Population Sector Program (HNPSP) TB control is also recognized as a priority and at the end of 2006 the entire country was covered under the DOTS strategy (NTP 2007).

The TB prevalence rate has reduced from 406 per 100,000 per year in 2006 to 391 per 100,000 per year in 2007. During this period, TB mortality rate also reduced from 47 to 45 per 10,000 per year (NTCP and WHO, Bangladesh).

The data on MDG indicator 24a, which is TB detection rate under DOTS, show that the country has been highly successful in identifying the TB cases from 21percent in 1994 to 71percent in 2006 and well on track towards 100percent detection rate by the year 2015. The most significant improvements in identifying TB patients under DOTS were between 2002 (34 percent) and 2006 (71 percent), the detection rate more than doubled in this period (Figure 6.10).

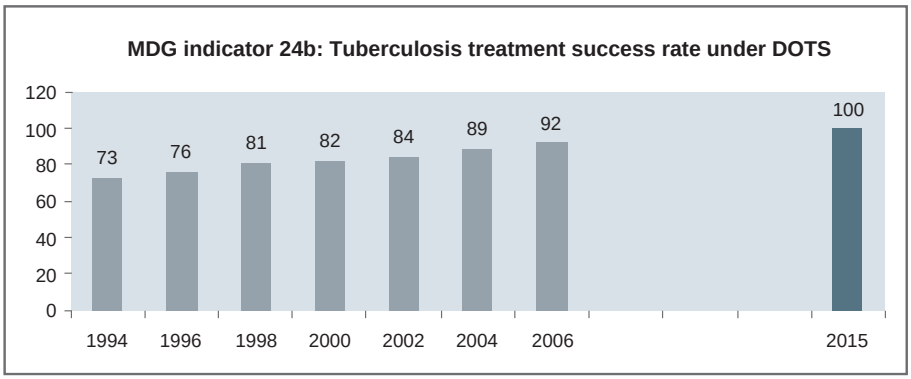
Figure 6.10: Tuberculosis detection rate under DOTS



Source: Annual Report 2007(NTP)

The country has made good progress in tuberculosis treatment under DOTS as well. The tuberculosis treatment success rate under DOTS gradually and consistently increased from 73 percent in 1994 to 92 percent in 2006. Given this phenomenon Bangladesh is well on track towards achieving the MDG target - which is 100 percent treatment success rate (Figure 6.11).

Figure 6.11: Tuberculosis treatment success rate under DOTS



Source: Annual Report 2007(NTP)

6.11 Challenges ahead in achieving MDG6

- Limitation of the data on HIV/AIDS prevalence is a major obstacle in tracking the MDG targets. Most of the population data is based on assumptions and the seven National HIV/AIDS Serological Surveillances are based on information collected on the high risk groups. Scaling up prevention interventions to the general population is not yet a priority in Bangladesh, other than for young people (UNGASS 2008).

- Social stigma and other cultural barriers are contributing to the low level of participation of the general population in the HIV/AIDS prevention programs in Bangladesh. The existing gender and regional disparities in awareness and knowledge about prevention of AIDS among the citizens should be reduced in order achieve the MDG targets by 2015.

- Currently the HIV/AIDS treatment, care and support are mainly provided by the NGOs and steps should be taken to mainstream HIV/AIDS into different public and for-profit private health sector to improve access to the care and increase involvement of all types of providers.

- Halting and reversing the spread of malaria seems to be one of the major challenges faced by the country. Though the malaria prevalence reduced significantly in 2006, but increased markedly again in 2007.

- Despite the success of high cure rate of tuberculosis under the NTP, the case detection rate is considerably lower than the target and needs special attention to accelerate the case detection rate by ensuring improvements of the quality of diagnostic services.

- Lack of early diagnosis of tuberculosis is a key obstacle for the tuberculosis prevention program in Bangladesh. Antibiotic resistance in tuberculosis is currently at a low level, but threatens to become more common.

- In Bangladesh still now there is very little knowledge about the MDGs at the grassroots level. Until and unless the concept is well understood by the general public, the achievement of the MDGs might be hampered.

6.12 Major Interventions and Targets for attaining MDG6

This section describes the key interventions for attaining MDG6 in Bangladesh.

6.12.1 HIV/AIDS

The Second National Strategic Plan 2004-2010 prioritized some interventions of the HIV/AIDS Program and also set targets for those interventions. Based on the analysis of the HIV/AIDS situation and vulnerability factors to the epidemic in Bangladesh this MDG Needs Assessment and Costing study has finalized the interventions for attaining the HIV/AIDS related targets of MDG 6 by discussing with the key stakeholders and reviewing the policies and plans.

The interventions can be classified into four broad groups: HIV/AIDS prevention programs, treatment of PLHIV, care and support programs for the HIV/AIDS infected and vulnerable population, and enabling environment.

6.12.1.1 HIV/AIDS prevention Program

The prevention programs are mainly targeted for specific risk groups like female sex workers, MSM, IDUs, clients of sex workers, truck drivers, and migrant workers. The other important interventions which aim to prevent the spread of HIV/AIDS infection in Bangladesh are youth education of HIV/AIDS, safe blood transfusion program, mass media campaign, and voluntary counseling and testing (VCT).

Prevention Programs for the high-risk groups

The prevention program for the risk groups includes counseling and condom distribution. 57 percent of the female sex workers, 47 percent of the male sex workers/MSM, 82 percent of the IDUs and 15 percent of the transgender have been reached by the prevention programs in 2007 (UNGASS 2008, UNGASS 2006, MIS 2007). The Governments Strategic Plan 2004-2010 aims at universal coverage of prevention programs by 2010. Considering the current situation the study/TWG set the same target coverage for 2012 in the costing exercise.

However the proportion of high-risk individuals who received HIV/AIDS testing in the last 12 months and who know the results is quite low (five percent of the female sex workers, eight percent of the male sex workers/MSM, and three percent of IDUs). The harm reduction program such as needle/syringe exchange program for the IDUs has been launched few years back. Recent studies show that the program started to positively influence the risk behavior of the IDUs. However, no data are available on the current coverage.

Safe Blood Transfusion Program (SBTP)

Safe Blood Transfusion Program (SBTP) was launched in Bangladesh in 2000 and before that blood screening was not mandatory in either government or NGO facilities. Currently five transfusion transmissible infections (TTI) - HIV, Hepatitis B, Hepatitis C, Syphilis and Malaria are being screened before transfusion in 99 blood centers. A total of 13,36,699 units of blood have been screened since 2000 to 2007 (MIS 2008). The proportion of blood screened before transfusion per year in Bangladesh is yet not known, and as a result the study used the percentage of safe blood donation in developing countries (57percent) as a proxy indicator for 2007.

Youth Education of HIV/AIDS

The Bangladesh HIV/AIDS Program has successfully incorporated HIV/AIDS information into the secondary and higher secondary school curriculum (grade VI to XII). Under this program around 36,000 teachers have been trained in 2007. "Train the Trainer" program taught teachers how to develop lesson plans and lead classroom sessions. These trained teachers have trained about 32,000 teachers of 6,375 institutes and additional 63,750 teachers have participated in orientation sessions on HIV/AIDS (NASP 2007b). The school HIV/AIDS Program, which now operates in 20 districts, will be scaled up to cover 40 of the 64 districts in Bangladesh during 2007-2012 (UNGASS 2008).

Mass Media Campaign

Mass media campaigns are expected to play a key role in behavioral change towards HIV/AIDS prevention. In Bangladesh the current mass media campaigns are using television, radio, newspapers and local folk media to create awareness on various HIV/AIDS related issues and also to reduce stigma and discrimination against the PLHIV.

Voluntary HIV/AIDS counseling and testing (VCT)

Voluntary Counseling and Testing (VCT) is client initiated testing, and coverage of VCT is extremely low in Bangladesh because of fear of social stigma and discrimination and low perception of risk. VCT services are still targeted at the high-risk population and there is little coverage for the general population. Only seven facilities have been established for this purpose till 2006 and few of them are fully functional (UNGASS 2006, UNGASS 2008). NASP is developing counseling modules and guidelines on minimum standards of VCT. The VCT units are needed to be established for providing the counseling and laboratory services in blood transfusion centers since all facilities for HIV/AIDS testing are available there.

6.12.1.2. Treatment of PLHIV

Antiretroviral Therapy (ART)

Development of antiretroviral therapy (ART) has significantly improved the mortality and morbidity of HIV/AIDS diseases around the world. This intervention can prolong and improve life for people living with HIV/AIDS (PLHIV). In Bangladesh, only 13.3 percent of adults with advanced HIV/AIDS infection have received ART in 2007 (UNGASS 2008)[13] . Five organizations including four NGOs or self-help groups and one public institute (Infectious Diseases Hospital) are providing ART. The current coverage is far below the national demand and concentrated in Dhaka city. The study/TWG decided to set the target of universal coverage of treatment by 2010 for the costing exercise.

Laboratory tests associated with ART

The people living with HIV/AIDS infection need to go through pathological investigations on a regular basis and they are an integral part of the treatment procedure. The laboratory tests associated with ART are CD4, viral load, full blood count, creatinine, ALT, cholesterol and screening for TB. Currently, only two institutes, ICDDR,B and Combined Military Hospital, have the equipment to conduct the CD4 tests in the country.

6.12.1.3 Care and Support

The most important care and support Programs of HIV/AIDS are clinical management of common opportunistic infections (OIs), nutritional support to PLHIV, and support to orphans and vulnerable children. Currently the treatment of common opportunistic infections is provided to those patients receiving ART based on their disease profile. However, the number is considerably low compared to the total national demand.

No current estimate is available on the number of children who have lost one or both of their parents due to AIDS. In 2002, there may have been 100 orphans and in 2004 somewhere between 44 and 132 children would have lost one or both parents, which is a very insignificant number in Bangladesh's population (UNGASS 2008).

6.12.1.4 Enabling environment

HIV/AIDS-related stigma and discrimination is one of the major barriers to fight against HIV and AIDS epidemic. Research should be conducted to estimate the extent of stigma and discriminations and to identify appropriate measures to reduce it. AIDS case surveillance or routine AIDS reporting of AIDS cases is currently not conducted in Bangladesh.

[13] Six different types of ARV drugs are currently produced by two national pharmaceutical companies in Bangladesh, but paediatric formulations and ARV formulations for pregnant mothers are not available (Azim et al. 2008).

6.12.2 Malaria

Insecticide-treated Mosquito Nets

The use of insecticide treated bed nets for protection from mosquito bites effectively reduce malaria transmission and thus widely used in malaria control programs. In Bangladesh, 70000 Long Lasting Insecticide-Treated Nets (LLINs) and another 156000 Insecticide Treated Mosquito Nets (ITMNs) were procured in 2007 and supposed to be distributed within a short period (Malaria Program, DGHS). A total of 1.6 million LLINs will be distributed among the vulnerable families in 13 high-risk malaria-endemic districts, by 2012, using Global Fund Grant (GFATM Round - 6) (WHO 2008).

Rapid diagnosis and treatment of malaria

Early diagnosis and prompt treatment of malaria can reduce the malaria mortality rate substantially. Bangladesh launched the Revised Malaria Control Strategy (RMCS) in 1994 and subsequently reinforced its efforts to control malaria in the high-risk areas. The Communicable Disease Control Program under the HNPSP aims to reduce the malaria specific mortality and morbidity by 50percent by the year 2011 and as the key intervention suggested universal access to Early Diagnosis and Prompt Treatment (EDPT) (HNPSP 2008).

6.12.3 Tuberculosis

Directly Observed Treatment Short-course (DOTS)

The NTP adopted the WHO recommended strategy of Directly Observed Treatment Short-course (DOTS) in 1993. Since then, Bangladesh has achieved many of its TB-control goals. However, major challenge remains to further improve the case detection rate. In 2007, the case detection rate was 72 percent and treatment success rate was 98 percent. The research set the target at 100 percent coverage by 2015.

Directly Observed Treatment Short-course (DOTS) Plus

Directly Observed Treatment Short-course (DOTS) Plus are needed for the Multi Drug Resistant (MDR) TB patients. Currently three percent of the new cases and 18 percent of the re-treatment cases require DOTS Plus in Bangladesh (NTP data 2008).

Coverage and Target of Major Interventions for attaining MDG6 are shown in Table 6.14.

Table 6.14: Coverage, target and unit cost of major interventions for attaining MDG 6

Interventions	Coverage in 2007	Target coverage in 2015[14]	Unit/Average cost (BDT)
HIV/AIDS treatment			
Antiretroviral therapy	13.3%	100%	66,000 per year
CD4 laboratory test	20%	100%	2,500
Viral load	1%	100%	10,000
Malaria prevention			
Long lasting insecticide treated net	40%	100%	371
Insecticide treated mosquito net	40%	100%	37
Rapid diagnostic test	98%	100%	50
Malaria treatment			
Uncomplicated	70%	100%	1,200
Complicated	70%	100%	2,660
Tuberculosis treatment			
DOTS	92%	100%	2,500
DOTS+	92%	100%	159,460

[14] The need for universal access to HIV prevention and treatment by 2010 is reflected in UNAIDS targets and also in the National Strategic Plan 2004-2010. Therefore, the TWG decided to set 100% coverage for all the HIV interventions.

6.13 Resource Needs Estimates for MDG 6

The Integrated Health Systems Model used to estimate the resource need included interventions for health systems, MDG 4 and 5 and for the interventions related to malaria and TB for MDG 6. However for estimates relating to combating HIV/AIDS, a separate HIV/AIDS costing model was used to estimate the direct interventions.

For estimates using the HIV/AIDS costing model for intervention to combat HIV/AIDS, following base year data was considered: In 2006, the estimated people living with HIV infection were 7,500 in the country (NASP 2007b). No confirmed estimate is available for 2007[15].The coverage population for HIV/AIDS treatment and care was set at 11000 in 2007.

For estimates using Integrated Health Systems model, following data were considered for malaria: In Bangladesh, there were 50,634 confirmed cases of malaria in 2007, but the presumptive or clinically diagnosed number of malaria cases supposed to be much higher[16]. The data collected from the Malaria Control Program, DGHS, show that about 24,000 confirmed cases of malaria and 22,000 clinical cases were reported in three months only in the 13 malaria high-risk districts in 2008. Taking all these information into consideration, the coverage for malaria was set around 300,000 including presumptive cases.

For estimates using Integrated Health Systems model, following data were considered for tuberculosis: The tuberculosis incidence was 225 per 100,000 people in 2007 (NTP data 2008). Therefore, the coverage population for tuberculosis prevention and treatment program was 320,850 in 2007 and will be 358,844 in 2015 (BBS 2007).

Resource Needs for combating HIV/AIDS

In Bangladesh, current coverage of the treatment and prevention programs for HIV/AIDS are considerably low and if the country wants to provide appropriate treatment and care to all PLHIV, then it has to scale up expenditure on HIV/AIDS significantly. The results of the costing exercise show that a total of BDT 184,161 million should be spent on HIV/AIDS programs during 2009-2015 to achieve the MDG targets. About 55 percent of the total expenditure should be on HIV/AIDS prevention programs and 34 percent on HIV/AIDS treatment programs (Table 6.13).

The result of the cost analysis show that a total of BDT 102,296 million should be spent on HIV/AIDS prevention programs to halt and reverse the spread of HIV/AIDS in a densely populated country like Bangladesh. The estimated resource requirement for this program is BDT 10,514 million in 2009 and BDT 16,496 million in 2015.

The costing exercise estimated the expenditure flow needed for treatment of PLHIV and the results suggest that BDT 1,589 million will be needed, in 2009, to provide treatment to the PLHIV. The study/TWG estimated the number of HIV positive people in 2009-2015 based on the data that the number of PLHIV was 7,500 in 2006 and 11,000 in 2007. The treatment cost will increase significantly over the years because of current low levels of coverage of treatment procedures, the expected increasing number of PLHIV, and rising treatment cost. A total of BDT 63,103 million will be required, from 2009 to 2015, for treatment of PLHIV and the estimated resource requirement in 2015 will be BDT 21,606 (Table 6.13). The estimated allocation for 2008-2011 under HNPSP is BDT 3,327 million for prevention and treatment of HIV/AIDS (HNPSP 2008).

[15] There is data discrepancy in estimated number of PLHIV. According to some sources the estimated population living with HIV infection was 13000 in 2007 (HNPSP 2008, WHO 2007). However, reported estimated PLHIV from other sources were lower for same year.

[16] According to World Malaria Report 2005, there were 400,000 clinical cases and more than 57,000 laboratory confirmed malaria cases per year in Bangladesh (WHO 2005).

Resource Needs for combating Malaria

The model estimated the resource need for malaria prevention and treatment interventions and result shows that BDT 5,097 million will be required for providing LLIN and ITMN to the high-risk population during the period of 2009-2015. An additional BDT 8,689 million will be required to provide treatment to malaria patients (Table 6.13). The total estimated allocation for 2008-2011 under HNPSP is BDT 962 million for malaria and vector borne disease control (HNPSP 2008).

Resource Needs for combating Tuberculosis

The spreadsheets on tuberculosis estimated the yearly resource need for tuberculosis treatment interventions (DOTS and DOTS plus) from 2009 to 2015. The estimated resource need during this period for TB treatment is BDT 33,550 million (Table 6.18). The estimated allocation for TB and leprosy control program for 2008-2011 under HNPSP is BDT 2,636 million (HNPSP 2008).

The estimated per capita total cost of MDG 6 related interventions is USD 1.85 in 2009 and USD 4.8 in 2015 (Table 6.15).

Table 6.15: Yearly resource needs estimates for attaining MDG 6 by various prevention and treatment programs

Interventions	2009	2010	2011	2012	2013	2014	2015	Total	% of total
HIV/AIDS prevention programs	10,514	13,501	14,418	15,386	15,787	16,194	16,496	102,296	44.19
Treatment of PLHIV	1,589	3,262	4,760	6,947	10,139	14,800	21,606	63,103	27.26
Care and support programs	594	895	1,307	1,908	2,786	4,068	5,939	17,497	7.56
Enabling environments	193	192	178	163	198	163	178	1,265	0.55
Tuberculosis	4,162	4,351	4,548	4,754	4,968	5,191	5,576	33,550	14.49
Malaria prevention	434	528	633	756	854	900	992	5,097	2.20
Malaria treatment	1,040	1,102	1,239	1,274	1,310	1,345	1,379	8,689	3.75
Total (in BDT)	18,526	23,831	27,083	31,188	36,042	42,661	52,166	231,497	100.00
Total (in USD)*	270.85	348.41	395.95	455.96	526.93	623.70	762.66	3,384.46	
Per capita (in BDT)	126.37	160.26	179.60	203.98	232.53	271.21	327.26		
Per capita (in USD)*	1.85	2.34	2.63	2.98	3.40	3.97	4.78		

* 1 USD = 68.4 BDT

CHAPTER 6

Health Systems (MDGs 4, 5 and 6)

6.14 Health systems of Bangladesh: current status and future need

The following two subsections discuss the current status, and future needs of infrastructure and human resources of the health, nutrition and population sector of Bangladesh to attain MDG 4,5 and 6 by 2015.

6.14.1 Infrastructure

There are three main levels of health facilities in Bangladesh: primary health care (UHC, UHFWC, USC & CCs), secondary healthcare (District Hospitals), tertiary health care including Medical College Hospitals (MCH), and super specialized care (specialized institutions).

Under the HPSP, about 13,500 new community clinics (CCs), each for 6,000 people, were supposed to be constructed. So far, 11,883 CCs have been constructed and 8,426 are functioning either with DGHS Health Assistant (HA) and DGFP Family Welfare Assistant (FWA) or handed over to NGOs (DGHS data 2008). The HA and FWA are performing home visits and working from CCs (if operational) and are providing family planning services, maternal and child health care, including immunization, communicable disease control, symptomatic curative care for common complaints, and upward referrals (HNPSP 2008).

At Union level there are 3,622 Union Health and Family Welfare Centres (UHFWCs) under DGFP and upgraded UHFWC (formerly called Union Sub-centres, USC) under DGHS (HEU 2008). UHFWC has one Sub-Assistant Community Medical Officer (SACMO), one Family Welfare Visitor (FWV), one Pharmacist, one Aya and one MLSS. In the Unions, where no UHFWC has been constructed, there is a post of FWV only (HNPSP 2005). The training of FWVs in FWV Training Institutes managed by NIPORT started in 1970s, but unfortunately has stopped since 1997. The termination of the training of FWVs is expected to have adverse effect on maternal and child health in Bangladesh as FWVs provide services to mainly rural women (BHW 2007). Each of the 1,275 upgraded UHFWCs has the posts of a Medical Officer, a Medical Assistant and a Pharmacist (HNPSP 2008).

There are 431 Upazila Health Complexes (UHCs) with 31-50 beds in each facility and 60 Rural Health Centres (RHCs) with 10-20 beds in each facility, and providing both outpatient and inpatient care, at Upazila level. A total 107 UHCs have been upgraded from 31-bed hospital to 50-bed hospital so far and in another 163 facilities the extension is under construction (CMMU data 2008). Another 16 UHCs (31 bed) will be constructed soon. The 20 bed hospitals are located in remote areas of the upazilas where there are no UHCs or the place is 10 to 15 kilometres away from the UHC and DH (CMMU data 2008).

In each of the UHCs, on the health side there are nine doctors including one dental surgeon, nursing supervisor and senior staff nurses, two Medical Assistants, medical technologists (pharmacy, radiology, dental) and an EPI technician along with other support staff. The UHCs also have the posts of Upazila Family Planning Officer (UFPO), Medical Officer (Maternal and Child Health), Assistant Family Planning Officer, Senior FWV and two FWVs on the family planning side (HNPSP 2005).

The second layer facilities on the health side in the country constitutes of 61 District Hospitals (DHs). DHs are larger facilities in comparison with UHC, with an average bed size of 133 (range 50 to 375). There were seventeen 50 bed DHs, one 75 bed DH, thirty-three 100 bed DH, one 120 bed DH, four 150 bed DHs, and two 250 bed DHs in 2007 (HEU 2007).

The districts also have Maternal and Child Welfare Centres (MCWCs) based in the district town which offer Comprehensive Emergency Obstetric Care (C-EmOC) and clinical contraception run by the DGFP. There are a total 98 MCWCs in the country. Among them 62 are located at each district level[17] , 12 at Upazila level

[17] The construction of the other two MCWCs at the district level is suspended for some unknown reasons.

and 24 at Union level. The government has taken steps to up-grade all the MCWCs from ten-bed hospitals to 20 bed hospitals. According to the Construction, Maintenance and Management Unit (CMMU) up-gradation of 40 MCWCs have been completed and in the other 22 MCWCs the extension is under construction. The up-gradation cost per MCWC is around BDT 3.5 million (CMMU data 2008).

The third layer of the public health system includes Medical College Hospitals (MCHs) and Post Graduate Institutes and Hospitals. There are 15 Government and 34 Private Medical College Hospitals (MCHs), one Dental College, one Homeopathic Medical College and Hospital, and one Ayurvedic Degree College and Hospital (HEU 2007). Another five public MCHs will be established in Pabna, Cox's Bazar, Jessore, Rangamati and Noakhali. The estimated cost of construction per MCH will be BDT 1,000 million (PWD data 2008).

In Bangladesh there are also 21 specialised hospitals (mental, leprosy, infectious disease, chest diseases etc.). There are a 200 bed Institute of Child and Mother Health (ICMH) and a 600 bed Institute of Diseases of Chest and Hospital (IDCH) in Dhaka- the capital city. A 250 bed TB hospital is under construction in the city as well.

6.14.2 Human Resources

The scarcity of skilled health personnel is one of the main challenges in the health sector of Bangladesh as there are around five physicians and two nurses per 10,000 population (BHW 2007). The density of qualified health care providers, including doctors, dentists and nurses, in the country is 7.7 per 10,000 population, which indicate severe shortages of health workforce[18]. Moreover, the distribution of qualified providers is highly urban biased. There are 18.2 physicians, 5.8 nurses and 0.8 dentists per 10,000 population in urban area while the corresponding figures in rural area are 1.1, 0.8, and 0.08 respectively. The data also show that the number of male physician per 10,000 population is five times higher than the number of female physician per 10,000 population (Table 6.16).

