Sixth Five Year Plan of Bangladesh
2011-2015

Background Papers

Volume 4
Cross Sectoral Issues

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ACRONYMS

ACC	Anti Corruption Commission
ACH	Automated Clearing House
ADB	Asian Development Bank
ADP	Annual Development Programme
AEI	Agro-ecological Zone
AEIS	Annual Establishments and Institutions Survey
AOGCM	Atmosphere-Ocean Global Circulation Model
ATM	Automated Teller Machine
BAEC	Bangladesh Atomic Energy Commission
BANBEIS	Bangladesh Bureau of Educational Information and Statistics
BANSDOC	Bangladesh National Scientific and Technical Documentation Centre
BAP	Bali Action Plan
BARC	Bangladesh Agricultural Research Council
BAU	Bangladesh Agricultural University
BB	Bangladesh Bank
BBBF	Bangladesh Better Business Forum
BBS	Bangladesh Bureau of Statistics
BCC	Bangladesh Computer Council
BCCP	Bangladesh Centre for Communication Programs
BCCSAP	Bangladesh Climate Change Strategy and Action Plan
BCS	Bangladesh Computer Samity
BCSIR	Bangladesh Council of Scientific and Industrial Research
BdOSN	Bangladesh Open Source Network
BEC	Bangladesh Election Commission
BERNET	Bangladesh Education and Research Network
BIDS	Bangladesh Institute of Development Studies
BIBM	Bangladesh Institute of Management
BITAC	Bangladesh Industrial Technical Assistance Centre
BKB	Bangladesh Krishi Bank
BMDC	Bangladesh Medical Development Council
BMET	Bureau of Manpower, Employment and Training

BPO	Business Process Outsourcing
BRAC	Bangladesh Rural Advancement Committee
BRRI	Bangladesh Rice Research Institute
BSCL	Bangladesh Submarine Cable Limited
BSCIC	Bangladesh Small and Cottage Industries Corporation
BTCL	Bangladesh Telecommunications Company Limited
BTN	Bangladesh Telecentre Network
BTRC	Bangladesh Telecommunication Regulatory Commission
BTTB	Bangladesh Telegraph and Telephone Board
BUET	Bangladesh University of Engineering and Technology
CAO	Chief Advisors Office
CC	Climate Change
CDA	Chittagong Development Authority
CDM	Clean Development Mechanism
CHT	Chittagong Hill Tracts
CIMMYT	International Maize and Wheat Improvement Center
COMLA	Commonwealth Library Associations
CoP	Conference of Parties
CPD	Centre for Policy Dialogue
CPTU	Central Procurement Technical Unit
CTEE	Computer Teaches Everyday English
DAE	Department of Agricultural Extension
DAM	Department of Agricultural Marketing
DBS	Digital Bangladesh Secretariat
DFID	Department for International Development
DoE	Department of Environment
DPE	Directorate of Primary Education
DTE	Directorate of Technical Education
EBRS	Electronic Birth Registration System
EC	European Commission
ECNEC	Executive Committee on National economic council
EDGE	Enhanced Data Rates for GSM Evolution
EEF	Equity and Entrepreneurship Fund

EMIC	Earth Models of International Complexity
EPO	European Patent Office
EU	European Union
FERI	Foundation of Education Research and Education
FID	Federation for Information and Documentation
FWA	Family Welfare Assistant
FWV	Family Welfare Visitor
FYP	Five Year Plan
GCM	Global Circulation Model
GDP	Gross Domestic Product
GHG	Green House Gas
GIS	Geographic Information System
GMO	Genetically Modified Organism
GoB	Government of Bangladesh
GPRS	General Packet Radio Service
HIES	Household Income and Expenditure Survey
HTP	High Tech Park
HYV	High Yielding Varieties
IAT	Institute of Appropriate Technology
IBPC	ICT Business Promotion Council
ICT	Information and Communication Technology
ICT4D	Information and Communication Technology for Development
IDDP	Intensive Dairy Development Programme
IFLA	International Federation of Library Associations
IGA	Income Generating Activity
ILDTS	International Long Distance Telecommunications Service
ILDTSP	International Long Distance Telecommunication Services Policy
IMED	Implementation, Monitoring and Evaluation Department
IMR	Infant Mortality Rate
I-PRSP	Interim Poverty Reduction Strategy Paper
IRRI	International Rice Research Institute
ISP	Internet Service Provider
ITES	IT-enabled services

KP	Kyoto Protocol
LAN	Local Area Network
LDC	Least Developed Country
LGED	Local Government Engineering Department
LIR	Less Integrated Region
MDG	Millennium Development Goals
MFI	Microfinance Institution
MICR	Magnetic Ink Character Recognition
MoA	Ministry of Agriculture
MoDM	Ministry of Disaster Management
MoE	Ministry of Environment
MoEF	Ministry of Environment and Forests
MoI	Ministry of Industries
MoLGRD	Ministry of Local Government and Rural Development
MoPT	Ministry of Post and Telecommunications
MoSICT	Ministry of Science and Information and Communication Technology
MRA	Microcredit Regulatory Authority
MRV	Reportable and Verifiable
MSME	Micro, Small and Medium Enterprises
MTNL	*Mahanagar* Telephone Nigam Ltd
NAMA	Nationally Appropriate Mitigation Action
NAPA	National Adaptation Plan of Action
NARS	National Agricultural Research System
NARS	National Agricultural Research System
NCST	National Council for Science and Technology
NDT	Non-destructive Testing
NEC	National Economic Council
NFE	Non-formal Education
NGO	Non Government Organisation
NIB	National Institute of Biotechnology
NIKS	National Information and Knowledge System
NMC	Nuclear Medicine Centres
NMST	National Museum of Science and Technology

NSL	National Science Library
O&M	Organisation and Management
PDBF	Palli Daridro Bimochan Foundation
PGCB	Power Grid Company of Bangladesh
PKSF	Palli Karma Sahayak Foundation
PMO	Prime Minister's Office
PO	Partner Organisation
POS	Point of Sale
PRIME	Programmed Initiative for Monga Mitigation
PRS	Poverty Reduction Strategy
PRSP	Poverty Reduction Strategy Paper
PSTN	Public Switched Telephone Network
R&D	Research and Development
RAJUK	Rajdhani Unnayan Kartipakkya
RAKUB	Rajshahi Krishi Unnayan Bank
RCM	Regional Circulation Model
RDA	Rural Development Academy
REOPA	Rural Employment Opportunities through Public Assets
RMG	Readymade Garments
RNFA	Rural Non-farm Activity
SASEC	South Asia Subregional Economic Cooperation
SDC	SAARC Documentation Centre
SDC	Sustainable Development Commission
SEF	Small Enterprise Fund
SICT	Support to ICT Task Force
SME	Small and Medium Enterprises
SMEF	Small and Medium Enterprise Foundation
SMESDP	Small and Medium Enterprise Sector Development Programme
SPARSO	Space Research and Remote Sensing Organization
STEP	Support to Training and Employment Programme for Women
TBA	Trained Birth Attendant
TFR	Total Fertility Rate
TRIPS	Trade Related Intellectual Property Rights

UGC	University Grants Commission
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNFCCC	United Nations Framework Convention on Climate Change
URC	University Resources Centre
US	United States
USAID	United States Agency for International Development
VAT	Value Added Tax
VOIP	Voice over Internet Protocol
VSAT	Very Small Aperture Terminal
WFP	World Food Programme
WSIS	World Summit on the Information Society
WTO	World Trade Organization

FOREWORD

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

I am happy to learn that the General Economics Division (GED), Planning Commission and the Bangladesh Institute of Development Studies (BIDS) are jointly publishing the technical framework results and the background studies conducted for preparation of the country's Sixth Five Year Plan (2011-2015).

The technical framework of the Sixth Plan and the background studies generated quantitative/qualitative benchmark values and targets for all relevant sectors/indicators of the plan and identified critical macroeconomic foundation for future intervention. It also forms the basis for determining sectoral targets for prudent responses during the Sixth Plan period.

I am particularly pleased to note that this is a first attempt made in our plan history to publish the results of the economic models and background papers in six volumes that form the basis for the preparation of the Sixth Five Year Plan Document. It will be a useful reference to the policymakers, development planners, academics and researchers alike to examine and evaluate the rationale of plan targets and resource allocation. I am sure it will also provide impetus for preparing future models when formulating Seventh Plan for Bangladesh.

I am confident that the Sixth Five Year Plan will amply guide us in realising our "Vision 2021" goal of becoming a middle-income country by 2021 when we will celebrate the Golden Jubilee of our Independence.

Both the GED of the Planning Commission and the BIDS deserve my special thanks for undertaking this novel venture.

Air Vice Marshal (Retd.) A. K. Khandker

PREFACE

The National Economic Council (NEC) in May 2009 decided to prepare the country's Sixth Five Year Plan (2011-2015) within the framework of the Perspective Plan (2010-2021) and keeping the goals of the Vision 2021 in view. The Planning Commission constituted a high level inter-ministerial "Steering Committee" with the Planning Minister as its chair and formed a "Panel of Economists" for guiding the process of formulating the Plan within a participatory framework.

The preparation of the Plan necessitated the formulation of the technical framework for finalising the Plan strategies and indicating the desirable development path that would lead to fulfilling its objectives. Several background studies were also undertaken for generating quantitative/qualitative benchmark values and targets for relevant indicators of the Plan and fill-in critical knowledge gaps. The Bangladesh Institute of Development Studies (BIDS) was assigned to conduct the background studies and develop the technical framework of the Plan for which renowned economists and development practitioners in the relevant fields were engaged to complete the tasks within the stipulated time period. The drafts of the studies were reviewed by relevant experts in the government as well as from the professional and academic community. Based on such elaborate feedbacks, the drafts were modified and finalised by the authors under the overall supervision of BIDS.

These studies provided valuable information/inputs which significantly contributed towards drafting the Sixth Five Year Plan. The studies are rich in contents and, if made available, will enrich the knowledge base relating to development challenges and development options facing Bangladesh. In view of the importance of these studies, it has been decided that BIDS and the General Economics Division (GED) of the Planning Commission will jointly publish these studies, including the technical framework, for making these available to interested readers and users. It may be added here that similar studies conducted during the preparation of the earlier Plans have not been made available in the public domain.

The studies have been published in six separate volumes. It is expected that these volumes will help the readers to understand the rationale for the choice of the specific paradigm underlying the Plan and the design of the policy package adopted for the Plan for reconciling the goals of efficiency with those of equity. The studies attempt to spell out a reform strategy and agenda for agriculture, food security,

industrialisation, poverty reduction, social development, sustainable management of natural resources, and other development issues in Bangladesh in the light of current conditions as well as past experience.

We would like to express our deep gratitude to the authors of the technical framework and background studies for their sincere efforts in finalising the manuscripts in time. We are also indebted to the relevant officials of GED and BIDS for their untiring support and cooperation. We hope that the relevance of the issues and the diverse contents and analysis of the publications would make these volumes useful for the research community, policymakers, and others interested in understanding the development challenges of Bangladesh.

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Chapter 1

Off-farm Employment and Income Growth through Micro Credit–Implications for Sixth Five Year Plan

M.A. Baqui Khalily
Rushidan Islam Rahman

1.1 INTRODUCTION

One of the greatest challenges that a country like Bangladesh faces is the creation of regular employment opportunities for growth and poverty alleviation. In such situation, promotion of non-farm employment will have dual effects: first, it will reduce pressure on farm sector for employment, and second, farm wage will increase because of relatively higher demand for labour (Islam 2006, Besley and Cord 2007, Hossain 2002). Off-farm employment includes both wage employment and self-employment in non-farm sector. Such employment creation takes place either through promoting private sector led enterprise development or micro finance institutions directed micro enterprise development. In the former case, it is wage employment that is being created. In the later case, it is mostly self-employment.

Government of Bangladesh has, through social safety net interventions and other measures, created off-farm employment for the poor households. Those programmes are essentially need based and have short run effect.[1] In recent years, we find from different studies, poverty is more prevalent among the households with higher dependency on wage income and less among the households with self-employment as occupation (Narayan and Zaman 2009). In a recent study, it was found that households with self-employment, regardless of the sector, had lower intensity of poverty in monga stricken areas of north-western region of Bangladesh.

Growth of rural non-farm enterprises can be an important source of growth of income and self-employment. In a densely populated country like Bangladesh, formal sector non-farm enterprises cannot absorb the growing labour force, and the

[1] However, the GoB has been rigorously promoting education for skill development and human resource development which have direct impact on income and employment. In addition, through its expansion in government size, in Bangladesh, the government emerges as a single employer in the country.

role of informal sector can be important and is rising. To promote income growth through non-farm self-employment, microfinance can play a crucial role.

Over the past decades, self-employment in non-farm sector in rural areas has expanded through access to micro credit. Gains from such access can be maximised if vulnerability of poor is reduced through insurance mechanism and other complimentary services (Ahsan and Barua 2009, Hamid, Khalily and Barua 2009, Khalily and Samad 2009, Khalily *et al.* 2010). The basic objective of this paper is to evaluate the role of micro credit, credit in general, in off-farm employment creation and income growth. In the process, we will also show that credit has wider role in smoothening consumption and reducing vulnerability.

Finance is one of the primary interventions that directly influence outcomes – growth in income, poverty alleviation and off-farm employment creation. We identify three financial service requirements that, on the one hand, will reduce income vulnerability and enhance income level, on the other hand. First, access to credit of poor households will relax liquidity constraint of the resource constrained poor households and create economic opportunities. Second, access to social safety net programmes can minimise income and consumption vulnerability for the extreme poor households. Expansion of such programmes can be complimentary to the first requirement. Third, access to insurance services can protect family from income shocks and preserve wealth.

Quite a large number of literature have addressed the issue of access to finance and its impact on employment, income and other outcomes (for example, Cotler and Woodruff 2008, Langemeier and Patrick Levy 1993, Beck, Demirguc-Kunt and Maksimovic 2004, Kumar 2005). These studies show that access to finance promotes household or enterprise level development. In this paper, we will also show that access to micro finance contributes to income growth and non-farm employment creation in Bangladesh.

The remaining of the paper is structured into five sections. Section focuses on the role of government in microfinance in Bangladesh. As micro finance is largely dominated by non-government micro finance institutions, this paper is basically focused on the role of non-government micro credit. We present a discussion on the outreach and product diversification of non-government Microfinance Institutions (MFIs) in Section 1.3. Section 1.4 evaluates impact of micro credit on income growth and employment creation based on available empirical evidences. Section 1.5 evaluates determinants of non-farm economic activities and income growth. We have also used some case studies to substantiate our findings from the analysis of the determinants of income growth and non-farm economic enterprises. In addition,

the case studies provide information on returns to capital. Traditionally, we have evaluated the role of micro credit in terms of impact on income, employment, savings and other economic outcomes. Until recently, the forgotten part was the role of credit in minimising seasonal poverty and vulnerability. Minimising seasonal poverty and vulnerability essentially contributes to income growth and sustainable economic activities. The role of micro credit in reducing seasonal poverty and vulnerability is discussed in Section 1.6. Section 1.7 identifies issues, based on the analysis in the previous sections, to ameliorate impact of micro credit on income growth and non-farm employment creation as implications for Sixth Five Year Plan.

1.2 THE ROLE OF GOVERNMENT IN MICROFINANCE IN BANGLADESH

The GoB is generally is the single largest source of off-farm employment. But its direct role in employment creation has been quite limited in rural areas. However, through expanding social inputs like expansion of education and health services, it has contributed to income growth and employment. The government of Bangladesh has been playing both direct and indirect role in generating non-farm activites and income growth. The GoB creates short term employment during any shock through "cash for work" and other social safety net programmes. It promotes off-farm economic activities and in turn employment creation by expanding rural credit through public sector banks. Karmasangsthan Bank has been financing initiatives of unemployed youth for employment. Bangladesh Krishi Bank and other public sector commercial banks have been extending small loans to non-farm sectors. All these banks have around 4,000 branches in rural financial market. Loans made by the banks are generally under targeted credit programmes like agricultural credit, SME credit and cooperative credit. There has not been any major study on the effectiveness of public sector credit in creation of off-farm economic activities and employment. As such, credit elasticity of off-farm employment and income is unknown. Nevertheless, total rural credit expanded by the public sector banks has been substantial.

Table 1.1 shows an increasing trend in the disbursement of targeted agricultural and specialised programmes for rural development by the public sector banks. The share of specialised agricultural development banks (BKB and RAKUB) is consistently around 66 per cent. Although disaggregation of such loans is not available, we find it difficult to point out the share of non-crop loans. Nevertheless, the available newspaper reports suggest that around one-third of these loans are non-crop loans. These loans finance off-farm economic activities, and, in turn, contribute to self-employment creation vis-à-vis income growth.

TABLE 1.1
TARGETED AGRICULTURAL AND SPECIALISED CREDIT PROGRAMME THROUGH PUBLIC SECTOR BANKS AND COOPERATIVES (TAKA IN CRORE)

Year	BRDB & BSBL	Specialised Banks (Agricultural Development Banks)	State Owned Commercial Banks	Total Public Sector Targeted Credit Disbursement	Share of Specialised Banks
1999-00	408.31	1905.51	537.47	2851.29	66.83
2000-01	251.81	2189.88	577.98	3019.67	72.52
2001-02	313.7	2042.25	598.96	2954.91	69.11
2002-03	354.88	2243.1	680.39	3278.37	68.42
2003-04	502.48	2640.87	905.66	4049.01	65.22
2004-05	665.32	3149.32	1142.14	4956.78	63.54
2005-06	752.12	3551.66	1192.43	5496.21	64.62
2006-07	782.69	3482.02	1027.8	5292.51	65.79
2007-08	740.36	4061.12	1365.5	6166.98	65.85
2008-09	698.99	4703.69	1588.89	6991.57	67.28

Source: *Bangladesh Statistical Year Book*, Several Issues.

Although non-government micro finance programmes dominate micro credit market structure, the GoB micro credit programmes are no less important. The noted source is Palli Daridra Bimochan Foundation (PDBF), organisational transformation of BRDB's RD-12 programme. This is the only organised public-sector micro credit programme. BRDB has been promoting rural development through providing both rural finance including micro finance and skill development training. It has been contributing substantially but its effects are less sustainable. It is also heavily subsidised. Nevertheless, both PDBF and BRDB have expanded credit substantially during the past years. Extent of micro financial services provided by the government agencies and PDBF is reported in Table 1.2.

The Government of Bangladesh implements micro credit programmes for different target groups through its implementing agencies. Table 1.2 provides trend in disbursement of total micro credit for the period 2003-08. Multiple programmes are implemented under ten ministries. There has been an increasing trend in the disbursement of micro credit. Over the 2003-08 period, the average growth rate was around five per cent. The dominating ministry, as expected, is the Ministry of Rural Development and Cooperatives. Under this ministry, BRDB and PDBF implement

different programmes. The participation of public-sector banks under the Ministry of Finance is quite limited. Although disbursement of government micro credit programmes has increased over time, little is known about its impacts on poverty alleviation, income growth or employment.

TABLE 1.2
DISBURSEMENT OF GOVERNMENT MICRO LOANS UNDER DIFFERENT ADMINISTRATIVE DIVISIONS/MINISTRIES (TAKA IN CRORE)

Ministry	2003-04	2004-05	2005-06	2006-07	2007-08
Finance	23.23	9.94	4.9	11.44	21.51
Rural Development and Cooperatives	427.94	659.91	687.21	864.17	797.52
Women and Children Affairs	11.74	29.25	31.24	28.14	4.99
Social Welfare	54.88	44.59	71.86	41.02	64.90
Fisheries and Livestock	50.40	50.65	17.24	4.04	2.9
Industries	36.86	35.69	31.48	22.97	8.66
Agriculture	147.72	70.02	28.03	35.67	35.11
Land	0	8.70	10.14	5.50	8.76
Local Government	1.33	3.37	6.00	16.32	31.95
Youth and Sports	34.65	62.87	77.77	60.02	60.75
Textiles	8.07	9.16	4.68	3.31	0.60
TOTAL	796.87	994.32	974.39	1101.20	1039.74

Source: *Bangladesh Economic Review 2008*, GoB.

1.3 NON-GOVERNMENT MICRO FINANCE IN BANGLADESH: OUTREACH AND PRODUCT DIVERSIFICATION

Micro finance revolution that started in Bangladesh some three decades ago has brought changes in financial landscape in rural financial markets. Assetless households who did not have access to credit can now access to credit. MFIs address the problem of formal market failure due to adverse selection and moral hazard. It offers an institutional framework that can make rural financial market more effective. The major elements of micro finance are: (i) self-selected group; (ii) compulsory savings; (iii) participation of poor members in investment decisions; and (iv) peer group in loan monitoring and recovery. Micro finance sector has evolved and developed over time to address the diversifying needs of the poor members or borrowers. Loan products are being increasingly diversified; both loan size and intensity of outreach have been growing.

1.3.1 Outreach

Outreach of the MFIs is defined in terms of number of members, borrowers and branches. Wide expansion over the past six years has taken place. Number of

members at the end of 2008 was 33.4 million, almost doubled during the past six years. Grameen Bank alone has a share of around 20 per cent of the members. More than 90 per cent of the members are borrowers. Over 600 MFIs mobilised these members through a network of over 14,500 branches, three times the number of commercial and development bank branches in rural credit market (Table 1.3). Such expansion enables poor households to access financial services offered by the institutions. In fact, this wide network reflects both horizontal and vertical deepening of rural credit market and micro finance institutions. This is apparent from the analysis in the next few sub-sections.

TABLE 1.3

BANGLADESH MICRO FINANCE REVOLUTION–OUTREACH

(IN MILLION)

	2003	2004	2005	2006	2007	2008	Growth rate
Total members	17.75	20.68	24.37	29.00	33.14	35.87	4.48
Grameen Bank (GB) members	3.12	4.05	5.58	6.91	7.41	7.67	12.72
Total borrowers	13.45	15.61	18.96	25.99	29.05	29.28	5.43
GB borrowers	2.81	3.65	5.02	6.22	6.67	6.90	13.76
MFI branches (number)	6,837	9,165	9,253	11,368	14,577	14,577	1.67

Source: CDF and Institute of Microfinance.

1.3.2 Financial Outreach

The effect of members mobilised is found in the higher demand of credit. Over the years, it has grown. Loans outstanding amounted to Tk.158 billion in 2008 from Tk.52 billion in 2003. Annual average growth rate was around 5 per cent. Critics often argue that growth of credit is a reflection of growing indebtedness. This probably is proved to be wrong even simply looking at the amount of savings that the members/borrowers have saved and its growth rate over time. The net savings balance has been growing at a higher rate than the rate of loans outstanding. Annual average growth rate of net savings had been around 6.75 per cent during the period 2003-08 as against around 5 per cent for loans outstanding (Table 1.4). The same trend is observed when it is expressed in per capita. Savings not only makes the members financially independent, but it also acts as insurance in times of crisis. During the past several natural shocks, savings have played as a cushion for the poor members. During the shock in monga as well as in 1998 flood or even in recent *Sidr*, micro finance members have coped with their own savings in most cases.

TABLE 1.4

FINANCIAL OUTREACH OF THE MFIS, 2003-08

(Tk. In billion)

	2003	2004	2005	2006	2007	2008	Average growth rate
Loans Outstanding	52.5	64.4	83.7	110.9	138.6	158.8	5.06
Net Savings	28.9	38.5	52.0	73.1	87.8	104.4	6.70
Net savings as % of Loans Outstanding	55.1	59.8	62.1	65.9	63.3	65.7	
Average loan balance per borrower (Taka)		4,087	4,231	4,345	4,536	5,106	0.53
Average saving balance per borrower (Taka)		2,324	2,615	2,275	2,926	3,296	0.90

Source: Institute of Microfinance, CDF and authors' own calculation.

1.3.3 Loan Products Diversification: Response to the Needs of the Borrowers

A typical criticism being launched against the micro finance model is its fixed character—one model fits all. In Bangladesh, such criticism appears to be incorrect, as micro financial institutions have always addressed the needs of both borrowers and lenders. This is depicted in the stated purpose of the loans by the borrowers. Over the past three years, 2005-2008, there has been a shift in the demand for loans products (Table 1.5). Over 25 per cent of the loans were for the social sector—housing, education and health—and around 23 per cent for the agricultural sector. Such diversification is in contrast to what was in the late 1990s when more than 65 per cent of the loans were for small business and transport. Agriculture was very negligible. The share of different loan products in total loans can be used for allocating resources for the Sixth Five Year Plan.

TABLE 1.5

STATED DIVERSIFIED LOAN USE (PANEL DATA OF 195 MFIS)

Loan Products	2005 (%)	2006 (%)	2007 (%)	2008 (%)
Crops	6.64	8.78	8.73	10.76
Fisheries	2.88	2.93	2.68	2.82
Livestock	13.61	13.27	11.28	9.40
Sub-total	23.13	24.98	22.69	22.98
Cottage and food processing	7.60	5.16	5.14	6.46
Small business and transport	43.82	46.18	45.89	47.38
Health, education and housing	25.45	23.68	26.28	23.18

Source: CDF-Institute of Microfinance (2008).

The most important sector appears to be livestock. It constitutes almost one-eighth of the total loans disbursement. In 2008, almost Taka 26 billion was disbursed for livestock. This sector has a future. As livestock training facilities are available at the union level, livestock can be promoted through MFIs. On the one hand, it is relatively less risky enterprise, and on the other hand, it has higher demand. The sector can further grow if there is a forward linkage in the private or public sector. Several meat processing companies can be established which will meet local demand in addition to exporting. It can be a major sector for poverty alleviation.

We get similar picture from the analysis of loan portfolio of Grameen Bank, the oldest micro finance institution in Bangladesh. There has been substantial shift in portfolio mix (Table 1.6). Livestock is the dominating sector. Beef fattening was ranked 19 among the top 25 portfolio in 1998, and it moved to 2 over a span of ten years. Milch cow remains number one. Bullock raising was prominent. Taken all these together, livestock remained the top ranking portfolio for Grameen Bank.