There are also high regional disparities in the distribution of physicians, nurses and dentists in the country. The highest number of physicians is concentrated in Dhaka division (10.8 per 10,000 population) followed by Chittagong division (4.8 per 10,000 population). The availability of qualified health care provider is lowest in Barisal, followed by Sylhet and Rajshahi (Table 6.16).

Table 6.16: Distribution of physician, nurse, dentist per 10,000 population and nurse per physician ratio by gender, area and division.

	Physician	Nurse	Dentist	All	Nurse per Physician ratio
Male	4.50	0.20	0.20	5.00	0.05
Female	0.80	1.80	0.03	2.70	2.10
Rural	1.10	0.80	0.08	2.10	0.70
Urban	18.20	5.80	0.80	24.90	0.30
Barisal	1.70	0.90	0.30	3.08	0.50
Chittagong	4.80	3.60	0.30	8.80	0.70
Dhaka	10.80	2.80	0.50	14.20	0.20
Khulna	1.30	1.90	0.05	3.30	1.40
Rajshahi	2.10	1.10	0.00	3.20	0.50
Sylhet	2.20	0.40	0.00	3.20	0.10
National	5.40	2.10	0.30	7.70	0.40

Source: BHW 2007

[18] According to WHO the threshold density for the doctors, nurses and midwifes is 22.8 per 10000 population below which coverage of the essential interventions to attain the MDGs is not possible (BHW 2007).

The current status of health personnel and the future capacity of the health sector are discussed below.

Physicians

The total number of estimated doctors available in 2007 was 38,537 and only 38 percent of them are employed in the public sector and 62 percent are employed in the private sector. The total number of dental surgeons in the same period was 2995. The government owned institutes producing doctors include one medical university, 23 post-graduate medical institutes (including medical colleges offering post graduate degree/diploma), 15 medical colleges, one dental college and two dental units attached to Rajshahi and Chittagong medical college. The private medical institutes producing doctors include 34 medical colleges, nine dental colleges and five post graduate medical institutes. The total enrollment capacity of these institutes is 4,816 seats including public medical colleges (2,260) and private medical colleges (2,556) (BHW 2007). Currently, these MCHs produce around 1,200 doctors per year (BHW 2007).

The total number of available doctors falls greately short of what is required for attaining the MDGs. According to Main Report of Mid Term Review 2008, the estimated need of doctors was 98,550 (based on Low Income Countries average) in 2007. This implies that there was a shortage of around 60,000 doctors.

Nurses

There are 70 nursing institutes, 51 run by the Government and 19 by private entrepreneurs, in the country offering three years Diploma in General Nursing and one year Diploma in Midwifery/Orthopedic. There is one College of Nursing affiliated to the University of Dhaka offering two years Bachelor of Science Degree (BSc.) in Nursing and Public Health Nursing (BHW 2007). Another Nursing College will be constructed soon. Though the nursing institutes admit 2280 students every year, around 1200 students qualify as diploma nurses (BHW 2007).

The total number of registered nurses in the country was 21,715 in 2007 and 14,971 nurses were employed in the public sector (HEU 2007). The shortage of nurses was even much higher than the shortage of doctors. A total of 163,177 additional nurses are required, based on the Low Income Countries average, to achieve the MDGs (MTR 2008).

Medical Assistants

Medical Assistants provide assistance to doctors and play an important role in the health sector of Bangladesh, specially in the primary health tier (UHC, UHFWC and USC). The Medical Assistants Training Schools (MATS) was established in 1979 and it offers a three-year diploma course. All five MATS are located at the district level and the teachers of the institutes are medical doctors. The main challenges to train medical assistance are to teach SSC-passed students complex subjects like anatomy and physiology, and lack of textbooks designed for such students, especially in Bengali. These training institutes train around 300 medical assistants each year (BHW 2007). More than 1900 medical assistants were employed in the public health facilities under DGHS in 2007 (MIS data 2007).

Health Technologists

The demand for Health Technologist is rising rapidly with increasing number of hospitals, clinics and diagnostic centers and also for the upgradation of the public facilities. The health technologists include laboratory technicians, pharmacists, radiographers, sanitary inspectors, and physical therapists.

There were a total of 79 training institutes for the health technologists in Bangladesh in 2007. Under the State Medical Faculty (SMF), MOHFW, there were 32 health technology institutes and 47 private health technology institutes were functioning under the Technical Education Board of the Ministry of Education. Another 30 institutes have been already sanctioned by the Ministry of Education. A total of 4,386 students got admitted into the public and 3375 in the private health technologist institutes in 2006 (BHW 2007).

In 2007 there were 10,653 health technologists in Bangladesh (BHW 2007). Among them around 5,000 health technologists were employed in the public sector (MIS 2007). The generally acceptable ratio of health technologist to doctor is 5:1. But in Bangladesh the ratio of technician to doctor is 1:3.6 implying severe shortage of health technologists which is greatly hampering the cost effective health service delivery.

Skilled Birth Attendants

The WHO definition of skilled birth attendant is " an accredited health professional such as midwife, doctor or nurse, who has been educated and trained to proficiency in the skills needed to manage normal (uncomplicated) pregnancies, child birth and the immediate postnatal period, and in the identification, management and referral of complications in women and newborn" (WHO 2004). However in Bangladesh by definition assistance during delivery by skilled health professional includes doctor, nurse, midwife, paramedic and also the Community Skilled Birth attendant (CSBA)[19] (BDHS 2007). CSBA are the accredited health workers working at the community level, i.e., Family Welfare Assistant and female Health Assistants, who have been educated and trained to proficiency in all the midwifery skills.

The Government of Bangladesh started the "Community-Based Skilled Birth Attendant Training Program", with technical and financial assistance from WHO and UNFPA, in 2003. Obstetrical and Gynaecological Society of Bangladesh (OGSB) has been providing six month training to FWA and female HA in facilities like the Family Welfare Visitor Training Institute (FWVTI), Nursing Institutes and Mother and Child Welfare Center (MCWC). On average 480 CSBAs are produced each year by providing training to batches of 18 trainees in 38 centers in 48 districts. A total of 4,000 CSBAs have been trained out of the target 13,500 so far, from 2003 to 2007, in 216 Upazilas (BHW 2007). To achieve the target by 2015 the OGSB will have to train 1250 CSBA per year (UNFPA data 2008). The training cost per CSBA is BDT 150,000 and therefore BDT 187,500,000 will be required annually to achieve the target by 2015.

6.15 The challenges ahead in Health systems in Bangladesh

- Scarcity and poor distribution of qualified health professionals is one of the major challenges faced by the health sector of Bangladesh. Improved human resource management is required to address the urban bias of the health workforce and the absenteeism in rural health facilities.

- Current capacity of the pre service training institutes falls greatly short of the requirement and new training institutes, especially for nurses and medical technologists, should be built and the capacity of the existing institutes should be increased.

- About 64 percent of the total healthcare expenditure in Bangladesh is out-of pocket expenditure by the households. This huge household spending is mainly related to expenditure on drugs, diagnostic tests and transport to the facility. Demand side financing schemes, which subsidize theses costs, can increase the utilization of healthcare by the women and children, who are usually the non-earning members in the family, and also by the poor.

- Misperceptions regarding the need for care and social barriers contribute to low levels of demand for maternal and child care in Bangladesh. Effective health education programs are needed to increase the demand for modern healthcare.

[19] The community skilled birth attendants (CSBAs) are to provide normal safe delivery in homes and referral to the emergency obstetric care (EmOC) sites, if needed.

6.16 Major interventions for Health systems

This section describes the key interventions for improving health systems for MDGs 4, 5 and 6 in Bangladesh.

Construction of new health facilities

In Bangladesh the private health facilities are located mainly in urban areas and the public and not-for-profit private hospital/health facilities are the predominant modern health service delivery points in rural areas. Construction of new facilities in rural areas to increase the access to health care and reduce indirect cost [20] is essential to improve the health sector performance. In view of that more CCs, UHFWCs and UHCs need to be built to increase the utilization of healthcare, especially by women and children. Under the current health, nutrition and population sector program about 1600 CCs, 16 UHCs and 5 new MCHs will be constructed by 2011 (HNPSP 2008).

Upgradation of existing health facilities

Upgradation of the existing health facilities is one of the key health system interventions of the current health sector program. A total 107 UHCs have been upgraded from 31-bed hospital to 50-bed hospital so far and in another 163 facilities the extension is under construction. Ten DHs will be upgraded from 100 bed hospitals to 200 bed hospitals and in other two DHs, the capacity will be increased by additional 150 beds. Two MCHs will be expanded from 500 bed hospitals to 1,000 bed hospitals (Table 6.17)

Pre-service training of health personnel

The current capacity of the post-graduate medical institutes and medical colleges need to be increased to fill the gap between the required and actual number of qualified physicians in the health sector of Bangladesh. More public and private nursing training institutes need to be established urgently to increase the number of nurses.

In-service training of health personnel

The important in-service training programs for MDGs are clinical management training for doctors and paramedics under Integrated Management of Childhood Illness (IMCI), to train medical officers in obstetrics or anesthesia under comprehensive EmOC program, and training of FWA and female HA to produce CSBA by the Obstetrical and Gynecological Society of Bangladesh (OGSB).

6.17 Resource needs estimate for Health Systems

For the health systems, the information on current number of health personnel employed in the health sector was collected from MIS, DGHS. The study also collected detail information on cost of infrastructure and equipment of each type of facilities. The construction costs of primary level facilities were collected from Construction, Maintenance and Management Unit (CMMU) and secondary and above level facilities were collected from Public Works Department (PWD). Under the previous and current health sector programs, a significant numbers of facilities at primary (UHC), secondary (DH, MCWC) and tertiary level (MCH) have been and will be upgraded by increasing the number of existing beds, with the aim of enhancing the capacity of the hospitals. The estimated upgradation/construction costs of DH and MCH under HNPSP are presented in Table 6.17 below. The estimated average upgradation/construction cost of the DHs is around BDT 80 million and of the MCHs is BDT 300 million.

[20] In public and not-for-profit private health facilities services are provided free of cost or at nominal prices. Yet the distance to the facility and travel cost, which are often called as indirect costs, are important determinants of demand for health care.

Table 6.17: Estimated up-gradation/construction costs of DHs and MCH under HNPSP

Activities	Number	Estimated cost per facility (in million BDT)
Up-gradation of DH from 50 beds to 200 beds	1	80
Up-gradation of DH from 100 beds to 250 beds	9	85
Up-gradation of DH from 150 beds to 250 beds	1	73
Up-gradation of MCH from 500 beds to 1000 beds (Mymensingh, Faridpur)	2	300
Extension of DH (establishment of CCU)	3	150
Modernization and extension of MCH	6	300
Construction of new facilities and modernization of existing infrastructure of Dhaka MCH	1	600

Source: PWD data 2008

Total Resource Needs

The integrated model used for estimating resource need for the health related MDGs calculated the costs of health systems for all the MDGs and related indicators. The result of the analysis shows that a total of BDT 778,571 million should be invested on health systems during 2009-2015 to achieve the MDGs 4, 5 and 6 [21]. 52 percent of the fund should be used for the salaries and in-service training of the health personnel. Approximately 18 percent should be spent for pre-service training as there are severe shortage of qualified providers, especially doctors, nurses, and technicians, in the health sector of Bangladesh (Table 6.18).

The results indicate that BDT 39,191 million should be spent on building new facilities. The operation and maintenance costs of the existing and new facilities will be BDT 42,797 million during 2009-2015. The estimated resource need for administration, monitoring, evaluation and research is BDT 44,659 million and the programs for demand creation is BDT 69,471 million (Table 6.18).

The trend of the expenditure flow shows that the resource requirement for building new infrastructure and pre-service training of the health care professionals will increase gradually from 2009 to 2013 and then decrease slightly during 2014-2015. The reason behind this is investment on capacity development of the health sector should be made earlier if the country wants to meet the increasing demand for healthcare by the growing population in 2015. The estimated cost of the other health system interventions needs to be increased gradually from 2009 to 2015.

The estimated per capita expenditure needed for health system is USD 6.8 in 2009 and USD 13.2 in 2015 (Table 6.18).

[21] The integrated health model is designed in a manner that it is possible to costs only one type of facility in each level of care. Therefore, the costing tool could only estimate the costs of one type of public health facility at each level of care including infrastructure, health personnel, equipment/referral equipment administration/monitoring/evaluation etc.. The study/TWG decided to increase the costs of health system estimated by the tool by 40 percent to incorporate the costs of the

- Public facilities which were not included in the model as there are different types of public facilities at each levels of care with different capacity, service utilization and staffing pattern.
- Private not-for-profit health facilities (NGOs), and
- Private clinics and hospitals.

Table 6.18: Yearly resource needs estimates for health systems for attaining health related MDGs by specific interventions

(million BDT)

	2009	2010	2011	2012	2013	2014	2015	Total	% of total
Infrastructure									
Construction costs	4,878	5,065	5,255	5,576	7,052	5,142	6,223	39,191	5.00
Equipment costs	773	797	819	916	1,033	840	1,152	6,330	0.80
Facility upgradation costs	487	485	226	154	154	280	126	1,912	0.24
Operation and maintenance costs	5,551	5,721	5,898	6,087	6,321	6,499	6,720	42,797	5.50
Human resources									
Salaries and In-service training	31,710	36,159	45,309	62,483	70,757	76,304	85,047	407,769	52.40
Pre-service training	13,094	18,848	27,373	24,376	24,734	16,542	15,870	140,837	18.10
Referral equipment	1,957	2,203	2,321	2,587	2,723	2,967	3,116	17,874	2.30
Administration, Monitoring and Evaluation, Surveillance, etc.	3,504	3,990	4,988	6,870	7,775	8,380	9,152	44,659	5.70
Demand creation	5,439	6,845	8,290	9,775	11,301	12,867	14,954	69,471	8.90
Commodity supply system	686	727	781	1,176	1,315	1,453	1,593	7,731	1.00
Total (in BDT)	**68,079**	**80,840**	**101,260**	**120,000**	**133,165**	**131,274**	**143,953**	**778,571**	**100.00**
Total (in USD)*	**995.30**	**1,181.80**	**1,480.40**	**1,754.30**	**1,946.90**	**1,919.20**	**2,104.50**	**11,382.62**	
Per capita (in BDT)	465.12	540.36	670.32	786.60	855.00	834.48	902.88		
Per capita (in USD)*	6.80	7.90	9.80	11.50	12.50	12.20	13.20		

* 1 USD = 68.4 BDT

6.18 Total Resource need for health-related MDGs 4, 5 and 6

The results of the costing exercise show that a total of BDT 1,459,158 million (USD 21,333 million) will be required during the period of 2009-2015 to attain the three health related MDGs (Table 6.19). On average the country should spend USD 19.9 per capita on health interventions over the seven years period of 2009-2015. But the most important challenge is that the estimated cost for attaining MDGs is much higher than the current total health spending in Bangladesh.

Table 6.19: Total resource needs estimates for attaining MDG 4, 5 and 6 (2009-2015) by type of health interventions

(million BDT)

Interventions	Total cost (in million BDT)	Total cost (in million US$)	Average per capita (in BDT)	Average per capita (in US$)
Infrastructure and equip.	90,231	1,319	84.30	1.20
Human resources	548,606	8,020	512.40	7.50
Child health	322,639	4,717	301.30	4.40
Maternal and rep. health	126,450	1,848	118.10	1.70
Tuberculosis	33,550	490	31.30	0.50
Malaria	13,786	201	12.90	0.20
HIV/AIDS	184,161	2,692	172.00	2.50
Administration, Monitoring and Evaluation, Surveillance, etc.)	44,659	653	41.70	0.60
Demand creation	69,471	1,016	64.90	0.90
Referral equipment and commodity supply system	25,605	374	23.90	0.30
Total	**1,459,158**	**21,333**	**1,362.80**	**19.90**

Year wise resource needs calculated by the integrated model show that a total of BDT 125,185 million should be invested in 2009 and the required amount will increase to BDT 278,926 million in 2015 (Table 6.20). The trend of the estimated cost of attaining health related MDGs show that the country needs to regularly increase investment in the health sector during the period 2009 and 2015, but the rise in the estimated cost from 2013 to 2014 is not that significant. Because once the country invests on the capacity development of the health sector it will be receiving the benefit of it for some time without additional investment.

Table 6.20: Yearly resource needs estimates for attaining MDGs 4, 5 and 6 by type of health interventions

(million BDT)

Interventions	2009	2010	2011	2012	2013	2014	2015	Total	% of total
Infrastructure and equipments	11,688	12,069	12,199	12,733	14,560	12,761	14,221	90,231	6.20
Human resources	44,804	55,007	72,682	86,859	95,491	92,846	100,917	548,606	37.60
Child health	27,390	38,548	43,713	47,929	52,247	54,589	58,223	322,639	22.10
Maternal and reproductive health	11,191	13,291	15,643	17,992	20,681	23,068	24,584	126,450	8.60
Tuberculosis	4,162	4,351	4,548	4,754	4,968	5,191	5,576	33,550	2.30
Malaria	1,474	1,630	1,872	2,030	2,164	2,245	2,371	13,786	1.00
HIV/AIDS	12,890	17,850	20,663	24,404	28,910	35,225	44,219	184,161	12.60
Administration, Monitoring and Evaluation, Surveillance	3,504	3,990	4,988	6,870	7,775	8,380	9,152	44,659	3.00
Demand creation	5,439	6,845	8,290	9,775	11,301	12,867	14,954	69,471	4.70
Referral equipment and commodity supply system	2,643	2,930	3,102	3,763	4,038	4,420	4,709	25,605	1.70
Total cost (in million BDT)	**12,5185**	**156,511**	**187,700**	**217,109**	**24,2135**	**251,592**	**27,8926**	**1,459,158**	**100**
Total cost (in million USD)*	**1,830.20**	**2,288.10**	**2,744.10**	**3,174.10**	**3,539.90**	**3,678.20**	**4,077.80**	**21,332.7**	
Total cost per capita (in BDT)	865.70	1,067.60	1,262.30	1,439.70	1,583.60	1,622.10	1,774.30		
Total cost per capita (in USD)*	12.60	15.60	18.40	21.00	23.10	23.70	26.00		

* 1 USD = 68.4 BDT

About 37.6 percent of the resources should be invested in salaries, in-service trainings and pre-service trainings of the health personnel, and 6.2 percent on infrastructure. The proportion of resources required for the direct interventions for improving child health is 22.1 percent, maternal health is 8.6 percent, and for reducing burden of HIV/AIDS is 12.6 percent, tuberculosis is 2.3 percent and malaria is one percent.

The estimates on the per capita resource needs show that the per capita expenditure required to achieve MDGs 4, 5 and 6 is USD 12.6 in 2009 and USD 26.0 in 2015.

CHAPTER 7

ENVIRONMENT

MDG GOAL 7

Ensure Environmental Sustainability

MDG Goal 7 - Ensure Environmental Sustainability

Summary Statistics: MDG Goals, Targets, Indicators and Achievements

GOAL	TARGET	INDICATORS		BASE YEAR 1990-95	2006	TARGET 2015	STATUS OF PROGRESS
GOAL 7 ENSURE ENVIRONMENTAL SUSTAINABILITY	**Target 9** Integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources.	Proportion of land area covered by forest		9.00	11.32	20.00	NEEDS ATTENTION
		Proportion of protected area to surface area to maintain biological diversity		1.60	1.83	5.00	NEEDS ATTENTION
		Carbon dioxide emissions (metric tons per capita)		0.14	0.30	-	LOW EMISSION
		Consumption of ozone depleting CFCs		280.60	155.14 (2007)	-	ON TRACK
		Energy use (kilogram oil equivalent) per USD1000 GDP(PPP)		123.10	92.00	-	NEEDS ATTENTION
		Proportion of population using solid fuels		88.70	86.80	-	NEEDS ATTENTION
	Target 10 Halve, by 2015, the proportion of people with sustainable access to safe drinking water and basic Sanitation	Proportion of the population with sustainable access to an improved water source	rural	78.00	77.00	100	ON TRACK
			urban	76.00	71.00	100	ON TRACK
		Proportion of the population with sustainable access to sanitary latrines	rural	15.30	81.50	100	-
			urban	61.20	80.00	100	-
	Target 11 By 2020, have achieved a significant improvement in the lives of at least 100 million slum dwellers	Proportion of households with access to secure tenure		31.18	36.40	39.74	NEEDS ATTENTION

7.1 Overview of state of Environment in Bangladesh

At present actual forest coverage in Bangladesh is 11.32 percent which is much less than the target set by the government. Bangladesh has less than 0.02 hectares of forest land per person, one of the lowest forest-man ratios in the world. Intensive afforestation and reforestation programme will improve the forest coverage for meeting MDG targets.

Protected areas play an important role for conservation and for the protection of natural and cultural resources. The unique and biological fitness of protected areas provide economic, recreational, educational, scientific and spiritual benefits to man and serve as the gene bank of the more important flora and fauna. Currently, there are 19 Protected Areas (PAs) in Bangladesh covering an area of 2441.75 sq. km which is 12.7 percent of the total forests areas of the country and about two percent of the country. It is recommended that PAs should be at lease five percent of the country's total area.

Government of Bangladesh has recently declared 8 areas as Ecologically Critical Area (ECA) under Environmental Conservation Act, 1995. DOE has designated six ECAs and has plans to designate several more from 2006. Over the next five years, the DOE will concentrate on assessing the need and priorities for designating and managing ECAs, and on defining a strategy for meeting these needs.

The primary source of the increased atmospheric concentration of CO2 since pre-industrial period is from the use of fossil fuels, with land use change providing another significant but smaller contribution. Emission of CO2 was 0.141 Mt in 1990 and increased about 20 percent in 2000 and reaching to 0.30 Mt in 2007. As a least developing country (LDC) Bangladesh DOEs not have any commitment for GHG reduction. Notwithstanding it's favorable position, sustained efforts are still being made to actively control major sources of CO2 emissions in order to mitigate the country's impact on global climate.

The major Ozone Depleting Substances dropped from 280.68 metric tons in 1995 to 155.14 metric tons in 2007. The highest consumption (870.99 MT) of CFCs was recorded in 1997 which was reduced to 328.0 Mt ODS used in 2002. Consumption reduced sharply during 2000-2002 due to the implementation of ACI project. However, implementation of 'CFC Free Technology Transfer' project (1998-2002) by ACI Ltd reduced the highest limit consumption in the aerosol sector and reduced about 50 percent consumption of CFCs. Bangladesh undertook a good number of national policies and programmes to protect ozone layer at the national and international level since 1994. The national ODS Phase-out Plan is being implemented by the DOE.

A major portion of the urban waste of Bangladesh is composed of organic materials, which produce methane (CH4) as they decompose. The contribution of methane to global warming is much higher than that of carbon dioxide. Proper management of urban waste could thus be an important area for mitigation while ensuring a cleaner city. Some of the toxic and hazardous components of the wastes, particularly hospital and industrial wastes while mixed with household garbage increase the risk of spread of diseases. Untreated liquid garbage once dumped into the open water bodies destroys the fish habitat and some of it toxic components may eventually go into the human food chain. Surface water pollution affects the health of poor people. Waterborne diseases are the major cause suffering for the poor people living in the rural and urban areas. Surface water scarcity in the dry period, water logging, groundwater pollution by arsenic are some challenges of water resource management.

Community based schemes help low income fishermen by creating employment and livelihood opportunities in backward and forward linkage activities, fingerling production, fish catching, processing, and marketing, these are all has particular significance for poverty reduction. Poor fishermen in Bangladesh are disadvantaged by policies that favor powerful people capturing fishing rights.

Effective and equitable land use policy will the best possible use of land resources and delivery of land related services to people through modernized and efficient land administration. Land user's right will enhance preventing land degradation. Land zoning will also provide the security of lands for improving environmental activates.