TABLE 1.6
ACTIVITY WISE DISBURSEMENT OF GRAMEEN BANK LOAN: 1998-2008

Activities	2008	2008: Ranking	1998	1998: Ranking	(2008-1998) % change
Milch cow	5,925,349	1	2,463,737	1	14.05
Grocery shop	4,498,380	4	986,033	4	35.62
Paddy husking	2,833,509	5	1,656,466	2	7.11
Rice/Paddy trading	5,088,140	3	736,557	5	59.08
Cow fattening	5,707,760	2	192,753	19	286.12
Land lease	1,918,556	8	690,087	6	17.80
Cloths trading	1,149,078	16	250,423	15	35.89
Stationery shop	1,397,817	11	355,766	11	29.29
Paddy cultivation	2,607,450	6	1,594,557	3	6.35
Bamboo works	2,037,082	7	409,783	9	39.71
Vegetables cultivation	1,331,327	13	277,053	12	38.05
Vegetables trading	1,471,389	10	251,334	14	48.54
Rickshaw purchase	1,255,598	14	180,986	20	59.38
Fish trading	1,564,045	9	178,730	21	77.51
Betel leaf cultivation	537,245	21	251,545	13	11.36
Puff led rice making	32,214	25	160,566	23	-7.99
Bullock raising	951,174	17	498,839	8	9.07
Land cultivation	620,022	20	396,776	10	5.63
Pisciculture	662,697	19	222,339	16	19.80
Poultry raising	885,162	18	219,413	17	30.34
Goat raising	490,329	22	168,396	22	19.12
Sugarcane cultivation	40,255	24	3,088	25	120.36
Farming	1,156,006	15	15,065	24	-
Plantation	1,340,247	12	599,651	7	-
Higher Edn. Loan	105,351	23	214,465	18	-

Source: Grameen Bank Annual Report (various years).

Data shows that the largest share of micro credit has been used in various types of trading activities. Such trading takes various forms ranging from peddling to large shops. Both retailing and wholesale intermediary roles can be observed. Grocery shop is the most common form of trading activity taken up by micro credit recipients. Popularity of this form is due to several reasons. It is the most obvious form of retailing business, and therefore, the channels of buying and selling goods are well known. In this sub-sector, the scale of activity can vary more or less continuously. This activity brings quick return that is suitable for repaying micro credit which is in most cases done in weekly/fortnightly instalments.

1.3.4 Micro Enterprise Loans

In general, micro enterprises are defined as enterprises with at least one new full time employment, either hired or self. Micro enterprise loans are typically designed for the graduating members—moved from income generating activities (IGAs). But with higher demand for loans from the small business houses in the community, MFIs have also opened the window of micro-enterprise loans for the non-member business people. Therefore, there is also lateral entry for micro enterprise loans. However, around three-fourth of the micro-enterprise borrowers are the graduating members. Micro-enterprise loans are defined as the loans between BDT 30,000 and BDT 500,000.

TABLE 1.7

MICRO FINANCE REVOLUTION—MICRO ENTERPRISE BORROWERS AND LOAN OUTSTANDING

(In Million)

MFIs	2006 Borrowers	2007 Borrowers	2008 Borrowers	Average growth rate	2008 ME loan Outstanding
Grameen Bank	1.02	1.27	1.64		8236
BRAC	0.11	0.20	0.24		2462
ASA	0.24	0.30	0.45		7657
PKSF-partners	0.13	0.14	0.10		3842
Total Micro Enterprise	1.50	1.92	2.43	24.12	22,197
Grameen Bank share (%)	68	66.15	67.49		37.10
Grand Total	25.99	29.05	29.28		158,800
% of Total	5.77	6.61	8.29	12.6	13.97

Source: Institute of Microfinance and Authors' own calculation.

With the growing size of enterprise and the associated characteristics, MFIs have more flexible design—individual approach is pursued. Major providers are Grameen Bank, BRAC, ASA and some emerging national MFIs funded by Palli

Karma-Sahayak Foundation (PKSF), a wholesale lending agency in Bangladesh. Number of micro enterprise borrowers had increased by over 50 per cent during the period 2006-08, from 1 million in 2006 to 1.64 million in 2008 at an annual average growth rate of 24 per cent (Table 1.7). Micro enterprise loans outstanding in 2008 were Taka 22.2 billion, which was around 14 per cent of the total loans outstanding. Older MFIs have higher share in the micro enterprise loans. Around 8 per cent of the borrowers are micro-enterprise borrowers.

1.3.5 Micro Finance: Farming and Seasonal Loans

Conventionally, MFIs have been financing off-farm enterprises. Over time, they have broadened scope of their activities and addressed diversified needs of the poor households or borrowers. Many poor are engaged in farming under contract growing or share cropping system. In such a situation, they have demand for credit to finance agricultural inputs. On the other hand, demand for seasonal loans also exists. Seasonal and crop loans are new frontier of micro finance movement in Bangladesh. PKSF, a wholesale lending agency for micro finance sector, is the prime mover.

Given the nature of the activities, MFIs have adopted flexible instalment payment system. Interest rate varies between 10 and 20 per cent. The concept of society or group exists in crop and seasonal loans. Loan size varies between Tk.10,000 and Tk.50,000. In recent time, Bangladesh Bank has been providing agricultural credit through BRAC under credit repayment guarantee scheme. BRAC guarantees repayment of loans. It charges an interest rate of 10 per cent charged flat on principal. In 2008, the amount of loans outstanding for farming and seasonal loans was Taka 11 billion, around five per cent of the loans outstanding of the MFIs.

1.3.6 Micro Finance: Addresses Needs of the Ultra Poor

Targeting ultra poor is another frontier of micro finance movement in Bangladesh. More than 20 per cent of rural population live in extreme poverty. These households live below lower poverty line, which is defined as the line where average food consumption per capita is equal to average total consumption, implying that the households did not have any food expenditure.

MFIs have been addressing the needs of the ultra poor through different programmes. Beggars, destitute, landless, daily wage earners, bonded labour, female headed poor households, physically handicapped, seasonal labour, poor households living in char and/or flood prone or river erosion areas and households with no regular income flow are generally under the ultra poor programmes. They

are generally in structural poverty. In the case of structural poverty, special focus is needed to push them forward.

MFIs in Bangladesh have been pursuing flexible system to provide financial services to the ultra poor. There are variations in approaches as practiced in Bangladesh. Although generally group approach is pursued, most MFIs tend to follow individual approach. Flexible loan contract as well as loan interest rates are offered. Lending interest rate of normal credit programme is 20 per cent. In the case of ultra poor programmes, it varies between zero and 15 per cent.

Repayment installment system is flexible, although annual repayment period is one year. Flexible payment system based on the ability of ultra poor is followed.

Like traditional micro finance programmes, savings is the dominating element. The major MFIs in Bangladesh have been implementing separate programmes for the ultra poor. BRAC has an approach with assets transfer and training support in addition to daily subsistence allowance. Grameen Bank has Beggars' programme (interest free flexible loan repayment system). It has a credit guarantee scheme under which ultra poor traders trade credit for goods worth maximum Tk. 2,000 ($30). The supplier of credit gets Grameen Bank guarantee. ASA has a special programme for the UP which is offered through specialised branches. PKSF has been implementing ultra poor programme through its partners with flexible terms and conditions.

Bangladesh MFIs have made significant progress in reaching out the ultra poor. Around 4 per cent of the members are ultra poor members when micro finance coverage of ultra poor is compared with the total number of members mobilised. Around 1.38 million ultra poor members have been brought under micro finance net by the end of 2008. Of them, around 80 per cent were borrowers. Loans outstanding amounted to Tk. 2.25 billion. The design of the ultra poor programmes enables its members to save. Around 29 per cent of the loans outstanding was member net savings. This reflects that even the ultra poor can save if appropriate instruments are available.

In brief, micro finance has expanded tremendously, both horizontally and vertically. With wider branch network, MFIs have been able to expand financial services to the millions of poor members and borrowers. Financial products are diversified—from traditional small business to livestock development and manufacturing. From the portfolio mix of the lenders, one is able to derive information on demand side. Livestock has a higher demand. This is less risky. Small business remains prominent sector. Demand for loans for financing these sectors has grown over time. Increase in the supply of loans is a testimony of such higher demand. All these expansion have significantly contributed to employment

creation. Impact of micro finance, based on empirical evidences, is evaluated in the next section.

1.4 IMPACT OF MICRO CREDIT ON INCOME GROWTH AND OFF-FARM EMPLOYMENT CREATION

The issue of impact had been of great interest to the policymakers and national and international agencies in the 1980s as micro credit increased the hopes of the millions that poverty can be alleviated substantially through making provision for access of poor households to credit. In Bangladesh quite a number of studies have been conducted on the impact of micro credit at the household level (e.g., Hossain 1984; Khalily *et al.* 2010a, Rahman 1996, Zohir *et al.*). These studies are based on different methodologies and outcome indicators. Hossain *et al.* (1984) conducted first major study on the impact of Grameen Bank on different outcomes at the households level. The study was based on comparison of pre-and-post micro credit conditions. The subsequent studies adopted both descriptive and econometric approaches but provided more insights.

Hossain (1984) found that the participants of Grameen Bank were better off than non-participants. He estimated that (a) about one third of members who reported to be unemployed became self-employed after joining micro credit program of the bank; (b) Grameen borrowers' income was about 43 per cent higher than the target groups in control villages; and 28 per cent higher than the target group non-participants in the project villages, and (c) overall income in the programme villages was 16 per cent higher than in the control villages. Atiur *et al*. reported similar findings. They argued that the rural economic activities with micro finance experienced improvement in productivity.

The World Bank-BIDS study in 1991-92 and 1998-99 used rigorous econometric techniques. It amply documents that micro credit had positive impact on higher income growth, savings, consumption and higher accumulated wealth for the participants than the non-participants.

Rahman (1996) analysed the impacts of micro credit of PKSF credit programmes; comparing participants and non-participants, obtained the result that micro credit contributed to income enhancement. In addition, it had contributed to food security and higher level of expenditures in non-food items and human capital development. Furthermore, Rahman showed that self-employment was higher for the participating households.

The findings of all these studies had been consistent: higher income growth, higher savings and higher share of income from self-employment in total income for the participants than the non-participants.

Rahman (2000) reviewed some major studies on the impact of micro credit on income and employment. The review paper aptly summarises findings on impact of micro credit on income growth. The author showed that micro credit had positive impact on either income growth or expenditure growth. The participants were better off (Table 1.8). The table summarises the findings of the major studies conducted during the period 1984-1999 on the impact of micro credit on income growth of participants compared to non-participants. Has there been any change in the findings in the studies conducted in the following decade?

TABLE 1.8

IMPACT OF MICRO CREDIT ON INCOME AND EXPENDITURES: EVIDENCE FROM THE PAST STUDIES

Source	Name of organisation studied	Income or expenditure per annum (Taka)	Participants	Control (non-participants)	% change
Hossain 1984	GB	Income, per capita	1,762	1,346	30.9
Hossain 1988	GB	Income, per capita	3,524	2,523	39.7
BIDS 1990	BRDB	Income, per household	6,204	4,260	45.9
BIDS 1990	BRAC-RDP	Income, per household	2,844	1,560	82.0
IMEC 1995	Proshika	Income, per household	22,244	17,482	27.2
Rahman 1996	PKSF	Expenditure, per household	26,390	23,802	10.9
Khandakar 1998	BRAC	Expenditure, per capita	5,180	4,202	23.3
Khandakar 1998	GB	Expenditure, per capita	5,050	4,335	16.5
Khandakar 1998	RD-12	Expenditure, per capita	4,931	4,279	15.2
Halder 1998	BRAC	Expenditure, per capita	8,244	6,480	27.2
BIDS 1999	PKSF	Expenditure, per capita	36,528	33,732	8.3
IMEC 1999	Proshika	Income, per household	48,635	43,584	11.6

Source: Rahman (2000).

Zohir *et al.* (2001) provide a detailed analysis of the impact of PKSF micro credit borrowers. This study was conducted in 91 villages of 23 upazilas. It administered three repeat surveys, on a matched sample of about 3,000 rural households, during 1998, 1999 and 2000. They too reported that (a) the share of self-employment in total employment days was more than 60 per cent for the participants compared to around 27 per cent for the non-participants; (ii) self-employment constituted 48 per cent of total income for the participants compared to 28 per cent for the non-participants; and (iii) return to capital was higher for the

regular participants. While the direct and indirect impacts of microfinance have all led to increases in rural self-employment activities, it is primarily in the area of transport services where the programmes have made significant contribution. They showed further, through regression analysis, significant positive effect of regular programme participation on income and on average consumption of poor households. In particular, increases in the consumption of pulse, fish and milk were more prominent among the MFI borrowers, when controlled for land ownership. Sen (2001) in Zohir study assessed the impact of micro credit on poverty. He showed that during the period 1997-1999, the rate of decline in poverty for the regular participants was 3 per cent higher than that of non-participants. The annual average decline was one per cent.

Rahman *et al.* revisited Zohir's samples in 2005. Similar and consistent findings were derived: (a) average income during the period 2000-05 for the regular participants grew at an annual rate of 11.7 per cent as against 2.8 per cent for the non-participants; (b) income from self-employment was higher for the participants than the non-participants; (c) poverty declined at an annual rate of over one per cent during 2000-04.

1.4.1 The Latest Evidence on the Impact of Micro Finance

Khalily *et al.* (2009) conducted a study on the impact of PRIME (Programmed Initiatives for Monga Mitigation) interventions in 2008 over a sample of 5,300 households in the greater Rangpur region. Among the major impacts that they found were on employment creation and income growth.

TABLE 1.9

EMPLOYMENT AND INCOME STRUCTURE OF POOR HOUSEHOLDS IN GREATER RANGPUR

	N	%	Mean income	Mean days
Wage employment only	2,538	49.83	32,088.27	420.15
Self–employment only	1,034	20.30	82,415.87	379.28
Both wage and self–employment	1,521	29.86	51,552.55	637.29
Total	5,093	100.00	4,9219.9	481.23

Source: Khalily *et al*. (2009).

The households were engaged either in wage employment or self–employment or both. As evident from Table 9, around 50 per cent of the poor households were engaged in wage employment. But another 50 per cent of the households were

engaged exclusively in off-farm self employment or both. We find higher income for the households engaged in self-employment. Higher number of employment days and probably higher return to self-employed economic enterprises may have contributed to higher income level. Access to micro credit of poor households may have opened the gate of opportunities for the participating households. Table 1.10 shows mean income and employment by access to micro credit.

TABLE 1.10
EMPLOYMENT STRUCTURE ACCORDING TO STATUS OF MFI MEMBERSHIP

		Employment status	N	%	Mean income	Mean days
Member of MFI	No	Wage employment only	2,010	53.99	33,533.96	407.52
		Self-employment only	696	18.69	43,114.50	373.21
		Both wage and self-employment	1,017	27.32	52,226.50	647.02
	Yes	Wage employment only	528	38.54	34,353.25	475.21
		Self-employment only	338	24.67	62,068.67	421.75
		Both wage and self-employment	504	36.79	46,927.88	616.13

Source: Khalily *et al.* (2009).

Access to micro credit creates self-employment opportunities for the micro credit borrowers (Khandker 1998, Rahman and Khandker 1994, Sajjad Zohir *et al.* 2001). In greater Rangpur, we found that intensity of wage employment was lower for the participating households than the non-participants. Around 54 per cent of the non-participating households were solely dependent on wage employment compared to 39 per cent for the participants. On the other hand, 60 per cent of the participating households had self-employment compared to around 45 per cent for the non-participants. Similar results were also derived for income growth. Average income from self-employment of the participating households was around 50 per cent higher than the non-participating households. It probably reflects higher return to self-employment economic enterprises. Khalily *et al.* (2008) concluded that access to micro credit has created opportunities for the participating households. The opportunities are creation of self-employment for the households and diversification of economic activities. But where are these self-employment created? Does income vary by farm and off-farm economic activities of the micro credit borrowing households? This is well documented that self-employment of

micro credit borrowing households is created mostly in non-farm sector, and income from non-farm sector is higher than from the farm sector (Table 1.11).

TABLE 1.11
INCOME STRUCTURE OF THE POOR HOUSEHOLDS BY SECTOR AND MFI MEMBERSHIP

	Aggregate			Non-Member			MFI-Member		
	N	%	Mean income	N	%	Mean income	N	%	Mean income
Farm income only	877	35.36	12,869.38	623	37.31	12,776.4	254	31.36	13,097.44
Off farm income only	1,215	48.99	43,947.84	788	47.19	41,410.73	427	52.72	48,629.93
Both farm and off farm income	388	15.65	72,128.34	259	15.51	70,350.36	129	15.93	75,698.09
Total	2,480	100.00	37,999.29	1,670	100.00	36,176.88	810	100.00	41,756.59

Source: Khalily (2010b).

1.4.1.1 Further Evidence from Pathrail Union: Early Bird in Micro Finance

InM-PKSF did a census of all the micro credit borrowers in Pathrail union, one of the unions in Tangail district, where Grameen Bank model was replicated in the 1970s. We analysed the data of the borrowers in order to understand the effect of micro credit. As we did not have any non-participants, the impact of micro credit was captured by age of membership and also by intensity of overlapping. Higher intensity of overlapping can be considered as a proxy for higher loan size. Similarly, new members will be distinctly different from older members in terms of loan size, savings and income generating activities.

In Pathrail, employment was classified into three groups—wage employment, self-employment and both. As expected, higher employment days per household was higher for the households engaged in both wage employment and self–employment. Average employment days for this group were 456 days as against 321 days for wage employment only households and 396 days for self-employment only households. With the increase in the household overlapping (defined as number of persons with more than one membership with MFIs), substitution between self-employment and wage employment is noted. Table 1.12 presents employment of households by overlapping. While wage employment decreases with increase in household overlapping, self-employment continues to increase. For no overlapping households (i.e., only one member per household), average number of wage employment and self-employment was almost the same, around 330 days, but the gap between these two types of employment increases with the increase in

participation of households in micro finance. Such gap widens sharply from overlapping of four. As overlapping implies higher inflow of resources, the increase in self-employment probably reflects effects of scale and size effects of enterprises.

TABLE 1.12
AVERAGE EMPLOYMENT DAYS BY NUMBER OF OVERLAPPING IN PATHRAIL UNION, TANGAIL, 2007

Overlapping	Wage employment	Self-employment–off farm only
0	323.19	348.39
1	326.92	360.90
2	331.48	390.54
3	323.92	433.28
4	234.30	525.87
Above 5	204.45	828.77

Source: Khalily *et al.* (2008b).

Several findings are derived from the empirical evidences we have discussed in this paper. First, micro credit contributes to self-employment creation in non-farm economic activities. Second, there is a substitution between wage employment and self-employment or between farm employment and non-farm employment. Third, households with self-employment in non-farm economic activities have higher employment days and higher income level. This does not necessarily imply that micro finance alone contributes to creation of off-farm employment opportunities. The effect of micro credit can be augmented through other complimentary interventions. In the next section, we discuss the determinants of off-farm employment and income to derive necessary policy implications.

1.5 DETERMINANTS OF NON-FARM SELF–EMPLOYMENT AND INCOME

Most of the research on rural non-farm (RNF) activities and on the choice between farm activities and non-farm activities focused on the choice of sector of activity and not on the choice of self-employment vs wage employment in such RNF activities (Asaduzzaman 2004, World Bank 2004, Khandker 1998). It must be recognised that the choice of self-employment in non-farm activities is likely to require a different set of qualifications and personal traits compared to those who choose wage employment in non-farm sector (Rahman 2004). Individual and family characteristics are likely to explain the choice of self-employment in non-farm activities. Regional difference will also play a role because of the difference infrastructural facilities, etc.

To explain the choice RNF self-employment, logistic regression analysis has been conducted. The dependent variable in the equation is "whether head of the household is in non-farm self-employment". Self-employment is usually organised as family enterprise and the choice may be examined through head of households' employment status. The independent variables include age and square of age, education of the worker, education of other workers, sex of worker and dummies for Divisions. However, a cautionary remark is pertinent at the outset. Choice of an entrepreneurial role in non farm sector will depend on the organisational ability of the family's labour force and especially that of the head of the household. Such ability may not always be captured through their human capital endowment.

The estimated equation reveals one important result: education has a significant impact on the adoption of non-farm occupation (Table 1.13). The coefficients of head of household and of other family workers are significant. The equation shows that there are significant differences among divisions in terms of suitability of non farm activities. Rural households in Khulna division and in Sylhet division have lower probability of having non farm occupation (compared to Dhaka division, which is the omitted dummy).

TABLE 1.13

FACTORS INFLUENCING ENTRY INTO RNF SELF-EMPLOYMENT: RESULTS OF LOGIT REGRESSION

Explanatory Variables	Coeff.	s.e	Sig.	Exp. (B)
Age head	.01	.01	.39	1.01
Age of head square	-.00	.00	.08	1.00
Education of head	.05	.00	.00	1.05
Education of other worker	.02	.01	.00	1.02
Sex of head	-.16	.11	.15	.86
No. of family worker	-.03	.09	.75	.97
No. of female worker	-.19	.15	.21	.83
Ratio of female worker	.46	.42	.28	1.58
Land owned in decimal	-.00	.00	.00	1.00
Division dummy for Chittagong	-.01	.07	.87	.99
Division dummy for Khulna	.03	.08	.69	1.03
Division dummy for Rajshahi	-.31	.07	.00	.73
Division dummy for Barisal	.06	.09	.48	1.07
Division dummy for Sylhet	-.60	.10	.00	.55
Constant	-.57	.40	.16	-
-2 log likelihood	9448.2		.00	
Per cent correct prediction	15.37			
N	7543			

Source: Hamid, Khalily and Barua (2009).

1.5.1 Rate of Return to Non-Farm Activities

Whether micro credit helps income growth of recipient families has been debated. A direct assessment of the impact of micro credit on income growth is difficult. Past studies of impact of micro credit on income growth adopted a number of alternative approaches:

- Most studies looked at poverty situation of households and poverty assessment was based on consumption expenditure. Such assessment may not, however, fully reflect the impact of micro credit on income because micro credit may be directly channelled to consumption and get reflected as poverty reduction even without an impact on income.
- Studies have also examined the impact on households' income and/or rate of return on economic activities where micro credit has been invested. Such analysis is complicated due to the methodological problems underlying the calculation of return. Most difficult issues are the valuations of family labour and even enumeration of hours of family labour. Effective rate of interest on capital, imputed rent of family owned land and house, etc. are difficult to estimate.

However, the entire return to a micro credit financed activity cannot be attributed to micro credit. Value of capital in an enterprise consists of investment financed by micro credit as well as other sources of loan and own savings. But one cannot partition the return to each source of fund in proportion to the amount invested. In fact, money is fungible and one cannot be sure whether one source of fund would be available for investment if other sources were not present. In this sense, even consumption financed by micro credit may have contributed to investment. Therefore, a simple method is used here whereby rate of return to entire capital has been calculated after accounting for all current cost. The rate of return to sub-sectors and to activities with various size of capital in each sub-sector has been calculated to draw conclusions on which activities can or should grow through further allocation of micro credit (discussed in the latter part of this section).

1.5.1.1 Scope of Scaling up of Rural Non-Farm Enterprises

One cannot draw firm conclusions on the scope of income growth through micro credit financed RNF only from the above regressions.[2] The problem arises because of the possibility of reverse causality. This means, those who are in RNF

[2] This has been recognised by other recent studies on the role of RNF in poverty reduction (World Bank 2004, Osmani *et al*. 2003) although a number of studies have highlighted that involvement in non-farm activities raises family income (Kam *et al*. 2004, Sen and Hulme 2004, Hossain 1992).

and are above the poverty threshold may have undergone improvements after entering into this activity or they might have started RNA from higher income levels. Another important question is, if non-farm self-employment can raise income, why this is not spreading at an accelerated pace? A related question is how to achieve scaling up of the present enterprises. The case studies were collected to help answer some of these questions. RNF enterprises of poor and non-poor households are usually of different nature. The linkages between self-employment and return to labour can be understood through detailed data on labour input and capital.

Data for a number of enterprises from two sub-sectors have been presented in Tables 1.14 and 1.15. These are poultry production and paddy processing. In both tables the first few columns show enterprises of non-poor households and the last column provides data on a low income household.[3] The contrast between the small enterprise and the larger ones are:

- Total capital in the poor household's enterprise is very small.
- Capital labour ratio is also strikingly different. In the small enterprises of poor households, capital labour (family + hired) ratios were much smaller compared to the larger ones.
- Percentage returns to capital from the small enterprises are unusually high.
- Return to capital is also high for the larger enterprises as well. These returns are many times higher than the rate of interest of any bank.
- For the mini enterprises, the monthly earning per worker is close to the monthly salary of paid workers in RNA.

These findings raise some questions relevant for policies for RNFA growth. If rate of return to capital is so high, why these enterprises cannot expand? The banks and MFIs should extend credit to new and existing enterprises. The answer is that other constraints which do not appear in the Tables 1.14 and 1.15 may be binding. As mentioned earlier, such constraints operate in the form of shortage of land/house, managerial labour, etc. Another observation is that the poor households' self-employment enterprises are observed to earn as much as full time wage labourers. Then why the unemployed women from poor households cannot engage in self-employment and add to family earnings.

[3] The enterprises were selected purposively to represent various sizes. These are located in various parts of greater Mymensingh district.

1.5.2 Determinants of Income from RNFA

In addition to entry into rural non-farm activities, the determinants of return from such activities deserve attention. Rural non-farm activities can be dynamic ones and offer possibilities of generating better return than traditional crop agriculture. RNF activities may as well constitute marginal form of survival strategies of poor households. To examine the factors contributing to income levels from RNF self-employment, another multiple regression equation has been estimated (using OLS method). The results of the equation conform to expectation (Table 1.14). The explanatory variables with significant coefficients are being highlighted here.

TABLE 1.14

FACTORS AFFECTING HOUSEHOLD INCOME FROM RNF SELF-EMPLOYMENT: RESULTS OF MULTIPLE REGRESSION

Dependent Variable: Log of average monthly RNF self-employment income

Variables	Coefficients (B)	t-value	Sig.
(Constant)	7.58	167.84	.00
Age head	.00	.29	.77
Education of head	.01	2.88	.00
Education of other worker	8.08E-05	.06	.95
Trade dummy	.11	3.26	.00
Service dummy	-.46	-10.14	.00
Construction dummy	.01	.14	.89
Other dummy	-.00	-.12	.90
No. of self-employment/unpaid family members	.14	13.46	.00
No. of non-workers	.08	9.44	.00
Ratio of female worker	-.29	-8.34	.00
Land owned in decimal	.00	6.42	.00
Sewing machine (dummy)	-.03	-.64	.52
Motor bike (dummy)	.34	7.15	.00
Cycle (dummy)	.08	3.36	.00
Division dummy for Chittagong	-.06	-2.55	.01
Division dummy for Khulna	-.18	-8.81	.00
Division dummy for Rajshahi	-.26	-13.99	.00
Division dummy for Barisal	-.13	-5.22	.00
Division dummy for Sylhet	.19	5.68	.00
No. of total rooms in dwelling house	.13	17.87	.00
Whether electricity in household?	.10	7.44	.00
Sample size	5,350		
Value of F	130.18		
Adjusted R-bar square	.34		

Education of head of household is weakly significant. Education of other family workers is also positive but not significant. Dummy variables representing sector of non-farm work have been included as explanatory variables. "Manufacturing" is the base (omitted dummy). Compared to manufacturing, RNF self employment in other sectors is less remunerating. The coefficient of service is negative and significant. Household assets have significant positive impact on RNF income. Assets included in the equation are land, total rooms in the dwelling house, access to electricity. Among durable goods (used for both productive and consumption use), motor bike has a significant positive coefficient. Among the Division dummies, Chittagong, Rajshahi, Barisal and Khulna have significant negative coefficient compared to base Dhaka.

1.5.3 Micro Credit and Women's Self-employment in RNF

Self-employment absorbs the largest percentage of female labour force participants in Bangladesh. Women's preference for self-employment is usually based on the advantage that it can be easily combined with their domestic responsibility. While this is generally true, there are a few risks as well. Women's self-employment may result in:

- returns to women's self-employment may be low.
- high total workload which results from the combination of economic activity and domestic activity.
- women may not get access to income/produce from self-employment or unable to retain control over their income.

This section will examine these aspects of self employment of women on the basis of the experience of micro credit financed activities. Women's participation in a wide range of self-employment has been possible through the use of micro credit provided by Grameen Bank and other NGOs. Bangladesh's Micro Credit programmes have been internationally acclaimed for their success in generating employment and income for poor women in particular.

Micro credit programmes for generation of self-employment were dominated by male borrowers during the early years of micro finance activities. In 1983, only 45 per cent of total members of Grameen Bank were women. Participation of women in micro credit programmes increased rapidly during the late 1980s and the early 1990s. In 1985, female borrowers were around 65 per cent. During the 1990s, more than 90 per cent borrowers of Grameen Bank have been women. During the initial period, another large NGO, called ASA, had both male and female groups. But as soon as ASA shifted its emphasis to the provision of credit, all the groups were turned into women's groups, the wives or female household members being the

substitutes for men. This gives an impression that women can play a useful role in channeling credit. Most of the smaller NGOs also work mainly among women.

An analysis of various aspects of micro credit financed women's economic activities can help in understanding the extent of gender participation in RNF. To derive meaningful insights into this issue, we shall try to trace some of the key indicators, including return to self-employment and control over credit. In addition, one should also look at their control over income generated through such self-employment and in overall decision making.

In the context of the returns to women's self-employment, the following aspects will be highlighted: whether self-employed women obtain a lower return than self-employed men, whether self-employment brings them a lower return compared to wage employment and whether the nature of male and female RNF is different.

Data for making these comparisons is scanty. Return to self-employment is available only from micro studies. Case study materials have been used to supplement data from surveys. There is a common notion that the return to self-employment is lower for women compared to men. It is difficult to test this hypothesis because both men and women from the same family are usually engaged in an activity. Moreover, there is also a job segmentation within an economic activity and between activities. Women contribute more labour in certain activities, e.g., livestock raising, production of small handicraft items, etc. In livestock raising, women perform the feeding, shed cleaning, etc. which are located in the premises of the household.

Average return to labour in female and male dominated activities has been presented in two studies (Zohir *et al.* 2001, Rahman and Khandker 1994). Zohir *et al.* show that average return to labour is much lower in activities where women contribute more than 50 per cent of labour input.

Lower return in some of the female dominated activities, as shown in Zohir *et al* 2001, is due to two factors:

- the norms of women's involvement in traditional activities, and
- the use smaller amount of capital.

Another pertinent comparison is the return to labour for the same economic activity when it is performed with varying ratios of male and female labour. Rahman and Khandker (1994) provide such data, which shows that return to labour is not always lower in the enterprises with higher percentage of female labour input. This has been observed in livestock raising activities.

The case studies presented below can illustrate the difference in return to male and female labour using enterprises in each sub-sector.

1.5.4 Paddy Processing Business with Male and Female Family Workers

The case studies of paddy processing business include enterprises based on male and female family labour. In this sector, female labour takes various forms: entrepreneurial cum physical labour, hired labour and mainly physical labour. The case studies[4] will focus on the following aspects of gender differences in employment in this sector:

a) A description of the type of work performed by hired persons and family's male and female labour force.
b) The size of capital and the links between this factor and the role of women.
c) Earnings and rate of return to labour for different combinations of male and female labour.

In the predominantly paddy mono culture cropping system in Bangladesh, women contribute significant amount of labour in the processing phase of the crop. Traditionally, women's role in productive activities in the rural areas of the country was confined to activities performed within the vicinity of the homestead. Paddy processing in "dheki" was performed within the household premises and therefore was within the spatial sphere of women's activity dictated by the societal norms. Such manual processing of paddy resulted in low productivity and intense drudgery of female workers. Therefore, it is not surprising that this was gradually replaced by power driven large scale rice milling machines. Such automation has important implications not only for productivity but also for women's employment in this sub-sector.

Before the introduction of commercial rice mills, the major source of poor women's employment was paid employment for paddy husking and processing. The introduction of rice mills had taken away this job from female wage labourers. Rice mills are usually located close to the market centre and/or close to the road links. Therefore, the family's women usually do not participate in this activity. To run the business, family's male members perform the managerial and supervisory role. A few male workers are usually hired to perform the major work in the mill: measuring, operating the machinery, packaging of finished product etc. Before husking the paddy, it is parboiled and dried. This work is performed in the open space prepared for this purpose. Female wage labourers are usually hired for some of these activities, especially for winnowing which separates the broken rice. Thus women who lost the paddy husking job, which they performed in their houses, now find an alternative employment.

[4] It should, however, be mentioned that the case studies can highlight the nature of gender related differences in this sector, but the conclusions cannot be quantitatively established on the basis of such case studies.

The two rice mills covered by the case study confirm this practice. One mill has hired 20 men for work with the machine and to do the marketing. Five women have been hired to do the drying and winnowing. The owner, of course, works full time. In another smaller rice mill business, only three men have been hired, who, along with 10 women and the owner, perform all job. Following the mechanisation process, another type of small scale paddy processing and trading business has emerged. This is a home based activity. Paddy is purchased and taken home where it is parboiled and dried by family's women (sometimes with a few hours of part-time female wage labourer). Then it is husked in rice mills on payment of a charge and the finished product (rice) is marketed by the original enterprise. This business makes value added through the initial processing and through performing the marketing function. One case of such business has been presented. Such small paddy processing business was dominant among poor households who obtained micro credit especially during the early phase of micro credit. Since the profitability of such activities is low, this business is losing popularity and micro credit is being channelled to other activities.

The salient features emerging from these cases are as follows:

- The big paddy processing mills with large capital are usually managed by men. Family's women do not have a role in such business. In contrast, paddy processing business without the ownership of a rice mill can be managed by women or jointly by men and women. In these businesses, familys' women contribute a major part of labour. Possession of machinery, larger size of capital and location outside home result in women's deprivation of the managerial role. Rural women manage a business when the size of investment is small.
- Due to smaller size of investment, income per month and the rate of return to labour are smaller in the firms with female family labour. Percentage return to capital is not very different.
- In the rice mill, the hired male workers perform the tasks of operating the machine and other processes related to marketing. These jobs require some skill, experience and numeracy. Therefore, the salary of the male workers is higher than the women. In some other mills, where women work outdoors (in drying and boiling), the wage rates of men and women did not show much difference.

Poor households are vulnerable because of idiosyncratic risk and covariate risk. The presence of these risks affects both poor and non-poor. In either of the cases, it makes them vulnerable. In some cases, covariate risks, such as flood, cyclone, tornado and other natural disaster, may contribute to seasonal poverty. In this

section, we use the term "vulnerability" in terms of consumption vulnerability, income vulnerability and exposure to different shocks. We present two evidences—one on monga where consumption vulnerability is extreme, and the other one on exposure to different shocks, based on a national survey. Both the surveys were conducted by Institute of Microfinance.

Monga (famine like situation), caused by flood or draught, in north-western Bangladesh is frequent. It is essentially caused by inadequate employment opportunities for the poor during September-November when there is no farming. It is equally observed in Southern Bangladesh where intensity of covariate risk is colossal, caused by cyclone, for example. In the north-western region of Bangladesh, intensity of poverty increases during monga, although poverty is structural in nature. The Government of Bangladesh has been expanding social safety net programmes like food for works programmes, 100-day employment guarantee scheme, old age pension scheme. Despite expansion, its ability to outweigh marginal loss from covariate risk is limited as not all poor are under these programmes and the amount of benefit is small. In such a situation, more long term interventions are required. In this case of monga type of situation, off-farm economic activities need to be created so that farm-based employment can be largely substituted by off-farm based employment opportunities. In this case cyclone driven covariate risk requires larger interventions. In either or both the cases, two financial services will be required—one, provision of micro credit, and second, provision for micro insurance.

TABLE 1.15
CASE STUDIES OF POULTRY FARMS

Inputs/Return		Poultry Farm Case 1	Poultry Farm Case 2	Poultry Farm Case 3
Family Labour	Male	2	2	1.0
	Female	0-	-	0.5
Hired Labour	Male	2	1	-
	Female	1-	-	-
Salary per month per labour		3,562	3,000	-
Fixed Capital (taka) with land		450,000	344,100	12,000
Working Capital (taka)		225,000	121,400	54,000
Land used in the enterprise (Dec.)		10 Dec.	4 Dec.	1 Dec
Total land owned		18 Dec.	8 Dec.	3 Dec.
Yearly net income of the owner of the enterprise		3.0 Lac	1.56 Lac	0.13 Lac
Return as % of capital		44.44	33.48	20.70
Sources of capital		SELF	BRAC	ASA
Women's participation as labour (%)		0	0	33
Total capital (Fixed plus current) per labour		168,750	155,166	44,000
Fixed capital per labour (taka)		112,500	114,700	8,000

Source: Case studies conducted for the present study.

TABLE 1.16
CASE STUDIES OF RICE MILLS AND PADDY PROCESSING

Inputs/Return		Rice Mill (big)	Rice Mill (Med.)	Paddy processing with MC
Family Labour	Male	2	4	1.5
	Female	-	-	0.5
Hired Labour	Male	20	3	-
	Female	5	10	-
Salary per month per labour		4,750	2,375	-
Fixed Capital (taka) with land		20,0000,00	2.5 Lac	5,000
Working Capital (taka)		51 Lac/M	15 Lac/M	16,500
Land used in the enterprise		150 Dec.	100 Dec.	0.5 Dec
Total land owned		250 Dec.	125 Dec.	6 Dec.
Monthly net income from the enterprise (taka)		14 Lac/M	3.5 Lac	3,780
Return as % of capital		57.69	303.50	211.00
Sources of capital		KRISHI BANK	KRISHI BANK	BRAC and ASA
Women's participation: labour (%)		18.52	58.82	25.00
Capital per labour (taka)		930,000	102,900	10,750

Source: Case studies conducted for the present study.

1.6 MICRO FINANCE AND REDUCTION OF SEASONAL POVERTY AND VULNERABILITY

Khalily *et al.* (2008a) showed that consumption vulnerability[5] in the greater Rangpur region was extreme. Around 47 per cent of the poor households basically get into a situation of occasional starvation during monga, but, overall, over 95 per cent of the poor households are affected by monga in vulnerable 23 upazilas of Kurigram, Lalmonirhat and Gaibandha (Table 1.17).

The worst affected are the ones with day labour as principal occupation. Monga is created by flood and absence of farm activities during the months of August-November. Khalily *et al.* (2009) showed that households with fewer land, labour as principal occupation, and small savers are worst affected during *monga*. On the other hand, households living in char areas are most affected. But the authors

[5] A household is vulnerable to consumption if its consumption reduces during monga from the normal consumption level. We classified consumption into occasional starvation, consumption rationing and three full meals.

showed further that households move to better consumption ordering if the households have higher savings, more land, and more stable income sources like off-farm economic activities including service.

TABLE 1.17

DISTRIBUTION OF HOUSEHOLDS BY CONSUMPTION ORDERING DURING MONGA AND NORMAL TIME

Consumtpion Ordering	The Greater Rangpur (N=482,948)		
	Monga time (per cent)	Normal time (per cent)	Incidence of Monga
Occasional starvation	47.2	8.5	39.7
Consumption rationing	48.3	50.8	-2.5
Three full meals	4.4	40.6	-36.2
Total	100.0	100.0	-

Note: Incidence of monga is the difference between per cent of households in monga and in normal time against each consumption ordering.

1.6.1 How Can Consumption Vulnerability be Reduced?

PKSF introduced multi-intervention based programme what they termed as PRIME (Programmed Initiatives for Monga Mitigation) in 2006. It contains several interventions—cash for works programme, emergency loan, seasonal loan and flexible micro credit programmes. Cash for works programme was only implemented in Lalmonirhat in 2006. But later on, it was closed. Faridi and Khalily (2008) showed that cash for works programme did contribute to reducing consumption vulnerability of the monga affected households in 2007. This is quite expected as wage income during monga contributes to consumption smoothening. This is equally true for the government social safety net programmes as long as such support is available during any covariate shock. Some safety net programme like cash for works programme will contribute to reducing vulnerability of the poor households.

Khalily *et al.* (2008a) evaluated impact of programmed initiative for *monga* mitigation (PRIME) programme on different outcomes. They focused essentially on impact of flexible micro credit programs on different outcomes, as there was no cash for work programme. The authors using propensity matching score and difference-in-difference test showed that participating households were better off. More than 55 per cent of the monga affected households that had occasionally starved during the year 2007 were better off during the monga in 2008. Several factors contributed to this, as noted by the authors: shift from wage employment to

self-employment, increase in savings and higher income level. Participants were better off than the non-participants in programme villages and control villages. It was not only access to micro credit that contributed to reducing consumption vulnerability. The authors through regression analysis showed that households with access to government social safety net programmes were less vulnerable than the households with no access to micro credit as well as government social safety net programmes. Intensity of reduction in consumption vulnerability was smaller than the households with access to micro credit.

1.6.2 Income Vulnerability

Poor households are basically engaged in wage employment. During the past three decades, greater evidences are found of their engagement in self-employment with the advancement of micro finance services. But the long run marginal benefits depend on the state of local economy, level of agricultural development, ability to cope with adverse shocks and the level of human capital development. Poor households are subject to income and consumption vulnerability because of their limited financial and economic ability. In this section, we discuss about income and consumption vulnerability of poor households. Income vulnerability is proxied by variability in wage employment. Vulnerability to wage employment depends on the level of agricultural development, expansion of off-farm economic activities and access of poor households to financial services.

Poor households are generally exposed to vulnerability to wage employment because of their higher dependency on agriculture for employment. It is more prevalent when there is no or limited farm activities. This is exactly the scenario in north-western of Bangladesh—the greater Rangpur region. Overall, average wage employment per household varies between 17 and 25 days. Households, on an average, had higher mean days of employment during Agrahayan-Jaistha—around 25 days of work per month in 2008. Lower mean days of employment were noted for the months Bhadra-Kartik when the poor households are exposed to *monga*. Low average employment days per household in farming—around 14 days a month—contributed to such situation. But the vulnerability to wage employment was minimum for the households that had wage employment in non-farm sector or both farm and non-farm sectors. Vulnerability of the poor households in monga areas is clearly evident from Figure 1.1 and Table 1.18.

As evident from Figure 1.1, there is generally a positive relationship between farm employment and off-farm employment, except during the period Bhadra-Kartick when substitution in employment takes place from farm to off-farm.

Vulnerability to income, ceteris paribus, is minimum for the households with self-employment as they have stable economic days of work, around 20-22 days

(Table 1.19). But the households with multiple employment opportunities—self-employment both in farm and off-farm—have higher average employment days.

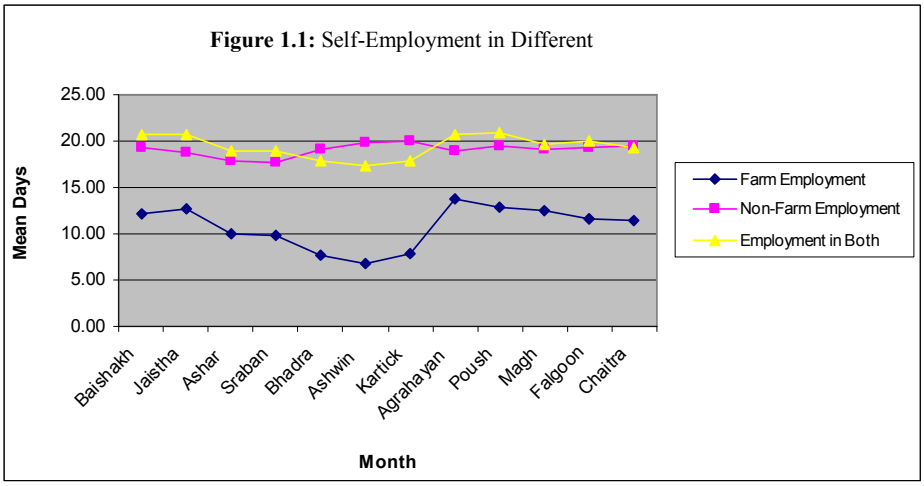
TABLE 1.18

AVERAGE WAGE EMPLOYMENT OF POOR IN THE GREATER RANGPUR

Month	Aggregate	Farm	Non-farm	Both
	Mean Days	Mean Days	Mean Days	Mean Days
Baishakh	24.25	21.10	26.95	30.32
Jaistha	25.82	23.00	27.34	31.95
Ashar	20.83	17.77	24.01	25.76
Sraban	20.33	17.71	23.5	24.37
Bhadra	18.39	14.72	23.74	22.76
Ashwin	17.57	13.57	23.64	21.52
Kartick	18.51	14.42	24.36	22.94
Agrahayan	27.13	24.30	27.63	33.85
Poush	25.76	23.12	27.02	31.38
Magh	25.00	22.12	27.14	30.72
Falgoon	24.27	21.11	27.07	30.27

Source: Khalily *et al.* (2010).

Figure 1.1: Self-Employment in Different



Source: Khalily *et al.* (2010b).

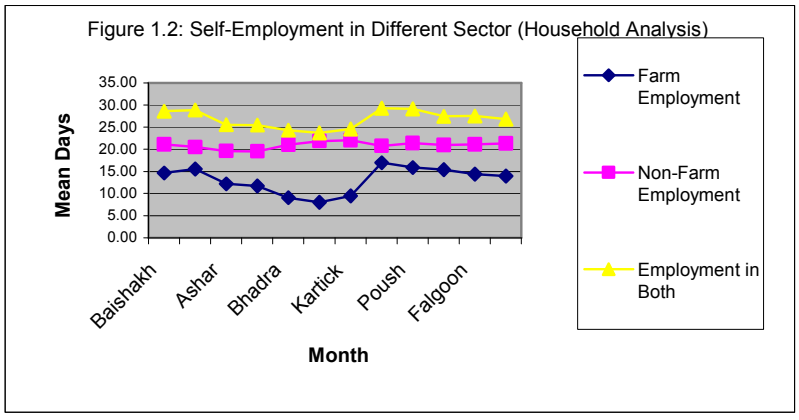
TABLE 1.19

VARIABILITY IN SELF-EMPLOYMENT BY MONTH IN THE GREATER RANGPUR

Month	Aggregate	Farm only	Non-farm only	Both farm and non-farm
	Mean Day	Mean Day	Mean Day	Mean Day
Baishakh	20.35	14.66	21.13	28.61
Jaistha	20.32	15.55	20.51	28.90
Ashar	18.32	12.22	19.63	25.51
Sraban	18.12	11.74	19.54	25.47
Bhadra	17.97	9.09	21.04	24.31
Ashwin	18.02	8.01	21.89	23.72
Kartick	18.68	9.47	22.05	24.60
Agrahayan	20.92	16.93	20.74	29.27
Poush	20.92	15.86	21.38	29.12
Magh	20.30	15.40	20.97	27.41
Falgoon	20.10	14.38	21.13	27.54
Chaitra	19.98	13.96	21.34	26.83

Source: Khalily *et al.* 2010a.

Self-employment in farm activities is lowest but has the similar seasonal fluctuation as noted for wage employment. There seems to be a substitution between self-employment in farming and self-employment in off-farm economic activities. It is clearer during the monga time—Ashwin-Kartick (Figure 1.2). This is quite expected.



Source: Khalily *et al.* (2010b).

The question is, what has contributed to higher average self-employment? Earlier evidences suggest that micro finance may have contributed to it. We estimated average employment days of self-employment and wage employment. We also found that micro finance member households have higher average self-employment in off-farm economic activities.

1.6.2.1 Vulnerability due to Shocks

Poor are vulnerable, as argued above, due to idiosyncratic and covariate risk. There are two ways to address these risks. The first approach is to increase incomes so that households are able to cope with shocks, and the second approach is to cover risks through insurance mechanism so that household assets are protected. We have mostly addressed the first approach. In order to adopt the second approach, one needs to understand the vulnerability of poor to different shocks. Hamid, Khalily and Barua (2009) identified different types of shocks through a nationally representative survey and also a small survey of extreme or ultra poor covered under the Rural Employment Opportunities through Public Assets (REOPA) of the UNDP.

TABLE 1.20
NATURE OF SHOCKS DURING THE LAST 2 YEARS

Nature of crises	Total N=3,482 Percentage (Frequency)
Life – death	4.65 (162)
Health	37.31 (1299)
Crop	10.28 (358)
Properties	9.62 (335)
Livestock	13.87 (483)
Wedding & Dowry	9.68 (337)
Migration to abroad	10.8 (376)
Education	1.58 (55)
Others	2.21 (77)
Total	100 (3482)

Source: Hamid, Khalily and Barua (2009).

Households are generally more exposed to health related risks, followed by livestock related risk (e.g., death of livestock or livestock stolen) and crop damage and cost of migration of family member (Table 1.20). Not all households are able to cope with crisis. We report in Table 1.21 about the coping mechanism of the households who were exposed to death and health related shocks. Around five per

cent of the poor households could not cope with the shocks. Only around 28 per cent of the households coped with shocks with their regular income and around 22 per cent by their own savings**.** Importantly, people borrowed (around 25 per cent) and sold permanent and temporary assets including livestock (around 12 per cent) to cope with the shocks. These coping mechanisms are costly. Hamid, Khalily and Barua (2009) showed that such coping mechanism has an effect on vulnerability to consumption.

TABLE 1.21

COPING MECHANISMS USED FOR LIFE RISK AND HEALTH SHOCKS

Coping mechanisms	Life risks (death)		Health shocks	
	Recent year Per cent (N)	The previous year Per cent (N)	Recent year	The previous year
Unable to cope with the shock	7.5 (12)	4.39 (5)	4.0 (64)	4.92 (45)
From regular income	24.8 (40)	28.95 (33)	32.56 (519)	27.76 (254)
From savings	22.4 (36)	21.05 (24)	19.70 (314)	22.51 (206)
Borrowing without interest	8.7 (14)	6.14 (7)	11.61 (185)	9.40 (86)
Borrowing with interest from individual	8.1 (13)	7.02 (8)	(134) 8.41	8.52 (78)
Borrowing from NGO	7.5 (12)	7.89 (9)	7.72 (123)	7.98 (73)
Borrowing from banks	2.5 (4)	1.75 (2)	0.56 (9)	0.22 (2)
Selling permanent assets	2.5 (4)	3.51 (4)	1.76 (28)	2.51 (23)
Mortgaging permanent assets	3.1 (5)	2.63 (3)	2.13 (34)	2.08 (19)
Selling temporary assets	0.6 (1)	1.75 (2)	1.38 (22)	1.97 (18)
Mortgaging temporary assets	0.6 (1)	-	0.06 (1)	0.11 (1)
Selling livestock	1.2 (2)	4.39 (5)	2.45 (39)	4.15 (38)
Cutting down expenditure	-	-	-	0.11 (1)
Donation	6.8 (11)	4.39 (5)	3.58 (57)	3.93 (36)
Insurance	- (-)	0.88 (1)	-	-
Others	3.7 (6)	5.26 (6)	4.08 (65)	3.83 (35)
Total	100(161)	100(114)	100(1594)	100(915)

Source: Hamid, Khalily and Barua (2009).

1.6.3 Effects of Shocks in the Households on the Vulnerability to Consumption and Poverty

Shocks affect vulnerability to consumption and poverty in several ways. First, it increases vulnerability to poverty through its effect on erosion of physical and financial assets. Second, it increases vulnerability to consumption through its direct effect on reduction in consumption. Hamid, Khalily and Barua (2009) ordered vulnerability to consumption into four—food deficit throughout the year, occasional food deficit, neither surplus nor deficit, and surplus of food. The data shows that about one-third of the households have some short of food deficit, about half of the households are in the threshold of deficit or surplus and only 20 per cent have food surplus (see Table 1.22). Around one-third of the households remain in food deficit. Although the economic burden of shocks is very regressive, the amount of financial and physical assets decreases by the amount of cost of shocks.

TABLE 1.22
FOOD SUFFICIENCY LEVEL IN THE HOUSEHOLDS AND ECONOMIC BURDEN (IN TAKA)

Food sufficiency level in the households	Frequency in percentage (N)	Total costs (mean) in Taka
Food deficit throughout the year	7.89 (311)	58,752 (165,643)
Occasional food deficit	26.40 (1,040)	57,320 (141,233)
Neither deficit nor surplus of food	45.71 (1,801)	71,780 (152,643)
Surplus of food	20.00 (788)	78,055 (192,356)
Total	100.00 (3,940)	

Source: Hamid, Khalily and Barua (2009).

Ordered logit technique was used to assess determinants of vulnerability to consumption and also to assess effect of economic cost of shocks and financial assets. The authors controlled for the following household level attributes: age of the household head (measured in years), sex of the household, education of the household head (measured in years), household size, electricity connection in the household (yes=1, no=0), number of member living abroad, log of economic burden of shocks (measured in Taka), log of financial asset (measured in Taka), amount of land (in decimals), area dummy (programme area=1, control area =0), and log of household income. In addition, we have used village dummies for controlling village level attributes. Table 1.23 shows the ordered logit estimation of food sufficiency level. The model is jointly significant at the one per cent level.

The results show that education of the household head, electricity connection in the household, number of member living abroad, log of financial asset and log of household income and area dummy have significant positive association with food sufficiency level, as expected.

Household size has significant negative association with food sufficiency level, as expected.

Economic burden of shocks has significant negative association with food sufficiency level. This implies that economic burden of shocks significantly increases the probability of households of being in consumption deficit. This supports the notion that economic cost of shock makes households more vulnerable.