The poor families in urban towns live in slums, squatters' settlements in un-hygienic and unendurable environment. Basic services like pure drinking water, sanitation, footpaths, drainage are totally absent in the areas. The population density in the slums is 200 times greater than the usual density of Bangladesh. Despite the problems, migrants from rural areas continue to migrate to the cities. Currently there is no land title for slum dwellers. Government policies and environmental interventions must focus on reducing the incidences of environment related or environment conditioned poverty due to lack of access to resources or loss of livelihoods.

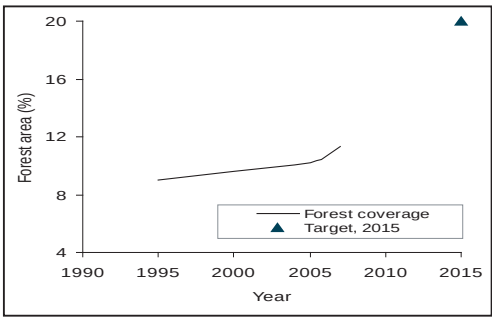
7.2. Progress in Achieving Targets on Environment

7.2.1 Forest Cover

The role of forest is not only in maintaining the ecological balance but also plays an important role in the national economy through creation of employment opportunity, support for subsistence and socio-economic up-lift of rural poor. Poverty reduction through social forestry is now success story within Forestry Sector of Bangladesh. About 0.335 million rural poor are now engaged directly to the participatory co-management approach in the social forestry program. This sector is contributing five percent of the nation's GDP, which is significant in highlighting the real importance of the sector. Notwithstanding this sector is the major source of energy, furniture, construction materials etc. and plays a vital role of protecting extreme climatic events.

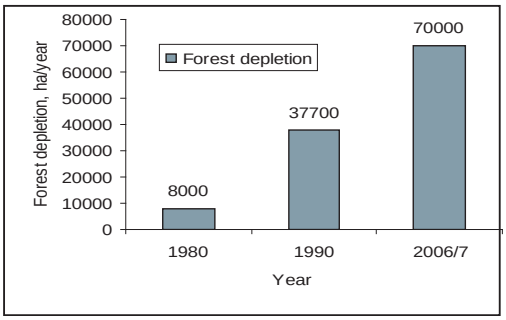
National Forest and Tree Resources Assessment 2005-2007 by Forest Department, SPARRSO and FAO indicated that forest area was 11.32 percent of the total area. If the current growth rate is maintained, it will be required fourteen years to reach the target of 20 percent forest coverage (Figure 7.1).

Figure 7.1 Proportion of forest coverage



Source: BBS 2002,2006

Figure 7.2 Changes of forest depletion



However, depletion of forest was 70,000 hectares per year and Bangladesh has less than 0.02 hectares of forest land per person, one of the lowest forest-man ratios in the world. In the 1990, depletion rate was 37,700 ha per year which nearly doubled in 2006/7 (Figure 7.2). The average annual depletion rate was 0.053 during 1990-2006. More emphasis will be given to afforestation and reforestation, strip plantation along roads, railroads, and canals/embankments which can contribute to increase the total forest coverage.

Forest Policy and Sustainable Forest Management

The current forest policy formulated in 1994 has been considered to be the most elaborate policy in the history of the country. Under this policy, participatory social forestry has been institutionalized in Bangladesh. The analysis shows that, progress is slow and is blocked on several fronts. A number of identified technical, managerial and logistical problems are hindering policy and program implementation. In addition, corruption contributes to the observed problems.

The real strength of Bangladesh forestry is locally based, participatory forestry with co-management of protected areas and highly motivated people who increasingly recognize the need for a healthy forest ecosystem that will provide future economic stability. Because it is the rich homestead forests of Bangladesh that generate the majority of commercial forestry products, it is important that education continues at the grass-roots level. In addition, educated forestry and environment professionals have been identified as the future driving forces towards better and sustainable forest management.

7.2.2 Protected area for biological diversity

There are 20 Protected Areas (PAs) in Bangladesh covering an area of 2441.75 sq. km which is 11.32 percent of the total forests areas of the country (FD, 2008) and about two percent (Table 7.1) of the country. But PAs should be at lease five percent of the country's total area but presently these are below it. Estimates indicate that the protected area under national parks and wildlife sanctuaries increased over the years. It was only 1.64 percent of the total land area over 1990-95 and increased to 1.73 in 2000 and further increased to 1.83 in 2005. In 2007 it raised to 1.84 percent. If the present growth rate (0.35) is maintained than PAs would be 2.3 percent in 2015 which is much less than the expected (5 percent) areas. The areas have been demarcated as biological corridors which connect the wildlife sanctuaries, national parks, game reserve to allow the free and uninhibited movement of animals and birds within the natural range.

Table 7.1: Ratio of protected area to surface area for maintaining biological diversity

Year	1990-95	2000	2005	2006	2007	Target 2015	Predicted 2015
Protected Area (%)	1.64	1.73	1.83	1.84	1.843	?	2.30

Source: Compendium of Environment Statistics of Bangladesh, BBS, 2005
*Forest Department, 2008, http://www.infoplease.com/ipa/A0107317.html

A total of 19 PAs are notified under the Bangladesh wildlife (preservation) order 1973 except Hazarikhil Wildlife Sanctuaries. The biggest Protected Area in Bangladesh is the Sundarbans West Wildlife Sanctuary with an area of 71502.103 hectares and the smallest Protected Area is the Ramsagar National Park with an area of 27.76 hectares. The protected area harbors around 500 species of wild vascular plants and around 840 species of wild animals. These flora and fauna are vital ingredients to the people's existence and important components of ecological balance.

Ecologically Critical Areas

Government of Bangladesh has recently declared eight areas as Ecologically Critical Area (ECA) under Environmental Conservation Act, 1995, with the notice issued in April 1999. The ECAs are ten kilometers around the Sundarbans Rserve Forests, Cox's Bazar Teknaf Sea Beach, Saint Martin's Island, Sonadia Island, Hakaluki Haor, Tanguar Haor and Marjat Baor (Table 7.2). Activities banned in these areas include: felling or collecting trees; hunting, catching or killing wildlife; industrial establishment; fishing and other activities that might affect fish and aquatic life; and any activities that could destroy or change the natural characteristics of soil or water.

Table 7.2. List of Ecologically Critical Areas (ECAs) in Bangladesh

Serial No	ECAs	District/s	Total area in Hectares
1	Around the Sundarbans Reserve Forest	Bagerhat, Khulna, Satkhira	10 Km
2	Cox's Bazar (Teknaf, Sea beach)	Cox's Bazar	10,465
3	St. Martin Island	Cox's Bazar	590
4	Sonadia Island	Cox's Bazar	4,916
5	Hakaluki Haor	Maulavi Bazar	18,383
6	Tanguar Haor	Sunamganj	9,727
7	Marjat Baor	Jhinaidha	200
8	Gulshan-Banani-Baridhara Lake	Dhaka	-

The ECA introduces the concept of a supportive role for DOE to perform in helping other agencies deliver their conservation mandates. However, it assigns limited authority to DOE itself, and that is to designate ecologically critical areas, and to prescribe allowed or prohibited uses for those areas. DOE has designated six ECAs and has plans to designate several more since 2006. However, the DOE's resources for this work are extremely limited. Over the next five years, the Department will concentrate on assessing the need and priorities for designating and managing ECAs, and on defining a strategy for meeting these needs. This includes developing proposals for establishing and institutionalizing clear processes and procedures for designating and managing ECAs. Follow-through depends upon securing GOB commitment, consensus and cooperation among government agencies and stakeholders to move forward, and upon securing the-resources necessary to begin implementing the strategy. District authority should be integrated with the ECAs management team. In the meantime, DOE will continue to liaise with other government agencies in support of their efforts to safeguard biological productivity and biodiversity.

St Martin's Island is one of the few areas in the world where coral-algal communities dominate rocky reefs that supports significant breeding areas for globally threatened marine turtle species and serving as a stepping stone for several globally threatened migratory waders. In the recent times, the numbers of national and international tourists are increasing rapidly to the Saint Martins Island. With the increasing tourist local inhabitants with migratory labours including Rohingya refugees are increasingly putting pressure on the island's environment to sustain their daily needs. Adverse impacts include those on endangered green turtles and Olive Ridley turtles so much so that they no longer come to the island to lay their eggs. It is one of the major indicators of the health of sea, are not getting the suitable environment for laying eggs.

The number of species, especially the flora and invertebrates, of Bangladesh not yet been counted exactly. Khan (2001) reported that Chittagong zone alone possess over 2,259 species of flowering plants. Hassan (2003) stated that there are over 700 species of flowering plants, 500 species of medicinal plants, 300 species of mangrove and mangrove associate plants and 300 species of wetland plants in Bangladesh. The fauna, especially the wildlife includes 125 species of mammals, 750 species of birds, 500 species of fishes, 125 species of reptiles and 9 species of amphibian.

Bangladesh has lost about 10 percent of its mammalian fauna, thee percent avifauna and four percent reptile during the last 100 years. IUCN Bangladesh has identified 201 species of wildlife in the country are threatened under different degree of extinction risk (Table 7.3 and Table 7.4). Loss of species is mostly coupled with loss of habitat. For most of these endangered species the forest and wetlands are the last refuge. Forest cover, as indicated above, is also under constant threat. Forests are increasingly being degraded and denuded by encroachment and faulty management practices. Wetlands are in worse condition compared to that of forests. Wetlands are being converted into agricultural land and substantially degraded through the development activities.

Table 7.3: Status of inland and resident vertebrates of Bangladesh (IUCN, 2000a)

GROUP	TOTAL NO. OF LIVING SPECIES	EXTINCT	THREATENED				DATA DEFICIENT (DD)	NOT THREATENED (NO)
			CRITICALLY ENDANGERED (CR)	ENDANGERED (EN)	VULNERABLE (VU)	TOTAL		
FISH (FRESH WATER & BRACKISH WATER)	226	0	12	28	14	54	66	146
AMPHIBIANS	22	0	0	3	5	8	7	7
REPTILES	109	1	12	24	22	58	39	12
BIRDS	388	2	19	18	4	40	53	17
MAMMALS	110	10	21	13	6	40	53	17
TOTAL	895	13	64	86	51	201	323	371

Source: ADB, 2004

Table 7.4: Status marine and migratory vertebrates of Bangladesh (IUCN, 2000a)

GROUP	TOTAL NO. OF LIVING SPECIES	EXTINCT	THREATENED				LOWER RISK (LR)	DATA DEFICIENT (DD)	NOT THREATENED
			CRITICALLY ENDANGERED (CR)	ENDANGERED (EN)	VULNERABLE (VU)	TOTAL			
FISH (MARINE)	442	0	0	0	1		3	0	438
REPTILES (MARINE)	17	0	1	4	0	5	0	0	12
BIRDS (MIGRATORY)	240	0	0	2	4	6	6	4	224
MAMMALS (MARINE)	3	0	0	2	1	3	0	0	0
TOTAL	702	0	1	9	8	18	6	4	674

Source: ADB, 2004

In recent years, Bangladesh has demonstrated increased determination and commitment to address the challenges of ensuring sustainable use and conservation of its natural resources, including its biodiversity. The objective of these activities is to develop a National Biodiversity Action Plan which fulfils Bangladesh's international commitments under the Convention on Biological Diversity (CBD), while also reflecting national priorities and the country's unique cultural, historical and geographical setting. A number of specific policies, laws, action plans and strategies have been developed in this regard.

7.2.3 Carbon dioxide per capita emission

The main source of CO2 emission in Bangladesh is the combustion of fossil fuels which contributed more than 40 percent CO2 in the air. Though current National Figures are not available but according to GED (2007) Carbon dioxide emission has increased over the years 20percent in 2000 and it became 0.30 Mt in 2007 (Table 7.5). The net effect of CO2 gas emission was reduced to 11 percent by the cooling effect of aerosols during 1992-2002. As a least developing country (LDC) Bangladesh does not have any commitment for GHG reduction under UNFCC. Bangladesh prepared her Initial International Communication, based on 1994 emission inventory data and there is no National data on emission Inventory since 1994. Government has been implementing the Second International Communication which will be completed by August 2010. It is expected updated data on emission and future projection will be available soon.

Table 7.5: Carbon dioxide per capita emission

	1990-95	1996	1998	1999	2000	2003	2004	2005	2006
CO^2 emission, Mt	0.14	0.183	0.177	0.189	0.218	0.247	0.256	0.266	0.30

Source: MDGs, GED, Planning Commission, GOB 2007, UNFCC - CDIAC via UNSTATS

Air pollution

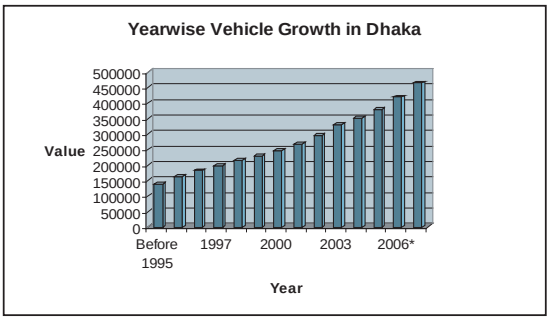
Air pollution is more acute in urban areas than in rural areas, Dhaka is a more polluted city compared to the other divisional cities. Due to rapid urbanization the total number of vehicles has increased rapidly (Figure 7.3). In 1995, the number of vehicles was about 150,000 which increased three times higher in 2007. The automobiles on the road are often very old, overloaded and poorly maintained and emit smoke far exceeding the prescribed limit. Industrial development is another major source of air pollution. Most industries in Bangladesh are situated in major urban areas. Food industry emits maximum amount of pollutants followed by cement, pulp and paper industry and textile (Table 7.6). Among food industry, most of the pollutants come from the sugar mills.

Table 7.6: Top five polluters that causes air pollution

Rank	Industrial Sector	Emission (tons/ Year)	% Contribution	Cumulative Percent
1	Food industry	146,356.06	38.70%	38.70%
2	Cement/Clay	62,725.88	16.60%	55.30%
3	Pulp and Paper	51,963.92	13.70%	69.00%
4	Taxtile	39,831.01	10.50%	79.50%
5	Tobacco	16,992.22	4.50%	84.00%

(Islam, et. al., 2001)

Figure 7.3. Year-wise vehicle growth in Dhaka city.

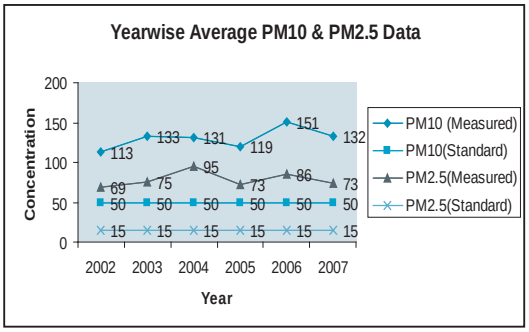


Source: AQMP, DOE 2007

Air quality

Air Quality Monitoring being performed by the DOE has obtained some principal parameters values. The principal parameters being measured during 2002-2007 for ambient air quality are PM_{10}, $PM_{2.5}$, SO_2, NO_x, CO and O_3. The equipment used to measure particulate matter is the PM_{10} inlet equipped high volume sampler for PM_{10}, the Partisol sampler for $PM_{2.5}$ and subsequent sampler. Particulate matter concentrations (as PM_{10} and $PM_{2.5}$) on annual basis in the city of Dhaka indicate a slightly increasing tendency from 2002 to 2006 (Figure 7.4). Both PM_{10} and $PM_{2.5}$ concentrations exhibit level exceeding WHO guidelines as well as exceed more than the national standards of annual PM_{10} (50µg/m³) and $PM_{2.5}$ (15µg/m₃). Plotting the average monthly concentrations from 2002 to 2007 shows a consistent trend in the seasonal variations.

Figure 7.4. Annual average PM10 and PM2.5 in Dhaka



(Source: AQMP, DOE 2007)

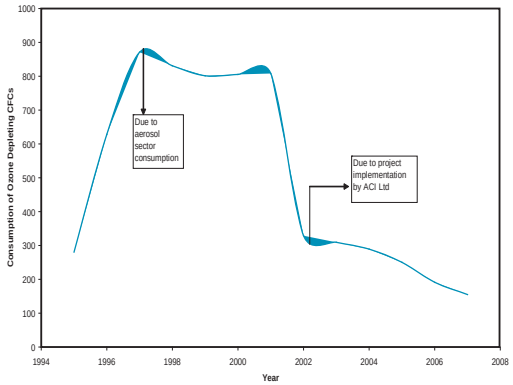
The direct costs related to hospitalization and medicine will increase tremendously in the coming years if higher level of air pollution is not reduced in Dhaka and also in other urban locations. The cost of air pollution to the nation will exceed few billions if other indirect costs like loss of life and loss of workdays are taken into account.

Two-stroke engines and old vehicles, which are very inefficient in burning fuel, are the major source of such high air pollution level in Dhaka. At the same time, plying of motorized and non-motorized vehicles (like rickshaws) on the same road together with bad traffic management often multiplies the level of pollution. In rural area, main sources of pollution are brick kilns, wood and biomass consumption (indoor air pollution).

7.2.4 Ozone depleting CFCs

The consumption pattern of ozone depleting substances, CFC's, is presented in Figure 7.5 below. The major Ozone Depleting Substances, such as CFC-11, CFC-12 and CFC-115 dropped from 280.68 metric tons in 1995 to 155.14 metric tons in 2007. During this period the highest consumption (870.99 MT) of CFCs was recorded in 1997 which was reduced to 328.0 Mt ODS used in 2002. Consumption reduced sharply during 2000-2002 due to the implementation of ACI project. The highest value appeared due to the more consumption in the aerosol sector. However, implementation of 'CFC Free Technology Transfer' project (1998-2002) by ACI Ltd reduced the highest limit consumption in the aerosol sector and reduced about 50 percent consumption of CFCs.

Figure 7.5: Consumption of Ozone Depleting CFC's



Source: Ozone cell, DOE 2008

Bangladesh undertook a good number of country policies and programmes to protect ozone layer at national and international level since 1994. In 2005, the country programme was updated with the financial support of multilateral fund (MLF) under Montreal Protocol. A national ODS phase out plan was finalized in 2004 to reduce 85 percent of the ODS use by the end of 2007, and 100 percent by 2010. National ODS Phase-out Plan is now being implemented by the DOE. Progress towards achieving these targets are being made also through instituting licensing system to control the import of ODSs and ODS containing products that are already in use the country.

The Government of Bangladesh undertook a reconnaissance study on import and consumption of ODSs in 1993 and based on the study, a detailed Country program was drawn up in 1994. According to the paragraph 1 of Article 5 of the Protocol, Bangladesh is operating activities and enjoining the ten year grace period of phasing out the ODSs. Bangladesh's estimated baseline consumption by taking the average consumption in 1995, 1996, 1997 and starting its phasing out operation since 1st January 1999 and a National Technical Committee was formed in 1994 for phasing out ODSs within the timeframe.

There are a good number of projects that were implemented or are under the process of implementation under the Montreal protocol. (i)Institutional Strengthening for Phase out ODSs; (ii) Conversion to CFC Free technology for the production of Aerosol Products at ACI Ltd; (iii) Implementation of a National Programme for Recovery & Recycling of Refrigerants; (iv) Training Programme on Good Practices in Refrigeration; (v) Training Programme for Customs Officers; (vi) National ODS Phase-out Plan; (vii) Phasing out of CFC in the manufacturing of metered dose Inhaler in Medicine manufacturing sector in Bangladesh. As per Montreal Protocol obligations Bangladesh is now in full compliance.

7.2.5 Natural Disaster

Bangladesh regularly faces natural disasters like flood, tidal bore, tornado, cyclone, droughts etc. Floods and tropical cyclones are the two most common natural disasters in Bangladesh. Seasonal flooding is a recurrent phenomenon in the country. About 22 percent of the land area is flooded in the wet season even in a normal year, and about 60 percent of the country are considered flood prone (ADB, 2004). Poor and marginalized people were highly affected; especially women and children became vulnerable.

Table 7.7 explains that the most common type of natural disaster in Bangladesh is flood, which affects lives, properties and the environment (two major floods occurred in 1998 and in 2000). The floods during 1998 were the longest duration in the history of Bangladesh (Table 7.7) and the water level did not recede for a long time (flooding in Dhaka started in the 3rd week of July and continued till the 3rd week of September 1998).

Table 7.7: Comparison of flood situation

	1988	1988	2004	2007
INUNDATED AREA	61 PERCENT	68 PERCENT	38 PERCENT	46 PERCENT
DURATION OF FLOOD	23 DAYS	72 DAYS	21 DAYS	24TH JULY 2007 5TH-15TH SEPTEMBER 2007
PERSONS AFFECTED	45 MILLION	31 MILLION	36 MILLION	16 MILLION
TOTAL DEATHS	2335 PERSONS	918 PERSONS	800 PERSONS	649 PERSONS
LOSS OF INCOME/ASSETS	USD 330 MILLION	USD 20 MILLION	USD 22 MILLION	USD 10.6 MILLION

Source: DOE, 2006

During the period 1973-1987, about 2.18 million tons (MT) of rice was damaged due to drought and 2.38MT due to flood. Drought affects annually about 2.32 Mha and 1.2 Mha of cropped land during the Kharif (summer) and Rabi (winter) seasons (Dey, et al., 2006).
Tropical cyclones, originating in the southern Bay of Bengal, strike the coast of Bangladesh in the months of April-May and October-December. Cyclones are generally associated with storm surges of several meters in height, which are mainly responsible for major devastation in terms of loss of life and damage to property and infrastructure. In past years, two massive cyclones hit Bangladesh - one on 12-13 November 1970 and another on 29 April 1991. The former killed about half-a-million people, but in the latter - though more severe - loss of human life was lesser due to warning signals and disaster preparedness. The existing policies are as follows:

The institutional responsibility for natural disasters is assigned to the Disaster Management Bureau under the Ministry of Relief and Rehabilitation. The Act, the Policy and the Plan for disaster management are in draft form, and are in process of finalization. However, the Standing Order on Disasters - revised in 1999 - is a comprehensive document that outlines management activities, at all levels and by all partners, during normal, emergency and post-emergency periods.

The Cyclone Preparedness Program of the government is aimed at minimizing loss of human life and property through building public awareness, warning and providing protection in cyclone shelters. Since 1960s, nearly 2,000 cyclone shelters have been constructed along the coast. However, the capacity of these shelters to be able to protect the local people is very minimal. In addition, the death of animals, both domestic and wild, has so far been ignored.

Current flood prevention measures include structural interventions like embankments (over 8000 km in length), drainage improvement and river training works - did not yield expected results due to inadequate or poor operations and maintenance activities. Management of these infrastructures are not yet designed to ensure participation by the people of the locality.

The Flood Forecasting and Warning Centre (established in 1972) of the BWDB that collect rainfall and water level data and provide flood forecasts is yet to deliver the results to the public. In this, accuracy in forecasting and dissemination of information are essential ingredients for their success.

One of the tectonic faults passes through Bangladesh increasing the risk of earthquake. At the same time, construction of high-rise buildings in the cities has increased risk of damages (both human life and cost of property damages) due to an earthquake. The government cannot ignore this any more and should consider the following actions:

- Construction of cyclone shelters should receive priority with the aim to provide protection to at least 80 percent of the high-risk population in an area. The recommendations of the Multipurpose Cyclone Shelter Plan of 1992 can provide directions for implementation.
- All shelters must be equipped with facilities to provide a decent living for the people during disasters.
- Government shall take steps to review existing flood protection embankments for the shortcomings and inadequacies and take measures to remove them.
- To manage the flood protection and irrigation infrastructure, an appropriate management structure shall be developed so that it guarantees public participation both in selecting locations for any new embankment as well as in sharing the costs of its operations.
- The 1998 flood has shown the weakness in the current structural protection plan of Dhaka city. Consequently, embankments in all major and secondary towns to prevent urban flooding must be maintained and water level within the protected area must be monitored to prevent any future disasters. At the same time, the eastern side of Dhaka City shall be protected to reduce damages of properties and resources. An embankment along the Balu river is, therefore, recommended.
- Recent floods have shown the inherent weakness of our existing flood forecasting system. It is not possible for people to understand the true picture of the flood from the existing warning messages. Consequently, it is strongly recommended that localized flood-warning languages be used to alert people on the upcoming floods.
- Government should authorize local governments to monitor compliance of building codes during constructions to minimize life and property damages during a earthquake.
- Government should actively consider introducing a 'disaster insurance scheme' to prevent a sudden collapse of the economy in case of a natural disaster. This will help the government to quickly rebuild the economy after disasters.

Vulnerability and Adaptation to Climate Change

Bangladesh is extremely susceptible to the impacts of natural disasters such as frequent tropical cyclones and climate-related vulnerabilities. As a result, the coastal belt and its connected riverbanks are at serious risk due to their geographical locations. The coastal area is ecologically sensitive and climatically vulnerable, due to the continuous process of land accretion and erosion. In addition, current global climatic change is expected to result in loss of human habitation and destruction of coastal resources through rising sea levels Numerous environmental, cultural and socio-economic problems are predominant in the area due to water-logging, salinity intrusion, river siltation, and reduction in the agricultural production are increasing poverty and social conflicts.

Coastal Zone Management and Sustainability

The coastal zone of Bangladesh is highly fertile and characterized by rich biodiversity and natural resources - both renewable and non-renewable. The world largest mangrove forest, the Sundarbans, is an important world heritage area situated in this coastal system. Recently, coastal Bangladesh has also attracted international attention for its high potential of inshore and offshore natural gas, minerals, aquaculture, food availability, tourism industry and tidal power. However this zone is extremely susceptible to the impacts of natural disasters such as frequent tropical cyclones and climate-related disturbances such as sea level rise and loss of habitable land mass and vulnerability to natural disasters. As a result, the coastal belt and its connected riverbanks are at serious risk due to their geographical locations. The coastal area is ecologically sensitive and climatically vulnerable due to the continuous process of land accretion and erosion. In addition,

current global climatic change is expected to result in loss of human habitation and destruction of coastal resources through increasing sea levels. Thus the inhabitants of coastal areas are under threat. The management systems of coastal resources are also not well organised.

Coastal Bangladesh consists of 19 districts that comprises of 2.85 million hectares (7.6 million acres) in area and is 200 km in length (120 miles) including about 148,000 square km of crisscrossed watercourses of the mighty rivers - Padma, Jamuna, Meghna and Karnophuli and with a 710 km long coastline. Since 1974, the coastal area has also been expanded to include an exclusive economic zone (EEZ) of 200 nautical miles that reaches the edge of the continental shelf. This is now under the economic jurisdiction of the country for exploration, exploitation, conservation and management of its living and non-living resources.

Bangladesh has made its initial steps as to build on present achievements and develop further initiatives such as promotion of an enabling institutional environment, supporting continued efforts in the process of establishing ICZM in Bangladesh (as specified in the Coastal Zone Policy (CZP) and Coastal Development Strategy (CDS)), coordinate the implementation of the CZP, CDS and the Priority Investment Program (PIP) especially for the issues of climate change, monitoring and assess PIP and knowledge management and social communication. An integration of tidal power into coastal development offers potential benefits in economic, social and environmental improvement by involving local people through community-based co-management. In the integrated coastal development process, multi-sectoral activities would contribute to the sustainable livelihood of the communities, where tidal power would help to improve and modernise the economy of the coastal community through integration of aquaculture, livestock, poultry, agriculture, public health, and micro-credit systems.

Impact of Climate change

The impact of climate change is a serious risk to poverty reduction and threatens to undo decades of development efforts. As the Johannesburg Declaration on Sustainable Development states, "the adverse effects of climate change are already evident, natural disasters are more frequent and more devastating and developing countries more vulnerable". While climate change is a global phenomenon, its negative impacts are more severely felt by poor people and poor countries like Bangladesh. Bangladesh is more vulnerable because of its high dependence on natural resources, and its limited capacity to cope with climate variability and extremes. Experience suggests that the best way to address climate change impacts on the poor is by integrating adaptation responses along with the mitigation measures into development planning.

Adaptation Measures for Climate Change Impacts

As climate change is a global problem, so all countries must work to reduce their greenhouse gas emissions and learn how to cope with the impacts of climate change. Bangladesh, however, have relatively small greenhouse gas emissions, so mitigation is less important for her. Adaptation is more relevant for poorer nations because of its relative vulnerability to the impacts of climate change, which stems partly from geographic location funnel shaped Bay of Bengal's locations and the tidal affected areas of flood-prone coastal Bangladesh. As a developing country, Bangladesh's adaptive capacity is also lower than that of developed countries because of its limited financial resources, skills and technologies and high levels of poverty. Reliance on climate sensitive sectors such as agriculture and fishing is also high.

The Intergovernmental Panel on Climate Change (IPCC) recognizes Bangladesh as one of the most vulnerable to climatic variability and change because of multiple stresses, such as poverty, and its low adaptive capacity. Actions should aim to reduce the vulnerability of a system (such as a city) or population (such as a coastal village) to the negative impacts of anticipated human-induced climate change. Adaptation to climate variability involves taking action to reduce vulnerability to short-term climate shocks. Often adaptation to climate variability will also result in adaptation to climate change. Adaptation activities can be of different types, from the purely technological (such as sea defense construction), to behavioral (such as shifts in choice of food or recreation), managerial (such as changes in farming methods) and policy (such as

planning regulations). Climate risk assessment needs to be incorporated into development activities by all of relevant professionals.

The IPCC states that in Bangladesh, agricultural production, including access to food, is projected to be severely compromised by climate variability and change. Adaptation activities include using drought-resistant crops, introducing new farming techniques and diversifying income sources. As climate-related disasters such as floods, cyclones and droughts are recurring problems for Bangladesh, early warning systems along with institutional plans are of crucial important. Some are quite successful (such as the cyclone warning system in Bangladesh), but many are inefficient and unlikely to be able to cope with future disasters exacerbated by climate change. Strengthening national and local capacity in disaster risk reduction and disaster management by working with existing structures is thus a precursor for the disaster management in Bangladesh.

This is fundamental to achieve the Millennium Development Goals (MGDs), including the over-arching goal of halving extreme poverty by 2015, and sustaining progress beyond 2015. Climate change is now very much a reality, and for the poorest of the poor the implications are particularly daunting. These often remote or marginalized Bangladesh communities are so burdened they will struggle to meet the coming challenges. Adaptation - learning to cope with rising temperature and other effects of climate change - is a difficult but essential task for these vulnerable millions.

7.2.6 Solid Waste Management

With the high density of population and continued urban migration of more people, the task of managing solid waste has become a monumental challenge for major urban center like Dhaka, Khulna, Chittagong, Rajshahi etc. The present system (i.e., run by the Dhaka City Corporation), is inefficient and unsatisfactory. Everyday the population of DCC area produces 3,200-3,500 tons of garbage and only 42 percent of this is collected by DCC and disposed of in open landfill site. Solid waste management in the slum areas in the three urban areas, like Narayangong, Chittagong and Kustia are deplorable with only 27.1 percent solid waste being managed (UN-Habitat, 2007).

Collection of household garbage by the city corporations and the municipalities are insufficient and so a large percentage (often more than 50 percent) of the garbage is left on city streets. These eventually find their way into the city drainage lines and in the sewage system and are responsible for water logging in many cities. Organic and inorganic garbages are not separated at source and the dumping in the landfill sites is becoming risky as the possibility of groundwater contamination increases. Some of the toxic and hazardous components of the wastes, particularly hospital and industrial wastes while mixed with household garbage increase the risk of spread of diseases. Untreated liquid garbage once dumped into the open water bodies destroys the fish habitats and some of it toxic components may eventually end up in the human food chain.

However, some success in the collection of household wastes should be noted. These are mainly administered by local residents, organized local communities or associations, and also some NGOs. Success in this area should be capitalized and efforts should be duplicated in other areas. The Kalabagan method of waste collection from households and the work of Waste Concerns are some examples where private and voluntary institutions were successful in building a 'clean neighborhood'.

To deal with the problem of waste management, following actions are suggested:

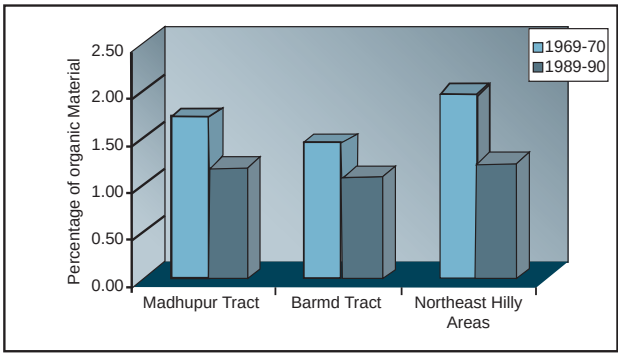
- Separation of toxic / hazardous components of hospital / industrial waste for appropriate treatment and hospital wastes should be disposed-off using environmentally safe technology.
- All industries, new or existing, should have their respective ETPs constructed and running.
- Introduce area-based primary collection from households by NGOs and Community organizations in all built-up residential areas.
- Promote recycling and resource recovery both at the industrial level and at the household level.
- Promote secondary collection and transportation of garbage by private and voluntary organizations.
- Establish Sanitary landfill sites.

Some NGOs have already demonstrated the success of involving community in waste recycling. This community approach has been very successful in waste collection. But problem arises with the insufficient capacity of City Corporation to collect this accumulated waste from community collection centers for further dumping in the landfills. Long-term planning is needed in identifying future landfills. Improved management of existing landfill sites should be given a high priority. Promising potential in reducing the need for landfill sites needs strong support from the Government. Government also should promote 3R (reduce, recycle and reuse) programmes. Solid waste from hospitals is a major concern for environmental quality in city areas. Structural interventions like installing incinerators at the hospital premises can be a major intervention option. But this must be backed by proper monitoring from the designated authorities that deal with environment and health issues.

7.2.7 Agricultural Land Degradation and Salinity

Depletion of organic matter in the soil, degradation of the physical and chemical properties of the soil, reduction in the availability of major micronutrients, imbalance in the fertilizer application and build-up of toxicity through improper use of pesticides are the major reasons of soil fertility decline (Figure 7.6). 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 unsuitable cultivation practices in the Barind and Madhupur tracts.

Figure 7.6: Changes in Organic matter from 1969-70 to 1989-90



(Karim et. al., 1994)

Increase in salinity of the topsoil has a large impact on agricultural production. 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.

Land is being degraded by soil salinity, water logging and soil contamination, deforestation, water pollution, drawdown of water table and drainage congestion. Climate change and sea level rise are also potential threat to land resources. Due to soil salinity, water logging and acidification about 0.83 Mha, 0.7 Mha and 0.6 Mha respectively of crop land is degrading in every year (Dey, et al., 2006). 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. 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 (Table 7.8).

Table 7.8: Valuation of losses from land degradation (after Karim et. al. 2001)

Item	Total loss	Costs in million taka/year (% of GDP of 1997 at Constant Market Price)
Water erosion-production loss	1.06 mt/yr	6613.84
Water erosion-nutrient loss	1.44 mt/yr	25,576.46
soil fertility decline-production loss	4.27 mt/yr	26,641.48
Soil fertility decline-additional input needed to replace	1.22 mt/yr	21,66825
Salanization (Production loss)	4.42 mt/yr	27,577.25
A. Productivity loss		60,832.57 (3.33%)
B. Nutrient loss		47,244.71 (4.37%)
C. Estimated total loss		108,087.28 (7.70%)

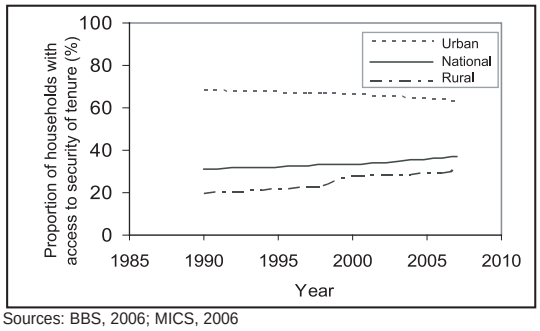
7.2.9 Improving the Lives of Slum Dwellers

Migration of people to metropolitan cities, and particularly to the capital city of Dhaka, from the rural areas has become the common phenomenon in Bangladesh over the last several decades. However, the potential benefits of life in cities fail to reach the majority of the poor migrants. As a result, many migrants live in poor housing like, slums, squatters' settlement with some living without a shelter in unhygienic and unsustainable environment. The population density in the slums is 200 times greater than the usual density of Bangladesh (CUS, 2005). One third of the urban population live in conditions of extreme poverty, with congestion and lack of basic amenities, footpaths, drainage are often absent in different slums of Bangladesh (LGED/UNDP/UN-Habitat, 2007). Despite the problems, migrants from rural areas continue to migrate to the cities. The global indicator for Target 11 is the proportion of households with access to secure tenure. Four additional dimensions of this target 8 have been identified by UN Habitat: i) Access to security/durability of housing; ii) access to safe water; iii) access to sanitation; and iv) sufficient living area.

Secure tenure/Durability of housing

In the urban areas, the proportion of household with access to security of tenure declined from 68.28 percent in the 1990 to 63.2 percent in 2007. Security of tenure at the national level increased from 31.18 percent in 1990 to 36.69 percent in 2007. The growth rate of urban tenure security declined more that 10 percent in 2007 from 1990. If this trend continues then population with access to security of tenure would be about 60 percent for urban, 40 percent for rural and overall 40 percent for national by 2015 (Figure 7.7).

Figure 7.7: Proportion of households with access to secure tenure



Sources: BBS, 2006; MICS, 2006

Bangladesh currently has no clear-cut policy for urban management. The Local Partnerships for Urban Poverty Alleviation Project of LGED/UNDP/UN-Habitat during 1996-2006 has improved community empowerment especially women and strong partnerships between the local government and communities in some areas of Bangladesh.

Tenure Insecurity

Evictions of slums on government land are a common event. A study conducted by Center for Urban studies (CUS, 2005) found of the 9,048 slums, 6.5 percent experienced one or more evictions in their present location or were currently under the threat of eviction (Table 7.9). It must be emphasized, however, that this provides only a partial indication of the extent of eviction.

Table 7.9: Threat of Eviction: Tenure Insecurity

(% of clusters)

EVICTION INCIDENCE	DHAKA	CHITTAGONG	KHULNA	RAJSHAHI	SYLHET	BARISAL	ALL CITIES
NONE	95.50	89.60	82.50	91.10	98.90	94.90	93.50
ONCE	1.40	2.80	5.00	-	0.50	1.70	1.70
TWICE/MORE	1.90	1.90	6.00	6.90	0.10	3.10	2.40
CURRENTLY UNDER EVICTION THREAT	1.20	5.70	6.50	2.00	0.40	0.30	2.40
DON'T KNOW	0.00	0.00	0.00	0.00	0.00	0.30	0.00
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Source: CUS, 2005

To assure household security, it requires agreement of the landowner to at least ten years security of tenure. It is not clear however that communities recognize this as sufficient security to risk investment of their own capital and savings in improving their housing as seen in other Asian cities (LGED/UNDP/UN-Habitat, 2007). Indeed, when questioned why families were not investing in improved shelter, the common response was that this may be wasted investment if they are required to move.

The income status of different urban sites households describes in Table 7.10. It is found that household incomes were to be less than BDT 5000 per month. The highest percentage was found within the range of BDT. 2001-3000.

Table 7.10: Income group

INCOME RANGE (BDT/MONTH)	NARAYANGANJ	%	CHITTAGONG	%	KUSTIA	%	TOTAL	%
<2000	0	0.00	1	10.00	2	22.20	3	10.70
2001-3000	4	44.40	3	30.00	4	44.40	11	39.30
3001-4000	4	44.40	3	3.00	30	2.00	9	32.10
4001-5000	0	0.00	0	0.00	1	11.10	1	3.50
>5000	1	11.10	3	30.00	0	0.00	4	14.30
TOTAL	9	100.00	10	100.00	9	100.00	28	100.00

Source: LGED/UNDP/UN-Habitat, 2007

Regarding the type of housing and services of the study area, it was found that 6.18 percent of households live in pucca dwellings, 47.08 percent semi-pucca and 52.34 percent in kutcha houses (Table 7.11). Only a few were found to live in 'Jhupris'-these being the most temporary of shelters.

Table 7.11: Household structure

STUDY AREA	NO. OF SETTLEMENTS	PUCCA	SEMI-PUCCA	KUTCHA	JHUPRI
KUSTIA	20	3.35	11.15	5.35	0.15
NARAYANGANJ	18	0.40	8.30	7.05	2.25
CHITTAGONG	70	2.43	27.63	39.94	0.00
4001-5000	0	0.00	0.00	0.00	1.00
TOTAL	108	6.18	47.08	52.34	2.40

Source: LGED/UNDP/UN-Habitat, 2007

Challenges

In the urban areas, the slum dwellers pay high rent for staying in the slums with very poor facilities. They lose even this inadequate shelter due to frequent slum eviction. It was estimated that urban population in 2000 would be 26 million. Under the assumption that population growth will stabilize by 2035, and that current rate of rural-urban migration is maintained, it was estimated that urban population in 2015 will reach nearly 50 million. The majority will be living in the four major cities of Dhaka, Chittagong, Khulna and Rajshahi. Quality of life is especially poor in the urban slums where residents often do not have proper access to education, safe water and other health services. Traditionally, the majority of resources have been allocated for rural development.

7.3 Major interventions for Target 9 on Environment

Interventions aimed at mainstreaming environmental concerns and their mitigation will ensure that all development activities systematically take into consideration environmental issues as early as possible in the decision making process. The identified interventions to strengthen the legal and policy framework will promote compliances and enforceability while plugging existing loopholes, bridging identified gaps, cleaning ambiguities and ensuring timely identification of emerging environmental concerns and issues by 2015.

The interventions aimed at ensuring compliance and enforcement of environmental regulations will greatly assist in ensuring environment sustainability by 2015. Building the capacity of relevant agencies such as DOE, FD within MOE&F, Disaster Management Bureau (DMB) of MF&DM, LGED of MLG&RD, environmental employees are interventions that are expected to increase the country's currently limited environmental management and help fully realize its environmental goals and objectives. The following are the further elaborations of key identified interventions.

7.3.1 Reducing Exposure to Environmental Health Impacts

Major interventions for reducing exposure to environmental health impacts are presented in Table 7.12, while the details for each intervention are mentioned below:

a. Water Quality Monitoring

Increase the numbers of water quality monitoring system to identify and monitor water quality standards

Water pollution is a major problem in most parts of Bangladesh. The nature of the problem varies between regions and locations. For example, major urban water pollution is linked with disposal of untreated industrial wastes in the rivers and lakes and major rural water pollution is linked with open-air latrine by the rivers and lakes. Surface water pollution affects the health of poor people who cannot afford to choose between contaminated and non-contaminated sources. Waterborne diseases are the major cause suffering for the poor people living in the rural and urban areas. It is necessary to effectively monitor the surface water as well as ground water sources to protect poor people from health affect. There are 30 water quality monitoring systems are working in DOE. It is expected that additional 30 WQM systems will be added by 2015. Sixty trained staff are working for water quality monitoring, it is expected that the number of staff will be 200 in the coming days by 2015.

b. Air Quality Monitoring

Increase the numbers of air quality monitoring system for identify and monitor air quality standards

Outdoor air pollution has been a major problem in all most of the cities of Bangladesh, especially in Dhaka. Air pollution in Dhaka is a serious health problem, which is growing worse as the population and number of vehicles keep rising. Recently, the pollution level had reduced significantly due to the introduction of lead-free gasoline in Bangladesh. However, the emission of lead has increased due to gasoline and total suspended particulate matter (SPM) levels are 4 to 8 times higher than the Bangladesh standard of 200 µg/m3. The causes of air pollution are rise in vehicular traffic and increase in population density. In the rural area, main sources are brick kilns and wood and biomass. To identify the source of pollution, it is therefore necessary to increase AQM systems as well as more trained staff for implementation. Acceptance Test Procedure (ATP) should be running in each industry. There are five air quality monitoring (AQM) systems are working all over Bangladesh. It is expected that additional six AQM systems will be increased by 2015. At present, there are 35 trained staffs working for AQM all over Bangladesh, it is expected that additional 85 air quality monitoring system will be added with the present numbers.

c. Reducing CO2 emission

Inter Dhaka train service

Population is increasing tremendously in Dhaka city day by day. Vehicular traffic is a common phenomenon in Dhaka which increases air pollution. There no inter rail service in Dhaka. Mono rail service can reduce air pollution as well as traffic jam in Dhaka. At least two train services are necessary to reduce air pollution as well as traffic jam.

Alternative fuel- compressed natural gas (CNG)

To avoid health risks for millions of people, there is no alternative than switching to 'cleaner' fuel. In this regard, Bangladesh is fortunate as CNG is a cleaner fuel compared to other imported fuels. It is expected that within the next five to six years, all light vehicles will be converted into CNG system, and for uninterrupted supply of gas to these vehicles more CNG stations will be planned.

d. Chemicals standard Monitoring

Pesticides use, which was on an average 3,850 metric tons annually during 1973-1990, has gradually increased to a record consumption of 25,443 metric tons in 2005. Rising use of pesticides has led to fears of adverse health consequences and of water contamination. Furthermore, many studies have documented use of low quality and banned pesticides in the agricultural sector field which poses a serious threat to the environment. It is an urgent need to increase monitoring activities to identify pesticides standard. The

Department of Agricultural Extension has a monitoring unit to identify pesticides quality standard. It is expected that additional four pesticides quality monitoring units will be set-up in divisional cities.

e. Management of urban waste

A major portion of the urban waste of Bangladesh is composed of organic materials, which produce methane (CH4) as they decompose. The unit contribution of methane to global warming is much higher than that of carbon dioxide. Methane could be captured for subsequent use or waste could be incinerated to produce electricity. Proper management of urban waste could thus be an important area for mitigation while ensuring a cleaner city. Furthermore, the lowered emissions could be traded in the carbon market. Promote CDM in waste management sector. All industries, new and existing, should have their respective ETPs constructed and running. Promotion of 3R (reduce, reuse, recycling) through policy development, capacity-building, awareness-raising and technological interventions can be effective modern action for waste management.

Increase the number of waste collection vehicles and equipment

Current waste collection vehicles and equipments are not sufficient and not environment friendly to collect and transport the solid waste in the divisional cities, highest shortage of vehicles and equipments in Dhaka city. Currently, 890 vehicles and equipments (trucks, container carriers & containers) are being used for collecting waste and transport to all cities, with highest numbers (790 vehicles and equipments) in Dhaka city. It is expected that additional 210 vehicles and equipments will be added by 2015 when no waste will be kept on roads or dumped in drainage canals.

Community based primary collection

Introduce area-based primary collection from the households by NGOs and Community organizations in all built-up residential areas. At present 280 CBOs are working for collecting waste from door to door. It is expected that an additional 320 CBOs will be working by 2015.

Composting

Composting can enhance the life of landfill by reducing the volume of waste. The dumping site at Matuail, will, within a year's time be filled up. Composting can create new jobs for the poor unemployed labour force in the city. There is heavy demand for compost by the farmers because organic matter depletion from soil in rural areas demands replenishment. About 82.90 percent of soils in Bangladesh have less than 3.5 percent organic matter. Composting can reduce green house gas and attract investments from developed countries. Recently the first Composting Clean Development Mechanism (CDM) project has become operational in the country. There are about 30 composting plants presently working in Bangladesh. It is expected that additional 170 composting plants will be installed by 2015.

Sanitary landfill

Dhaka has only two landfill sites, one is Matuail and other is in Amin Bazar, Boliumpur, Dhaka. There is no sanitary landfill site in the other five divisional cities. It is very important to develop at least five sanitary landfills in the other five divisional cities.

Recycling programs

Recycling involves processing used materials into new products in order to prevent waste of potentially useful materials, reduce the consumption of fresh raw materials, reduce energy usage, reduce air pollution (from incineration) and water pollution (from landfills) by reducing the need for "conventional" waste disposal, and lower greenhouse gas emissions. Recycling is a key component of modern waste management and is the third component of the "3R" waste hierarchy. There are more than four recycling programs are being used for recycling of waste in Bangladesh. It is expected additional ten recycling programs would be started by 2015.