TABLE 1.23

ORDERED LOGIT ESTIMATION OF FOOD SUFFICIENCY LEVEL

Explanatory variables	Dependent variables: food sufficiency level (0 = deficit in whole year, 1= sometime deficit, 2= neither deficit nor surplus, 3= surplus)
Age of household head	-00.2 (.002)
Education of the household head	.078*** (.009)
Household size	-.134*** (.039)
Electricity connection (1 = yes, 0 = no)	.468*** (.081)
Number of household living abroad	.295*** (.071)
Sex of the household head (1 = female)	-.075 (.107)
Log of economic burden of shocks	-.044*** (.007)
Log of financial asset	.078*** (.009)
Total land (in decimals)	.058*** (.009)
Area (1= program area, 0= control area)	.035 (.152)
Log of income (in Taka)	.963*** (.049)
No. of observations	3822
Cut point 1	8.30
Cut point 2	10.61
Cut point 3	13.42
LR ch2	1701.32***
Pseudo R2	0.1804
Log likelihood	-3,864.69

Source: Hamid, Khalily and Barua (2009).

Notes: 1. Figures in parentheses are standard errors.

2. *** indicates significant at one per cent level.

1.*6.4 Role of Access to Micro Finance in Minimising Consumption Vulnerability*

Households cope with different shocks in a number of ways—income enhancement and insurance mechanism. Insurance mechanism includes role of savings and transfer of risk to insurance companies. In this section, we argue that poor households having access to micro finance, ex-ante any shock or crisis, are less vulnerable; we also use another evidence to demonstrate that ex-ante access to finance reduces consumption vulnerability in *monga* type of situation. We use estimates in Khalily *et al.* (2009) to validate our assertion. During monga, households cope in a number of ways—advance sale of labour, sale of assets, internal migration, borrowing from informal sources and advance sale of crops. These coping mechanisms are costly and erosive in nature. On the other hand, adoption of such mechanism reflects vulnerability of the poor households. Khalily *et al.* (2009) tested the hypothesis that ex-ante access to finance improves vulnerability of poor households in monga like situation through its effect on different coping mechanisms using Prime impact data of 5,300 households of 2008. They estimated impact of ex-ante access to micro finance on different coping mechanisms compared to counterfactual group using endogenous switching regression technique.

TABLE 1.24
IMPACT OF ACCESS TO MICROFINANCE ON COPING MECHANISM

Access to Microfinance Status	Counterfactual compared to microfinance participation status			
	Advance Labour Sale (days)	Advance crop sale	Sale of assets	Informal borrowing
HHs with Access to Microfinance	1.48	487.74	36.30	249.99
HHs without Access to Micro Finance	-3.32	-744.53	- 273.74	- 659.79

Source: Khalily *et al.* (2009).

Ex-ante access to microfinance has positive impact on reducing vulnerability of poor households. Households with ex-ante access to micro credit remain better off compared to counterfactual situation. In the absence of ex-ante access to micro finance, these households would have sold higher days of advance labour and advance crops and would have borrowed more. On the other hand, the households without ex-ante access to micro finance would have been also better off had they had ex-ante access to micro credit. These households would have sold less advance

labour and advance crop and less borrowing (Table 1.24). With ex-ante access to micro finance, households would have less erosion in financial assets and less vulnerability to consumption as well as poverty.

1.6.5 Can Micro Credit Help Income Growth and Reduce Vulnerability in the Coastal Areas?

Natural calamity in the coastal region is an important poverty generation process. With climate change, the coastal zone is experiencing cyclone, rising frequency and intensity of cyclones, tidal surge, etc. During the last three years, there were two major disasters, "sidr" and "aila". Both were devastating in terms of loss of assets including houses and other productive assets as well as extensive damages done to the infrastructure. "Sidr" affected larger areas along the entire coastal belt. The damages caused by "aila" were more localised in nature but included long term degradation of land and waterbodies. Such disasters are usually followed by short term relief activities. Rehabilitation of economic activities and repair or rebuilding the infrastructure and reversal of the overall degradations are more difficult and efforts are usually scattered and not well coordinated or synchronised.

This situation poses special vulnerability for micro credit organisations and their clients. Such vulnerability was exposed during the last two disasters. The experience of micro credit institutions in their efforts to rehabilitate their clients and reutilise their micro credit programmes can highlight the role of micro credit in such disaster prone areas.

To obtain insights from their experiences, an information gathering session was organised for exchange of ideas and to obtain practical insights for identification of future strategies. To follow the discussion systematically and to link these with the current concerns about the role of micro credit in the provision of rural finance, this section will cover the following issues:

(1) Relief, rehabilitation and coordination for disaster management;
(2) Role of micro credit for household in extreme poverty;
(3) Loss of investment, micro insurance and new investment;
(4) Soft loan for disaster affected, credit market instability and sustainability of MCIs.

Any large scale and devastating calamity is responded by quick relief activities. Such relief activities are usually conducted by government organs and the Ministry of Disaster Management is expected to play the key role. However, the government organs need some time to chat the route of relief activities—the priority areas, how

much relief and how to administer. In the meantime, the local NGOs have to begin their effort to reach their clients with relief.

In fact, the micro credit-NGOs keep in touch with their borrowers from the time when warning signals are hoisted. They inform the clients and help them to more to go to cyclone shelters and to take their asset and other belongings to safe places. Since the last "sidr" micro credit -NGOs have kept this in mind that there may be need for shelter and keep their clients alert.

In the relief phase, they identify the clients with most urgent need and on the basis of their assessment they distribute relief goods. Since micro credit institutions have information on the borrowers background, their credit history and assets before the disaster, they may assess the losses quite accurately. Relief aims first at food security, shelter, drinking water and other essentials.

Most NGOs have an "emergency fund" for such relief operation. Some NGOs get supply of relief goods from international NGOs and donor organisations. Government's relief distribution is not quite targeted and covered the entire affected region, as it should. The local administrative units wait for instructions from central command and therefore, there may be some delays. In the meantime, local elected representatives and local administration put pressure on NGOs to perform the relief distribution in coordination with these offices. This would help in overall coordination of relief if done with good intention and when government's relief fund comes, the same joint effort continues. On the part of the NGOs, there are complaints that there are attempts to downplay the role of NGOs, and/or to use them for political purposes.

Lack of coordination also occurs because NGOs want to give relief for short duration which is absolutely essential. In contrast, government does not have a definite plan and keeps on supplying relief as demanded by local political leaders and as the need gets publicised by the media. As a result, the micro credit clientele also spend time for relief rather than making progress with economic activities. This is further worsened by government's announcements about postponement of repayment of micro credit installments. This will be further elaborated.

1.6.6 Credit Market Adjustments and Its Impact

Natural disaster is followed by a number of adjustments in the rural credit market. The specialised credit agencies of the government usually reschedule the loans. Depending on severity of the disaster, interest exemption announcements are made. Once in a while the liquidation of the principal along with interest is not uncommon.

NGOs usually adopted their own policies in this respect. However, during the last two disasters, government issued administrative ruling about micro credit repayment moratorium. After "sidr," repayment of all micro credit was postponed for three months. After "aila" it has been postponed for a year.

A breathing space after the disaster is of course essential because the households' very survival and food security has to be ensured. Time and effort must go for collection of drinking water, construction of house, etc. However, there is an optimal duration of such moratorium on main economic activity and normal employment. In this context, if there is a pressure of loan repayment, it has a positive side as well. It acts as a mechanism of jumpstarting economic activities of the households devastated by the disaster. Nonetheless, it needs further details of how this may be minimised for families whose investments have been washed away.

Micro credit NGOs have, over the years, devised various strategies for responding to such calamities which happen sometimes in minimise forms. These NGOs leave a short period for people to return from their shelters and restore normal daily life. Then the micro credit NGOs provide a small loan to the borrowers, which can be used for investing in activities with quick return. They may keep a part of the new loan to start repaying the two loans after an initial interval. The need for repayment of loans acts as a push factor or as an incentive, however one may interpret it, for generating income through a combination of working longer hours, minimising more family labour (including women), etc. Curtailing non-essential (or even essential) consumption may supplement the efforts of income generation.

If there is no intervention from the government, the NGOs may choose, on the basis of their assessments of loss, what type of rescheduling policy they will adopt. If the affected households do not make any loan repayment, they cannot obtain another loan and will not have access to the investible fund. This creates negative repercussions for the NGOs as well. If the loans are not being repaid for a period as long as a year, it becomes difficult to meet the current administrative costs. During this period the field staff will have no work. Since the NGOs attempt to minimise administrative cost, the field staff may lose job. This will set in a negative cycle in the area. If such calamity is repeated in close intervals, the NGOs activity may become unsustainable.

However, if the matters are left entirely to the NGOs' discretion, some of the NGOs, if not all, may not take a humane attitude and leave the borrowers little time to absorb the shock caused by the calamity. Moreover, if the decision to postpone the installment collection (most NGO credits are repaid in fortnightly installments)

is not taken immediately and well communicated to all levels, the field staff may set to work in the day following the disaster. After all, if they fail in their job, they may fear that they will be made responsible for the default. Therefore, it is a matter of fine balance between leaving a breathing space for the borrowers to return to normal life and help their endeavour to restart the micro credit financed income generating activities and repayment of loan.

MFIs have responded to both idiosyncratic and covariate risks through insurance mechanism. The insurance mechanism essentially evolved initially to protect their loans. But over time it has grown to cover risk of the borrowers and expanded horizon of insurance coverage. They now offer credit insurance (borrowers), livestock insurance (borrowers), term and endowment insurance (borrower and non-borrower), accident insurance (Both), health insurance (to a limited extent) and micro enterprise insurance. Different insurance products with combination of different benefit packages are offered to the poor members.

In a recent survey, Khalily *et al.* (2009) showed that more than 50 per cent of the MFIs offer some form of micro insurance. The dominating product is only credit risk insurance product. Along with this, term life insurance policy is offered. However, with the exception of a few MFIs, most do not offer any health related product, the risk that over a one-third of the households are exposed to in any given year. Given the fact that mortality rate is very low, MFIs have accumulated some Taka 50 billion as insurance fund. Although the insurance products are not diversified, even simple credit insurance product protect borrowers from being perpetual indebted because of death of the income earner or borrower. Effect of micro credit can be larger in poverty alleviation if risks of the households are covered under micro insurance. This will not only protect household assets from erosion during any shock but will contribute to higher income growth from loan.

1.7 INCOME GROWTH AND EMPLOYMENT CREATION THROUGH MICRO FINANCE—IMPLICATIONS FOR SIXTH FIVE YEAR PLAN

We have demonstrated in the past sections that micro finance does make positive impact in income growth and non-farm employment. There are other interventions like SME development, free education, health, access to rural credit and social safety net programmes that have also impact on off-farm employment creation as well as income growth. But little is known on the intensity of impact. From the perspective of creating wider impact (defined in terms of number of off-farm employment and intensity of income growth), micro finance is more effective than any other interventions, both in the short and long runs, particularly for the poor. Micro finance also contributes to minimising consumption vulnerability. But

in order to promote more non-farm economic activities and reduce consumption vulnerability, MFIs need to upscale their activities with more product diversification, and price their products at a level such that welfare of poor borrowers is maximised. In this section, we highlight the issues that need to be addressed to maximise benefits of micro finance as well as to create off-farm employment opportunities from the perspective of sixth five year plans. While we address the issues of enhancing impacts of micro finance, we also focus on the issues concerning access to formal rural credit. In highlighting the issues, we assume that GoB continues to expand other interventions like education, health, social safety net programmes and investment in general.

TABLE 1.25
INTEREST RATES UNDER FLAT METHOD

Interest Rates Charged (%)	Number of MFIs	Percentage
5	1	0.1
10	8	1.2
12	23	3.3
12.5	75	10.9
15.00	507	73.5
20.00	23	3.3

Source: CDF Micro Finance Statistics, 2006.

1.7.1 Reduction in Interest Rate—A Viable Option?

Interest rate is the most discussed issue among the professionals and practitioners as well as politicians because of two different approaches. One group of practitioners favour charging interest rate based on the actual cost of operation and some margin for future. Interest rate appears to be high because of high transaction cost (Rahman 2004). On the other hand, others including politicians advocate for low interest rate. Their argument is more driven by several factors: (i) effective interest rate is almost double the nominal interest as nominal interest rate is charged on flat method; (ii) commercial banks charge interest rate on declining interest rates; and (iii) welfare of poor is maximised by low interest rate regime. Two interest rates are common in the sector—15 per cent and 12.5 per cent. PKSF required its partner organisations to reduce interest on loans from 15 per cent (Flat) to 12.5 per cent (flat) beginning July 2004 because it provides subsidised capital to the partner MFIs. Even with this rate, its partners are found to be financially viable. In a recent meeting of the stakeholders with the Minister of Finance, it was decided that a uniform interest rate of 15 per cent on flat method should be charged by the

MFIs. But this makes effective interest rate still higher, around 28 per cent. Many MFIs charge effective rates of interest in the range of 21-40 per cent. The MFIs' rationale is that if such rates can be paid by the borrowers and still per hour return to labour is higher than the relevant wage rate, there cannot be a serious objection to such charges. In fact, MFI's saving services also require consideration when a desirable rate of interest is chosen (Rahman 2001).

However, the issue is more complex. In micro credit financed enterprises, a high dose of family labour input will bring down the hourly return and the rate of return to capital (assuming a low opportunity cost of labour) will be high. When a family can eke out a subsistence living through such a combination, it will accept the rate of interest charged by MFIs. There always remains the possibility that the charges are lowered and the poor borrowers receive greater benefits. This consideration has to be weighted against the above concerns about MFI-sustainability.

Some NGOs believe in a philanthropic motive and the rate of interest is very low. This position needs to be reviewed and that philanthropy may be consistent with a higher rate of interest if the interest earned is used for expanding loans among a larger number of poor households and for covering the poorest borrowers, which may involve larger operational costs. Thus MFIs must strike a balance between helping a small number of poor with larger benefits per borrower through a low rate of interest, or expanding their operations outreach.

Can we make a comparison of MFIs and commercial banks rate of interest? The average rate of interest for poor borrowers of MFIs is observed to be much higher than the rate of interest for richer clients of commercial banks who pay in the range of 10-18 per cent on their loans. This difference involves an obvious inequity and therefore, the reasons behind this difference should receive attention. The rate of interest charged by the financial organisations will depend on the cost of funds which they lend, and the cost of intermediation. MFIs' cost of funds is lower than the cost of funds for the commercial banks, the latter being reflected in the rate of interest paid on the mobilised savings. The cost for the MFIs is lower because many of them obtain funds from cheaper sources, including international donors and PKSF which provide funds at lower rates of interest. Members' savings are likely to be less expensive for MFIs because they pay their savers a lower rate of interest and the savings are not easily accessed by the members. Thus the gap between the rates paid on savings and service charge on loans is also relevant.

MFIs' charge a higher rate of interest on loans because of the high costs of loan operation among poor and illiterate clients. This is due to the door-to-door services provided by most MFIs and the small size of the loans. If the high rate of interest is

due to the cost of door-to-door services, the MFIs may make an endeavour to reduce the cost through modifications of these practices. If the cost of banking among the poor is high because of their illiteracy and because they are not capable of dealing with the usual banking practices, this is, to some extent, a legacy of the deprivation from the lack of access to education and prevailing social system.

The major MFIs are aware about this and the rates of interest are observed to be more or less stable during the recent years. More vigorous competition among the MFIs (often in the same location) may have contributed to this stabilisation. Stabilisation of rate of interest can be helpful in the overall development of the MFI environment, rather than a vigorous price competition leading to frequent changes in clients' affiliation. NGOs charging high rates of interest may be motivated to bring down the rates and set targets for such reduction in the coming years.

Interest rate has to be reduced in order to maximise income growth for the poor borrowers. There are two ways through which interest rate can be reduced: (i) Micro Credit Regulatory Authority (MRA) can set limit on interest rate, and (ii) the GoB can critically examine the issue of interest rate and subsidise it as they do public sector banks. In reviewing interest rate, one should note that providing financial services at the door steps of poor borrowers is costly. There are arguments for and against high interest rate. The challenging issue is to rationalise interest rates. Lower interest rates will ameliorate the level of economic welfare for the poor borrowers.

The Sixth Five Year Plan should emphasise on the need for capping micro finance lending interest rate but, at the same time, should also underscore the needs for sustainability of MFIs.

1.7.2 Reduce Vulnerability of Poor to Increase Welfare Impact of Credit and Non-Credit Interventions

Microfinance, over the years, has made significant contribution in all strata of poor people. Programmes and products are diversified. Empirical studies, as discussed earlier, demonstrate that the participating households are better off in terms of increased income and assets and, in turn, better quality of life. Microfinance contributes to reduction in poverty by over one per cent point. It could make higher impact had vulnerability of poor households been reduced. Poor are vulnerable to almost annual recurring of different shocks. The PRIME experiences suggest that provision for emergency loans and consumption loans during any shock can substantially reduce shock-induced or seasonal poverty. But, on the other hand, it is often reported by the MFIs that the branches that are implementing vulnerability reducing seasonal or emergency or consumption loans are not

financially viable. Therefore, one of the major challenging issues would be to introduce interventions for reducing vulnerability of poor. Interest free consumption loans during any crisis and/or low premium based micro insurance might be among the vulnerability reducing interventions. Government social safety net programmes like cash for work, food aid would be less costly for the poor households. Development of appropriate savings instrument will be another approach. It is well established that poor can also save when appropriate instruments are available. Savings can act as an insurance mechanism in time of any crisis. Poor members of MFIs have saved around Tk.100 billion against loans outstanding of Tk. 162 billion by the end of 2007. This has increased in 2008. However, challenge becomes more difficult when covariate risk like *Sidr* affects borrowers adversely. But all these challenges make things difficult for the MFIs operating with higher degree of risk. The experience of *Sidr* for the MFIs has been too costly—suspension of loan recovery drive, on the one hand, and provision of new loans, on the other hand.

MFIs have successfully covered *monga* affected households in north-western region of Bangladesh. It has contributed to reducing vulnerability of these households. Equally vulnerable are the poor households in coastal belt and char areas. Recent natural shocks have deepened their degree of vulnerability.

In terms of policy implications for the Sixth Five Year Plan, vulnerability is reduced through different mechanisms: (i) introducing micro insurance programmes, (ii) expanding social safety net programmes during any covariate risks, (iii) providing emergency loans through MFIs; and (iv) providing financial services by public sector banks.

1.7.3 Involve MFIs in Promotion of International Migration and Remittances

It is well documented that overseas migration has skewed effect on income regionally because of skewed distribution of migrant workers. Most of the migrant workers are from the relatively resource-rich Chittagong, Noakhali and Sylhet regions. Least number of overseas migration takes place in the west and north-western regions of the country. Several factors may have contributed to it: (i) fewer number of recruitment agencies operating in these regions, (ii) lack of information about overseas employment, (iii) people in the regions are relatively less skilled, and (iv) cost of overseas employment might be too high. It is well reported very regularly that manpower agencies have been generating exorbitant profit and often are regarded as the source of exploitation. Some time, overseas employment-seeking people are being cheated in connivance with some responsible personnel involved in the process. In such a situation, an alternate mechanism can be MFIs, both from the perspective of opening the gate of overseas employment to west and

north-western region of the country and reducing cost of migration. During the tenure of the last caretaker government, PKSF in partnership with Bangladesh Bureau of Manpower, Employment and Training (BMET), Bangladesh Association of Recruitment Agencies and commercial banks. Under the arrangement, the price of overseas employment is determined by the government, training is given by BMET, selection of poor migrants and financing of migration by PKSF, and bank is involved in remittances. The tri-party agreement also brings transparency in the business of overseas employment. There is an inverse relationship between remittances and poverty. This is well documented in the literature. With such evidences, focusing on poor for overseas employment will have higher impact. MFIs, because of network and transactions with poor under group concept, offer better opportunities to make overseas employment more effective for poor households. In some cases, MFIs may even be given licenses for exporting manpower under close supervision of PKSF and MRA.

Under the Sixth Five Year Plan, GoB should diversify export manpower opportunities and make it less costly. The experience of tri-partite agreement of PKSF-Government-Recruitment agencies can be extended and adopted as a policy.

1.7.4 Micro Enterprise Development and Economic Growth

The least understood or explained is the issue of micro enterprise development. Over the years, many micro borrowers have become micro entrepreneurs with higher scale of operation of micro enterprises. MFIs identify enterprise as micro enterprise if loan size varies between Tk. 30,000 and Tk. 350,000, although micro enterprises are defined in literature little differently. Micro enterprises, as globally defined, must have at least one hired labour. In the context of Bangladesh, as argued by the MFIs, requirement of at least one hired labour should be relaxed to full employment of even one family member otherwise remained unemployed. Despite the debate over definition, fact remains that micro enterprises in Bangladesh create employment opportunities. There is no precise estimate of micro enterprises promoted and financed by MFIs. The number is put at 6 million. The field level experiences suggest that many micro borrowers for income–generating activities (IGAs) have graduated to micro enterprise level. But promoting sustainable micro enterprises requires policy support from the government for sectoral development.

Micro enterprises should have forward linkage for the concerned sector development. Government industrial policy should substantially be focused on micro and small scale enterprise development with appropriate forward and backward linkages. In addition, it must contain protective measures for micro enterprises. Micro enterprise development can bring major revolution in economic

growth and industrial development as these are mostly rural economy based. Promotion of micro enterprises will not only contribute to direct rural employment creation and rural industrialisation, it will also have spill-over effects on the rural economy. Therefore, non-farm enterprises, financed through MFIs, will have greater contribution in rural economic growth and development.

Micro enterprises can be promoted through: (i) ensuring large loans; (ii) flowing of information on markets, linkage between private sector and micro entrepreneurs; (iii) providing training to micro entrepreneurs for up-scaling of enterprises in future; and (iv) provisioning for insurance mechanism in case of any covariate risk affecting micro enterprises. The Sixth Five Year Plan should focus on micro enterprise development as a vehicle for off-farm employment and income growth.

It is estimated that MFIs offer micro enterprise loans to 6 million borrowers. With the annual growth rate of 20 per cent, it is expected that over the next five years, the expected number of micro enterprises will reach around 15 million. This will certainly bring a major revolution in the rural economy. However, development of micro enterprises will require higher level of skill development training and other relevant areas. The estimated number of training days over the next five years will be 15 million. This estimation is based on the assumption that one-fifth of the projected 15 million micro entrepreneurs will have higher ability to move at the next level of enterprise development, and that each entrepreneur will require five person days of training.

The GoB jointly with MFIs, Institute of Microfinance and the government training institutions should make provision for training. In addition, it should consider MFIs as the sources of information. Therefore, the GoB should provide all necessary information to MFIs about micro enterprises and potential growth sector for dissemination.

1.7.5 Access to Information and Training of Borrowers

Non-farm economic activities are largely financed but the portfolio of activities is limited. As argued earlier, poor borrowers and micro-entrepreneurs should have access to different information and new products. Major challenge is to provide such information and also offer them actual platform for training. MFIs as well as Upazila extension officers can provide new information. In addition, prospective micro entrepreneurs may have exposure visits to successful projects. MFIs in collaboration with the Upazila level administration or local government can organise such visits. Government can arrange training programmes for the micro-entrepreneurs. Local business communities may be involved into such programmes.

1.7.6 Special Focus on Livestock and Poultry Development

Livestock is the dominating sub-sector. Almost one-fifth of the formal agricultural credit or micro credit is used for livestock of different size. Due to expectedly higher returns to capital, familiarity and easy to learn technology, poor borrowers have focused on livestock and poultry. In many districts including Rangpur, a major revolution took off, but because of bird flu poultry sector was badly affected. Confidence of the investors has been shattered. Livestock is also subject to different diseases. In such a situation, in order to promote livestock and poultry sector, there is a challenge of providing technical support services. MFIs and Upazila level administration can provide such services. GoB has already emphasised on livestock development. This needs to be further coordinated. In particular, GoB should work closely with MFIs in the development of livestock sector in Bangladesh. Not only poor will be benefited from it, but it will also contribute to the development of export-oriented meat processing industry. This is what ought to be underscored in the Sixth Five Year Plan. Demand for loan will increase over time. Given the fact that around one-fifth of total micro credit goes into livestock, with the growing increase in the number of memberships, total demand for loans for livestock will also increase.

1.7.7 Seasonal Poverty of Fishermen and Microfinance

Microfinance has proven to be effective in combating seasonal poverty due to monga in the north-western region. It can equally address the issue of other seasonal poverty in other regions. Important one can be the fishermen who have seasonal occupation. During the off-season, MFIs can bring fishermen under their net, and help fishermen diversify their economic activities. Around 15 million people are associated with fisheries, including 3.5 million of marine fisher people. Fisheries contribute US$18 billion to GDP. GoB through PKSF can undertake a massive programme for tackling seasonal poverty of inland and marine fishermen. In addition, participation of fishermen in micro credit will help diversify their income generating activities.

We have discussed the critical issues confronting development of non-farm sector from the demand side. In this section, we focus on supply-side measures that ought to be undertaken to promote non-farm sector.

1.7.8 Build Capacity of MFIs

Micro finance institutions because of their network can be expected to play more versatile role in poverty alleviation and creating off-farm employment opportunities. But one of the major obstacles that MFIs face is their limited capacity. With the exception of few MFIs, most institutions are offering very

conventional financial services. Their staffs are learning on the job. Moreover, they are not able to deal with new situation because of their limited exposure. This is not only with the field level staffs. Small and medium MFIs also do not have much organisational capacity to provide multidimensional services. In addition, whatever working knowledge and the training facilities do the MFIs have, they are all organisation specific—they do not represent behaviour of total sector. Moreover, MFIs lack specialised trained staff in the area of finance, accounting and human resource management. Therefore, capacity of the MFIs in Bangladesh needs to be enhanced so that they can cope with every situation and they can provide multi-dimensional services to meet challenging needs of the sector as well as poor borrowers.

Capacity of the institutions can be enhanced in two ways—upgrading skills of the staffs through standardised training modules, and introducing formal academic degree programmes or courses in micro finance and poverty. The challenge is to provide standardised training to MFI staffs. Institute of Microfinance (InM) has undertaken massive project to improve capacity of the institutions through providing training to MFIs 50,000 staffs using 15 standardised modules by 2014. The mechanism that the Institute is contemplating to adopt is to develop standardised modules and provide training to the staffs jointly with training providing agencies using the InM trained trainers. Total number of training days will be around 250,000 person days. It will be quite challenging to introduce courses or degree programmes in micro finance and poverty at the university level because of mis-perception about future of micro finance and MFIs. This is common misperception that there is no professional future at MFIs. People tend to forget that MFIs are formal part of formal financial markets. MFIs will develop like any other financial institutions.