Table 7.12: Interventions to Reducing Exposure to Environmental Health Impacts

	Intervention Parameter	Unit	Base (2006)	Target as 2015 (additional)	Unit Cost (million BDT)
1	Water quality monitoring systems purchased	nos.	30	30	1.00
2	Trained Staff for enforcement for Water quality monitoring	nos.	60	140	0.20
3	Arsenic purifying filter	nos.	5,000	20,000	0.004
4	Trained staff for arsenic mitigation	nos.	500	2,000	0.01
5	Air quality monitoring systems	nos.	5	6	20.10
6	Trained Staff for enforcement for AQM system	nos.	35	85	0.20
7	Increase the number of double Decker bus	nos.	148	52	5.24
8	Alternative fuel- compressed natural gas (CNG)	nos.	5,548	244,579	0.015
9	Inter Dhaka train service	nos.	0	2	500.00
10	Monitoring Pesticide systems	nos.	1	4	13.00
11	Waste Collection Vehicles and Equipment	nos.	890	210	2.50
12	Community Based Organizations for solid waste collection system	nos.	280	320	0.10
13	Composting Plants	nos.	30	170	4.00
14	Recycling programs	nos.	4	10	35.00

Source: DOE, 2006, BBS 2006, DCC, Waste Concern

7.3. 2 Improving Livelihoods (Including Ecosystem Services)

Major interventions for improving livelihoods are presented in Table 7.13 while details are given below.

a. Land zoning

Land zoning provides the security of lands for improving environmental activities. The main aim of land zoning is to achieve best benefit by preventing land degradation and conserve the natural environment. At present government has taken initiative to zoning of lands with mapping in six Upazilas. The similar activities will be implemented in other Upazilas of the country.

b. Create land market for easy access by potential buyer and seller

As there is no land market for easy access of all categories of people therefore it is difficult to identify the exact true owner of that land. The present system keeps people in dark about the correct scenario of land ownerships. There is an initiative from the Ministry of Land, GOB to open land market in one Upazila for easy access to all categories people with the target to cover all other Upazilas by turn.

c. Small Scale Irrigation Programs for sustainable water access

Considering the perspective of the future population boom in Bangladesh and the global economic scenario, the present trend towards self-sufficiency in food is not sufficient to meet future demand for the increasing population. So, for economic emancipation of the people of this country and to maintain sustainable self-sufficiency in food provision for the future additional population of the country, there is no alternative to proper use and expansion of modern and environmentally friendly sustainable technology in the agricultural sector. Small scale irrigation program brings opportunities for sustainable water access for attaining substantial crop as well as fisheries production. Sustainable water access can reduce the production loss as

well as adverse environmental conditions. At present ten small scale irrigation projects are being implemented all over Bangladesh. It is expected that the number will be increased to 50 by 2015.

d. Participatory Irrigation Management Program

Participatory approaches to irrigation through the exchange of best practices, lessons learned, training materials and networking among professionals, researchers, policy makers and farmers is important. Proper irrigation water management may allow irrigation of additional land with the same volume of water and provide a remarkable increase in crop yield. The increased crop yields may contribute to the reduction in hunger and poverty in rural Bangladesh. Bangladesh can save USD 8,962 million annually which is one-sixth of total annual budget of fiscal year 2003/4 if irrigation is managed properly (Dey et al., 2006b). This type of program is being implemented in 71 Upazilas, it is expected this program will be extend to 120 Upazilas by 2015.

e. Climate resilience seeds

Drought affects annually about 2.32 Mha and 1.2 Mha of cropped land during the Kaharfi (summer) (November to June) and Rabi (winter) (July to October) seasons respectively (Sajjan et al., 2002), while soil salinity, water logging and acidification affect 3.05 Mha, 0.7 Mha and 0.6 Mha of crop land, respectively (BARC, 2000) in the country. During the period of 1973-87, about 2.18 million tons of rice was damaged due to drought -the corresponding loss was 2.38 million tons due to flood (Paul, 1995). Bangladesh Rice Research Institute (BRRI) has developed ten varieties (for Salt tolerant: BRRI Dhan 40, 41, 47; Drought tolerant: BRRI Dhan 42, 43; Saline prone: BRRI Dhan 10, 23, 30; Cold tolerant: BRRI Dhan: 26, 27) in adverse situation after a long research work of 15-20 years. It is expected that five more varieties would be developed by 2015.

f. Forests and Biological Diversity: sustainable management that benefits poor people

From the situation analysis it can be seen that the actual forest coverage is much less than the target set by the government. The similar situation has appeared in case of protected areas which is less that the standard value. Many interventions have been suggested to improve forest coverage to reach target of 20 percent. Suggested interventions for forest and biological diversity for sustainable management that benefits poor people are explained in Table 7.13. The present investments in forestry sector are explained in the following aspects as cross-cutting issues of environment, under mainstream funding:

Co-managed forest initiatives for benefiting poor people

Co-managed forestry is a benefit sharing scheme in which the landless and the marginal farmers are employed in tree plantation work. Today's forests are evolving toward the dynamic, economic, integrated, diverse and shared forests of tomorrow. To a large extent, tomorrow's forests will be those of private and community initiative. Tomorrow's forests will be everywhere-in farmer's fields, in fallows, on roadsides, in compounds, and on hillsides and degraded lands. The aim of the co-managed forest is to protect the forests involving local people for sustainable management that benefits poor. At present there are five co-managed forest initiatives (in five PAs) that have been implemented. It is expected that 14 more initiatives will be implemented by 2015.

Pro-poor forest and wild life management plans

Develop and implement forestry and wildlife management plans with stakeholders, especially poor residents. At present there are nine management plans have implemented and it is expected that 35 plans will be implemented by 2015.

Pro-poor timber and NTFP value addition schemes

The value addition schemes will give support to poor people for maintaining their daily requirements by

selling the value added products like, toys, furniture, flower branch, etc in the market from timber and non timber forest products. Currently there is no such scheme in Bangladesh but it is expected that FD will implement a scheme like to benefit the poor.

Pro-poor nature tourism initiatives for benefiting poor people

The aim of the nature tourism initiatives is to benefit poor through employment, local purchasing and entrance fees etc. There are 28 pro-poor nature tourism initiatives already working in the field. It is expected that 40 more initiatives will be implemented by 2015.

Afforestation and reforestation programme

Forestry is an important way to sequester carbon. In addition, the afforestation and reforestation of degraded land contributes to food security by providing fruits and other edible products; energy security by providing fuel wood; livelihood security by employing people in forest plantations; harvesting and trade in forest products; and can protect land from soil erosion and landslides, particularly in hilly areas. Afforestation and reforestation thus address multiple needs. The programme needs to be divided into several sub-programmes. Currently forest coverage is ten percent of total area which is half the targeted coverage. There is a pressing need to increase forest coverage with sufficient technological support. Following are some areas that can increase the forest coverage:

Timber and non timber forest product development

51,800 hectares of forest plantations lands are covered by timber and non-timber forest. It is expected that the total areas of timber and non timber forest will be 9,720 hectares by 2015.

Strip plantation

The total length of strip plantations along roads, railroads, and canals/embankments is 49,500 km which is expected to be increased to 74,500 km by 2015.

Coastal belt afforestation

For the coastal belt, selection of species will be a major concern. As salinity is expected to increase with rising sea levels, emphasis should be given to saline tolerant species. For freshwater wetlands, suitable submergence tolerant species such as Hijol (Pongamia pinnata) and Coroch (Baringtonia actangula), which can also protect against wave erosion, could be used. Currently, the area of the coastal belt afforestation is 160,000 ha and it is expected that additional 5,000 ha will be increased by 2015.

Biodiversity protection

Biodiversity in Bangladesh is significant. Like other sectors of Bangladesh ecology, the diverse biological resources are also threatened by human activity. Forest area is already is a small proportion of the total land area and is being depleted by the combined pressure from timber extraction, encroachment by expanded by agricultural activities and by the land grabbers. Medicinal, food & fodder and indigenous plants have been tinned out significantly in the recent years and will be extended in the coming days. 50 ha of medicinal and indigenous pants were planted by 2006. It is expected that massive plantation will be taken by FD to reach 5,000 ha of medicinal & indigenous plants by 2015.

Increase the number of co-managed Protected Areas (PAs)

Protected Areas (PAs) in Bangladesh cover about two percent of the country's total area. But PAs should be at least five percent of the country's total area. The unique and biological fitness of protected areas provide economic, recreational, educational, scientific and spiritual benefits to man and serve as the gene bank of the more important flora and fauna. The PAs have been demarcated as biological corridors which connect the wildlife sanctuaries, national parks, game reserve to allow the free and uninhibited movement of animals and birds within the natural range. At present number of protected areas is five which is expected to increase 25 by 2015.

Trained staff enforcement

There is a great shortage of trained staff in most of the sectors for sustainable environment. It is necessary of trained staff enforcement in each sector for efficiently performing task.

g. Improvement of the lives of slum dwellers

Land titles for the security of Tenure for slum dwellers

Migration of people to metropolitan cities from the rural areas has become a common phenomenon in Bangladesh over the last several decades. The main reason for migration is to fulfill the basic requirement of the poor people. The poor families in urban towns live in slums, squatters' settlements in un-hygienic and unsustainable environment. Basic services like pure drinking water, sanitation, footpaths, drainage are totally absent in the areas. The population density in slums is 200 times greater than the usual density of Bangladesh. Despite the problems, migrants from rural areas continue to migrate to the cities. Currently there is no land title for slum dwellers. It is expected that there will be five new land titles to the security of tenure for slum dwellers by 2015.

Slum livelihood upgrading scheme

The goal of the 'Local Partnerships for Urban Poverty Alleviation Project (LPUPAP)' was to alleviate poverty through empowering urban people and create a sustainable process of supporting people's efforts to overcome poverty for it to become the mainstream policy of urban governance. Urban poor have benefited from the LPUPAP project supported by UNDP & UNICEF during 2000-2007. It is expected that additional 999 slum neighborhood upgrading schemes (one hundred families per scheme) will be taken up by 2015

Table 7.13. Interventions for improving livelihoods (includings ecosystem services)

	Intervention Parameter	Unit	Base (2006)	Target as 2015 (additional)	Unit cost (million BDT)
1	Land zoning	nos.	6	554	15.00
2	Create land market for easy access by potential buyer and seller	nos.	1	456	20.00
3	Small scale irrigation programs for sustainable water access	nos.	10	40	15.00
4	Environmentally vulnerable seeds	nos.	10	5	2.50
5	Community based schemes for poor fishers	nos.	1	1	20,00.00
6	Co-managed forest initiatives for benefiting poor people	nos.	8	14	45.00
7	Pro-poor forest and wildlife management plans	nos.	9	26	5.40
8	Pro-poor timber and NTFP value addition schemes	nos.	0	5	3.60
9	Pro-poor nature tourism initiatives	nos.	28	40	50.00
10	Timber & non timber forest plantation established	ha	51,800	45,000	0.089
11	Strip plantation established	Km	49,500	25,000	0.074
12	Coastal belt afforestation established	ha	160,000	50,000	0.017
13	Medicinal, food & fodder and indigenous plants for biodiversity protection	ha	50	4,950	0.086
14	Increase the number of Co-managed PA schemes	nos.	5	14	60.00
15	Land titles for the security of tenure for urban slum dwellers	nos.	0	5	1,200.00
16	Slum neighborhood upgrading schemes (one hundred families per scheme)	nos.	1	999	35.00

Source: Task Force of MOL, FD, BWDB, FD, BBS

7.3.3 Reducing vulnerability through capacity and Investment for Climate Adaptation & Disaster management

Major interventions for reducing vulnerability through capacity and investment for climate adaptation & disaster management are presented in Table 7.16 while details are given below.

Capacity development for climate adaptation

Development of adequate human capacity to effectively manage climate resilient development programmes and to take part in international negotiations. Adequately trained people do not currently exist in the country to develop and implement climate change policies, programmes and projects. Due to this lack of expertise, Bangladesh has been unable to grasp opportunities to effectively use new global financial instruments. Also, climate change negotiations have now entered a phase where constant tracking and decision making at short notice are required. While Bangladesh has so far been in the forefront of such negotiations, she has often been unable to take part fully because of a shortage of exhaustive information in key areas. The AWG-LCA negotiations need expertise of the highest order. Available expertise is neither adequate nor always of the right type. It is therefore necessary to build human resource capacity in all these relevant areas across Government departments, private business and civil society, as all will be involved in different aspects of climate change management and action Activities will include short and long term training at home and abroad, study tours, exchange programmes, and financing for attending negotiations.

Development of national strategy for climate adaptation

Bangladesh Climate Change Strategy and Action Plan (BCCSAP) will be main basis of efforts to combat climate change over the next ten years. Adaptation to climate change is ultimately an issue of sustainable development. Even without climate change, LDCs are already severely affected by climate variability and extremes, and they remain extremely vulnerable to future changes in the regional climate that could increase the risks. It is essential that Bangladesh prepares now to adapt to climate change and safeguard the future well-being of population. It is expected that an additional national strategy and action plan will be added by 2015. It is important to note that Government of Bangladesh could able to establish of climate change fund of USD 45 million from national resources.

Funds for additional cost for climate proofing

Climate proofing is a shorthand term for identifying risks to a development project, or any other specified natural or human asset, as a consequence of climate variability and change, and ensuring that those risks are reduced to acceptable levels through long-lasting and environmentally sound, economically viable, and socially acceptable changes implemented at one or more of the following stages in the project cycle: planning, design, construction, operation, and decommissioning. Funds for additional cost cover infrastructure, human health and environment components. Climate proofing funds are not yet implemented but government has an initiative to provide climate proofing fund. It is expected that climate proofing funds will be invested in at least five programs by 2015.

Asset and Income support schemes

This support is for non-farm incomes in environmentally degraded rural areas, including voluntary migration. At present there is no income support scheme however it is expected the number of income support schemes will be ten by 2015.

Crop insurance

Crop insurance is purchased by agricultural producers, including farmers, ranchers, and others to protect themselves against either the loss of their crops due to natural disasters (such as floods, drought, cyclone), or the loss of revenue due to declines in the prices of agricultural commodities. Crop insurance schemes can

help to prevent a sudden collapse of the economy in case of a natural disaster. This will help the government to quickly rebuild the economy after disasters. At present, there is no crop insurance scheme running in Bangladesh, it is expected that government will start this program across the country.

Automation of meteorological observation stations

It is necessary to convert the meteorological parameters collecting system into automation. Real data is pre requisite for getting true early warning. There is no digitized meteorological station all over Bangladesh. It is expected that existing ten stations will be automated by 2015.

Consultant for policy and legislation on disaster preparedness

National, regional and local disaster preparedness planning requirements allow a wide range of responses. A study in which such responses were cast against Quarantelli's minimum criteria and Levin's notion of experience as a powerful source for change is studied. Data collection and comparative analyses were accomplished through the examination of local school district plans and policies as well as interviews with school leaders who had survived disasters. The study concludes that school districts meet minimum local standards but few meet Quarantelli's minimum; and having lived through a disaster neither served as impetus to initiate disaster preparedness plans nor resulted in plans incorporating knowledge gained. Two consultants worked in 2006 for collecting information from the community, sub-division/divisional and national level preparedness and for preparing policy and legislation documents. It is expected that additional one new consultant will work for policy and legislation on disaster preparedness by 2015.

Awareness program for disaster preparedness

Public awareness is the most important for disaster preparedness. There are different ways to build public awareness: mass media campaigns, seminar, symposium, workshop.

Table 7.14 Intervention for Reduced Vulnerability through Improved Capacity and Investments for Disaster Management and Climate Adaptation

	Intervention Parameter	Unit	Base (2006)	Target as 2015 (additional)	Unit cost (million BDT)
1	Development of a national strategy for climate adaptation	nos.	1	1	1.36
2	Fund allocations for climate proofing	nos.	0	5	680.00
3	Asset and income support schemes	nos.	0	10	2,978.40
4	Crop insurance schemes	nos.	0	1	4,820.00
5	Automation of meteorological observation station	nos.	0	10	10.10
6	Consultant for policy and legislation on disaster preparedness	nos.	2	1	0.12
7	Awareness program for disaster preparedness	nos.	700	300	0.06

Source: Task Force of DOE, DMB

7.3.4. Governance Institutions, capacity and systemic issues

Interventions, coverage target and unit cost for Governance, institutions, capacity and systemic issues are presented in Table 7.15.

Capacity Building and Institutional Strengthening

Mainstreaming environment issues in national and sectoral development will require strong organizations and a robust institutional framework to ensure that the activities are sustained over the next several decades and beyond. Some organizations will be new (e.g., climate cells in Ministries and their agencies); others will have to be reformed and strengthened. In all cases, organizations will need to be provided with adequate logistics and other facilities for which adequate financing will have to be ensured. There is a pressing need to strengthen a number of existing organizations that are already underperforming in implementing the regular development programme.

Awareness, advocacy and education on environmental issues

Mass media campaigns:

Mass media include newspapers and other printed material, radio, television, billboards, etc. Mass media has an important role in information delivery to a vast percentage of population. A mass-media campaign is to promote important activities like, disaster preparedness, effectiveness of road safety public information campaigns, bad impact of air and water pollution on health, properly waste management etc. Mass media can also be effectively used for counter advertising and information delivery. There were 96 mass media campaigns conducted in 2006 and it is expected that an additional 54 mass media campaigns will be working by 2015.

Community based awareness programs:

Prevention of water resources from pollution, improvement in the local water supply and use, improvement of solid waste management, prevention of surface water sources from pollution in any given community are the some crucial community based awareness program which will make more water available for communities across the sections. Crucial changes in behavioral patterns as well as simple technical solutions can best be established at community level. There were 50 community based awareness programs conducted in 2006 which is expected that additional one hundred fifty community based awareness programs increased by 2015.

School based awareness programs

School based awareness program is very important because "our future is in the hands of our children". Most of all are aware that we have to take care of our environment but our children are not completely aware of it. School curriculum can make the school children more aware of such laws and the benefits of a healthy environment. Two hundred and fifty school based awareness programs were conducted in 2006. It is expected that awareness programs will be covered in all schools of Bangladesh.

Capacity building on EIA

Develop integrated impact assessment combining environmental, social and economic concerns to strengthen government's ability to manage environment for poverty reduction. At present there is no EIA program for poverty reduction however it is expected that this type of programs will be increased to 90 by 2015.

Develop data collection and management system

Data collection system as well as management is very weak in all concerned environment organizations. It

is essential to develop separate database systems in each institution and then make linkage to LAN as well as WAN for easy access to vendors. RS and GIS can be used for real time data estimation and presentation. MIS can also used for office management. It is expected that four data collection as well as management by 2015. At present there is no database system and it is expected that four database systems will be developed by 2015.

Research and studies on emerging environmental issues

Intensive focus should be given to conduct more research on emerging environmental issues. 12 adaptive researches on climate adaptation are conducted by different institutions supported by DOE. It is expected that 88 more research programs will be conducted by 2015.

Publications

Departmental activities can be published monthly, half yearly or research publication can be half yearly. Other issues of publications can be environmental quality guidelines, public notification on the developed guidelines and regulations. Each department like DOE, FD and LGED publishes yearly, and sometimes half yearly report. It is expected that four additional publications will be included by 2015.

Table 7.15: Interventions, coverage target and unit cost for Governance, institutions, capacity and systemic issues

	Intervention Parameter	Unit	Base (2006)	Target as 2015 (additional)	Unit cost (million BDT)
1	Mass media campaigns	nos.	96	54	0.50
2	Community base awareness programs	nos.	50	150	0.002
3	School based awarness programs	nos.	250	9,861	0.003
4	Number of capacity building programs on EIA	nos.	0	90	0.130
5	Develop data collection and management systems	nos.	0	4	11.68
6	Research and studies on emerging environmental issues	nos.	12	88	2.10
7	Publications and dissemination material	nos.	4	4	0.98

Source: Task Force, DOE, FD, and DMB

7.4 Resource Needs Estimates for meeting Targets on Environmental issues

It is estimated that a total of BDT 122,227.30 million will be required to undertake the entire interventions suggested above for the period 2009-2015 where capital cost is BDT 33,323.90 million and recurrent cost is 88,903.44 million. The cost breakup by interventions is shown in Table 7.16.

Table 7.16: Resource needs during 2008-2015

(million BDT)

	2009	2010	2011	2012	2013	2014	2015	Total (2009-2015)	Average
Reducing exposure to environmental health impacts									
Capital Cost	645.36	644.36	632.86	633.14	613.34	604.46	602.46	4,376.00	663.52
Recurrent Cost	1,813.20	1,889.02	1,961.94	2,034.56	2,107.58	2,180.24	2,251.20	14,237.74	1,921.37
Total	2,458.56	2,533.38	2,594.80	2,667.70	2,720.92	2,784.70	2,853.66	18,613.74	2,584.89
Improving Livelihoods (including ecosystem services)									
Capital Cost	4,518.26	4,488.54	3,543.12	4,431.03	3,385.39	3,316.32	3,286.32	26,968.98	3,742.10
Recurrent Cost	5,812.41	7,422.60	8,021.00	8,762.78	9,321.16	9,834.53	10,332.90	59,507.41	7,421.81
Total	10,330.67	11,911.14	11,564.12	13,193.81	12,706.55	13,150.85	13,619.22	86,476.39	11,163.91
Reduced Vulnerability through Improved Capacity and Investments for Disaster Management and Climate Adaptation									
Capital Cost	510.00	10.00	10.00	10.00	510.00	510.00	10.00	1,570.00	743.36
Recurrent Cost	1,248.19	1,548.51	1,848.76	2,149.01	2,449.26	2,749.51	3,049.76	1,5043.00	1,668.74
Total	1,758.19	1,558.51	1,858.76	2,159.01	2,959.26	3,259.51	3,059.76	16,613.00	2,412.11
Governance, institutions, capacity and systemic issues (not already covered)									
Capital Cost	64.72	52.62	64.22	54.22	64.22	54.22	54.72	408.92	52.57
Recurrent Cost	10.15	11.94	14.92	16.23	19.21	20.52	22.30	115.29	12.713
Total	74.88	64.56	79.14	70.45	83.43	74.74	77.02	524.21	65.29
Totals									
Capital Cost	5,738.34	5,195.52	4,250.20	5,128.39	4,572.92	4,485.00	3,953.50	33,323.90	5,201.56
Recurrent Cost	8,883.96	10,872.08	11,846.63	12,962.59	13,897.22	14,784.80	15,656.17	88,903.44	11,024.64
Total (BDT million)	14,622.29	16,067.59	16,096.82	18,090.98	18,470.16	19,269.80	19,609.67	122,227.30	16,226.20
Total (USD million)*	213.78	234.91	235.33	264.49	270.03	281.72	286.69	1,786.95	237.23
Cost per capita (BDT)	99.72	108.05	106.75	118.30	119.10	122.53	122.96		
Cost per capita (USD)*	1.46	1.58	1.56	1.73	1.74	1.79	1.80		

* 1 USD = 68.4 BDT

7.5 Overview of Energy Sector in Bangladesh

Energy is an important component to enable maximum benefits to the community acting as a key factor in development. It is one of the main indicators for modernisation of society and appears to be a vital factor in achieving sustainable development. Expanded energy services are essential to meet the MDGs for reducing hunger and poverty, improving health care and educational opportunities, and addressing gender equity. In addition, energy is central to all aspects of sustainable development, including access to water, agricultural and industrial productivity, health care, educational attainment, job creation and climate change impacts. Affordable, accessible and reliable energy supply is critical for uplifting the poor as well as for economic growth of a country. Use of higher quantum of per capita energy is definitely desirable. Under this context the fuel to generate the quantum target energy is a major case to decide upon, so that such increased energy consumption, instead of enhancing the pollution and degradation of environment, will rather be an environment friendly proposition. Domestic use of solar energy may be initiated. Solar energy may be used for generating electricity or for heating the water. Small household type equipments need to be developed. Bottling of condensates that comes out with the natural gas to produce LPG can be used for cooking. In every gas field a condensate processing plant may be established to produce LPG.