1.7.9 Expansion of Micro Finance Network to Less Accessible Areas

No precise estimate is available on the number of poor households brought under micro finance net. Based on available statistics from different sources, it is perceived that some 60 per cent of the poor has been brought under micro finance network. With multiple memberships, total number of memberships is around 33 million. If multiple overlapping is netted out, actual coverage of membership will perhaps be around 20 million. Overlapping is estimated to be around 40 per cent. Multiple memberships arise because of (i) demand for higher loan size, (ii) inability of MFIs to operate in remote and/or inaccessible areas, and (iii) the goal of MFIs to operate profitably with low degree of risk. Micro finance because of the design has higher promise to impact poverty. MFIs have the advantages of network. Such

network appears to have higher utility in the absence of effective government network. Therefore, the GoB, with the support of MRA, should target all MFIs to expand their network in all unions and villages—accessible or inaccessible. Localised small MFIs may be promoted and developed as a part of the government policy for programme deepening and making the market competitive. Until now, MFIs have been less active in more risky areas. Hilly areas, coastal belt and char areas are considered as highly risky by MFIs. In the Sixth Five Year Plan, expansion of financial services to relatively remote or less accessible areas should be emphasised. This will contribute to creation of off-farm employment opportunities.

1.7.10 Wholesale Lending Agency and Expansion of Micro Finance Sector

PKSF is the only wholesale lending agency in Bangladesh to finance micro finance sector. It has made tremendous impact in the expansion of this sector. Although we have experience of micro finance for three decades, the sector could not expand until PKSF started lending in the early 1990s. Even the big players in the micro finance sector are the outcome of the PKSF lending policy.

PKSF provides subsidised fund to its partner MFIs. It also provides technical support to its Partner Organisations (POs). Most importantly, PKSF has been implementing quite a number of new projects targeting different groups like micro entrepreneurs, urban poor, ultra poor and vulnerable group. It operates with a broad vision of poverty alleviation that includes not only credit but also non-credit interventions. Finally, it contributes to sustainable development of its partner MFIs through effectively monitoring their activities and instituting financial and operational systems. Regular training programmes for the PO staffs are part of the system development process.

PKSF has emerged as a sustainable and effective organisation because of the financial and policy supports that the GoB has lent to. In addition to providing initial seed money, GoB has borrowed from the World Bank to finance PKSF operations. Effective and efficiency of PKSF has attracted other donor agencies like ADB, IFAD, European Union and USAID to participate in PKSF programmes. All these financial supports immensely contribute to the expansion of operational and financial outreach, and, in turn, to expansion of micro finance sector.

Given the future demand for micro credit and micro enterprises, PKSF alone may not be able to meet the challenging demand in future. On the other hand, it may not organisationally be able to provide sustainable services. Every organisation should have optimum size. GoB needs to determine whether PKSF has reached organisationally optimum size. Although several banks are providing micro credit

for poverty alleviation, the amount of support is small. Therefore, they are not viable option. In the event, PKSF has attained its optimum size, it may be necessary to create an alternate wholesale lending agency. This will help expanding financial services in addition to making wholesale credit market more competitive.

Micro-Insurance

It started essentially protecting with their own credit risk, but now they realise the need for it for the poor households. A recent review showed that more than 50 per cent of the MFIs have been offering micro insurance services with some ad hoc approach. As discussed earlier, poor are exposed to health related shocks. Cost of coping has been enormous. Some insurance mechanism will contribute to wealth accumulation. In recent years, a number of MFIs are experimenting with life, health and cattle insurance services with formal approach. Results are encouraging. Institute of Microfinance has been working with UNDP in designing micro insurance products for the poor. The next step would be to experiment with the products and developing appropriate institutional and governance structure.

The debate remains over the process of offering insurance services to the poor. Two well known approaches exist—direct marketing and agency system. The common practice is agency system. In Bangladesh, experience of commercial insurance companies selling insurance products to low-income households has been very frustrating. This is partly due to absence of institutional structure of insurance companies in rural areas and long time to settle small claims. On the top of these, the insurance companies had not been able to cover true low income poor households. Therefore, poor largely remain outside the formal insurance net. The alternate mechanism can be MFIs. Due to their wide network and outreach, they are effectively able to offer micro insurance services to the millions of poor households. But MFIs will have to face some legal and operational challenges. Insurance is a technical business. Therefore, MFIs will require technical services. In addition, MFIs will be faced with the issue of legality of insurance operation as under Insurance Companies Act insurance can be offered only by insurance companies. Despite all these, the fact remains poor need insurance services, and MFIs can best offer these services. Appropriate structure needs to be designed. GoB has to look at the issue more realistically.

1.7.11 Increase Supply of Micro Credit

Micro credit has substantial impact on different outcomes. Over the past decades, micro finance sector has grown both vertically and horizontally. This is no longer exclusively zone for the poor. “Missing middle” as we call it in analysing rural credit market is being gradually covered. Needs of the borrowers have

changed with maturity. Demand for micro enterprise loans has been increasing. Greater focus is now given to link micro enterprise with private sector. Similarly, higher demand for financing livestock is also noted. MFIs need to extend micro finance services to fishermen to address their seasonal poverty. Consequently, demand for credit has been increasing.

We provide a projection of the demand for micro credit based on some parameters: (i) annual average growth in loans disbursement and the number of borrowers has been consistently around 15 per cent; (ii) average loan size has increased by 12 per cent annually; (iii) number of micro enterprise borrowers has been increasing at an annual rate of 24 per cent. Based on these figures, present loans disbursement of Taka 209 billion will certainly grow with higher demand for credit. Assuming the present growth rate constant, we estimate that over the next five years, the number of borrowers will stand at around 42 million and the annual demand for loans will reach on average around Taka 350 billion. That means, over the next five year period, around Taka 1,750 billion will be demanded. Are the institutions able to meet such level of demand? The answer is No, despite higher level of member savings.

1.8 CONCLUSION

In this paper we have addressed the issues of off-farm employment and income growth. We have discussed the issues covering both government and non-government initiatives. However, we focused mainly on the policies related to micro credit. Micro credit contributes to off-farm self employment creation and income growth of poor households. There are large number of other factors, including infrastructure development, education and overall social and economic progress (e.g. health service delivery, water supply and other public goods) that contribute to employment creation and growth. In the analysis on the determinants of income earning from rural non-farm activities, it was observed that education and a few other related variables showed positive impact. Therefore, the overall development and poverty alleviation should be comprehensive—credit must be inter-linked with macroeconomic policies.

Micro credit has made substantial impact on creating off-farm employment opportunities and income growth. But the inherent vulnerability of the poor borrowers undermines the gains from micro credit. Micro credit will have larger impact on off-farm employment creation and income growth if the issue of vulnerability is addressed. The ultimate mechanism is to develop insurance. Further gains can be derived if micro credit is accompanied by other services like marketing of output, access to technology and quality control which are essential for

productive use of micro credit. These services will, in particular, contribute to the development of micro enterprises, an area that has to be greatly considered to bring major revolution in rural economic growth. To achieve this goal of income growth and off-farm employment, the Government of Bangladesh should increase supply of micro credit through MFIs, introduce micro insurance services, and make provision for skill development training of borrowers. On the top of all these, a healthy competitive environment for micro finance sector has to be created for price and technical efficiency which will maximise welfare of the borrowers.

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Chapter 2

Urbanisation Management and Emerging Regional Disparity in Bangladesh: Policies and Strategies for Decentralised Economic Growth

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2.1 INTRODUCTION

2.1.1 Background

Bangladesh has traditionally been viewed as a country with a common language, culture and heritage and a land which is mostly a deltaic plain formed at the mouth of the mighty rivers, namely the Ganges (Padma), the Brahmaputra (Jamuna) and the Meghna. This simplistic narrative of the country, viewed as a single homogeneous entity, actually has masked remarkable heterogeneity in socioeconomic outcomes in different regions. The starting point of a discussion on the regional disparity in Bangladesh would, therefore, be the assessment that significant regional differences do exist in this country.

Regional disparity in the course of economic development is a common observation in all the countries throughout the world, developing as well as developed. This is to a large extent unavoidable since not all the regions of a country grow at the same pace and get benefits from economic growth at an equal proportion. Some regions grow faster as compared to others, for a number of reasons, including but not limited to, better communication facilities, access to energy and natural resources, higher concentration of entrepreneurs and skilled labour force, etc. On the other hand, some regions lag behind primarily due to lower concentration of economic activities and lower resource availability (GOB 2008).

Although Bangladesh has made remarkable successes in terms of poverty reduction during the last decade or so, not all the regions of the country exhibited the same pattern of poverty reduction. There are indications that the eastern and the southeastern regions of the country have been able to achieve much lower rates of poverty, whereas the northwestern, the western and the southwestern regions are lagging behind. Hence, there has been a new term in the literature coined as the

"east-west divide"—where the "east" is economically progressing fast and the "west" is facing difficulties in achieving sufficient poverty reduction (see World Bank 2008). There are critics who would attempt to refute this particular coinage by pointing out that even this term is simplistic since there are areas within the east which are economically lagging behind and there are also areas within the west which are doing remarkably well in terms of economic growth.

2.1.2 Key Features of the Economy

Bangladesh is one of the world's most densely populated countries and has also faced rapid population growth throughout the last century although the population growth rate has somewhat decreased to a moderate level in recent times. With already existing high level of poverty, the pressures of additional population to an already densely populated land area are causing enormous stress on the standard of living and well-being of the Bangladeshi population. Natural disasters such as floods, cyclones, and river erosion are also affecting the well-being of these population. The economy is also going through a process of transformation itself. There are several key features of this transformation of the economy in recent decades.

Firstly, the gradual decline of the amount of land allocated to agricultural uses because of continued shifting of land to non-agricultural uses. This is causing pressure on the agricultural sector to improve productivity with the shrinking agricultural land; this is mostly in order to achieve twin objectives of food-grain self-sufficiency and low price of foodgrain. An additional issue that is putting a large segment of the rural population under vulnerability is the increasing landlessness among the marginal farmers, mainly by gradual breaking up of landholding into ever smaller pieces through family extension. The landlessness is also caused by river erosion and other natural calamities.

Secondly, the occurrence of natural disasters in the form of floods and cyclones on a regular basis is hitting hard the well-being of the rural poor, particularly in the north and middle floodplains and the southern and south-eastern coastal areas. The country is even more vulnerable to global climate change today than it was ever before.

Thirdly, the manufacturing sector has been rather static in the economy in terms of share of GDP, though the private sector's involvement in this sector has been on the increase. The traditional shift of agricultural surplus labour into manufacturing labour force has not occurred due to this slow expansion of the manufacturing sector. A large number of rural poor is now crowding in the urban slums and searching for jobs in the informal service sector for subsistence earnings. Thus rapid

urbanisation is occurring in the form of transformation of some portion of rural poverty into urban poverty. To summarise, the share of agricultural sector in the GDP is on the decline, whereas the share of the service sector is on a rapid increase, almost completely bypassing the manufacturing sector.

Fourthly, there has been a dramatic improvement in the field of communication and transport in the last decade. Road network has expanded significantly, for example, construction of the Jamuna Bridge, which has brought the northern region of the country in much closer communication with the capital city. During the last decade, the mobile phone networking system has caused wonders since this has made transfer of information much affordable and timesaving.

Fifthly, women are increasingly participating in education and labour market. In the past, with a low level of average education level as a whole, the average female education level was even lower. At the same time, labour force participation rate for women was very low. Now the country has achieved gender parity in primary and secondary education, and women's involvement in the higher education is increasing. Similarly, the labour force participation of women is also on the increase.

Sixthly, remittance earnings by Bangladeshi workers abroad are increasingly becoming an important source of earnings for Bangladeshi households. Inflow of workers' remittances not only mitigates macroeconomic imbalances but it also contributes to the better socioeconomic outcomes in Bangladesh. In recent times, women workers are also migrating abroad and sending remittances home.

Seventhly, the country has a very large and vibrant non-government organisation (NGO) sector working in the fields of microfinance, savings generation, training, social awareness, education, women and child health and so on. The rapid expansion of the NGO sector as a complement to the government sector as well as its vibrancy is a particular feature of Bangladesh in recent times.

Even though the country is going through a process of transformation of the economy, one severe problem that persists is the unacceptably high level of poverty, which is also multidimensional in nature. Significant regional differences can be observed in different dimensions of poverty. It is imperative to understand such regional disparity issues and analyse policy implications in this regard. It is imperative to analyse these issues of regional disparity and address them in the Sixth Five Year Plan.

2.1.3 Organisation of the Paper

This paper is organised as follows. Section 2.1 is the Introduction. Section 2.2 deals with the issue of dissagregration in the country's regional disparity issue.

Section 2.3 deals with aspects of regional disparity in Bangladesh. Section 2.4 deals with factors that affect this regional disparity. Section 2.5 is on regional breakdown of public expenditure allocation in Bangladesh, particularly the recent trends. Section 2.6 discusses urbanisation management and housing sector challenges. Section 2.7 sets out targets to achieve during the Sixth Five Year Plan. Section 8 concludes with a set of recommendations.

2.2 DISAGGREGATION: AT WHICH LEVEL?

This paper examines the available data regarding regional disparity in Bangladesh at different spaces—some data are available only at national level, some are at devision level, some are at district level and there are even some data which are available at upazila level. The issue, therefore, arises which level of disaggregation needs to be pursued in the discussion of regional disparity.

The issue has policy significance since the government has to decide the appropriate level of disaggregation for dealing with the regional disparity issue. On the one hand, the more disaggregated is the target of government policy initiatives, the closer it may get to the actual requirements of communities. On the other hand, government projects require coverage over some amount of geographical areas to be efficient and cost-effecive; and this area may turn out to be larger than a union, or an upazila or a district. Therefore, disaggregation at the very minute level and policy recommendations on that basis need not be improving efficiency in terms of resource use and planning.

In Bangladesh, the largest sub-national spatial disaggregation is at the division level. Six administrative divisions are again divided into sixty-four districts, around 500 upazilas/thanas, around 4,500 unions and 87,000 villages. Data sources with regard to regional disparity issue differ with respect to coverage of the sub-national level. The regional income data is not available currently; the last year data on regional income is of 1999-2000, and this data is at division and district level. Other data sources mostly cover either division or district. The household poverty data is principally derived from the *Household Income and Expenditure Survey* (HIES). This is conducted in a 5-year round basis, and the last report was of 2005. The HIES data is representative at the division level, but not representative at any lower level, i.e., at district level.

There has been a term known within the literature on regional disparity in the country is the "east-west divide." This actually highlights the issue that divisions on the western side of the Jamuna-Meghna river flow up to the Bay of Bengal (Rajshahi, Khulna and Barisal) are economically lagging behind, whereas the divisions on the eastern side (Dhaka, Sylhet and Chittagong) are economically more

advanced at least in recent decades. The consequence of this divide is that the "west" is not being able to reap its due share of economic growth that is occurring in the country, whereas the "east" is taking most of the benefits from growth. One main reason is that, the argument proceeds, the capital city and the port cities, and surrounding industrial zones, are all in the "east", whereas the "west" does not have many growth poles. The presence of growth poles in the "east" has given impetus for promotion of manufacturing and services, whereas the lack of presence of growth poles in the "west" has led to lack of promotion of these, and a heavy dependence on agriculture.

The divisional level regional disparity data broadly supports the view of so-called "east-west" divide. At the division level, most of income and non-income indicators exhibit that the "western" districts are lagging behind, and the "eastern" districts are more advanced. Yet we need to point out that there are some regions in the "western" part which are performing reasonably satisfactorily (Jessore and Kushtia), and there are some regions within the "eastern" part (Cox's Bazar and Bandarban) which are lagging behind. Also there are some puzzling results, such as the case of Sylhet division—it exhibits good performances in terms of income indicators whereas it exhibits below-average performances in terms of non-economic indicators, i.e., education and health. So such notion of east-west divide may lead to contentious conclusion about regional disparity in Bangladesh. Any analysis on regional disparity, therefore, deserves finer disaggregation of available data.

In this paper, depending on availibiliy of relevant data, we conduct our analysis at district or former (greater) district level and in some cases at division level. The discussion on planning strategies is based on division-level disaggreagtion of data.

2.3 ASPECTS OF REGIONAL DISPARITY

In this section, we examine aspects of regional disparity in terms of a number of indicators, such as income, growth and poverty, education, health, agriculture, manufacturing, labour market and access to finance.

2.3.1 Income, Growth and Poverty Indicators

2.3.1.1 Incidence of Poverty

Bangladesh has made impressive gains in terms of poverty reduction over the last one decade and a half. While the upper level poverty head count rate in the national level was at 48.9 per cent in the HIES 2000, and the corresponding lower level poverty head count rate (extreme poverty) was at 34.3 per cent, these numbers declined to 40 per cent and 25.1 per cents respectively in the HIES 2005 (Table 2.1). There has been a continuation of a gradual decline in the rate of poverty

incidence—the upper level poverty head count rate was as high as 57 per cent at the beginning of the 1990s. A sustained moderately high real GDP growth rate since the early 1990s, which has averaged above 5 per cent per annum, is the principle cause behind this impressive performance.

Recent developments, however, might have negated some, if not all, of the net gains that Bangladesh could have made in terms of poverty reduction from economic growth that has occurred in the country between 2005 and 2009. A series of natural disasters along with an international food price shock have exposed the vulnerability of the country's poor. In 2007, there were two natural disasters—a massive flood closely followed by a devastating cyclone, *Sidr*, and in 2007-08 there was the food price hike, particularly of the main staple food, rice, in the face of the global food price hike. In May 2009, the coastal areas of the country faced another cyclone named *Aila* with devastating consequences in a smaller scale.

Bangladesh's record of average annual rate of poverty reduction between 2000 and 2005 was the second highest in South Asia, whereas it was moderate compared to the performances of East Asian countries, such as China, Thailand and Vietnam (World Bank 2008). Yet Bangladesh is expected to meet the Millennium Development Goals (MDGs) targets for infant and child mortality by 2015 and has already reached the MDG target of gender parity in the primary and secondary schooling (World Bank 2008).

It needs to be acknowledged that Bangladesh's commendable performance in terms of poverty reduction in the national level has not been equally shared among its different components in the sub-national level. For example, as Table 2.1 indicates, large differences exist between the rural and urban areas—head count rate of poor people has been around 50 per cent higher and those of extreme poor around 90 per cent higher in the former as compared to the latter. Large regional variations in distribution and rate of reduction of poverty are also noticeable in Table 2.1. Within the total group of six divisions, three divisions (Dhaka, Chittagong and Sylhet) are clearly ahead in terms of level of poverty headcount which has been achieved by 2005. These three divisions have been successful in reducing upper level poverty head count rates from above 40 in 2000 to about 33 in 2005 and at the same time they succeeded in reducing extreme poverty down to around 19 in 2005 from around 30 in 2000.

The other three divisions, namely Rajshahi, Khulna and Barisal, are lagging behind in terms of poverty reduction. Rajshahi division has been able to achieve reduction in poverty in a limited scale—upper level poverty head count rates decreased 6 percentage points from 57 per cent and extreme poverty decreased 8

percentage points from 43 per cent in 2000. The urban areas of Rajshahi division have even registered an increase in the upper level poverty rate. Khulna and Barisal divisions have registered insignificant gains, if any, in terms of poverty reduction. In all three divisions, urban areas have registered a reverse, actually an increase in the poverty rate, which is disturbing. If we compare figures for 1995-96 and of 2005, we find that the rate of extreme poverty in the national level has decreased from 36 per cent to 25 per cent; this reduction has not been shared by the laggard regions in particular, i.e. Rajshahi division has gained a reduction from 42 per cent to 35 per cent, Barisal division has gained a reduction from 44 per cent to 36 per cent and surprisingly Khulna division has actually remained stagnant at around 32 per cent. Therefore we note that though Bangladesh as a nation has gained in poverty reduction throughout the 1990s and this accelerated during the first half of the 2000s, there are regions in the country, particularly the divisions of Rajshahi, Khulna and Barisal, which could not achieve similar gains from the growth of national economy.

TABLE 2.1
INCIDENCE OF POVERTY (HEAD COUNT RATE) BY CBN METHOD, 2005, 2000 AND 1995-96

Poverty line and division	2005			2000		
	National	Rural	Urban	National	Rural	Urban
1. Using the Lower Poverty Line (Extreme Poverty)						
National	25.1	28.6	14.6	34.3	37.9	20.0
Barisal	35.6	37.2	26.4	34.7	35.9	21.7
Chittagong	16.1	18.7	8.1	27.5	30.1	17.1
Dhaka	19.9	26.1	9.6	34.5	43.6	15.8
Khulna	31.6	32.7	27.8	32.3	34.0	23.0
Rajshahi	34.5	35.6	28.4	42.7	43.9	34.5
Sylhet	20.8	22.3	11.0	26.7	26.1	35.2
2. Using the Upper Poverty Line						
National	40.0	43.8	28.4	48.9	52.3	35.2
Barisal	52.0	54.1	40.4	53.1	55.1	32.0
Chittagong	34.0	36.0	27.8	45.7	46.3	44.2
Dhaka	32.0	39.0	20.2	46.7	55.9	28.2
Khulna	45.7	46.5	43.2	45.1	46.4	38.5
Rajshahi	51.2	52.3	45.2	56.7	58.5	44.5
Sylhet	33.8	36.1	18.6	42.4	41.9	49.6
Poverty line and division		1995-96				
	National	Rural	Urban			
1. Using the Lower Poverty Line (Extreme Poverty)						
National	35.6	39.8	14.3			
Barisal	43.9	44.8	28.9			
Chittagong	32.4	35.3	12.1			
Dhaka	33.0	41.5	10.8			
Khulna	32.2	33.2	25.8			
Rajshahi	41.6	44.4	19.2			
Sylhet	--	--	--			
2. Using the Upper Poverty Line						
National	53.1	56.7	35.0			
Barisal	59.9	60.6	47.7			
Chittagong	44.9	47.2	29.2			
Dhaka	52.0	58.9	33.6			
Khulna	51.7	51.5	53.3			
Rajshahi	62.2	65.7	33.9			
Sylhet	--	--	--			

Source: BBS, HIES 2005 and HES, 1995-96 Report.

2.3.1.2 Distribution of Poor

GOB (2008) has documented the record for distribution of poor people within the overall distribution of population in the country based on the HIES 2005 data (Table 2.2). This provides us with an assessment of area-wise concentration of poor people in different divisions of the country. We notice that Dhaka division occupies 21 per cent of the total area of land and represents 32 per cent of the total population, whereas on the account of lower poverty incidence rate, it has 26 per cent of the poor population, thus a six percentage point lower concentration figure for poor people compared to share of population it represents (here poverty incidence is the upper poverty level head count rates of HIES 2005).

TABLE 2.2
NUMBER AND DENSITY OF POOR PEOPLE BY DIVISION, 2005

Division	Area	Population		Poverty		Poor		Population Density (per Sq. Km)	
	Sq. Km	per cent	Million	per cent	per cent	Million	per cent	Poor	All
Barisal	13297	9.01	8.9	6.42	52.0	4.6	8.3	346	669
Chittagong	33771	22.88	26.7	19.25	34.0	9.1	16.4	270	790
Dhaka	31120	21.09	44.7	32.23	32.0	14.3	25.8	460	1436
Khulna	22273	15.09	16.2	11.68	45.7	7.4	13.3	332	727
Rajshahi	34514	23.39	33.4	24.08	51.2	17.1	30.8	495	967
Sylhet	12596	8.54	8.8	6.34	33.8	3.0	5.4	238	699
Bangladesh	147571	100.00	138.7	100.00	40.0	55.5	100.00	376	940

Source: GOB (2008) from BBS.

Chittagong division has 23 per cent of total land and 19 per cent of total population, whereas it has a lower figure of around 16per cent of the total poor population, since it has a poverty incidence rate of 34 per cent only as against the national average of 40 per cent. On the other hand, Rajshahi, with around 23 per cent of land and 24 per cent of total population, has around 31 per cent of the total poor population, since it has a high poverty head count rate of 51 per cent. Rajshahi has the highest density of poor population within all the divisions–495 poor persons per square kilometer. Dhaka division has the second highest figure for density of poor population, but at the same time, it has the highest density of population per square kilometre, thus it has a higher number of poor people not because of higher level of poverty incidence, but because of large concentration of people, since it includes the geographical boundary of Dhaka city and its neighbouring regions. Sylhet division has the lowest concentration of poor persons per square kilometre.

Rajshahi division is, therefore, the most poverty-concentrated region in the country, followed by Barisal and Khulna divisions (see BBS and WFP 2004 and 2009 for discussion on local area estimation of regional mapping of poverty).

2.3.1.3 Intensity and Severity of Poverty

We need to examine not only the change in incidence of poverty in different divisions over time, but also the change in the intensity and severity of poverty. The most commonly used poverty measures are the group of measures known as the Foster, Greer and Thorbecke (FGT) measures. The incidence of poverty is measured by the "head-count index," which is the percentage of population living in households with a per capita consumption below the officially determined poverty line. The intensity (depth) of poverty is measured by the "poverty gap index," which estimates the average distance separating the poor from the poverty line as a proportion of that line (the mean value is taken over the whole sample with a zero distance allocated to the households who are not poor). A third category of poverty measure is the "squared poverty gap index," which is an average over the squared distance of the poor from the poverty line as a proportion of that line[1].

Table 2.3 reports the changes in the poverty gap index and the squared poverty gap index in the divisions within a ten-year timeframe; the values reported are based on the upper poverty line. The values of poverty gap index in 2005 for three laggard divisions of Rajshahi, Khulna and Barisal are double-digit, whereas for the other more economically advanced divisions of Dhaka, Chittagong and Sylhet the values are single-digit. We can compare these with corresponding values of Household Expenditure Survey (HES) Report 1995-96 and find that Dhaka and Chittagong divisions have gained impressive reductions in the poverty gap index, whereas gains for the other three divisions are not as much impressive. This implies that not only Dhaka and Chittagong divisions have lower incidence of poverty, they have achieved lower intensity of poverty as well. There is lower percentage of people within the total population in these divisions who stay in households with per capita consumption level below the poverty line. In addition to this, an average poor person in these divisions has a smaller distance from the poverty line, therefore, the depth or intensity that this person faces is lower. The opposite statement is

[1] All three measures are modeled in the following equation: $P_\alpha = 1/n \sum [(z - y)/z]^\alpha$ with α= 0, 1 or 2: (1) the head count index corresponds to α=0, (2) the poverty gap index corresponds to α=1 and (3) the squared poverty gap index corresponds to α=2. The poverty head-count index is most popular because of its simplicity; whereas more interesting aspects of the poverty situation can be examined by the second and the third measure of poverty (see BBS 1995-96 HES Report).

applicable to the laggard divisions. For example, we can consider the case of Barisal division. In this division, around 60 per cent of population was below upper poverty line in 1995-96 and this percentage only reduced to 52 per cent by 2005. Yet the poverty gap index value decreased only from 18 to 15.5. While poverty incidence has lessened by 8 percentage points, the poor in this division could not achieve noticeable reduction in his/her distance from the official poverty line based on cost-of-basic needs requirements.