The vision statement on power in Bangladesh identifies energy as a primary resource for poverty reduction. Rural electrification has been made a key goal and the government has targeted 100 percent electrification of all villages in the country by 2020. The national emphasis on rural electrification is also reflected in the Poverty Reduction Strategy Papers (PRSP) for Bangladesh, which identified rural electrification as a key area to foster economic growth with a pro-poor orientation. Increased demand for electricity from households, educational and health care facilities, and small & micro industry will require more than 50 percent increase in annual power supply. However, the big challenge for Bangladesh is to increase access to electricity, ensuring that the poor are not excluded. Interestingly, compared to their urban counterparts, rural Bangladeshi consumers receive fewer subsidies, pay their bills more promptly and engage in less pilferage. The widening gap between the rich and the poor, however, could lead to greater challenges.

The performance of the power sector in the last two decades fell short of expectations. The present generation capacity is not adequate to meet the peak power demand. The present generation capacity is not adequate to meet the peak power demand. Present peak demand is 6000 MW and available capacity is 3800-4200 MW, resulting in anticipated load shed is 800-1200MW (BPDB 2009). About 87 percent of the power generation capacity is gas based, 5.5percent is imported oil based, 5.0 percent is coal and 2.5 percent is hydro-based. Power generation is highly dependent on natural gas. Currently gas production is not sufficient to serve the existing power generation requirement. Further, due to gas transmission and distribution bottlenecks, the gas cannot be transported in some locations, resulting in inadequate power generation. Fuel diversity is essential to meet power generation needs in the face of gas shortage and high oil prices in the international market.

Bangladesh per capita annual fuel consumption is only 56 litres of oil, which is one of the lowest in the world. With a predominantly agro-based population, bio-fuel is the main cooking fuel in the rural sector. Rural Bangladesh is characterised by insignificant energy supply and the country as a whole has the lowest usage of electricity (only 156 kilowatt hours (kWh) per capita) in the world.

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 survey by BIDS, a rural household uses nearly three 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 fire wood use and levels of income is clearly positive and monotonic. This means that the poor have 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 rapidly.

Secondly, it is highly desirable to have as much tree cover as possible for the benefit of the country. Nationally and locally, this helps in reducing the energy deficiency while this also helps in keeping global carbon emission at a lower level. Initiating, application and habitation of waste to resource recovery (both biogas and fertilizer from solid waste, cow dung and night soil) is thus a good option and feasible too. A key factor in successful scaling up of rural energy access is the demonstration of replicable and sustainable institutional and financing mechanisms to deliver those services. The ground reality is quite stark. Population pressures on land have been leading to conversion of forest land and land under tree cover into other uses. At the same time this further lowers the supply of biomass and fuel wood for cooking raising their market value stimulating 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 adds pressure to forestland.

Energy sources of wood fuel, agricultural waste, solar energy, animal power and wind energy are decentralized, and can be considered renewable and environmentally friendly within demand limits. Renewable energy technologies (RETs) create income-generating activities for male landless and marginal farmers and for women from such households, while reducing environmental problems, like deforestation and indoor air pollution from cooking with poor quality fuels. In Bangladesh, the average solar radiation is 3.85 kWh/m2/year which is quite good for photovoltaic (PV) applications, except the monsoon season. This is now being used for lighting, radio and television in rural villages instead of kerosene lamps, which provide poor illumination, inadequate working hours of rural people at night. RETs could thus be selectively applied to various rural applications, potentially generating income, improving health and educational quality, and increasing labour productivity.

Solar power, Wind Energy and Biogas will be major interventions for RETs for electricity generation. Promoting energy saving bulbs will be one of the major interventions as electricity technologies which would help in reducing pressure on less electricity supply. Clean energy (an environmentally preferable energy source), in a crucial transition from short term 'environmental management' is also important for environment friendly sustainable development. Its application not only benefits the environment but also improves overall quality of life, raising standards of health and bringing about greater social and environmental equity. It could

involve the electricity which is generated from renewable resources and the sources of electricity that is cleaner than the previous form/use leading to protection of human health and the environment.

7.6 Current Situation Challenges in Energy

7.6.1 Energy use

In the urban areas grid coverage electricity is the main source of lighting and kerosene is used mainly in the rural areas. Changes in this ratio over time and across countries reflect structural transitions in the economy, and energy efficiency of different fuel mixes in different sectors. In principle, the lower the ratio, the higher the energy efficiency. Over time Bangladesh has been able to improve its energy efficiency from 123 per USD 1,000 GDP (PPP) in 1990 to 88 in 2007 (Figure 7.8). Efficiency improved about 14 percent during 1990-2000 and ten percent during 2000-2007.

Natural gas contributes more than 87 percent of the total net energy generated by public sector (BPDB) and private sector (IPP) (BPDB, 2008) which meets 24 percent of the country's total fuel need while hydroelectricity provides another three percent. About 11 percent of the fuel comes from imported coal and mineral oil (Figure 7.9).

7.6.2 Use of Solid Fuels

Figure 7.8: Energy use

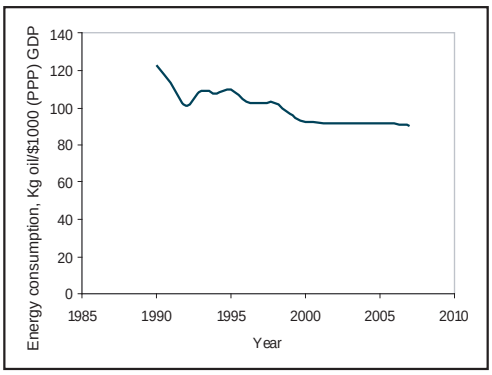
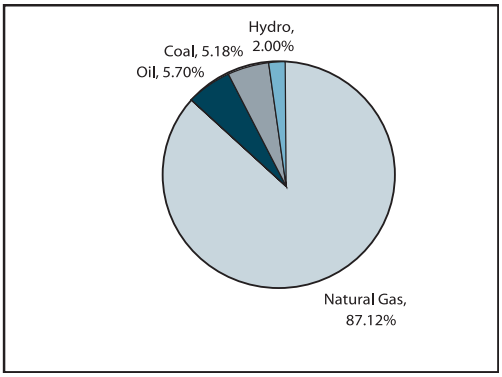


Figure 7.9: Primary commercial energy consumption by source, 2008



Source: BPDB 2008

Although not a global indicator, it was considered important for Bangladesh to track the proportion of population using solid fuel. About 88 percent of commercial energy consumption is met from natural gas, the remainder coming from oil augmented by hydropower and coal. Non-commercial energy sources, such as wood, animal wastes and crop residues, are estimated to account for over half of the country's energy consumption.

Currently, 30 to 50 percent of the total organic energy demand is met by fuel wood, and the remaining from agricultural by-products and cow dung (Table 7.17). As the heavy reliance upon bio-fuel in the rural areas has direct influence on the physiochemical characteristics of soil and the availability of fodder and fruit trees, there is urgent need for introducing alternative energy technology in the rural area. The lack of alternatives has already adversely impacted the greener concerns of environment and if allowed to continue, will lead to the rapid depletion of forest resources.

Bangladesh is also highly dependent on biomass fuels. More than 55 percent of the total energy

Table 7.17: Proportion of population using solid fuels

Type of fuel	**Residence**	1990*	1997	1998	1999	2000	2006	2007*
Wood/Bamboo	**National**	35.35	34.50	39.50	35.60	37.80	38.35	38.95
	Rural	30.60	30.80	35.70	35.20	37.10	39.06	40.86
	Urban	52.45	46.80	50.60	38.10	39.30	37.95	31.45
Leaves/Husk/	**National**	53.65	54.20	50.30	49.70	49.40	49.25	44.65
Cow-dung	**Rural**	68.60	67.10	63.10	54.90	60.10	54.00	51.08
	Urban	37.50	42.10	40.50	36.50	37.20	39.40	34.53
	Total	**89.00**	**88.70**	**89.80**	**85.30**	**87.10**	**87.60**	**88.74**

Sources: MICS, 2006; Poverty Monitoring Survey 1999; Report of health and demographic survey, BBS 2006, *Calculated by extrapolation method

consumption comes from biomass fuels and rest from commercial fuels, namely, natural gas, oil, electricity and coal of this country (Figure 7.10).

The energy needs of the estimated 85 percent of Bangladeshis living in the rural areas are primarily met through biomass, straw, jute stick, animal dung and fuel wood (Figure 7.11). The impacts of energy deprivation include drudgery for rural women and children burdened with the task of collecting, processing and using biomass, as well as health impacts related to indoor air pollution. The development of informal rural markets for even low-quality traditional biomass sources (for example, rice husk and animal dung) indicates an impending rural energy crisis, with prices of even the most basic fuel sources spiraling out of the reach of the very poor.

Figure 7.10 Consumption of biomass fuel

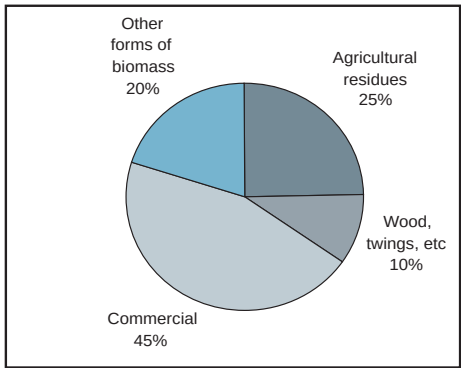
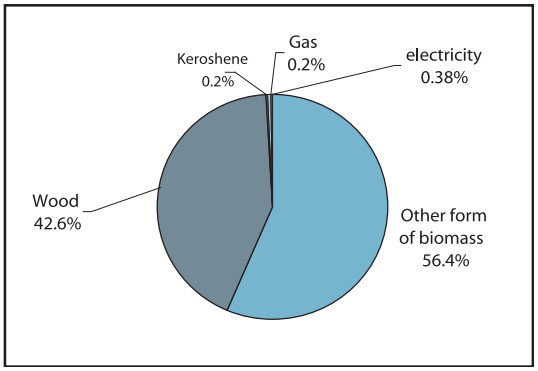


Figure 7.11 Percentage of households using different sources of fuels in rural areas



Source: BBS 2002

7.7 Major Interventions and Targets for Energy Sectors/End-uses

Table 7.18: MDG Interventions-Sectors/End-uses

MDG Interventions - Sectors/End-uses	
Households Cooking/Heating	Modern fuels for cooking and heating
Households Lighting	Electricity for lighting
Households - Other Electricity End-uses	Electricity based end-uses like lighting, refrigeration, information/communication, etc.
Health Centres/Hospitals	Electricity based end-uses like lighting, cooling, information/communication, etc.
Markets/Community Centres	Electricity based end-uses like lighting, cooling, information/communication, etc.
Government Institutions	Electricity based end-uses like lighting, cooling, information/communication, etc.
Other Institutions	Electricity based end-uses like lighting, cooling, information/communication, etc.
Small and Micro-industry	Electricity based end-uses like lighting, mechanical power, etc.; Modern fuels for heating end-uses
Agriculture Pumpsets	Electricity based mechanical power for pumping water
Other Agriculture Uses	Modern liquid fuels for agricultural operations
Rural Transport	Modern liquid fuels for rural transport

Attaining the MDG requirements, the focus will be on providing energy for meeting energy for household lighting and cooking needs. The major interventions are identified for meeting the energy targets are shown in Table 7.18 while details for costine are discussed bellow.

7.7.1 Modern Fuel for Cooking/heating

Natural Gas

Bangladesh has a good amount of reserved natural gas which has been contributing a lot in the urban areas for cooking and heating. However, rural people are totally neglected from its best use. Natural gas has access only 0.2 percent in the rural areas and 60 percent in the urban area in 2006. It is expected that NG coverage will be increased to ten percent and 100 percent in the rural and urban areas respectively by 2015.

Sustainable Biomass

Increase the access of sustainable Biomass as modern fuel for improved Cooking/Heating for agro-processing, micro-industry for improved Heating Systems. About 80 percent of population is dependent on biomass fuel. It could have been an environment friendly scenario if a sustainable output of these biomass fuels can be made available; leaving aside the organics from the farms to manure the agricultural fields to alleviate the soil degradation problem. Intensive afforestation and management of denuded sites; homesteads, roadsides, railroad sides, etc. may assist this issue to a great extent. Currently, sustainable

biomass (SB) has access one percent for cooking/heating as modern fuel. It is expected that access of SB will be increased to 30 percent by 2015.

7.7.2 Renewable Energy

The objective is to maximize the use of renewable energy sources to lower GHG emission and ensuring energy security. The scope for developing renewable energy supplies (e.g., solar, wind and sustainable biomass technologies) has not been explored well in Bangladesh.

Electricity production

Off-grid electricity

Existing grid has access of 96.8 percent and rest 3.2 percent from off-grid solar PV (three percent) in the rural area. It is expected that existing grid (grid-natural gas) coverage will be reduced to 68 percent and access of grid-coal will be increased to 20 percent. The off-grid access will be increased to ten percent where access of solar-pv and wind energy will be three percent and one percent respectively. In the urban area, existing grid has access of 100 percent, however, it is expected that the existing grid access will be reduced to 37 percent and access of grid-coal will be increased to 45 percent and off-grid access will also be increased to 14 percent where solar-pv, wind energy and biomass gasifier will be seven percent, five percent and two percent respectively.

Solar power

There is some use of solar power for limited domestic purposes. The main barrier to expanded solar energy use is the capital cost. However, since the cost of solar cells and solar panels in global markets is expected to fall gradually, Government of Bangladesh is actively considering for withdrawal of CDVAT-tax on solar panels to gear up solar energy and is also considering encouraging entrepreneurs who wish to start solar projects, possibly through incentives.

Wind Energy

The potential of harvesting wind energy, though recognized for many years, has not produced tangible results so far. The initial capital cost remains the main stumbling block. High variations in wind speed and sharp seasonal changes also present difficulties. The tidal range of the coastal belt is considered to be adequate for the generation of tidal power. However, there has not been any attempt to harvest such energy.

Biogas

Biogas development remains in its infancy. Even the popularization programs for improved cooking stoves, which save a lot of fuel wood, have had limited success. There are, then, technical, economic, social and institutional barriers to the adoption of renewable technologies. However, since renewable technology for power generation or direct use is carbon-neutral (or nearly so), technologies such as these should be considered.

The country has already set up a Sustainable Energy Development Authority to popularize renewable energy technologies. It should be provided with adequate financial and other support so that renewable energy becomes a part of the move towards a low-carbon development path. Each of these technologies, however, will need to be evaluated carefully to understand the technological and economic barriers and potential. If start-up costs are high, the issues of subsidy or other support may have to be considered. Power generation policy should also take these technologies into account in its planning.

7.7.3 Electricity Technologies

Electricity demand was 5500 MW whereas supply was 3500 MW, resulting in a shortage of about 2000MW in 2007. Alternative options are highly encouraged to meet the power demand of Bangladesh.

Promoting energy saving bulbs

Energy saving bulbs are nowadays very popular in different countries of the world. These bulbs are user-friendly. They consume less electricity but produce more light. However the use of such lamps in Bangladesh is insignificant due to lack of awareness about the benefits of using such lamps and most people in the country continue to use conventional lamps that consume more electricity but emit less light.

The use of energy-saving bulbs is important for the country because of the crisis of power being faced for some time. Bangladesh has a serious shortage of electricity as the total generation 3,500 MW falls short of the total peak hour demand of 4,500 MW. The use of such bulbs would help reduce pressure on supply. It is reported in the media that 30 per cent of total electricity is used for domestic lighting. It amounts to some 1050 megawatts a day. It is estimated that extensive use of energy saving bulbs can bring down this power consumption for lighting to 300 MW with a saving of as much as 700-750 MW every day. Energy experts are reported to have said that saving of this amount of power will help bring down load shedding to 50 per cent with a decrease of household consumers' bill by 80 per cent.

The use of such bulbs is still very limited in Bangladesh as most people do not know about the merits of their use. Another reason is that high prices of energy-saving bulbs discourage people from using these. People of low income groups cannot buy such costly bulbs. It is thought that at present only eight enterprises import them and maintain monopoly control over their marketing, thus the prices do not come down to the reach of the majority of the consumers. To increase the use of such bulbs the government should take a number of steps. On the one hand, publicity campaigns to make people aware of the availability and usefulness of those must be undertaken. People's attention must be drawn to the fact that, though costly initially, those bulbs are poor-friendly in the long run. They will also prove to be cost effective for big industries. On the other, steps must be taken to reduce their prices. More business organizations may be allowed to import energy saving bulbs. The Trading Corporation of Bangladesh may also be asked to import them to make sales at price affordable for people of low income groups possible. Technologies may be imported to produce these locally. The government may also withdraw or cut duty on import of energy-saving bulbs to popularize their use.

7.7.4 Diesel Fuel for Transportation and Agricultural related end-uses

Increase the access of diesel fuel for Agricultural and Transport related end-uses in the rural areas. Access of diesel fuel is 70 percent for transportation of agricultural use in 2006, it is expected that access will be increased to 100 percent by 2015.

7.7.5 Training for Capacity Development

Capacity development through training will be necessarily important to the government (BPDB), public and private sectors, CBOs and individuals for energy access.

7.7.6 Awareness and Education campaign

Mass media include newspapers and other printed material, radio, television and billboards, etc. Mass media has an important role in information delivery to a large percentage of the population.

A mass-media campaign to promote important activities like, energy saving bulbs, indoor air pollution, and increased use of sustainable biomass is necessary. Intensive afforestation and management of denuded

sites; homesteads, roadsides, railroad sides, etc. may assist with the increase sustainable biomass reserve to a great extent.

Among others, the interventions in the energy sector will facilitate agricultural mechanization and agro processing, stimulate employment generation and development generation and development of rural enterprises, education of children, improve health, reduce deforestation and other forms of land degradation, help to increasing carbon sinks and mitigating climate change, boost manufacturing, and generation of youth employment.

7.8 Resource Needs Estimates for Energy

The needs assessment is primarily based on rural and urban electrification programme of the Bangladesh Power Development Board (BPDB) which consists of on-grid and off-grid electrification programmes. The off-grid programmes includes solar-pv, wind energy and biomass gasifier power. The solar programme will need to be supplemented by other energy sources for cooking.

Data Sources

The sources of data for estimating resource needs are the BPDB 2006 data and data from Petrobangla of Bangladesh Oil, Gas and Mineral Corporation. Year 2006 data has been used as the base line in case of discrepancies. Demographic data, number of institutions, number of vehicles, etc have been collected from statistical year book, 2006, BBS. Number of small and micro-industry has been collected from Ministry of Commerce and Industry's report.

Methods

The estimation of resource requirement needs was done by using the pre-developed spread sheet-based model (Energy Costing Tool, Version 1.8) to project the gradual scaling up of investments and resource requirements. In addition to human resources and infrastructure targets, these models also include capital and operating/recurring costs. Unit costs were derived from existing national planning documents, project budgets, national expenditure reviews and other planning documents. In cases where existing unit costs appeared uncharacteristically low (e.g. salaries for civil servants); a more competitive and realistic figure were used. These costs were applied to the targets to get the total cost of the interventions, per annum. In cases where it was not possible to calculate the resources required for each individual intervention, more aggregate estimates from other studies (e.g. PRSP and MTEF) cost estimates were used.

Resource needs

The Annual cost of meeting MDG energy needs in Bangladesh are given below. The annual average cost for cooking/heating is BDT 78,358.02 million where capital cost is BDT 9,245.24 million and recurrent cost is BDT 69,112.78 million. The annual average cost for electricity end uses is BDT 47,351.37 million where capital cost is BDT 21,779.69 million and recurrent cost is BDT 25,571.68 million. The annual average recurrent cost for Liquid Fuel End-uses is BDT 2,570.84 million.

The total cost for entire energy interventions for the period 2009-2015 is estimated at BDT 897,961.58 million. The total capital cost of interventions BDT 217,174.51 million and total recurrent cost is BDT 680,787.07 million with the total for 7 years (Table 7.19).

Table 7.19 Annual Cost of Meeting MDG Energy Needs

(million BDT)

	2009	2010	2011	2012	2013	2014	2015	Total	Average
Cooking/Heating									
Capital Cost	6,900.01	7,899.84	8,524.47	9,198.48	9,925.79	10,710.60	11,557.47	64,716.66	9,245.24
Recurrent Cost	44,663.33	52,532.45	59,452.55	67,284.23	76,147.59	86,178.51	97,530.80	483,789.45	69,112.78
Total	51,563.34	60,432.29	67,977.02	76,482.72	86,073.37	96,889.11	109,088.27	548,506.12	78,358.02
Per Capita Cost	351.12	405.85	449.50	498.29	552.51	612.77	680.00		507.15
Electricity End-uses									
Capital Cost	12,316.78	15,321.94	17,886.67	20,880.73	24,375.95	28,456.24	33,219.54	152,457.84	21,779.69
Recurrent Cost	17,822.17	20,529.54	22,724.07	25,153.20	27,841.99	30,818.20	34,112.56	179,001.73	25,571.68
Total	30,138.95	35,851.47	40,610.75	46,033.92	52,217.94	59,274.44	67,332.10	331,459.58	47,351.37
Per Capita Cost	205.23	240.62	268.54	299.92	335.19	374.88	419.56		306.28
Liquid Fuel End-uses									
Capital Cost	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Recurrent Cost	2,225.52	2,304.42	2,425.23	2,552.37	2,686.17	2,826.99	2,975.19	17,995.88	2,570.84
Total	2,225.52	2,304.42	2,425.23	2,552.37	2,686.17	2,826.99	2,975.19	17,995.88	2,570.84
Per Capita Cost	15.15	15.47	16.04	16.63	17.24	17.88	18.54		16.71
Totals									
Capital Cost	19,216.79	23,221.78	26,411.14	30,079.21	34,301.74	39,166.84	44,777.00	217,174.51	31,024.93
Recurrent Cost	64,711.02	75,366.41	84,601.85	94,989.80	106,675.74	119,823.70	134,618.55	680,787.07	97,255.30
Total BDT Million	83,927.81	98,588.19	111,012.99	125,069.01	140,977.49	158,990.54	179,395.56	897,961.58	128,280.23
Total USD Million	1,227.01	1,441.35	1,623.00	1,828.49	2,061.07	2,324.42	2,622.74	13,128.09	1,875.44
Per Capita Cost BDT	571.51	661.67	734.08	814.84	904.95	1,005.53	1,117.86		830.06
Per Capita Cost USD	8.36	9.67	10.73	11.91	13.23	14.70	16.34		12.14

7.9 Overview of Safe Drinking Water and Sanitation

The introduction of safe drinking water through tubewells, higher sanitation coverage and improved primary health care has contributed to a significant drop in the mortality rate from diarrhoeal diseases. Water related diseases continue to account for the majority of deaths. Unfortunately, when rural people had developed the habit of drinking tubewell water being aware of its importance to avoid water borne diseases, arsenic was found in too high concentrations in tubewell water in many parts of Bangladesh. This has drastically reduced the coverage of safe water. Arsenic mitigation technologies are the alternative options for getting safe drinking in the rural areas. However, 29 percent of tubewells are also contaminated with bacteria which are mainly due to poor maintenance of the tubewell surroundings.

Most of the cases in urban areas water are supplied from ground water or surface water after treatment through pipe line. In other cases individuals have their own shallow or deep tube well. Dhaka WASA and Chittagong WASA supply between 80-85 percent of the total daily demand for drinking water. It is projected in the National Water Management Plan that in the next 30 years the urban population will out-number the rural population and tremendously increase the density of such areas. Such a situation forces the residents in the metropolitan cities to collect water from alternative sources. In most cases rural areas water is collected from either hand tubewell or surface water sources. It may be pond, river. Treatment processes or pond-sand-filter may be used in very few instances while mostly they are absent.

Sanitation programmes have also been implemented since 1970s, but success in improving sanitation coverage has been far less compared to other development sectors primarily because of lack of awareness among people of the benefits of improved sanitation. Added to this is the fact that the economic and social benefits of improved sanitation services are not always clearly visible to the policy makers. Technological innovations in sanitation have therefore remained slow in fulfilling the varying needs of the people and in facing the growing socio-economic and hydro-geological challenges. As a result, sanitation coverage in the country has not been encouraging in the past decades.