The values of squared poverty gap index of the divisions in 2005, 2000 and ii) 1995-96 in Table 2.3 provide information of severity of poverty. The table also exhibits a similar aspect of regional disparity in poverty measure. Barisal division is a particular cause of concern since it has the highest poverty incidence rate of 52 per cent, the highest poverty gap index value of 15.5 and also the highest squared poverty gap index value of 6.3 in the HIES 2005. This division, therefore, has the most widespread, deep and severe poverty level among all the divisions. However, due to smaller population, it does not have the highest concentration of poor people, which rank belongs to Rajshahi division. There is a higher percentage of population living in below-poverty households in this division, and an average poor person is further away from the poverty line; if we take the squared values of this distance itself, this division ranks higher, compared to any other division in the country.

TABLE 2.3
POVERTY GAP AND SQUARED POVERTY GAP BY DIVISION, 2005, 2000 AND 1995-96 (BY USING THE UPPER POVERTY LINE)

Division	HIES 2005 Poverty Gap			Squared Poverty Gap			HIES 2000 Poverty Gap			Squared Poverty Gap		
	Total	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban
Barisal	15.5	16.3	10.7	6.3	6.6	4.3	13.7	14.2	8.3	4.7	4.9	3.1
Chittagong	6.3	6.5	5.6	1.7	1.7	1.6	11.3	11.2	11.4	3.9	3.9	4.2
Dhaka	6.9	8.6	4.0	2.1	2.7	1.1	12.9	15.9	6.6	4.7	6.0	2.2
Khulna	10.8	10.4	12.3	3.5	3.2	4.6	10.0	10.0	10.3	3.0	2.9	3.7
Rajshahi	11.9	12.0	11.4	3.8	3.8	3.9	16.2	16.5	13.6	6.2	6.3	5.4
Sylhet	7.2	7.6	4.5	2.1	2.2	1.5	9.2	9.0	12.5	2.8	2.7	4.1
National	9.0	9.8	6.5	2.9	3.1	2.1	12.8	13.7	9.1	4.6	4.9	3.3

	HES 1995-96 Poverty Gap			Squared Poverty Gap		
Division	Total	Rural	Urban	Total	Rural	Urban
Barisal	18.0	18.1	16.7	7.1	7.1	7.7
Chittagong	10.5	11.2	5.9	3.4	3.6	1.7
Dhaka	14.9	17.1	8.9	5.8	6.7	3.4
Khulna	12.4	11.7	16.6	4.3	3.9	7.0
Rajshahi	17.9	19.1	8.5	7.0	7.6	2.9
Sylhet	--	--	--	--	--	--
National	14.4	15.4	9.2	5.4	5.7	3.4

Source: BBS, HIES 2005 and HES, 1995-96 Report.

2.3.1.4 Income and Growth Indicators

Though the issue of regional disparity has gained considerable attention among the policymakers in recent times (GoB 2008), research in this area could not progress due to lack of adequate data. Firstly, we consider the case of the HIES data. The *Household Income and Expenditure Survey* (HIES), conducted with a five-year interval, by the Bangladesh Bureau of Statistics (BBS), is the only officially recognised survey of household income, consumption and expenditure profiles in the country (we note that the last three rounds, referenced earlier, are of 1995-96, 2000 and 2005 and a new round for 2010 is being conducted now). The sample design of the HIES has the pattern that it is nationally representative only up to the division level, but it is not representative below the division level, such as at the zila, upazila or union level (see HIES documents of BBS). Therefore, the HIES data is ineffective if one wants to go beyond the division level with regard to the regional disparity issue, and examine issues within the five year intervals. Secondly, we consider the case of the BBS data with regard to national income accounting, which is disseminated through the *Statistical Yearbooks of Bangladesh* and also reported in the annual *Bangladesh Economic Reviews* from the Ministry of Finance, Government of Bangladesh. The BBS used to compile national income accounting data in the national level as well as in the regional level (such as for each zila) and this practice continued till 2000. Currently, the BBS no longer compiles regional national income accounting data; as a result, the available regional gross domestic product data series is only up to the year 2000.

Here we examine a particular compilation of data with a longer time horizon, which can shed lights on the issue of regional disparity from a separate perspective (Table 2.4). Here is a set of data on per capita gross regional product (regional GDP) of the former (greater) districts from 1982 to 1999-2000, exhibited at constant prices in two sets of base prices: one set is the 1984-85 prices and the other set is the 1995-96 prices, to note that this is a compilation of the BBS data of those years (Hossain 2006). The per capita income level at the regional level was less dispersed by the year 1982 with the first set of prices, and within 15 years, the greater districts had divergent growth patterns. The greater districts of Chittagong Hill Tracts, Chittagong, Khulna, Patuakhali, Dhaka and Sylhet started out in 1982 with higher per capita regional income compared to others and they maintained their overall lead in 1997 as well. Some other greater districts such as Pabna, Rajshahi and Rangpur started out as laggard regions and ended likewise. There are indications of a slow "catching-up" process at work, as a simple ordinary regression of annualized per capital regional product on initial level of per capital level exhibits a statistically significant negative coefficient value for the initial level of per capita regional

output[2]. This implies that the growth performance of the laggard regions was actually better within this time frame.

TABLE 2.4
PER CAPITA GROSS REGIONAL PRODUCTS OF GREATER DISTRICTS, 1982-83 TO 1999-2000

SL.	Greater District	per capita gross regional product at constant prices (TK)							
		(base: 1984-85 prices)			(base: 1995-96 prices)				
		1982-83	1993-94	1997-98	1995-96	1996-97	1997-98	1998-99	1999-00
1	Dinajpur	3547	4698	4689	11824	12372	12758	13307	13893
2	Rangpur	3201	4232	4450	9947	10512	10925	11316	11785
3	Bogra	3723	4793	5146	10776	11299	11796	12260	12799
4	Rajshahi	3170	4313	4471	11490	11906	12192	12907	13639
5	Pabna	3152	3728	3868	12103	12525	13103	13600	14203
6	Kushtia	3402	4755	5115	12311	12831	13383	13858	14535
7	Jessore	3286	4949	5172	12782	13300	13829	14192	14775
8	Khulna	4461	5627	5985	14292	14902	15026	15885	16626
9	Patuakhali	4305	5010	5627	13292	13544	13901	14726	15570
10	Barisal	3861	4842	4951	10851	11422	11302	11939	12503
11	Tangail	3922	4504	4800	9803	10295	10394	10560	11179
12	Jamalpur	4097	5194	5185	9995	10479	10897	11382	11853
13	Mymensingh	3529	4199	4473	11193	11214	11624	12092	13007
14	Dhaka	4276	5291	5963	25592	26332	27524	28157	29233
15	Faridpur	3292	4908	5229	9884	10441	10616	10865	11474
16	Sylhet	4325	5045	5396	11017	11833	12778	13856	14886
17	Comilla	3344	4587	4931	10419	10624	11055	11163	11636
18	Noakhali	3270	3935	4170	10522	10807	10873	11587	12197
19	Chittagong	5813	7689	8465	19828	20442	21257	22193	22979
20	Chittagong HT	17400	14400	16342	13845	14016	14315	15054	15753

Source: Hossain in Hossain *et al.* (2006), from BBS data.

[2] Simple ordinary least squares regression with 20 observations specifying annualized growth rate of per capita regional product at constant price in between 1982 and 1997 being regressed on only the base level of per capita provides a statistically significant negative value of estimated coefficient for the base level of per capita income with p-value at 0.00, adjusted R-square at 0.50.

Yet the analysis is somewhat different once we take the newer base price levels of 1995-96. A continuous time series of five years from 1995-96 to 1999-00 reveals that large differences were apperant by 1999-00. Dhaka, Chittagong, Chittagong HT and Khulna are the greater districts which are clearly ahead in this regard, while Rangpur, Tangail, Jamalpur, Faridpur and Comilla are the regions that have achieved much lower level of regional per capita output, and the differences between the two groups are considerable. A simple regression, similar to the one mentioned earlier, did not provide any statistical significance; therefore, we did not find indications of "catching-up" within this short five years. In fact, this piece of data indicates that per capita income is much higher in regions with "growth poles," such as the capital city itself, or the port cities and regions with historical advantages of being considered as commercial centres. On the other hand, other regions are lagging behind and the gap between the advanced and the laggard regions may even have widened in recent times.

2.3.1.5 Poverty Indicators at the Upazila Level

We have identified that up till 2005 the eastern and southeastern regions of the country (Dhaka, Chittagong and Sylhet divisions) have been more economically advanced, whereas the northern, western and the southwestern regions of the country (Rajshahi, Khulna and Barisal divisions) have been economically lagging behind.

The above pattern is observed when the data is classified according to administrative divisions. However, such classification often obscures the prevailing disparity between different districts or subdistricts within the same division as well as in the other divisions. So a more detailed breakdown of the data, such as according to former districts, districts, and sudistricts (upazilas), is in order. One useful resource is the *Poverty Mapping Report* by the World Bank, BBS and WFP (2009). This is a poverty mapping exercise which combines data of the HIES 2005 with a segment of data from the latest population census of 2001 by a statistical procedure termed as "small area estimation". The *2009 Poverty Mapping Report* provides estimates of population below the upper poverty line and the lower poverty line at the upazila/thana level. We have aggregated the upper level line poverty head count data into the district level by using proportion of population of each upazila/thana in 2001 census within the district as the relevant weight. This gives us aggregated district-wise upper level poverty headcount rate based on the HIES 2005 and the population census data of 2001 as sources of information. We have listed the most laggard 21 districts out of the total 64 districts according to descending order of aggregated head-count index values evaluated at their respective upazila/thana level (Table 2.5).

TABLE 2.5
MOST LAGGARD 21 DISTRICTS AND 21 UPAZILAS, 2005

SL.	District	Division	Hcnt (Up.)	MMax	Min	Upazila	District	Hcnt (Up)
1	Nilphamari	Rajshahi	0.70	0.76	0.59	Ali Kadam	Bandarban	0.78
2	Kurigram	Rajshahi	0.68	0.74	0.64	Galachipa	Patuakhali	0.77
3	Bandarban	Chittagong	0.65	0.78	0.48	Thanchi	Bandarban	0.77
4	Patuakhali	Barisal	0.63	0.77	0.36	Dasmina	Patuakhali	0.77
5	Rangpur	Rajshahi	0.62	0.67	0.55	Shyamnagar	Satkhira	0.76
6	Barguna	Barisal	0.61	0.67	0.48	Dimla	Nilphamari	0.76
7	Barisal	Barisal	0.60	0.72	0.33	Rowangchhari	Bandarban	0.75
8	Satkhira	Khulna	0.59	0.76	0.46	Ruma	Bandarban	0.75
9	Mymensingh	Dhaka	0.59	0.68	0.51	Kaliganj	Satkhira	0.75
10	Jamalpur	Dhaka	0.59	0.68	0.50	Kala Para	Patuakhali	0.74
11	Jessore	Khulna	0.57	0.66	0.43	Jaldhaka	Nilphamari	0.74
12	Panchagarh	Rajshahi	0.56	0.59	0.48	Char Rajibpur	Kurigram	0.74
13	Khulna	Khulna	0.53	0.73	0.33	Roamari	Kurigram	0.74
14	Lalmonirhat	Rajshahi	0.53	0.57	0.49	Dacope	Khulna	0.73
15	Sirajganj	Rajshahi	0.53	0.56	0.51	Teknaf	Cox's Bazar	0.73
16	Gaibandha	Rajshahi	0.52	0.60	0.50	Naikkhongchhari	Bandarban	0.73
17	Thakurgaon	Rajshahi	0.52	0.56	0.51	Kishoreganj	Nilphamari	0.72
18	Cox's Bazar	Chittagong	0.52	0.73	0.39	Bakerganj	Barisal	0.72
19	Dinajpur	Rajshahi	0.50	0.55	0.46	Domar	Nilphamari	0.71
20	Natore	Rajshahi	0.50	0.53	0.45	Assasuni	Satkhira	0.70
21	Pabna	Rajshahi	0.49	0.54	0.45	Nageshwari	Kurigram	0.70

Source: Authors' Calculation from BBS.

Table 2.5 indicates that Rajshahi division has the highest number of districts (11) which have the highest aggregated upper level poverty head count index. Out of a total of 16 districts in Rajshahi division, 11 are in the list of districts with highest aggregated poverty rate. This is followed by Barisal division, which has 3 districts out of a total of 6 that are listed here. In addition to this, Khulna division also has 3 districts that are listed here, out of a total of ten districts. Chittagong division has 2 districts in the list, whereas Dhaka division also has 2 districts. Out of a total of 4 districts in Sylhet division, none of them are listed in this particular poverty list. Although Rajshahi division dominates the district list, the scenario is more complicated in the upazila list, though former is an aggregate of the latter. The pattern of poverty at the upazila level does not necessarily follow the so-called "east-west divide." Some of the upazilas listed here, with highest level of upper poverty level head count rate are located in otherwise advanced regions, such as even in the Chittagong district. There are some upazilas in the former Chittagong Hill Tracts (CHT) region, which have recorded very high scores in terms of poverty rate, for example Ali Kadam, Thanchi, Rowangchhari, Ruma and Naikkongchhari upazilas of Bandarban district. Patuakhali district in Barisal division also has some

upazilas that are listed here, such as Galachipa, Dasmina and Kala Para. The upazila list implies that there are "poverty pockets" in the country, and these "pockets" are located mostly either in the CHT region, the coastal belt and the Jamuna river bank-erosion prone regions. In the following sections, we investigate this pattern of regional disparity further, discussing other aspects of this phenomenon.

2.3.2 Education Outcomes

2.3.2.1 Data at the National Level

Ensuring primary education for both boys and girls in all the countries of the world is one of the important targets under the MDGs. This section explores progress of the country in achieving this goal using different indicators. For this purpose, education indicators from the Directorate of Primary Education (DPE) and the *Multiple Indicator Cluster Survey 2006* (MICS) are used to show progress and spatial differences in educational attainment.

The *School Survey Report 2007,* published by the DPE, reports that the net enrollment rate in primary education has reached 91.1 per cent in 2007, which was only 60.5 per cent in 1990. According to the MICS 2006, net intake rate in primary education at the national level is 67.4, implying that 67.4 per cent of children of primary school-entry age are attending the first grade. It is observed that there is a positive correlation between mothers' education and the net intake rate. Only 61.7 per cent of the primary school-entry age children are attending the first grade whose mothers have no education, whereas this is 75.8 per cent for children whose mothers have completed secondary education. Similarly, the net intake rate is the highest for the richest segment (72.0 per cent) of the sample households and the lowest for the poorest households (63.3 per cent).

2.3.2.2 Data at the Sub-national Level

Non-income poverty measures such as education outcomes present a different picture of regional disparity compared to the income measures of poverty. Table 2.6 presents some key education outcomes data obtained from the MICS 2006 report. At the divisional level, net intake rate is the highest in Khulna (74.5 per cent), followed by Sylhet (73.5). On the other hand, this ratio is the lowest in Barisal (62.6 per cent), followed by Dhaka (64.2 per cent). It is also observed that children in urban slums (44.9 per cent) and the tribal areas (49.1 per cent) have very limited access to primary education (not showed here). There is not much difference between rural and urban children.

TABLE 2.6
KEY EDUCATION OUTCOMES, 2006

	Net intake rate in primary education	Net primary school attendance rate	Net secondary school attendance rate	Net Primary school completion rate	Transition rate to secondary school
Barisal	62.6	84.1	42.2	52.1	87.8
Chittagong	66.5	83.2	38.0	44.4	91.8
Dhaka	64.2	78.3	37.6	44.3	89.1
Khulna	74.5	87.0	46.5	53.3	91.9
Rajshahi	68.5	79.9	39.4	47.6	87.2
Sylhet	73.5	81.7	30.1	44.3	82.6
National	67.4	81.3	38.8	46.7	89.1

Source: MICS 2006.

Net primary school attendance rate at the national level is more satisfactory than the net intake rate. Around 81.3 per cent of children of primary school age are found to be attending primary school at the national level. Though the performance of divisions for the same indicator does not significantly diverge from the national levels this is relatively better in Khulna division (87.0 per cent). The scenario in urban slums is the worst where the rate is only 52.3 per cent and this is also lower among the tribal children (67.9 per cent).

However, the progress in primary education presented above reflects only a partial picture of the primary education system of the country. According to the MDG Bangladesh Progress Report 2008, the country was not in a position to reach the target of full primary education completion rate by 2008.

The MICS survey found that the net primary completion rate at the national level is only 46.7 per cent, indicating that only 46.7 per cent of the children completed the last grade of primary education in the sample of primary school completion-age children. Female children were more likely to complete primary education than their male counterparts, where the net completion rate was only 41.5 per cent for male children and 52.1 per cent for female children. The performance of Khulna (53.3 per cent) and Barisal (52.1 per cent) divisions are relatively better than the national level. One of the most important reasons for such low completion rate is poverty, as reflected in the MICS survey that net primary school completion rate is only 30.7 per cent in the poorest quintile, while it is 46.7 per cent in the richest quintile. Since the children of better off households are more likely to complete primary education, they are also more likely to be enrolled in the secondary school. At the national level, 89 per cent of children are found to be admitted in secondary

level, among those who were in the last grade of primary school during the previous school year. Overall, Khulna division is the best performer in terms of all the education outcomes presented in Table 2.6.

If we examine the data at district level, we can find that progresses in some of the districts are much worse than the divisional level scenario presented above. Table 2.7 shows the name of the worst performing districts according to the ranking based on net primary school completion rate. The worst case is found in the Bhola district of Barisal Division. Three districts from Rajshahi division (Nawabganj, Kurigram and Naogaon) fall in the worst 15 districts in terms of net primary school completion rate. Four districts from Dhaka and Chittagong division and two districts of Sylhet division fall in this category. Interestingly, Sylhet district itself is ranked third among the top performer in terms of net primary school completion rate (not showed in the table). Six of these districts (Bhola, Habiganj, Sunamganj, Cox's Bazar, Sherpur and Nawabganj) not only have low net primary school completion rate they are also within the worst performing group in terms of transition rate to secondary school.

TABLE 2.7
PRIMARY SCHOOL COMPLETION AND TRANSITION TO SECONDARY SCHOOL (15 WORST PERFORMING DISTRICTS), 2006

Rank (Ascending)	District	Division	Net primary school completion rate	Transition rate to secondary education
1	Bhola	Barisal	32.6	79.4
2	Nawabganj	Rajshahi	33.4	83.2
3	Sherpur	Dhaka	33.9	82.4
4	Habiganj	Sylhet	34.2	80.6
5	Chuadanga	Khulna	34.8	90.2
6	Kurigram	Rajshahi	36.0	89.0
7	Mymensingh	Dhaka	36.2	90.0
8	Naogaon	Rajshahi	37.9	91.4
9	Cox's Bazar	Chittagong	39.0	82.2
10	Bandarban	Chittagong	41.0	94.0
11	Netrakona	Dhaka	41.1	79.4
12	Sunamganj	Sylhet	41.3	72.6
13	Lakshmipur	Chittagong	41.4	95.0
14	Faridpur	Dhaka	41.5	91.2
15	Noakhali	Chittagong	42.4	90.0

Source: MICS 2006.

Though it is observed that around 89 per cent surveyed children got admitted in the secondary level (who have completed their primary education in the previous

year), only 38 per cent secondary school age children are found to be attending secondary education level. Net attendance ratio at secondary level in the rural areas (36.5 per cent) is 8 per cent lower than that in the urban areas (44.6 per cent). The ratio drops to 18.1 per cent for the poorest quintile, whereas it is 60.2 per cent for the richest quintile. Table 2.8 shows the performance of the districts ranked in terms of net attendance rates at secondary level. Netrokona district from Dhaka division, Cox's Bazar district from Chittagong division and Habiganj district from Sylhet division have been found out to be the three worst performing districts in terms of secondary school net attendance rates.

TABLE 2.8
SECONDARY SCHOOL NET ATTENDANCE RATE (WORST PERFORMING DISTRICTS), 2006

Division	District	Male net attendance rate	Female net attendance rate	Total net attendance rate
Dhaka	Netrokona	20.2	28.9	24.2
Chittagong	Cox's Bazar	23.2	28.7	26.0
Sylhet	Habiganj	22.4	30.1	26.2
Chittagong	Bandarban	26.6	28.8	27.6
Sylhet	Sylhet	26.3	30.1	28.2
Dhaka	Sherpur	26.0	30.7	28.4
Dhaka	Kishoreganj	23.7	34.2	29.0
Rajshahi	Kurigram	27.9	31.2	29.6
Barisal	Bhola	28.4	30.9	29.7
Sylhet	Sunamganj	29.7	30.0	29.9
Rajshahi	Sirajganj	32.8	31.7	32.2
Rajshahi	Nawabganj	27.3	37.3	32.4

Source: MICS 2006.

One of the important ways for women empowerment is education and the country has achieved significant success in ensuring education gender parity at both primary and secondary levels. The gender parity index (proportion of girls divided by proportion of boys) for primary and secondary education respectively are 1.06 per cent and 1.14 per cent. Primary school net attendance ratio for girls of the poorest quintile of the sample households is 7.5 per cent higher than the boys of the same group. Similarly, in secondary level, girls' ratio is higher by 8 per cent over boys for the poorest group. One reason for such large gap in net attendance ratio between boys and girl is the poorer households emphasise on empowering their female children with education. Another factor behind this result may be that the boy children of poor households start working for money at their early ages.

Reducing illiteracy is an important precondition for the socioeconomic development process. In the earlier discussion, it is observed that children education is positively correlated with the education of mothers. Many government and non-government organisations are working in different parts of the country to reduce illiteracy among adult population. According to the *Sample Vital Registration System* Report (SVRS) of 2007 the adult literacy rate (measured by the percentage of population over 15 years of age who can write a letter in the same age group) has increased to 58.3 per cent in 2007 from 37.2 per cent in 1991. Though adult literacy rate is higher for male (63.1 per cent) than their female (53.5 per cent) counterparts, the latter increased at a higher rate than the former since 1991. To assess regional difference in adult literacy rate, women aged 15-24 years can be used from the MICS Report of 2006. Under this definition a women is literate if she can read a short simple statement in Bengali or completed secondary or higher education.

TABLE 2.9
DISTRICTS WITH LESS THAN 60 PER CENT ADULT LITERACY RATE, 2006

Division	District
Barisal	Bhola
Dhaka	Jamalpur
	Kishorganj
	Netrakona
	Sherpur
	Tangail
Rajshahi	Kurigram
	Sirajganj
Sylhet	Habiganj
	Sunamganj
Chittagong	Bandarban
	Cox's Bazar

Source: MICS 2006.

Table 2.9 lists the districts where less than 60 per cent of 15-24 aged women are found to be literate. Division wise adult literacy (woman) is the lowest in Sylhet division (62.7 per cent) and highest in Khulna division, followed by Chittagong (74 per cent), Barisal (72.3 per cent), Dhaka (68.5 per cent) and Rajshahi division (67.9 per cent). Table 2.9 also shows that five districts in Dhaka division fall in the list of bottom twelve districts.

2.3.3 Health Outcomes

The country has achieved significant progress over the last two decades in some important health indicators. Table 2.10A and 2.10B present comparison among the South Asian Countries, as reported in the *World Health Statistics 2008*.

Life expectancy at birth in Banlgadesh is now equivalent those to India and Pakistan, neonatal mortality rate is lower than those of these two countries. The country also performed better in MDG4—infant mortality rates and under five mortality rates declined significantly from the 1990 level and is now below the corresponding figures of India and Pakistan. However, maternal mortality rate and adult mortality rate are still the highest among the south Asian countries. It is clear that Sri Lanka out performs all others in these indicators and the country still needs to progress a long way to reach that level.

According to the SVRS data, in the year 2007 under-five mortality rate declined to 60 (per 1,000 live births) and infant mortality rate (IMR) reduced to 43 (per 1,000 live births) whereas the MDG target is 48 for the former and 31 for the latter. However, regional differences are reflected for both of these indicators in the SVRS 2007 report. Khulna division stands in a much better situation in terms of both of these indicators and already achieved the MDG target for both of these indicators.

TABLE 2.10A
PROGRESS OF BANGLADESH VIS-À-VIS OTHER SOUTH ASIAN COUNTRIES

	Life expectancy at birth (years) Both sexes			Neonatal mortality rate (per 1,000 live births)	Infant mortality rate (per 1,000 live births) Both sexes			Under-5 mortality rate (probability of dying by age 5 per 1,000 live births) Both sexes		
	1990	2000	2006	2004	1990	2000	2006	1990	2000	2006
Bangladesh	55	61	63	36	100	66	52	149	92	69
India	58	61	63	39	82	66	57	115	89	76
Pakistan	58	61	63	53	100	85	78	130	108	97
Sri Lanka	67	69	72	8	26	16	11	32	19	13

Source: World Health Statistics 2009.

TABLE 2.10B
PROGRESS OF BANGLADESH VIS-À-VIS OTHER SOUTH ASIAN COUNTRIES

	Adult mortality rate (probability of dying between 15 to 60 years per 1000 population)			Maternal mortality ratio (per 100, 000 live births)
	Both sexes			Female
	1990	2000	2006	2005
Bangladesh	319	254	254	570
India	278	258	241	450
Pakistan	250	218	206	320
Sri Lanka	241	217	166	58

Source: World Health Statistics 2009.

TABLE 2.11
UNDER FIVE (5) MORTALITY RATE PER 1,000 LIVE BIRTHS BY DIVISION, 2007

Division	Total	Rural	Urban
Barisal	63.27	65.78	46.0
Chittagong	66.49	69.65	54.6
Dhaka	59.38	60.82	56.0
Khulna	40.14	39.99	40.7
Rajshahi	65.03	64.68	67.5
Sylhet	57.63	63.34	20.4
National	60.05	61.59	54.2

Source: SVRS 2007.

District level data in 2007 show that 24 districts have already achieved the under-five mortality rate target (31 per 1,000 live births) set under MDG and 24 districts are expected to reach the target by 2015. However, 16 districts are reported to have under-five mortality rate over 72, which are unlikely to achieve the target by 2015. Table 2.12 reports the districts which are unlikely to reach the under five mortality rate target by 2015.