The sanitary condition of urban slums is deplorable. Most of the slum dwellers have literally no latrines, only a few have pit or surface latrines. They often defecate on the drains, in open fields, near the roads, or by the riverbanks. The problem is acute for female residents who have to wait till sunset for defecation or use a neibour's latrine, if available. Unhygienic hanging latrines are still prevalent in urban slums. The linkage between sanitation and poverty is often overlooked. It is poor people who suffer most from lack of access to basic facilities and services. Loss of earnings and production are additional handicaps for poor people, for whom physical fitness is the main productive asset.

However, the government expects to achieve this target and has targets of safe water and sanitation for all by 2011 and 2010 respectively. The Ministry of Local Government, Rural Development and Cooperatives, through the Local Government Division (LGD) and in the association with NGOs and development partners,

has taken the lead to achieve the national sanitation goal. The LGD has been able to mobilize the sector and create vibrant collective of partners that have taken on a variety of tasks in promoting changes in sanitation coverage.

The major intervention to make available access to safe drinking water in the rural areas will be for construction of schemes like STW and DSP TW in the low covered areas. An increase of arsenic mitigation technologies will also be encouraged. The major intervention to provide access to basic sanitation in rural areas will be to increase the percentage of people with access to appropriate improved toilets. For urban areas, the major intervention will be the provision of access to safe drinking water through the construction of water treatment plants and piped connections to the house. For access to basic sanitation, the interventions will be through construction of proper sewerage system to provide pour-flush latrines while completely doing away with other inferior technologies. New sewerage and waste-water treatment plants in the larger urban areas will be encouraged.

7.10 Current Situation and Issues on Water supply and sanitation

7.10.1 Rural water supply status

The basic level of safe water supply services in Bangladesh is achieved through handpump and tubewells. It was estimated that in 1990 about 78.0 percent of population in rural population had access to safe drinking water, the coverage increased to 96.3 percent in the 2000. However, arsenic contamination of 22 percent of tubewells in the country proportionately lowered the service coverage. The implementation of Arsenic Mitigation-Water supply project by MLG&RD during 1998-2004 changed the service coverage and became increased to 77 percent in 2006 (Table 7.20). It is estimated that the total number of different types of tubewells in the country installed by the Government (DPHE), NGOs and private individuals is about 7.0 million. 78 percent tubewells are installed by the individuals themselves while DPHE installed 18 percent and NGOs four percent only.

Table 7.20: The proportion of population with access to safe drinking water

Rural		Year					
		1990	1995	2000	2005	2006	2007
Access to safe drinking water	Rural (%)	78.00	82.00	96.30	77.00	77.00	84.00

Sources: Progress drinking water & sanitation, UNICEF/WHO, 2008, MICS 2006; BIDS 2004; LGD, MLG&RD, 2005, DPHE 2008

Groundwater contaminated by Arsenic

Arsenic contamination in the ground water is the biggest man-made problem in Bangladesh. Many village people drink it without knowing it and some peoples drink it though knowing as there is no alternate source of water. Bangladesh government and a number of NGOs are working to remediate this problem. Arsenic contamination in ground-water provides a graphic picture of environmental degradation as well as its impact on poor population of Bangladesh. It has been well 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 not get married and are seen as a burden to their families and their communities. In a recent survey conducted in 270 villages, more than 7,000 arsenic affected patients identified so far been identified. The United States Environmental Protection Agency (EPA) said that, in Bangladesh with regard to protected future cases of arsenic-related health burden, skin cancer would affect 375,000 people (Roy, et al., 2008). The estimate also suggested that in Bangladesh approximately 6,500 people may die from cancer every year, and a total of 326,000 people in a period of 50 years, while 2.5 million people will develop some kind of arsenicosis during that period. 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 dose to 90 percent live in rural areas.

7.10.2 Urban Water Supply

It was estimated that in 1990 about 76.0 percent of population in urban population had access to safe drinking water, the coverage increased to 95 percent in the 2000. The urban water supply access was estimated to be 71 percent in 2006 (Table 7.21) of which coverage of piped water supply is only 39 percent and the remaining 32 percent by handpump tubewells. If the present growth is maintained in the coming years, it would be possible to reach the target by 2015. Thus, a large number of future urban populations will be required to be brought under reliable and safe piped water supply system.

Table 7.21: The proportion of population with access to safe drinking water

Urban		Year					
		1990	1995	2000	2005	2006	2007
Access to safe drinking water	Urban (%)	76.00	80.00	95.00	71.00	71.00	86.00

Sources: Progress drinking water & sanitation, UNICEF/WHO, 2008, MICS 2006; BIDS 2004; LGD, MLG&RD, 2005, DPHE 2008

Circle wise water source & coverage is shown in Table 7.22 The number of safe water pumps is highest in Dhaka circle with the lowest in Chittagong circle. Circlewise coverage by running water pump is highest in Khulna circle and lowest in the Chittagong circle. From the study it is revealed that Chittagong circle is still lagging behind than other circles.

Table 7.22 Circle-wise water sources & coverage

SL NO.	CIRCLE	NO. OF DISTRICT	NO. OF UPAZILA	TOTAL WATER SOURCE			NO. OF CONT. PUBLIC TW
				RUNNING	CH. UP	TOTAL	
1	DHAKA	12	93	283,510	12,254	295,764	29,300
2	CHITTAGONG	8	72	247,344	17,327	264,671	46,583
3	SYLHET	4	37	78,471	3,928	82,399	7,017
4	BARISAL	6	40	108,693	7,125	115,818	6,045
5	FARIDPUR	5	27	81,831	3,298	85,129	23,372
6	RAJSHAHI	6	49	135,497	6,540	142,037	5,932
7	RANGPUR	10	75	180,499	7,958	188,457	2,525
8	KHULNA	10	59	158,379	8,889	167,268	35,934
9	CHT	3	25	17,485	6,833	24,318	0
	BANGLADESH	64	477	1,291,709	74,152	1,365,861	156,708

Source: NMIC, DPHE, February, 2008

Water Access to slum areas

The major sources of drinking water in slums areas were municipal taps and tube wells (Table 7.23). A small portion of households (1.9 percent) collected drinking water from other sources (rivers, ponds, lakes, canals etc.). Dhaka's slum residents typically relied on municipal tap water while those in other cities usually used tube wells. In 40.9 percent of these clusters, one tap was shared by 6-10 households while in 22.7 percent a single tap was used by 11 to 20 families.

Table 7.23 Source of Drinking water by City

(% of clusters)

CITY	MUNICIPAL TAP	TUBE WELL	OTHER SOURCES	NUMBER OF CLUSTER
DHAKA	92.30	6.50	1.20	4,966
CHITTAGONG	28.70	65.20	6.10	1,814
KHULNA	2.10	97.90	0.00	520
RAJSHAHI	12.80	87.30	0.00	641
SYLHET	36.30	62.80	0.90	756
BARISAL	15.60	84.40	0.00	351
ALL CITIES	61.10	37.00	1.90	9,048

Source: CUS, 2005

Table 7.24 Tap Water Sharing Pattern by City

(% of clusters, among those with tap water source)

NUMBER OF HOUSEHOLDS SHARING ONE TAP	DHAKA	CHITTAGONG	KHULNA	RAJSHAHI	SYLHET	BARISAL	ALL CITIES
NOT SHARED	1.40	24.20	38.10	8.70	1.00	-	4.50
2-5	19.60	24.40	4.80	20.90	6.50	26.10	19.60
6-10	45.80	23.70	4.80	34.90	20.30	14.50	40.90
11-20	21.70	15.70	28.60	28.60	45.90	43.50	22.70
21-30	4.70	3.90	23.80	4.40	20.30	8.70	6.80
ABOVE 30	6.80	8.00	-	2.40	5.90	8.70	6.80
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Source: CUS, 2005

7.10.3 Rural Sanitation

In 1990, 15.3 percent of rural population had access to sanitary latrines (Table 7.25). Coverage increased to 35 percent in 2000. A nationwide "Community based Total Sanitation' campaign was lunched in 2003 with aim of reaching 100 percent coverage by 2010. Projects named 'alternative water supply/sanitation' and 'water sanitation & flood protection capacity building' were implemented by MLG&RD during 1998-2004. The coverage increased to 57 percent in 2005. Again the rural sanitation coverage increased to 84.7percent in 2007 because during last twenty months following 2005, five million latrines were installed. The growth rate is very encouraging, about 17 percent per annum. The country is expected to reach her target 100 percent, if the present growth rate is maintained.

Table 7.25: The proportion of population with access to sanitary latrines

Sanitation Target		Year				
		1990-95	2000	2005	2006	2007
Access to Sanitary latrines	Rural (%)	15.30	35.00	57.00	81.50	84.70
	Urban (%)	61.20	60.00	74.00	80.00	86.00

Sources: MDGs Mid Term Bangladesh Progress Report 2007; MICS 2006; BIDS 2004; LGD, MLG&RD, 2005; BBS 2006.

7.10.4 Urban Sanitation

It is estimated that sanitation coverage is 80 percent in urban areas. In 2003, the Government set a target to of 100 percent sanitation coverage by 2010 and launched an awareness campaign, promotion and construction components. The national sanitation campaign emphasizes installing pit latrines for both rural and urban areas. The use of on-site sanitation (pit latrines and septic tanks) will be appropriate in many high density areas due to lack of space and the risk of groundwater contamination. Different off-site approaches (conventional or small-bore sewers) are needed in high-density urban areas which require higher level of technical skills and high investment costs. De-sludging and safe disposal of the latrines and septic tanks is another worrying environmental problem. Thus, is spite of the relatively higher percentage of sanitation coverage in the urban areas compared to the rural ones the actual sanitation situation is worsen mainly because of high population density.

However, Multiple Indicator Cluster Survey (MICS) by UNICEF & BBS, 2006 found that the percentage population without access to sanitary latrines was 42 percent for urban and 68 percent for rural. A study conducted by DPHE in 2003 found that lack of money more than 72.0 percent of rural and 80.0 percent of urban population do not have a latrine. The values were 84.5 percent and 88.4 percent in case of City Corporation and municipalities. The percentage was higher (31.5 percent) in case of city corporation population of having latrine due lack of space. Lack of awareness, 25.3 percent of urban population was not interested to have latrine. City corporation people (5.5 percent) do not have latrine because of preference of open defection. However, due to lack of material, 3.2 percent population of City Corps, do not have a Latrine (Table 7.26).

Table 7.26 Reasons for not having a Latrine

AREA/REGION	NUMBER OF HOUSEHOLDS WITH NO LATRINES	LACK OF MONEY(%)	LACK OF SPACE(%)	LACK OF AWARENESS(%)	PREFERENCE FOR OPEN DEFECTION(%)	LACK OF MATERIAL(%)
NATIONAL	8,982,551	73.23	10.64	25.13	4.23	1.99
RURAL	8,595,626	72.90	10.30	25.32	4.27	2.05
URBAN	386,925	80.47	18.26	20.85	3.32	0.59
CITY CORPS.	30,727	67.91	31.53	23.04	5.53	3.20
MUNICIPALITIES	356,198	81.55	17.12	20.66	3.13	0.37

Source: DPHE 2003

7.11 Major Interventions and Targets for Water supply and sanitation

The major intervention to make available access to safe drinking water in the rural areas will be construction of schemes (source intake-STW, DSP TW) in the low covered areas. Arsenic mitigation technologies will also be encouraged. The major intervention to provide access to basic sanitation in the rural areas will be to increase the percentage of people with access to appropriate improved toilets. The use of other inferior technologies will be discouraged at the same time.

The major intervention for the urban areas will be to provide access to safe drinking water through the construction of water treatment plants and piped connections to the house. For access to basic sanitation, the interventions will be through construction of proper sewerage system to provide pour flash latrines while completely doing away with other inferior technologies. The interventions will include providing new sewerage and waste-water treatment plants in larger urban areas.

Common interventions in both urban and rural areas will be to focus on improving drinking water standards through monitoring of water quality and training to build up the capacity of the government (DPHE), NGOs and private individuals. Rehabilitation and repair of old and non-functional infrastructure will continue, and awareness and educational programmes will also be under-taken to emphasize the importance of safe drinking water and basic sanitation.

The total population was 140.6 million in 2006 where 75 percent live in rural areas. The number of rural household was 21.2 million. The average household size, 4.9 persons have been used. The population growth rate was 0.95 for rural and 2.98 for urban areas.

As the MDG water and sanitation targets are well on track, the coverage targets for both urban and rural areas are to provide universal access to safe drinking water and basic sanitation by 2011 and 2010 respectively. The coverage targets for provision of sewerage and wastewater treatment facilities in the five urban divisional cities by 2015.

7.11.1 Rural Areas

The major interventions for providing access to safe drinking water in the rural areas are:

Increase access of rural communities through the ongoing Rural Water Supply & Sanitation programme, which include the construction of schemes and extension of existing ones; like increase the numbers of Shallow Tubewell (STW), Deep Set Pump (DSP) Tubewell and Arsenic Mitigation Technology which are cost effective, durable and simple.

Rural Water Infrastructure Coverage

The percentage of rural population who will be provided with access to safe drinking water will be increased from the existing 71 percent to near 100 by 2011 through the construction of more schemes and rehabilitation of existing ones.

Shallow Tubewell

The depth of STW is typically within 30-50 m. STW is a low cost, easy to operate and maintain robust technology. It is the common technology in Bangladesh. When the GWT is below the suction limit of 7.5 m, the STW are not functional. In some areas, water from shallow depths are contaminated by Arsenic. At present 29 percent of population are covered STW and it is expected that water coverage will be nearly same in 2015. Unit cost of a STW is BDT 5,000 (according to DPHE).

Deep Set Pump Tubewell

The depth of deep set tubewell (DST) is usually within 100 to 150 m. Due to excessive withdrawal of GW for irrigation, the GW level is gradually lowering, particularly during the dry season. As such there is an increasing trend of the LWT areas, which at present is estimated to be 26 percent of the total area of Bangladesh. The use of DSP TW technology is also increasing in those areas. At present 19 percent population is covered by DSP. Due to the increasing demand, it is expected that the coverage will reach to 32 percent by 2015. The unit cost of a DSP is set to be BDT 15,000

Deep Tubewell

Deep tubewells (DTW) are used to extract water from deeper aquifers. In Bangladesh, a handpump tubewell is called a deep tubewell when its depth is over 75m. DTW technology operates under suction mode in the same principal as a STW, the only difference is that the depth of the tubewell is more than 75m DTW technology is mostly used in the saline zone (coastal belt) where the depth of tubewell is around 300 m.

However, due to arsenic in groundwater, DTW technology increased all over Bangladesh. Water from DTW is free from arsenic that many studies documented. The technology is easy to operate and robust like STW. At present seven percent population are covered by DTW and it is expected the coverage will be same in 2015 because of its installation cost is too high. As such, only, a limited number of houses can afford a private tubewell and most of the population depends on the public community wells.

Arsenic Mitigation Technology

Arsenic mitigation technologies are considered as a separate technology because of the vast magnitude of the problem. The government of Bangladesh has recommended four alternative technologies for arsenic affected areas. These technologies avoid the use of arsenic contaminated groundwater. They are (i) dug wells, (ii) pond sand filter, (iii) rain water harvesting and (iv) deep tubewells (using deep aquifer that is arsenic free). Apart from these recommended technologies many household and community levels arsenic removal alternative technologies are being tried out. Appropriate technological solutions are being tried out though many are still in a development stage in Bangladesh. Piped water supply is also considered as a feasible option for many arsenic affected areas. Arsenic removal technologies require validation from the Government. More than 22 percent tube wells are contaminated by arsenic of Adopting alternative clean water source technologies like arsenic mitigation technology that is cost effective, durable and simple. Currently 16 percent population is covered by Arsenic mitigation technology and it is expected that the coverage will be increased to about 22 percent by 2015. Unit cost of a DTW is set to be BDT 45,000

Rural Piped Water Supply System

There are a very limited number of rural piped water supply schemes in water-scarce LWT areas in northwestern part of Bangladesh. Recently piped water supply is being promoted as an alternative to the arsenic contaminated hand tubewells and also in villages where the socio-economic conditions are favorable. Many villages in Bangladesh are believed to have potential to move from manually operated handpump tubewells to piped water systems. Unlike HTWs and other alternative technologies, piped water supply systems might need proper drainage system as domestic water use (bathing, washing, etc) is much higher. It is expected the piped water supply will be increased to about ten percent by 2015.

Rural Sanitation

The percentage of the rural population who will be provided with access to sanitation through improved toilets will increase from 81.5 to 100 by 2015. The main intervention for providing access to basic sanitation in the rural areas is to increase access to rural communities by upgrading sanitation facilities. In rural areas, sanitation infrastructures are generally single pit pour-flush water- seal latrines, improved pit latrine, septic tank and VIP. Table 7.27 presents the rural sanitation infrastructures coverage and unit cost of each infrastructure.

Table 7.27: Rural Sanitation Infrastructure Coverage and Unit Cost

Rural Sanitation Infrastructure Coverage				
	Implied % pop Covered, 2006	Target % pop covered, 2015	# HH per Connection	Unit Cost (BDT)
Single pit pour- flush water- seal latrine	26.00%	58.00%	1	10,618.00
Improved pit latrine (Two Pit)	32.50%	35.00%	1	7,190.00
Septic tank	17.00%	5.00%	1	50,690.00
VIP	6.00%	2.00%	1	10,618.00
Total	**81.50%**	**100.00%**		

Single pit pour- flush water- seal latrine

The most widely used latrine in the rural areas is the single pit pour-flush water seal squatting pan and a pit lined with few cement concrete rings or clay rings. The squatting pan may be directly over the pit or the pit may be off-set. It needs flushing by hand using 1.5 to 2.0 liters of water every time it is used. The water-seal prevent flies and odors. At present single pit pour-flush water-seal latrine covers 26 percent population and it is expected that the coverage will be increased to 58 percent by 2015 due to its increasing demand.

Improved pit latrine

A twin pit latrine consists of one squatting pan and two offset pits and a Y-junction for directing excreta from the squatting pan to either of the two pits. Currently, improved pit latrine covers about 33percent of population. The cost of twin pit latrine is proportionately more than a single pit latrine because of extra pit and the Y-junction. There is a little possibility to increase its coverage. It is expected the coverage will be reached to 35 percent by 2015.

Septic Tank

A septic tank is not generally applicable in rural areas where there is no piped water system with house connections. First it is costly to construct and only the rich families can afford to build a septic tank. The design is elaborate and copious flow of water is needed. In course of time, a septic tank may need emptying. However, in urban built-up areas where there is no water-borne sewer system, a septic tank is the solution. The present coverage of septic tank is 17 percent which will be reduced to five percent by 2015.

VIP

Currently VIP covers six percent of population which is expected to decrease to two percent by 2015. Unit cost of VIP is BDT 10,618.00 (cost from DPHE).

7.11.2 Urban Areas

The percentage of urban population who will be provided with access to safe drinking water will be increased from the existing 84 percent to 100 percent by 2011 through the construction of more schemes and the rehabilitation of existing ones. The main interventions for providing access to safe drinking water in the urban areas are to increase through household connection. The use of HTW and public tap is decreasing due to lack of maintenance. Table 7.28 shows the urban water infrastructure coverage, target and unit cost of each technology.

Table: 7.28 Urban Water Infrastructure Coverage & unit cost of each water infrastructure

Urban Water Infrastructure Coverage				
	Implied % pop Covered, 2006	Target % pop Covered (2015)	# HH per Connection	Unit cost (BDT)
Household Connection	39.00%	85.00%	1.00	55,485.00
Hand tubewells	29.00%	12.00%	25.00	56,170.00
Public tap	3.00%	2.00%	40.00	17,810.00
Rainwater collection	0.00%	1.00%	1.00	20,550.00
Total	**71.00%**	**100.00%**		

Urban Water Infrastructure Coverage

Household Connection

Houses that are directly connected to the piped system have the highest comfort of water supply since there will be internal pumping with several water points inside the house like baths, showers and toilets. This type of connection has the highest per capita use of water as a result of the high availability of the water (e.g. for bath, shower and flush-toilet). The cost of one m3 is low as compared to other service levels, ranging from BDT 30 to 200 per month, varying with pourashava / city but also depending on the size of the connection. At present, household connection covered 39 percent of the total urban population which is expected to increase 85 percent by 2015.

Hand tubewells

A number of hand tubewells (HTW) for public use have been sunk in the Pourashavas, mostly outside the areas served by piped supply. These tubewells are maintained by the local DPHE office and by caretakers and users themselves. As with public taps, over time the number of tubewells has gone down due to wear of the pumps and boreholes and lack of maintenance. HTW currently covers 29 percent of the urban population. It is expected that the coverage will be decreased to 12 percent by 2015.

Public tap

In many Pourashava, public taps are used by people who do not have house connection or public tap but live within the area of the piped system. Usually there is no charge for the water thus obtained but also comfort is lower than the other two types of piped connection. Supervision of the tap is not always available leading to vandalism or theft, rendering the tap useless and often the tap is then closed and sealed off. Over time the number of public taps in most municipalities has diminished. At present, public tap covered 2.5 percent of population which will go down to two percent by 2015 due to its proper supervision and maintenance.

Rainwater collection

A very few numbers of people collect rain water for their consumption. There is a target to increase the coverage of one percent by 2015.

Urban sanitation

The focus on sanitation in the urban areas will be to provide improved access of sanitation which is expected to be increased from 80 percent to 100 percent by 2010. The above described rural sanitation options exist also for urban areas, their applicability depending on the population density. Other options, specific for urban areas, are described in Table 7.29. The main interventions for providing access to sanitation in urban areas are described below:

Table: 7.29: Urban Sanitation Infrastructure Coverage & unit cost of each sanitation infrastructure

Urban Sanitation Infrastructure Coverage				
	Implied % pop Covered 2006	Target % pop Covered (2015)	# HH per Connection	Unit cost (BDT)
Conventional Sewer systems	20.00%	15.00%	1	20,550.00
Simplified sewerage	1.00%	0.00%	1	10,138.00
Septic tank	14.50%	10.00%	1	26,520.00
Pour flush latrine	34.00%	68.00%	1	10,618.00
VIP	5.00%	2.00%	1	10,618.00
Public toilets	4.00%	5.00%	1	500,000.00
Total	**78.50%**	**100.00%**		

Conventional sewer systems

The collection and transport of wastewater by means of sewers is a well known method widely applied all over the world. The amount of wastewater discharged to the system should be sufficient to let the self-cleaning process take place in the sewer pipes. If the water use is low then too many blockage will appear. The collected wastewater needs adequate treatment before the effluent can be discharged into open waters to protect downstream water users from polluted sources.

Wastewater collection as well as treatment is a costly undertaking (for investment as well as in operation and maintenance) and if cost-recovery methods would be applied to set the tariffs for users of the systems, these probably would be just as high or higher than a full cost-recovery tariffs for drinking water supply. In Bangladesh a very minor part of population is served by sewerage systems (only the central and south part of Dhaka), it would be worthwhile to consider other methods of sanitation for the remaining areas of Bangladesh. Therefore, it is expected that the coverage will be decreased from 20 percent in 2008 to 15 percent in 2015.

Pour flush latrine

Suitability of Pour flush latrine is described in the above section, the most widely acceptable latrine in rural as well as urban areas. The present coverage is 34 percent which is expected to increase 68 percent by 2015.

Waste water treatment coverage

Currently 30 percent of sewer connections are fitted with wastewater treatment where ten percent for each primary, secondary and advance treatment are taken place. It is expected that the 60 percent of existing sewer connections will be connected for waste water treatment and 70 percent of newly built sewer connection will be fitted for waste water treatment.

7.12 Resource Needs Estimates for Water Supply and Sanitation

It is estimated that a total of BDT 965,263.32 million will be required to undertake the entire interventions suggested above for the period 2009-2015 where BDT 188,887.38 million for water and sanitation for rural areas and BDT 776,375.94 million for urban areas. The cost breakup by interventions is shown in Table 7.30, 7.31 and 7.32.