TABLE 2.12
DISTRICTS WITH UNDER FIVE MORTALITY RATE OVER 72 PER 1,000 LIVE BIRTHS, 2007

Division	District	Division	District
Rajshahi	Kurigram	Sylhet	Maulvibazar
	Nilphamari		Sunamganj
	Rangpur	Barisal	Barisal
	Sirajganj		Bhola
Dhaka	Gopalganj		Jhalokati
	Jamalpur	Chittagong	Cox's Bazar
	Kishorganj		Lakshmipur
	Shariatpur		Noakhali

Source: SVRS 2007.

From 2001 to 2007, infant mortality rate reduced significantly in all divisions and in a much faster rate in Khulna division. In 2007, infant mortality rate is lower than national average in two poorest divisions: Khulna and Barisal, and marginally lower than national IMR in Chittagong division. Three other divisions Dhaka, Rajshahi and Sylhet fall below national rate.

Table 2.13
DIVISION WISE INFANT MORTALITY RATE, 2007

Division	2001			2007		
	Both Sex	Male	Female	Both Sex	Male	Female
Barisal	51	53	50	37	44	29
Chittagong	58	60	54	42	41	44
Dhaka	56	57	55	46	46	45
Khulna	51	49	52	27	30	25
Rajshahi	59	61	57	48	51	44
Sylhet	61	63	58	46	51	42
National	56	58	55	43	45	41

Source: SVRS 2007.

In 20 districts infant mortality rate is less than 31 per thousand live births, which have already achieved the target, and the remaining 17 districts are expected to achieve the target by 2015. District level disaggregation in child and infant mortality rates highlights the fact that we need to take immediate measures in the laggard districts to reduce child mortality rates.

TABLE 2.14
INFANT MORTALITY RATE PER 1,000 LIVE BIRTHS BY SEX AND ZILA, 2007

Ranking Descending	Division	District	Both Sex	Male	Female
1	Rajshahi	Kurigram	99.40	108.94	89.26
2	Sylhet	Sunamganj	82.89	94.98	69.66
3	Barisal	Jhalokati	80.33	70.61	91.20
4	Dhaka	Jamalpur	70.30	74.66	65.72
5	Dhaka	Kishoreganj	69.47	63.25	75.69
6	Chittagong	Lakshmipur	67.77	49.34	88.99
7	Rajshahi	Rangpur	67.32	50.71	88.52
8	Rajshahi	Nilphamari	66.85	64.52	69.03
9	Chittagong	Cox'sbazar	63.88	76.32	51.57
10	Sylhet	Maulavibazar	63.50	76.64	48.65
11	Dhaka	Gopalganj	61.65	81.84	46.37
12	Rajshahi	Sirajganj	60.14	81.85	39.00
13	Dhaka	Faridpur	58.06	52.14	65.00
14	Dhaka	Madaripur	56.70	74.54	38.35
15	Chittagong	Noakhali	55.61	55.38	55.84
16	Chittagong	Brahmanbaria	55.06	50.51	60.07
17	Rajshahi	Panchaghar	54.37	58.86	50.17
18	Rajshahi	Lalmonirhat	54.15	69.15	38.20
19	Rajshahi	Gaibandha	53.25	67.99	39.60
20	Chittagong	Feni	52.83	74.95	27.36
21	Khulna	Meherpur	50.89	60.05	40.22

Source: SVRS 2007.

Despite making significant progress in reducing maternal mortality rate since 1991, it is still one of the highest among South Asian countries (MDGPR 2008). By the year 2007, the maternal mortality rate at the national level stood at 3.51 per 1,000 live births (Table 2.15). With regards to division breakdown of the rate, Sylhet division is the worst performer with the highest maternal mortality rate of 5.55 per 1,000 live births in total and 5.72 in the rural areas. This is apperantly a puzzle that high performers in economic indicators may exhibit poor performances in some other measurements, such as non-economic measurements, e.g., education and health. We notice that Sylhet division is actually such a case. Complex social and institutional factors may have contributed to this situation. One plausible explanation could be that although remittances inflows are significantly high in this division but these are external sources of income generation, not entirely endogenous to the society' own development path. For that reason this region's good performances in economic indicators are not being equally matched by similar performances in human capital indicators.

TABLE 2.15
MATERNAL MORTALITY RATE PER 1,000 LIVE BIRTHS BY DIVISION AND LOCALITY, 2007

Division	Total	Rural	Urban
Barisal	5.41	5.45	5.15
Chittagong	3.01	3.31	1.91
Dhaka	2.66	3.10	1.61
Khulna	4.88	4.93	4.67
Rajshahi	3.52	3.82	1.41
Sylhet	5.55	5.72	4.48
Total	3.51	3.86	2.19

Source: SVRS 2007.

Maternal mortality is linked with the choice of place of delivery, lack of proper assistance during delivery and lack of accessibility to antenatal care, etc. The MICS (2006) reports that around 82.2 per cent child were delivered at home in the survey of women aged 15-49 years who gave birth in the two years preceding the survey. Only 16 per cent of the children were delivered in health facility. Only 4.8 per cent children of the poorest quintile were delivered at heath facility, whereas it is 47.1 per cent for the richest households. Delivery at health facility is the lowest in Barisal (10.3 per cent) and the highest in Khulna (23.6 per cent). Home delivery is the highest among the tribal population (93.8 per cent), followed by the slum dwellers (90.9 per cent). Table 2.16 reports the districts which have recorded less than 10 per cent delivery in health facilities.

TABLE 2.16
DISTRICTS WITH LESS THAN 10 PER CENT DELIVERY IN HEALTH FACILITIES, 2006

Division	District
Barisal	Barguna
	Barisal
	Bhola
	Patuakhali
Chittagong	Bandarban
	Brahmanbaria
	Cox's Bazar
	Lakshmipur
	Noakhali
Sylhet	Habiganj
	Sylhet
Dhaka	Jamalpur
	Kishoreganj
	Madaripur
	Netrokona
	Shariatpur
	Sherpur
Rajshahi	Gaibandha
	Kurigram
	Lalmonirhat
	Nawabganj
	Sirajganj

Source: MICS 2006.

Antenatal care is also important for safe delivery, which is comparatively low in Bangladesh. Only 56.2 per cent of the mother aged 15-49 who gave birth in the two years preceding the survey received antenatal care at least once during their pregnancy (Table 2.17). Habiganj district in Sylhet division has recorded the highest percentage of 69.5 per cent of mothers who did not receive any antenatal care. Closely following is the Sherpur district in Dhaka division which has recorded a high 66.2 per cent who did not receive antenatal care of any form. The disparity between the richest and the poorest quintile of households is very large, only 27.1 per cent of the poorest quintile received antenatal care, whereas 82.1 per cent of the richest received the service.

TABLE 2.17
DISTRICTS WITH HIGH PERCENTAGE OF WOMAN NOT RECEIVING ANTENATAL CARE, 2006

Ranking (Worst Performer First)	Per cent distribution of women aged 15-49 who gave birth in the preceding two years					
	District	Division	Medical doctor	Nurse / midwife	Community health worker	No antenatal care received
1	Habiganj	Sylhet	21.8	2.9	2.1	69.5
2	Sherpur	Dhaka	26.2	4.1	2.1	66.2
3	Sirajganj	Rajshahi	17.4	4.1	8.1	65.1
4	Barisal	Barisal	25.2	6.1	0.0	63.9
5	Mymensingh	Dhaka	20.8	10.7	3.8	62.9
6	Lakshmipur	Chittagong	27.6	1.7	1.7	62.1
7	Gopalganj	Dhaka	32.1	4.9	0.0	61.1
8	Rangamati	Chittagong	32.9	3.9	3.3	57.9
9	Satkhira	Khulna	24.8	15.9	0.9	57.5
10	Brahmanbaria	Chittagong	30.5	7.9	2.1	56.1
11	Madaripur	Dhaka	27.6	10.0	3.5	55.9
12	Nawabganj	Rajshahi	29.4	10.7	4.5	55.4
13	Noakhali	Chittagong	33.7	4.0	1.0	55.3
14	Shariatpur	Dhaka	28.8	7.1	5.8	55.1
15	Bhola	Barisal	24.3	10.2	4.0	53.7
16	Narsingdi	Dhaka	34.9	9.1	0.5	53.6
17	Bagerhat	Khulna	30.2	14.2	0.9	52.8
18	Narail	Khulna	33.1	5.5	5.5	52.5
19	Sunamganj	Sylhet	33.2	7.5	3.7	52.2
20	Gazipur	Dhaka	33.9	10.5	3.2	51.6
21	Manikganj	Dhaka	30.3	9.8	7.6	51.5
National			37.1	10.6	4.6	43.8

Source: MICS (2006).

2.3.4 Agriculture

2.3.4.1 Regional Variations in Agricultural Production

The agricultural sector has contributed around 21 per cent of the national GDP and provided jobs of 48 per cent of labour force in recent years, and these percentage figures have been on a slow and steady decline (G0B 2009). Yet this sector is the backbone of the rural economy and is crucially important for welfare of the country as a whole.

Large spatial variations exist in terms of crop production in the country; this is in line with the differences in soil characteristics, weather factors, agricultural cropping pattern, irrigation and agricultural credit distribution, etc. Along with crop production, regional variations can also be found in fisheries and forestry. We examine a record of regional variation in production of rice (Appendix Table 2.24). Rice is grown in every district of the country: while it is noticeable that land under rice cultivation is gradually decreasing in most of the districts, yield rate is increasing at the same time. Data on district-wise rice acreage do not match clearly with the previously discussed regional poverty data. Districts such as Rangpur and Rajshahi are found to be major rice producing areas, whereas their corresponding records for poverty level are not impressive. An additional record of regional variation in crop production is the record for district-wise wheat production (Appendix Table 2.1). Wheat is not produced in all the districts, and as such areas under cultivation for wheat and yield rate are decreasing for this crop at the same time. Dinajpur, Rangpur, Rajshahi and Comilla are the prominent regions in terms of wheat production.

In terms of agricultural input use, irrigation coverage is the most important indicator. There has been a rapid increase of irrigation coverage (sum of power pump, deep tube-well, shallow tube-well, hand tube-well, canals and traditional) in some particular districts, such as Dinajpur (222 per cent increase, during 1990-91 to 2005-06), Kushtia (165 per cent), Khulna (134 per cent) and Jessore (125 per cent). On the other hand, there are some other regions where the increase has been moderate, i.e., Chittagong (15 per cent) and Sylhet (28 per cent). Therefore, irrigation coverage figures point to some form of "catching-up" process at work where the previously unirrigated areas have now come under coverage. Yet to what extent this has contributed to reductions in regional income gap is an issue that requires a more detailed analysis.

An important issue at this point is to examine impact of growth of agricultural sector on the regional rural poverty rates (if any). Table 2.18 provides some data on this issue. This table lists annual compound rates of growth of agriculture sector and crop (agricultural sub-sector) for each greater district between 1980-81 and 1999-2000 and the corresponding head count rates in 1999. Jessore, Kushtia, Khulna, Rajshahi, Bogra and Dinajpur are the districts which have experienced large agricultural compound growth rates during this 20-year timeframe; out of these districts, Jessore and Kushtia have also recorded large crop sub-sector compound growth rates. A simple ordinary least squares regression of rural poverty head count rates on district-wise agricultural compound growth rates generates an estimated beta-coefficient of (−) 0.025 with standard error of 0.015 (p-value= 0.116), thus not statistically significantly different from the value of 0 at even 10 per cent level. This

may imply that even though there is a weak tendency that regions with high long-term agricultural growth rates end up with lower poverty head-count rates, this is not strong. The same least squares specification with crop sub-sector generates an estimated value of beta-coefficient with p-value at 0.107, implying a slightly stronger regression relationship. We note that what we find here is simply a weak statistical association; we do not establish causality in this exercise.

TABLE 2.18
AGRICULTURAL GROWTH AND RURAL POVERTY, 1980-81 TO 1999-2000

District	Annual compound rate of growth (1980-81-1999-00)		Rural poverty (Head count rate) (May 1999)
	Agriculture	*Crops*	
Barisal	0.770	0.050	0.510
Bogra	3.280	2.550	0.460
Chittagong	3.020	1.150	0.434
Chittagong H.T.	2.840	2.270	0.415
Comilla	2.910	1.810	0.449
Dhaka	2.070	0.740	0.434
Dinajpur	3.210	2.390	0.382
Faridpur	2.830	2.410	0.528
Jamalpur	2.510	1.890	0.498
Jessore	4.510	4.500	0.435
Khulna	3.490	1.420	0.392
Kushtia	3.620	3.420	0.333
Mymensingh	2.780	1.400	0.563
Noakhali	2.340	1.290	0.475
Pabna	2.210	1.180	0.469
Patuakhali	1.890	2.030	0.395
Rajshahi	3.450	2.840	0.412
Rangpur	2.520	1.620	0.519
Sylhet	2.440	1.510	0.406
Tangail	1.600	0.780	0.449

Source: GoB (2008).

2.3.5 Industry

2.3.5.1 Overview of the Manufacturing Sector

The manufacturing sector in Bangladesh is small compared to its development requirement. As we examine the data in Table 2.19, the sector has contributed around 15 to 17 per cent of GDP in recent years, and this share is only slightly increasing. However, we notice that the growth rates of this sector are higher compared to the other sectors of the economy. Both segments of the sector, small and cottage as well as medium and large ones are growing as quite similar rates.

The government has set up special exposrt processing zones (EPZs) in eight locations in the country—these are in Chittagong, Dhaka, Comilla, Mongla, Uttara, Ishwardi, Adamjee and Karnafuli. According to the BEPZA, a total of 230,406 workers and employees are working in these EPZs.

TABLE 2.19
SHARE OF MANUFACTURING SECTOR IN GDP AND ITS GROWTH RATE (IN 1995-96 CONSTANT PRICES)

Sub-Sector	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09 (p)
Small and Cottage	4.60	4.68	4.76	4.85	4.94	5.08	5.14	5.17
growth rate	7.69	7.21	7.45	7.93	9.21	9.69	7.10	6.59
Medium and Large	11.13	11.29	11.41	11.66	12.14	12.47	12.63	12.61
growth rate	4.60	6.56	6.95	8.30	11.41	9.74	7.26	5.65
Manufacturing	15.73	15.97	16.17	16.51	17.08	17.55	17.77	17.78
growth rate	5.48	6.75	7.10	8.19	10.77	9.72	7.21	5.92

Source: *Bangladesh Economic Review* 2009.

2.3.5.2 Regional Distribution of the Manufacturing Sector

The manufacturing establishments are unevenly scattered throughout the country. There are large concentrations of manufacturing units in growth pole locations such as Dhaka and surrounding areas, Chittagong and Khulna. On the other hand, concentration of manufacturing units is much lower in other areas. In Appendix Table 2.25 we examine the Gross District Product data of 64 districts between 1995-96 and 1999-2000. As against every district, we report the share of manufacturing in Gross District Product (mansh), regional per capita income (Rpcin) in 1999-2000 and regional per capita manufacturing income (Rpcmin) in 1999-2000. Brahmanbaria, Chittagong, Dhaka, Gazipur, Munshiganj, Narayanganj, Narsingdi, Jessore, Kushtia, Pabna and Serajganj are districts with more-than-proportionate share of manufacturing in district GDPs. On the other hand, other districts of the country have mostly single-digit percentage shares of manufacturing in their respective district GDPs. Thus we find an indirect measure of concentration of manufacturing activities in the districts, and we find that unlike agriculture, these activities are concentrated in only a handful of locations.

2.3.6 Labour Market

2.3.6.1 Basic Characteristics of the Labour Market

Bangladesh is characterised by an extremely dense population. It has falling fertility rates in combination with increasing life expectancy and lower child mortality over time. The working age population has been increasing more rapidly than the total population. This translates into a large number of entrants into the labour market every year, and they are needed to be absorbed in this market. This creates enormous pressure on the overall situation of the labour market.

There are some other aspects of Bangladesh labour market. Migration, both in-country and out-country, is increasingly becoming a dominant feature in this market. Government statistics estimate (arguably a conservative estimate) that 3.7 million Bangladeshis have emigrated during the last 30 years and about three million are currently living abroad, which is above 6 per cent of the total labour force (Sasin 2009). Rapid urbanisation is another aspect of this market. The growth of the urban population (from 20 per cent in 2000 to 25 per cent in 2005) was in fact more than thrice that of the total population. This process is mostly characterised by the rural-to-urban migration of prime-age population (Sasin 2009). Two more aspects are also noticeable in this market: one is the low literacy rate of the labour force population, and the other is the low participation rate of the female population in the labour force. Here we examine a less talked about dimension of this market, that is, the regional disparity aspect.

2.3.6.2 National Labour Market Data

Table 2.20 provides the data for employment of the national labour market by major industry categories from 1995-96 to 2005-06. Within these ten-year timeframe, proportions of sectoral shares in employment did not change much, except for some minor groups. Agriculture, forestry and fisheries have continued to cover around half of the labour force. Manufacturing sector has covered around 11 per cent of the labour force. Trade, hotel and restaurant have covered around 17 per cent throughout. If we examine the changes in terms of numbers of employment, we see there were 12.6 million additional jobs that were available at the end of the period, of which 5.8 million jobs were provided by the agriculture sector and another 1.7 million jobs were provided by the manufacturing sector. One particular concern from this data is that the share of the manufacturing sector in labour employment has remained almost static.

TABLE 2.20
EMPLOYMENT BY MAJOR INDUSTRY (IN MILLIONS), 1995-96 TO 2005-06 (15+ POPULATION)

Sector	1995-96	1999-2000	2002-03	2005-06
Total	34.80	39.00	44.30	47.40
Agriculture, Forestry and Fisheries	17.00	19.80	22.90	22.80
Mining and Quarrying	*n.a.*	0.20	0.10	0.10
Manufacturing	3.50	3.70	4.30	5.20
Electricity, Gas and Water	0.10	0.10	0.10	0.10
Construction	1.00	1.10	1.50	1.50
Trade, Hotel and Restaurant	6.00	6.10	6.70	7.80
Transport, Storage and Communication	2.20	2.50	3.00	4.00
Finance, Business Service and Real Estate	0.20	0.40	0.30	0.80
Health, Education, Public Adm. and Defense	*n.a.*	n.a.	2.50	2.60
Community and Personal Services	4.80	5.10	2.70	2.60

Source: BBS, *Labour Force Survey* (Various Years).

Appendix Table 2.2 provides another data on the national labour market. This exhibits numbers of male and female employees in different sectors as recorded in the Labour Force Surveys of 1999-2000, 2002-03 and 2005-06. A total of 665,000 new jobs were created in the professional and technical categories, of which 545,000 jobs went to the male candidates and 120,000 jobs went to the female candidates. Similarly, 35,000 additional administrative and managerial jobs were created within six years' time, of which 28,000 jobs went to the male and 7,000 went to the female candidates. Thus it appears that females are underrepresented in the high-skilled segment of the labour market.

Table 2.21 provides a different aspect of the national labour market. This exhibits labour force participation rates of the country from 1995-96 to 2005-06. One striking aspect of this data is that labour market participation rates are low compared to other developing countries, and particularly the female labour force participation rates are very low. There may be a number of reasons behind this low participation rate of females: most prominent ones being women's perceived traditional role of managing the homestead and lower bargaining power in the labour market, combined with lower level of human capital, compared to the males. Even then this female participation rates are improving in recent years.

If we examine the district-wise economically active population and labour force participation rates of 2005-06, we notice large differences in labour market sizes

and participation rates. Whereas male participation in districts is typically above 80 per cent, wide variations exist in the case of female participation rates. Some districts have a female participation rate as low as 5 or 6 per cent. It needs to be examined carefully the reasons behind this low participation rates of females. Districts with low or high female participation rates are scattered around all over the country side by side, and so no systematic pattern emerges from this. For 64 districts, the Pearson correlation coefficient between the head-count rate of poverty (upper level) in 2005 and the labour force participation rate in 2005 is found to have a value of 0.296 (p-value of 0.02). Breaking down into male and female, the correlation coefficient between poverty rate and male participation rate is 0.402 (p-value of 0.001) and that of female rate is 0.22 (p-value of 0.08). This implies that regions with higher poverty rate also tend to have higher labour force participation rate, but the measure of correlation is stronger in the case of the male than that of the female. Poverty is logically associated with higher participation in the labour market as expected, whereas for female this pattern is less clear because of their perceived societal responsibility of managing the family.

TABLE 2.21
LABOUR FORCE PARTICIPATION RATE (PER CENT), 1995-96 TO 2005-06 (15+ POPULATION)

	1995-96	1999-2000	2002-03	2005-06
		National		
Total	52.0	54.9	57.3	58.5
Male	87.0	84.0	87.4	86.8
Female	15.8	23.9	26.1	29.2
		Urban		
Total	51.7	55.8	56.8	55.7
Male	82.0	83.7	85.1	83.2
Female	20.0	26.5	27.4	27.4
		Rural		
Total	52.1	54.6	57.5	59.4
Male	88.6	84.0	88.1	88.0
Female	14.5	25.6	25.6	29.8

Source: BBS, *Labour Force Survey* (Various Years).

Appendix Table 2.27 exhibits district-wise unemployment rates for national, male, female, urban total, urban male, urban female, rural total, rural male and rural female categories. The officially cited unemployment rates in the country are quite low, whereas this somewhat masks the real picture of the situation in the labour market. In this market, most males would report that they are "employed," but

actually a large number of them would be working in low-paid jobs, for the sake of survival and in absence of adequate human capital; scope for upward mobility for a large number of them is limited. Therefore, it would be appropriate to examine the underemployment rates as well. On the other hand, most females would not even be participating in the labour market since dominant social view of women to manage household chores is a factor to reckon with. Therefore, the female labour market parameters are required to take these into consideration. Here we examine the official district data for unemployment, and we find some peculiar features of this data. First, almost in every case, female unemployment rate exceeds that of male unemployment rate, this implies females who actively search for jobs find it more difficult to find one compared to their male counterparts. And this phenomenon is widespread throughout the country. Second, some of the most severe cases of unemployment occur in the rural areas, whereas in the urban areas, the unemployment rates for male categories generally do not exceed 10 per cent. Thus unemployment has a tendency to increase in the dimensions of rural versus urban as well as female versus male aspects, and typically the most severe cases occur in the case of the rural female. Third, there are some pockets in the country where the unemployment rate is exceedingly high. The districts of Feni, Lakshmipur, Noakhali (Chittagong division), Gazipur, Manikganj, Munshiganj, Netrokona, Tangail (Dhaka division), Satkhira (Khulna division), Rajshahi (Rajshahi division), Jhalokati and Pirojpur (Barisal division) have exhibited high rates of unemployment, whereas some of their contiguous regions did not exhibit any. This implies that unemployment rates as reported in the official documents would need to be examined on a case-by-case basis.

2.3.7 Access to Finance

Finance is an important tool for fostering economic growth and the latter also helps developing the former. Access to finance reduces firms' liquidity constraints, thereby help investment and increases efficiency in production. Financial intermediation plays a critical role in efficient allocation of resources and creates new opportunities in the economy. Access to financial services facilitates the poor and the low-income households in endeavoring high return activities. In many developing countries poor and low-income households are often excluded from financial services. Regions with small number of financial intermediaries (e.g. banks, MFIs, etc) have low availability of credits to local firms and entrepreneurs. Conversely, financial intermediaries will be less interested to provide services in less developed areas. Spatial distribution of banks and other financial institutions therefore bears important implications for regional income and poverty level.

Table 2.22 shows per capita deposits and advances as on June 2009 in 6 divisions of Bangladesh. The table reflects that there are significant differences among the divisions in terms of both per capita advances and deposits. Firstly, both advances and deposits per capita are almost double in the Dhaka division relative to the Chittagong division which stands at the second position. Advances in all the four divisions are very low relative to Dhaka and Chittagong, indicating low depth of financial intermediation in the other areas, including the laggard districts. Another interesting fact is that though per capita deposit in Sylhet is not much lower than that for the Chittagong division, its per capita advance amount is lower than that for the Khulna Division. Also, there is a large gap between per capita deposits and per capita advances in the Sylhet Division. A higher per capita deposit in Sylhet division is understandable since Sylhet receives huge amount of remittances from abroad and low level of per capita advances may be due to lack of investment opportunities.

TABLE 2.22
PER CAPITA DEPOSITS AND ADVANCES AS ON JUNE 2009 BY DIVISION (THOUSAND TAKA)

Division	Per Capita Deposits	Per Capita Advance
Barisal	5.00	2.50
Rajshahi	4.80	3.50
Sylhet	15.60	3.70
Khulna	7.10	5.60
Chittagong	19.30	14.70
Dhaka	39.90	31.50

Source: Scheduled Bank Statistics, April-June, 2009.

Table 2.23 presents the low performing districts in terms of per capita advances. It shows that some of the districts in Dhaka and Chittagong divisions fall in the group of poor performing group though these divisions stand better at the aggregate level as showed in Table 2.22. Here districts with asterisk sign indicate that the district also included in the list of low performing districts in terms of per capita advances (Table 2.24). Similarly, districts with # sign indicate that the district fall in the group of districts with lower density of bank branches as well (Table 2.24).

Table 2.25 presents the number of economically active population covered by the microfinance institutions in six divisions of Bangladesh. The table reflects the proportions of population who take credits from the microfinance institutions (MFIs). However, per capita disbursement data is not available to compare with the

Table 2.23. It appears that microcredit coverage is relatively higher in economically backward divisions. While around 27.9 per cent population (economically active) is covered in the Rajshahi division, only around 17 per cent is covered in the Chittagong division. Sylhet division is not only characterised by low per capita advances (by banks) but also it has the lowest coverage under the microcredit programmes.

TABLE 2.23
DISTRICTS WITH PER CAPITA ADVANCES BELOW TWO THOUSAND TAKA AS ON JUNE 2009

Division	Districts	Advances	Division	Districts	Advances
BARISAL	Bhola*#	1.9	DHAKA	Gopalganj*#	1.7
	Jhalokati	1.8		Manikganj#	1.6
	Pirojpur	1.4		Sariatpur*#	1.7
CHITTAGONG	Brahmanbaria	1.7		Tangail	1.6
	Chandpur	1.7	KHULNA	Bagerhat	1.7
	Khagrachari*#	1.0		Magura*#	1.6
	Rangamati#	1.7		Meherpur*#	1.9
RAJSHAHI	Kurigram*	1.9		Narail*#	1.9
	Serajgonj	2.0	SYLHET	Habiganj	1.7
				Sunamganj	1.4

Source: Scheduled Bank Statistics, April-June, 2009.