Table 7.30: Annual Cost for resource needs for rural water and sanitation

(million BDT)

	2009	2010	2011	2012	2013	2014	2015	Total	Average
Total Cost Estimates for Rural									
Rural Water									
Capital Cost	1,714.23	1,751.32	1,789.02	1,826.33	1,864.13	1,902.55	1,941.58	12,789.15	1,827.02
Operating Cost	1,441.81	1,528.39	1,617.37	1,708.80	1,802.71	1,899.17	1,998.22	11,996.48	1,713.78
Rural Water Total	3,156.04	3,279.71	3,406.39	3,535.13	3,666.85	3,801.72	3,939.80	24,785.64	3,540.81
Rural Sanitation									
Capital Cost	10,037.41	10,249.23	10,464.47	10,683.19	10,905.43	11,131.25	11,360.70	74,831.68	10,690.24
Operating Cost	10,451.91	10,274.22	10,095.85	9,916.84	9,737.24	9,557.07	9,376.38	69,409.50	9,915.64
Rural Sanitation Total	20,489.32	20,523.44	20,560.32	20,600.03	20,642.67	20,688.32	20,737.08	144,241.18	20,605.88
Rural Hygiene and Education									
Capital Cost	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Operating Cost	1,997.16	2,032.45	2,068.24	2,104.52	2,141.30	2,178.59	2,216.40	14,738.66	2,105.52
Total Hygiene and Education	1,997.16	2,032.45	2,068.24	2,104.52	2,141.30	2,178.59	2,216.40	14,738.66	2,105.52
Hospitals Total (Rural)	174.54	182.21	190.30	217.64	240.83	187.62	172.60	1,365.74	195.11
Schools Total (Rural)	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.23	0.03
Human Resources Total (Rural)	380.63	432.61	484.58	536.56	588.54	640.52	692.50	3,755.93	536.56
Grand Total for Rural (BDT)	26,197.71	26,450.45	26,709.87	26,993.91	27,280.22	27,496.80	27,758.41	188,887.38	26,983.91
Grand Total for Rural (USD)	383.01	386.70	390.50	394.65	398.83	402.00	405.82	2,761.51	394.50
Per capita cost (BDT)	240.24	240.27	240.34	240.61	240.88	240.51	240.51		240.48
Per capita cost (USD)	3.51	3.51	3.51	3.52	3.52	3.52	3.52		3.52

Source: Water & sanitation NA &Costing Tool, version 1, 2006, GED, Planning Commission, GOB

Table 7.31: Annual Cost for resource needs for urban water and sanitation

(million BDT)

	2009	2010	2011	2012	2013	2014	2015	Total	Average
Total Cost Estimates for Urban									
Urban Water									
Capital Cost	28,754.76	30,295.97	31,903.89	33,581.00	35,330.12	37,154.07	39,055.78	236,075.58	33,725.08
Operating Cost	11,932.11	13,443.69	15,039.74	16,724.09	18,500.75	20,373.88	22,347.81	118,362.08	16,908.87
Urban Water Total	40,686.87	43,739.66	46,943.63	50,305.09	53,830.87	57,527.95	61,403.59	354,437.66	50,633.95
Urban Sanitation									
Capital Cost	13,594.64	14,256.88	14,947.20	15,666.70	16,416.52	17,197.87	18,011.98	110,091.80	15,727.40
Operating Cost	20,386.10	21,569.60	22,811.32	24,113.84	25,479.87	26,912.21	28,413.79	169,686.74	24,240.96
Urban Water Total	33,980.75	35,826.49	37,758.52	39,780.54	41,896.39	44,110.08	46,425.77	279,778.54	39,968.36
Urban Wastewater treatment									
Capital Cost	8,688.17	13,032.25	21,720.42	0.00	0.00	0.00	0.00	43,440.85	6,205.84
Operating Cost	5,324.69	6,651.21	8,862.07	8,862.07	8,862.07	8,862.07	8,862.07	56,286.22	8,040.89
Urban Wastewater treatment Total	14,012.86	19,683.46	30,582.49	8,862.07	8,862.07	8,862.07	8,862.07	99,727.07	14,246.72
Hygiene and Education for Urban									
Capital Cost	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Operating Cost	2,149.74	2,436.35	2,945.97	1,909.82	1,981.23	2,054.76	2,130.45	15,608.32	2,229.76
Total Hygiene and Education (Urban)	2,149.74	2,436.35	2,945.97	1,909.82	1,981.23	2,054.76	2,130.45	15,608.32	2,229.76
Hospitals Total for Urban	14.61	15.36	16.13	17.83	19.66	17.19	15.83	116.62	16.66
Schools Total for Urban	0.57	0.58	0.58	0.59	0.59	0.60	0.61	4.12	0.59
Human Resources Total for Urban	3,085.73	3,328.75	3,571.78	3,814.80	4,057.83	4,300.85	4,543.87	26,703.61	3,814.80
Total for Urban (BDT)	93,931.12	105,030.65	121,819.10	104,690.74	110,648.64	116,873.49	123,382.20	776,375.94	110,910.85
Total for Urban (USD)	1,373.26	1,535.54	1,780.98	1,530.57	1,617.67	1,708.68	1,803.83	11,350.53	1,621.50
Per capita cost (BDT)	2,485.85	2,699.16	3,040.01	2,536.97	2,603.75	2,670.65	2,737.79		2,682.03
Per capita cost (USD)	36.34	39.46	44.44	37.09	38.07	39.04	40.03		39.21

Source: Water & sanitation NA &Costing Tool, version 1, 2006, GED, Planning Commission, GOB

Table 7.32: Annual Cost for resource needs for water and sanitation

(million BDT)

Total for Water Supply and Sanitation	2009	2010	2011	2012	2013	2014	2015	Total	Average
Total for Rural (BDT)	**26,197.71**	**26,450.45**	**26,709.87**	**26,993.91**	**27,280.22**	**27,496.80**	**27,758.41**	**188,887.38**	**26,983.91**
Total for Urban (BDT)	**93,931.12**	**105,030.64**	**121,819.10**	**104,690.73**	**110,648.64**	**116,873.49**	**123,382.196**	**776,375.94**	**110,910.85**
Grand Total BDT million	120,128.84	131,481.10	148,528.97	131,684.65	137,928.86	144,370.30	151,140.60	965,263.32	137,894.76
Grand Total USD million	1,756.27	1,922.24	2,171.48	1,925.21	2,016.50	2,110.68	2,209.66	14,112.04	2,016.01
Per capita BDT	819.27	884.20	984.94	861.13	889.40	918.04	947.71		900.67
Per capita USD	11.98	12.93	14.40	12.59	13.00	13.42	13.86		13.17

CHAPTER 7

CHAPTER 8

SUMMARY & CONCLUSION

SUMMARY AND CONCLUSION

CHAPTER 8

Poverty and Hunger

In order to successfully achieve the MDG1 related to poverty and hunger, economic growth must have a stronger pro-poor orientation. This should be reflect in overall macroeconomic policy and budgeting for the successful implementation of the proposed poverty alleviation interventions, including focused and targeted poverty interventions. It is especially crucial that higher growth rates for the agriculture sector are stimulated through increased allocation of resources and investments in policies on agricultural subsidies, extension, and legislation such as the Land Act. These will have considerable impact on the agricultural productivity of smallholder farmers, and need to be reviewed to ensure that they facilitate poverty reduction and equitable access. Rural credit also forms a critical element for the success, as indicated in some of the interventions mentioned above. Ensuring access to affordable micro-insurance schemes, particularly for the poorer and vulnerable households, should be enhanced. Similarly, enhancing other rural income generation opportunities will require policies that support the development of small and micro intermediaries and economic facilities.

Bangladesh's progress on the MDG1 indicators during the 1990s has been good, but challenges remain moving forward. Indeed, there are several areas of concern highlighted in this report. First, there are very large regional disparities in virtually all of the MDG1 indicators in Bangladesh. Divisions such as Barisal, Rajshahi and Khulna have generally not performed well on several of the MDG1 indicators. Even if Bangladesh as a whole attains some of the MDG1 indicators, there will be several areas of the country that will remain distantly behind. In particular, these are specific rural and urban areas, as well as specialized zones such as haor, hilly areas, coastal areas and char areas. The analysis also suggests that achievement thus far of many of the MDG1 indicators is geographically concentrated in a few regions. This in turn means that targeted interventions, central government resources, and economic growth opportunities to the lagging divisions are needed to speed up the attainment of MDG1.

The primary challenges and actions needed to address are addressed to achieving the targets of MDG1 by 2015 are: reducing hunger and malnutrition; comprehensive programmes of integrated actions on many fronts including youth unemployment; supporting effective and sustainable safety net programmes for the vulnerable in poor areas; promoting pro-poor growth; expansion of rural infrastructure for ensuring access to health and modern facilities; and strengthening rural-urban market linkages for the poor.

The major interventions and targets for MDG1 are agriculture and rural development which consists of increasing agricultural productivity, investments in soil health, improved seeds, plant protection, small scale irrigation and water management, agricultural research, extension services of DAE, DLS and DoF, and subsidy in agriculture. Rural incomes and access to markets that includes building storage facilities to reduce post-harvest losses, agro-processing activities, access to micro credit.

The long term strategies to address urban poverty including formulation urban development plans to improve the living standards of the urban poor and the whole urban settlements at large should be initiated. There is a need to effectively address the growing rural-urban migration trends that have serious implications for the emergence of urban poverty and acute farm labour shortages. Improving rural access will require reviewing policies and regulations related to road construction in rural areas, especially the prolonged delays in acquiring required clearances, the maintenance of road infrastructure. Moreover, the following policies towards addressing the roads infrastructure to the rural areas are mentioned as:

- Ensure rural-urban linkages through selective expansion of district to village road network
- Extension and improvement of railway network access to rural poor;
- Ensure water transport services to the mass people especially poor people in unfavorable zone.
- Prioritize development of road communication to link growth center, union head quarters, upazila head quarters and national road system
- Extension of reliable and affordable electricity in the rural area of Bangladesh.

In addition, possibilities should be explored to develop appropriate compensation schemes to unemployed people during the monga period to engage them in construction and maintenance of small village roads in community level. Food security and rural income generation interventions need to be improved through developed for the continuation of VGD, VGF and guaranteed employment scheme for the poor.

- Extending coverage of safety net Programmes;
- Increase average amount of payment under SSNPs;
- Increase duration of payment under SSNPs;
- Effective implementation of delivery systems of existing SSNPs; and
- Extending SSNPs during natural calamities

Finally, the preparation of a national strategic plan as well as the financing strategy is suggested to implement and explore the required resource needs and the sources of fund.

Education

In view of the current situation and considering the targets for the three MDG 2 indicators namely net enrolment rate, primary cycle completion rate and the adult literacy rate the current study proposed a set of interventions. These interventions have been broadly categorised as supply side and demand side interventions. Major supply side interventions comprise infrastructure and human resource requirements, incentives for the service providers etc. The demand side interventions mostly dealt with incentives provided to the service recipients i.e., the students or the learners. Although the coverage is pre-primary, primary, secondary, and non-formal education sectors the major focus is basically given on primary education as the primary net enrolment rate and primary completion rates are the two critical indicators of the MDG 2. All these interventions together will contribute to achieving the targets set for the two specific indicators in the area of primary education. For adult education it is expected that increasing the number of learning centers to cover the potential learners coupled with the existing provisions for distribution of free learning materials will help achieve the specified target within the stipulated time period.

Policy support for implementing these interventions are in place through the two important national documents - the National Plan of Action II: 2003-2015 and the Second Poverty Reduction Strategy Paper (2009-2011). Large program like PEDP II has been in place with components addressing the issues that have directly linkage with the MDG 2 indicators particularly in the area of primary education.

Still there are challenges in implementing these interventions within the specified timeframe in terms of financial and human resource capacity. The estimated cost of implementing the suggested programs for achieving the MDG for education will require a huge amount of budgetary allocation. Need for a large pool of human resources with adequate managerial and technical skills cannot be denied. In both these areas there is enough room for the development partners to participate in the development activities and help achieving the MDG goals related to education. This will ease the path for achieving the other MDGs too.

Gender

The government's commitment to gender equity is the result of decades of development work in Bangladesh. The suggested interventions are expected to contribute to achieve the goals set out in MDG goals related to gender equality. The interventions for gender equality are believed to bring change in the attitude of policy makers, civil servants, judiciary, police, public leaders and media personnel. The broad interventions will address gender inequality for women's empowerment through dialogue with policy makers, politicians, media personnel for involvement of women in decision -making and in political bodies.

It is important that the support and involvement of policy makers will ensure community based awareness programme for sustaining gender based equality in education, helping girls transition to work, encouraging women's political participation and parliamentary reform to encourage major political parties to increase the number of women's nomination during national election.
Further attention of policy makers is necessary to reduce gender based violence and strengthening of gender mainstreaming in all ministries and organizations. The policy makers are in such position that they can influence the relevant bodies responsible to address gender inequality. They can advocate and lobby for increased budgetary allocation for the gender based programmes to effectively meet the desired goals of MDG goals on gender equality.

Support should be provided to address issues like discriminatory legislative and policy provisions and practices against women and girls. Sensitization of various groups is important and need to be done in culturally sensitive manner so they emerge as advocates for gender equality and speaks against VAW.

The practical understanding of the situation of women and prevailing gender inequality is needed to carry forward the MDG 3. Gender equity & equality is therefore one of the most important focus areas of MOWCA both at the organizational and the program levels. As an implementing ministry efforts by MOWCA to institutionalize gender equity got a major boost from its first official Gender Policy in 1997. The ambitious scope of this policy set the stage for much subsequent work in Gender, focusing MOWCA's organizational culture, accountability, technical capacity, programme, design, implementation, monitoring & evaluation, partnership and advocacy.

However the most important matter of concern is to develop mechanisms to provide a clear picture of how to translate the Gender Policy into concrete, behavioral terms. MOWCA has focal points which strongly encourage all sectoral ministries to have gender screening of their policies and to implement gender focused programmes. The major burden of gender integration remains with the MOWCA, with its staff approaching other sectors for assessment of gender component in their work. The onus should be actually be on the other ministries to approach MOWCA, which they rarely do because gender is yet to be priority. MOWCA should be at the lead to for ensuring integration of gender in other government sectors. This could be an effective strategy given the marginalization of the MOWCA .

Some indicators of MDG related to reduce gender disparity are on track, some are not on track and some have structural and socio-cultural barriers to be on the track in 2015 considering 2005 as benchmark. Therefore, if the current trends of those indicators which are far from being on track continue to it will be challenging to reach all the goals by2015. Even the recent trends may not be continued over the next two years (2007-08 and 2008/09) owing to the global economic shock. Bangladesh will require massive levels of investment to fully take up the challenges of MDG 3, in particular those where current performance is behind schedule. It may not be possible to generate resources from domestic sources only, and will therefore require the support and assistance of its development partners.

CHAPTER 8

Health

Bangladesh has made significant progress towards attaining the health related MDGs but much more must be done if we hope to achieve the goals by 2015. The improvements in some health indicators have been remarkable, especially reducing the under 5 mortality, providing vaccines to children and mothers, reducing vitamin A deficiency, and others. In other areas the country is lagging behind and more must be done to ensure that the promise of the MDGs is realized.

The country should give special emphasis to reduce neonatal mortality, improve nutrition during the early months of life, prevent and treat the most common life-threatening infectious diseases to reduce the infant mortality rate to the target level by 2015. Strategies for reducing drowning, which is a major cause of child mortality in Bangladesh, will also contribute to achieving MDG 4.

A package of services is needed in the community level to make deliveries safe for both mother and child. Access to health services to prevent and manage any maternal complications or any illnesses that occur in the first few days of life of a newborn is essential for attaining the interrelated MDG 4 and 5. Poor quality of care and misperceptions regarding need for care are the main causes of low level of care-seeking for illnesses of the women and children in Bangladesh. An effective community based work force can help to reduce the misperceptions of the families and parents regarding care for their children.

The country must ensure availability of CSBA for safe home delivery and CEmOC at all Upazila level for referral care to reduce the maternal mortality ratio to 143 per 100,000 live births, by 2015. The financial constraint of the poor women for seeking care at time of delivery can be removed by expanding the DSF in all Upazila, and it will need increasing level of expenditure on demand creation.

Despite the successes in malaria control program plasmodium falciparum infections[22] has increased notably in the past few years because of emergence and spread of antimalaria drug resistance in the hilly areas (ICDDR'B 2006). This seems to be one of the main obstacles for reverting malaria treatment failure rate.

Tuberculosis is a critical infectious disease in Bangladesh and additional resources and strategies are needed to identify cases earlier, before they have transmitted their infection to others. The success of TB control program largely depends upon an efficient monitoring mechanism and public awareness. Involvement and participation of private practitioners, not-for-profit providers at upazila level, and medical colleges are essential for successful control of tuberculosis.

[22] Among the malaria infections, both plasmodium falciparum and p. vivax are prevalent, the former being the predominant (70 percent) in Bangladesh (WHO 2008).

The low HIV/AIDS prevalence among the general population in Bangladesh places the country in a good position to halting and reversing the spread of HIV/AIDS by 2015. However, one of the major challenges is to provide treatment and care to all PLHIV. The exact number of people living with HIV/AIDS infection is not known and the coverage of VCT is extremely low. Moreover, the diagnosis, treatment and care of PLHIV require costly interventions, which are unaffordable by most of the population of risk groups.

Bangladesh currently spends on health considerably lower than what is required to achieve the health related MDGs. The country has to scale-up resources for the health sector and at the same time ensure optimum utilization of resources. The capacity of the pre-service training institutes for the health personnel should be increased substantially and strategies to increase the accountability of health sector professionals and deal with absenteeism problem in rural areas are essential for improving health sector performances in Bangladesh.

Environment

The natural environment is constantly changing due to both human interventions and natural phenomena like floods, cyclone, river bank erosion, landslides, water logging, drought etc. To ensure long-term environmental sustainability, environment policies have to keep up with the changing environment along with the change in human and development activities that impact it. Policy interventions should seek to improve environment outcomes that matter to improve by mainstreaming poverty environment issues into key process and their implementation including the national plans, sectoral strategies and sub-national planning.

As mentioned in the report above, the forest cover is depleting fast in Bangladesh and it has only 0.02 hectares of forest land per person (one of the lowest forest-man ratios in the world). Further, interventions are needed to reduce the air pollution including its timely and effective monitoring. It is evident that undertaking interventions related to environment will also have impact on other areas as well, especially on health.

Further, the impact of climate change, the natural disasters and loss of land due to degradation and salinity are important issues in Bangladesh. The TWG decided to consider the interventions on Environment in four broad categories - Reducing exposure to environmental health impacts; Improving livelihoods; Reducing vulnerability through capacity enhancement and investment for climate change and adaptation & disaster management; and Governance Institutions, capacity and systemic issues.
For reducing exposure to environment, the interventions identified relate to monitoring of air and water quality, reducing exposure to CO2 emissions through mass transit (railway) and through promotion of use alternative fuel (CNG), and solid waste management. Further, it was agreed that improving livelihoods is very important and interventions identified amongst other include co-managed forest initiatives for benefiting poor people, pro-poor forest and wild life management plans, slum livelihoods upgradation schemes and security of tenure for the slum dwellers.

The impacts of climate change have been a daunting challenge for Bangladesh, and the frequent natural disasters need interventions that address the reduction of vulnerability through capacity enhancement for climate adaptation while also providing asset and income support schemes. In addition capacity building and mass awareness campaigns will help sensitize people on environmental issues.

The approach adopted by the TWG emphasizes on preventive measures while also on remedial action. It was felt that addressing the key challenges will advance multiple goals and targets simultaneously and will have faster, deeper, wider, more cost effective and more lasting impact on environmental sustainability and human well being in the long-term than sequential interventions that address environmental challenges directly.

The vision Statement on Power recognizes energy as a prime resource for poverty reduction. Rural electrification has been made a key goal and the Government has targeted electrifying the country by 2020 through grid and off grid methods. The national emphasis on rural electrification is also reflected in the national Poverty Reduction Strategy Paper (PRSP), which identified rural electrification as a key area to foster economic growth with a pro-poor orientation (GOB 2005).

The interventions have been recommended by the Thematic Working Group for inclusion the MDG needs Assessment and Costing relate to modern fuel for cooking/heating, promotion and use of renewable energy, promotion of energy saving bulbs. Since grid electricity is highly subsided by the government, it is recommended that government will consider grants for enhancing programmes, particularly solar PV and bio-gas plant programmes.

Reduction of the use of fuel-wood and agricultural residues, exploring alternative energy resources, precautionary measures against potentially harmful use of nuclear energy and nuclear radiation, conservation of forest fuel and development of improved energy saving technology are recommended options for the sector. Apart from these, EIA has been made mandatory before implementing projects for exploration and extraction of fuel and mineral resources.

The provision of universal access to safe drinking water and basic sanitation will help to attaining basic human needs. It will also contribute to the achievement of MDGs in other areas like health, education and gender. Bangladesh has shown good progress towards achieving universal access to safe drinking water and sanitation, but challenges still remain in ensuing 100 percent access to all. Access to clean water and sanitation will result in reduction of water borne and sanitation related diseases such as typhoid, diarrhea, dysentery and cholera. Provision of safe drinking water will help in reducing child mortality and improve maternal health as both the child and mother. Women will not have to travel long distance to fetch water and it will reduce their water carrying burden and enable them to carry out other more productive and useful works. The additional income earned from the extra works undertaken in saved time will help to reduce with fetching water will also have more time to spend on their studies and other useful activities.

Needs, Costs and Financing

Assessment of Needs based on the situation analysis and the challenges through the Thematic Working Groups (TWGs) resulted in identification of interventions in all of the above mentioned areas with a view to achieve the MDG Targets in Bangladesh by 2015. The exercise has been comprehensive and has had active involvement of representatives of the respective Ministries of the Government of Bangladesh and the United Nations Agencies. Use of costing tools to cost the interventions has facilitated a harmonized approach for all sectors with MDGs.

An earlier study conducted by Millennium Project on MDG Needs Assessments in 2004 for Country Case Studies of: Bangladesh, Cambodia, Ghana, Tanzania and Uganda (lead by Jeffery Sachs) mentions that, in order to meet the MDGs, Bangladesh would need to spend a total of USD 66 per capita in 2005 increasing to USD 102 per capita by 2015. This translated into a total investment need of USD 155 billion between 2005 and 2015, which is equivalent to an average annual per capita need of USD 84.

However the study also notes certain important observations that will have impact on the total costs. The study notes "When interpreting these results, it is important to note the gaps in the current analysis …... we have so far not been able to include a number of interventions for each sector or area. In the case of Bangladesh, the missing interventions, which might have the strongest impact on the overall results, are summarized below":

This MDG Needs Assessment and Costing done by the Government of Bangladesh and UN family partners supported by the project "Support of Monitoring PRS and MDGs in Bangladesh" has included some of the cost factors mentioned above.

According to this current study, about **Total BDT 7,125.76 billion (USD 104.18 billion)** are needed to be spent to achieve all MDGs in Bangladesh from 2009-2015 at a per capita cost of BDT 5,115.95 (USD 74.79) in 2009 and BDT 8,289.48 (USD 121.19) in 2015. Thus annually about BDT 1,017.97 billion (USD 14.88 billion) would be needed to achieve MDGs in Bangladesh at an annual per capita costs of about BDT 6,676.15 (USD 97.60) (Refer Table 1).

Thus although the estimates costs are different due to inclusion of additional cost factors mentioned within the current exercise. However these are not too far apart also considering the different time periods.

However, it is important to note that the estimated costs resulting from the MDG Needs Assessment and Costing exercise will be borne not only through Government expenditure, but will also have its share of household expenditure. Household expenditures will be an important part of estimated costs for MDG1 and MDG 4,5 and6. It is thus essential that a follow-up study is done on Financing of MDGs in Bangladesh to this MDG Needs Assessment and Costing exercise that will have a detailed budget analysis wherein the expenditures regularly being incurred/planned by the Government of Bangladesh are reflected in addition to the household contributions by the people of Bangladesh.

CHAPTER 8

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ANNEXURE

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ANNEXURE



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