TABLE 2.24
DISTRICTS WITH PER CAPITA DEPOSITS BELOW FOUR THOUSAND TAKA AS ON JUNE 2009

Division	Districts	Deposit	Division	Districts	Deposit
BARISAL	Barguna	3.7	KHULNA	Jhenaidah	3.8
	Bhola*#	3.1		Magura*#	3.8
	Patuakhali	3.7		Meherpur*#	4.0
CHITTAGONG	Khagrachari*#	2.9		Narail*#	3.9
	Gopalganj*#	3.6		Gaibandha	2.2
DHAKA	Jamalpur	3.0	RAJSHAHI	Kurigram*#	1.9
	Kishoreganj	3.8		Lalmonirhat#	1.9
	Mymensingh	3.7		Natore	3.9
	Netrokona#	1.7		Nilphamari	3.3
	Rajbari#	3.5		Panchagarh#	2.0
	Sariatpur*#	3.9		Thakurgaon#	3.1
	Sherpur#	2.0			

Source: Scheduled Bank Statistics, April-June, 2009.

TABLE 2.25
PERCENTAGE OF POPULATION (ECONOMICALLY ACTIVE) COVERED BY MICRO CREDIT

Division	Population economically active	Number of microcrcdit borrowers (effective coverage)	Coverage (in per cent)
Sylhet Division	4,406,045	659,682	14.97
Chittagong Division	13,654,079	2,310,583	16.92
Dhaka Division	22,347,362	4,616,289	20.66
Khulna Division	8,229,154	2,081,996	25.30
Barisal Division	4,549,575	1,163,298	25.57
Rajshahi Division	16,823,326	4,690,323	27.88

Source: PKSF 2006. Maps on Micro credit Coverage in Upazilas of Bangladesh.

2.4 FACTORS AFFECTING REGIONAL DISPARITY

In this section we discuss factors that affect the issue of regional disparity in Bangladesh. A large number of factors can play a role in shaping up the regional disparity issue in the country, ranging from soil pattern and crop intensity to distribution of remittance earnings and pattern of allocation of public expenditure.

2.4.1 Soil Type Variations

Even though the country provides one with an impression of mostly a homogeneous, fertile plain land with a small portion of hilly areas in the northeast and the southeast, there is well-documented large variation in the soil patterns throughout the country. The country has been divided into thirty agro-ecological zones (AEZs) based on soil type, organic matter content and fertility levels of soil, etc.

Soil fertility levels differ markedly within different AEZs; for example, AEZ-1 is the old Himalayan piedmont plain which has moderate fertility level and organic matter contents are relatively higher compared to other flood plains; and just besides this are AEZ-2 (active Teesta flood plain) and AEZ-3 (Teesta meander flood plain) which have low to medium soil fertility level. If we examine the list, most of the regions are flood plains, with various measures of organic content levels and soil fertility measures. Some regions have been documented as having high or relatively higher soil fertility level, such as most of Panchagarh Thakurgaon districts and north-western part of Dinajpur district (AEZ-1), most of Barisal, Jhalokati, Pirojpur, Patuakhali, Barguna, Bagerhat, Khulna and Satkhira districts (AEZ-13). Some other

regions have been classified as having medium soil fertility levels, such as the Middle Meghna River Flood Plain (AEZ-16), the Young Meghna Estuarine Flood Plain (AEZ-18), the Old Meghna Estuarine Flood Plain (AEZ-19), the Eastern Surma-Kusiyara Flood Plain (AEZ-20) and the Northern and Eastern Piedmont Plains (AEZ-22). There are some regions which are classified as having medium or low soil fertility levels. Some regions have been documented as having low soil fertility status, such as regions covered under AEZs 2, 10, 15, 23, 24, 25, 26, 27, 28, 29 and 30 (mostly hilly areas as well as coastal areas of the East and the Southeast, the Barind tract and the Madhupur tract). Low soil fertility content might contribute to restriction on scopes of crop diversity and agricultural income potential of these regions.

Examination of these AEZ lists provides us with an underlying explanation of regional variation of agricultural and livelihood patterns, though this only forms a partial picture to the issue of regional disparity.

2.4.2 Population Growth Pressures

The pressure of rapid population growth is having an adverse impact on the standard of living of an average Bangladeshi household. Not only that this is a densely populated country, the population growth rate is also quite high. High density of population combined with high growth rate of population creates pressures on maintenance and improvement of public facilities and scopes of private initiatives. These nation-wide problems are also evident at the sub-national level. Therefore, one of the factors that contributes to the regional disparity issue is the differences of population growth at the sub-national level.

At the national level, the pressure of population growth in percentage terms has declined in recent times, whereas this is still enormous in terms of net addition to the existing population for each year. For example, in 1981, the population stood at 89.9 million and the growth rate of population stood at 2.31 per cent; this implies an addition of 2.077 million persons to the existing level during that particular year. On the other hand, in 2007, the population was estimated to be 141.8 million and the growth rate of population stood at 1.48 per cent; this implies an addition of 2.099 million persons to the existing level (BBS data). Therefore, even though there has been a major drop in the population growth rate in terms of percentage figures within these twenty-six years' of time, there has not been much decline in terms of yearly addition to the population.

We examine the sub-national level data in Appendix Tables 2.4 and 2.5. Appendix Table 2.4 exhibits population of greater districts in 1974, 1981 and 1991, and the exponential growth rates in the interim years. Some greater districts have

exhibited higher growth rates in comparison to other greater districts, such as Chittagong, Dhaka, Dinajpur, Patuakhali and Rajshahi during 1974 to 1981, and Bogra, Chittagong Hill Tracts, Dhaka, Dinajpur and Rajshahi during 1981 to 1991. Dhaka, Rajshahi and Dinajpur are the greater districts which have exhibited higher growth rates in comparison to others in both of the time periods. In the case of Dhaka greater district, a rapid expansion of the capital city in terms of population figures could provide one explanation for this. The explanations for higher growth rates of Rajshahi district and Dinajpur district require further investigation. While we compare two time periods in this table, we notice that matching with the national-level figures, the exponential rates of growth have decreased in all the greater districts, except for Chittagong Hill Tract; where there has been actually a reverse, possibly partly explained by net inflow of residents from other districts into the CHT during this period.

A higher figure for exponential growth rates of population at a particular region would create pressures on the existing resources available (public, private and natural) in that region, and this may be limiting economic growth. On the other hand, it could actually be the case that higher growth potentials of that region have provided the scope for higher net inflow of population from other regions in the first place. Therefore, it is difficult to conclude about the linkage between population growth and regional economic growth with prima facie pieces of information.

We examine population density data for 2001 and the total fertility rate (TFR) data for rural areas for 2001, 2003, 2005 and 2007 for 64 districts in the Appendix Table 2.5. Dhaka, Narayanganj, Narsingdi and Comilla are found to be the most densely populated districts, whereas Khagrachhari, Rangamati and Bandarban are the least densely populated ones. The districts of Dhaka, Narayanganj and Narsingdi include the capital city and surrounding industrial belt, whereas Comilla has traditionally been considered a densely populated region. The former Chittagong Hill Tracts districts exhibit a very low population density and this is expected to be the case. We notice that the TFR rates in rural areas are in general decreasing over time[3]. For example, in 2001, Dhaka district had a TFR rate of 2.54, and this rate declined to 1.69 by 2007. This implies while in 2001, a woman was expected to have 2.54 numbers of children throughout her reproductive age within her lifetime, if she were to experience current age-specific fertility rates at each year and if she

[3] Total Fertility Rate (TFR) is the average number of children that would be born to a woman over her lifetime if she were to experience the exact current age-specific fertility rates through her lifetime, and she were to survive from birth through the end of her reproductive life. It is obtained by summing the single-year age-specific rates at a given time (source: Wikipedia).

lives up to the end of her reproductive life; in comparison, in 2007, this number has declined to 1.69. These figures provide the fundamental basis for population growth, besides changes in numbers arising from different migration rates. We also notice that these TFR numbers differ in districts; most districts have exhibited high figures in the initial years followed by downward tendencies throughout. But there are some districts whose high TFR rates did not decrease to a large extent and also there are some districts which have exhibited actually a reverse—an increase in the TFR rate rather than a decrease. Districts of Jamalpur, Mymensingh, Lakshmipur, Nilphamari, Kishoreganj, Cox's Bazar, Netrokona and Habiganj have consistently exhibited high TFR rates. Districts of Shariatpur, Panchagarh, Sunamganj and Bhola have actually exhibited a reverse—an increase in TFR rather than the general tendency of a decrease in TFR. It needs to be further examined why some districts consistently have exhibited high TFR rates and some districts have exhibited reverse tendencies.

2.4.3 Crop Intensity and Scope of HYV Cultivation

One major factor that contributes to regional variations in farm income is the issue of crop intensity and scope of modern varieties in crop agriculture.

Appendix Table 2.6 exhibits national-level data on land utilisation statistics in the country from 1984-85 to 2005-06. There has been a tendency to shift from single-crop agriculture to double-crop or triple-crop agriculture; this was possible due to expansion of irrigation facilities and proliferation of high yielding variety (HYV) crops. Whereas the net cropped area has decreased from 21,353 thousand acres in 1984-85 to 19,289 thousand acres in 2005-06, the total cropped area actually increased from 32,496 thousand acres to 33,944 thousand acres with the help of increased cropping intensity. Therefore, even though the cropping sector is losing out land to other non-crop sectors on continuous basis, enhanced crop intensity is operating in the opposite direction and thereby, to some extent, neutralising losses from reductions in crop area. Within this overall tendency, another noticeable trend is the decrease of area belonging to single cropping combined with increase of area belonging to double- and triple-cropping. The overall index of crop intensity was 152 in 1984-85 and this increased up to 176 by 2005-06.

Appendix Table 2.7 exhibits sub-national level data on cropping intensity by former districts from 1999-00 to 2004-05. This clearly shows that there is a marked difference in cropping intensity in different regions of the country, which itself is a product of a number of factors, including soil condition and irrigation facilities. Khulna and Bandarban are the former districts with low index values of cropping

intensity, with average of 135.67 and 142.59 respectively. Bogra, Jamalpur, Rangpur and Jessore are the districts with mean indexes of crop intensity above or close to 200; these are the districts with higher crop intensity compared to others. On the other hand, Tangail, Comilla and Jessore are the districts with higher values of standard deviations of crop intensity around the mean within these years.

Appendix Table 2.8 exhibits the percentage of HYV in cropped area by former districts between 2001-02 and 2005-06. Boro crop is closely associated with HYV varieties in most of the greater districts since above 90 per cent of the cropped area is assigned to HYV varieties, except for the Patuakhali district (explanation for this requires further investigation). The percentage of HYV in cropped area is lower for Aus and Aman, and this varies with regions as well. Faridpur, Tangail, Patuakhali and Pabna are districts with low percentages of Aus and Aman cropped areas being assigned to HYV. Since yield rates are higher with HYV varieties as compared to those of local varieties, a low percentage of cropped area assigned to HYV implies lower income earning potential from crop agriculture in those regions.

Appendix Table 2.9 exhibits the classification of Boro crop with respect to variety type, such as local, HYV and hybrid in 2005-06. Hybrid variety is a newer type, and some districts such as Bhola, Narail, Bagerhat, Khulna and Natore have achieved high percentage of cropped area in this category. This implies that there is scope for adoption of newer varieties in boro crop season of these regions. On the other hand, districts of Sylhet division, particularly Sylhet district itself, have high percentages of boro crop area allocated to local varieties, and low percentages have yet been allocated for hybrid varieties.

2.4.4 Natural Disasters and Weather Factors

Bangladesh is one of the most natural disaster prone areas of the world because of its geographic location and own physiography. Natural catastrophes such as floods and cyclones not only jeopardise the life of the poor households but also lead the non-poor households to poverty. As the effect of covariate shocks cannot be effectively insured through some formal and informal insurance mechanisms, costly shock coping mechanisms (such as selling or mortgaging assets, borrowing from money lender at high interest rates) are adopted by the households. As a result, households may fall into poverty traps due to shocks. Natural disasters like floods and cyclones damage physical infrastructures as well as transport and communication system of the affected areas. Therefore, the overall economies of the areas are affected by these adverse events. Other types of natural disasters include drought, riverbank erosion and landslide, etc. While a large portion of Bangladesh is vulnerable to some sorts of natural disasters, most disaster prone areas are more likely to be poor.

Bangladesh is divided into three zones: 80 per cent floodplains, 12 per cent hills and 8 per cent terraces. Monsoon or seasonal floods are generally beneficial for soil fertility and agricultural output. Such floods occur mostly during August-October period due to heavy rainfall, both inside and outside the country. Floods become natural disasters for the country when water level rises higher than the expected level and occurs earlier or latter than usual timing. Disastrous flood can also arise in the form of flash floods, rain floods and coastal floods. Flash floods flow through hilly rivers, particularly the eastern and the northern rivers during April-May or September-November period. Rain floods are caused by heavy rain and drainage congestion and coastal floods or tidal surge are usually accompanied with cyclones.

Flood prone areas can be identified from the topographic distribution of Bangladesh, which have five classes (Table 2.26).

TABLE 2.26
TOPOGRAPHY OF BANGLADESH

Topography	Characteristics	Location
High land	Relatively high area and do not submerge during monsoon	Madhupur Garh in Tangail and Mymensingh; Bhawal's Garh in Gazipur and Dhaka, Barind tract in Rajshahi division, Lalmai area in Comilla, Tilla areas in Sylhet, Moulvi Bazar and Habiganj districts.
Medium highland	Normally flooded up to 90 cm high during rainy season for more than two weeks continuously	Barisal division, Major part of Khulna Division, northern part of Rajshahi Division, parts of Gazipur, Narasingdi, Noakhali, Feni, Lakshimipur, Comilla and Habiganj districts.
Medium low land and low land	Normally flooded 90 to 180 cm in medium low land and 180 to 275 cm in low land.	Major parts of Comilla, Brahmanbaria, Chandpur, Gopalganj districts and parts of Lakshmipur, Noakhali and Serajganj, Natore and Naogaon districts, northern parts of Khulna and Bagerhat districts minor parts of Jessore, Kishoreganj and Habiganj districts.
Very low land	Remain flooded up to 30ft during the rainy season. Haor bills, canals and other low lying land.	Most of the Haor and beels lie in Sylhet division and in Kishoreganj and Netrokona district.
Hilly land	Hilly areas	Rangamati, Bandarban, Khagrachari, parts of Chittagong, northern parts of Mymensingh, north and southern part of Sylhet division and eastern boarder of Comilla and north eastern strip of Feni district

Source: Compendium of Environment Statistics of Bangladesh 2005.

In the past two decades three major catastrophic floods affected a large portion of Bangladesh, damaging crops, livestock, houses and other infrastructures. According to Bangladesh Water Development Board, floods in 1988, 1998 and 2004 affected 84, 68 and 36 per cent of total area respectively (Compendium 2005). Table 2.27 shows a brief description of damages done by the flood in 2004. Some of the districts were more severely affected during these floods; such as Habiganj and Sunamganj (Sylhet division); Brahmanbaria (Chittagong division); Kishoreganj, Shariatpur and Mymensingh (Dhaka division); and Sirajganj (Rajshahi division) districts.

TABLE 2.27
DAMAGE OF ASSETS DURING THE 2004 FLOOD

Division	Damaged area (Square Km)	Affected households ('000)	Affected people ('000)	Crops damaged (000) acres		Damage of houses (000) No.		Death of livestock
				Whole	Partial	Whole	Partial	
Barisal	961	276	831	12	24	9	103	810
Chittagong	4,493	1,036	5,668	143	191	66	491	1,494
Dhaka	14,760	3,586	17,577	852	651	443	1,987	6,591
Khulna	53	6	26	7	6	0	4	0
Rajshahi	5,889	1,131	5,228	291	124	119	433	1,822
Sylhet	8,427	1,432	7,000	290	43	255	372	4,425
Total	34,583	7,467	36,330	1,595	1,038	892	3,389	15,142

Source: Compendium of Environmental Statistics of Bangladesh, 2005.

Southern parts of Bangladesh, especially the coastal districts of Chittagong, Barisal and Khulna division, are highly vulnerable to catastrophic cyclones. The cyclone of 1991 was the most catastrophic cyclone in the last two decades, which caused death of more than 138 thousand people. More recently the cyclone *Sidr* destructed a major portion of Khulna and Barisal Divisions in November 2007. Due to some protective measures adopted by the government and local people it is now possible to minimise human casualties during catastrophic cyclones.

Western districts of Bangladesh are susceptible to drought due to lack of rainfall. Drought cycle is approximately 5 to 10 years. Prolonged rainless days during Kharif or Rabi season can appear as drought. Drought prone areas are divided into five classes according to their severity. About 0.58 million hectares of land in Rajshahi and Nawabganj districts is considered the very severe drought

prone areas. Droughts may cause fall in agricultural production if it continues for long extended period.

2.4.5 Landlessness

One of the important factors behind spatial differences in poverty is entitlement to land. Entitlement to land through ownership or tenancy bears important implications for poverty reduction programmes. According to World Bank (2008), the rate of poverty has fallen more quickly for households with some ownership of land as compared to households with no land between 2000 and 2005. Classifying the population below the poverty line in terms of land ownership shows that poverty rate is the highest for the rural landless people. According to the HIES 2005 data, around 67 per cent of rural landless population are below the upper poverty line and 49 per cent are below the lower poverty line, thus there is a systematic positive relationship between the size of land ownership and incidence of poverty. One interesting observation is that during the 2000 to 2005 period poverty reduced faster for those who have no land at all relative to the group with less than 0.05 acres of land. Completely landless people are more likely to be involved in other occupational activities other than agriculture, and these may promise more return than agriculture.

TABLE 2.28
PERCENTAGE OF POPULATION BELOW THE POVERTY LINE BY LAND OWNERSHIP, 2005

	Using the lower poverty line			Using the upper poverty line		
	2005	2000	Change	2005	2000	Change
All Size	28.6	37.9	-9.3	43.8	52.3	-8.5
No Land	49.3	53.1	-3.8	66.6	69.7	-3.1
<.05	47.8	48.8	-1.0	65.7	63.0	2.7
0.05-0.49	33.3	41.7	-8.4	50.7	59.3	-8.6
0.50-1.49	22.8	30.6	-7.8	37.1	47.5	-10.4
1.50-2.49	12.8	22.9	-10.1	25.6	35.4	-9.8
2.50-7.49	7.7	12.4	-4.7	17.4	22.8	-5.4
7.50+	2.0	4.1	-2.1	3.6	9.7	-6.1

Source: HIES 2005, BBS.

Another important aspect of the HIES data is that the incidence of poverty reduced faster for the group owning some amount of land. The latter indicates that ownership of land up to a certain extent enhances the ability of poor households to get out of poverty. Landlessness does not necessarily exclude rural people from entitlement to land, as they can hire land from the tenancy market. The tenancy

market plays an important role in redistribution of entitlement to land: in this process large landowners endeavour into more productive ventures by renting out their lands to the landless (Kam *et al.* 2004). Therefore, ownership of land or accessibility to land through tenancy market also enables the poor to fight against poverty. Table 2.29 shows present scenario of landlessness in Bangladesh based on the preliminary findings from the Agricultural Census 2008.

TABLE 2.29
LANDLESS HOUSEHOLDS BY DIVISION, 2008

Division	Per cent of Landless Households			Landless as per cent of Total, Urban and Rural Landless Households		
	Total	Urban	Rural	Total	Urban	Rural
Dhaka	20.32	8.36	11.96	42.84	64.62	34.67
Sylhet	15.32	1.56	13.76	5.25	1.97	6.48
Rajshahi	14.50	1.35	13.15	24.79	8.52	30.90
Chittagong	13.28	3.44	9.84	14.50	14.25	14.59
Khulna	11.74	3.03	8.71	9.00	8.52	9.15
Barisal	9.36	1.44	7.92	3.62	2.05	4.21
Bangladesh	15.62	4.25	11.35	100.00	100.00	99.92

Source: Agricultural Census, 2008, BBS.

According to the Agricultural Census 2008, around 15.6 per cent households in the country have no land of their own, whereas among these 4.25 and 11.35 per cent households are located in the urban and the rural areas respectively. Proportion of landless households is the highest in Dhaka division (20.3 per cent). More importantly, Dhaka division alone includes about 43 per cent landless households of the country. The latter observation is not only due to the fact that a large proportion of the rural landless households migrate to the metropolitan area of Dhaka and surrounding areas, but also the proportion of landless households in the rural areas of Dhaka division is the highest among all the divisions. The high percentage of landlessness in Dhaka division is closely associated with the proximity of the Dhaka city. The link between landlessness and poverty becomes apparent for Rajshahi division, one of the economically backward divisions, which alone accounts for 31 per cent of total landless households of the country. However, such relationship can not be observed directly for other divisions using divisional level data. To explore the issue in more detail, district level data is also explored latter in this section. Table 2.30 presents the trend in landlessness over the last 25 years.

TABLE 2.30
TREND IN LANDLESSNESS, 2008

Division	Per cent of rural households with no land			Change in 2008 over 1996
	1983-84	1996	2008	
Barisal	7.27	9.10	8.44	-0.66
Chittagong	4.84	7.44	11.03	3.59
Dhaka	9.07	9.19	14.74	5.54
Khulna	8.30	7.68	9.55	1.87
Rajshahi	10.87	13.24	13.99	0.75
Sylhet	11.88	14.56	14.52	-0.04
Bangladesh	8.67	10.18	12.84	2.66

Source: Agricultural Census, 2008, BBS.

Till the early 1980s, landlessness was a more common phenomenon in Sylhet and Rajshahi divisions, as exhibited in Table 2.30. However, between 1996 and 2008, proportion of the landless households increased only marginally in Rajshahi and slightly declined in Sylhet division. The startling fact is that landlessness has increased significantly in both Dhaka and Chittagong divisions over the same period. The issue is explored further in Table 2.31, where fourth column from the left reports proportion of landless households in the rural areas and sorted in the descending order. Dhaka division has the highest four representatives in the group of first 10 districts (Dhaka, Narayanganj, Gazipur and Munshiganj). However, the reasons behind the intensity of landless households in these areas are likely to be different than landlessness in general. Though a close investigation on the causes of the rising landlessness is not feasible within the scope of this study, rapid urbanisation, opportunities for profitable non-farm activities and concentration as well as expansion of industrial areas in and around adjacent districts of Dhaka may have exerted a rapid transformation in land ownership structure.

Such transformation in the economy also becomes apparent in the fifth and the seventh column from the left in Table 2.31, which shows agricultural labour households and agricultural farm households respectively as per cent of total rural households. A ranking in terms of agricultural labour households show that the lowest five districts are from Dhaka Division (Dhaka, Narayanganj, Gazipur, Narshingdi and Munshiganj) and in terms of agricultural farm households four of these districts belong to the group of lowest six districts (except Narshingdi). In a

simple correlation analysis we found that there is a significant positive relationship between incidence of poverty at district level and proportion of landless households in rural areas excluding six major districts and three of the adjacent districts of Dhaka.

TABLE 2.31
LANDLESSNESS IN RURAL AREAS, 2008

Rank	Division	District	Per cent of rural households				
			Landless (No own land)	Agri Labour	Tenants	Agri Farms	Hybrid Boro Cultivator
1	Dhaka	Dhaka	33	7	18	20	9
2	Chittagong	Bandarban	27	33	37	69	11
3	Dhaka	Narayanganj	26	8	17	24	9
4	Chittagong	Cox's Bazar	20	37	31	45	11
5	Sylhet	Habiganj	19	40	32	54	21
6	Rajshahi	Sirajganj	19	35	33	52	26
7	Dhaka	Gazipur	19	17	31	49	15
8	Dhaka	Munshiganj	17	20	24	39	8
9	Rajshahi	Lalmonirhat	17	51	36	62	35
10	Rajshahi	Natore	16	49	34	59	20
11	Sylhet	Sunamganj	16	37	25	51	17
12	Chittagong	Rangamati	16	26	30	78	23
13	Rajshahi	Nilphamari	15	49	33	55	32
14	Rajshahi	Pabna	15	39	37	56	6
15	Rajshahi	Nawabganj	15	42	35	53	4
16	Chittagong	Brahmanbaria	15	31	32	56	11
17	Rajshahi	Kurigram	15	56	36	58	32
18	Rajshahi	Gaibandah	15	49	33	56	46
19	Khulna	Khulna	14	40	33	54	28
20	Rajshahi	Rangpur	14	46	33	56	49
21	Chittagong	Khagrachhari	14	38	28	74	10
22	Dhaka	Kishoreganj	14	37	29	52	15
23	Dhaka	Shariatpur	13	36	37	65	4
24	Rajshahi	Rajshahi	13	44	36	62	21
25	Dhaka	Jamalpur	13	41	39	61	19

Source: *Agricultural Census, 2008*, BBS.

TABLE 2.32
TENANT HOUSEHOLDS BY DIVISION, 2008

Division	Per cent of tenant households			Tenants as per cent of total, urban and rural tenant households		
	Total	Urban	Rural	Total	Urban	Rural
Khulna	34.98	2.51	32.47	14.26	18.70	14.00
Rajshahi	34.48	1.24	33.24	31.35	20.65	31.97
Barisal	27.76	1.67	26.09	5.70	6.30	5.68
Chittagong	27.36	2.27	25.09	15.88	24.13	15.42
Dhaka	25.28	1.41	23.87	28.34	28.91	28.31
Sylhet	24.46	0.39	24.07	4.45	1.30	4.64
Bangladesh	29.36	1.60	27.76	100.00	100.00	100.00

Source: *Agricultural Census, 2008*, BBS.

As mentioned earlier, entitlement to land through tenancy agreement can substantially help the rural landless people to safeguard against poverty in absence of other profitable opportunities. Table 2.32 shows the distribution of tenant households in different divisions, where tenant households are defined as those who pay rent in cash or in kind to the owner of the land to use the land for cultivation or any other purposes. Around 29 per cent of the households use land through the tenancy market, this may include land owner as well as landless households. Tenancy agreements are proportionately higher in the two poorest divisions of the country, Khulna (35 per cent) and Rajshahi (34.5 per cent). Rajshahi division alone includes 32 per cent of the total tenant households of the country, followed by Dhaka division.

2.4.6 Literacy Rate

One major factor that is expected to constrain the utilisation of labour force is a low level of literacy of the population. In the case of the sub-national level, there are differences in average level of literacy achieved in different sub-national categories. This might contribute to regional disparity since scope of utilisation of labour force in a region is expected to be related, among other variables, to the level of literacy achieved by the population in general, and the labour force participants of that region in particular. The economic growth process is such that the literate populace within a laggard region has a tendency to migrate to more economically advanced regions in search of education, job and business opportunities and thus the laggard regions suffer from shortage of literate labour force participants. In addition to that, low literacy rate may contribute to low labour force participation rate as well, since people with low literacy achievement may face difficulties in entering into the labour market. This is more evident in the case of a low female labour force

participation, since many women chose to stay to home and do household chores only, not because that they are unwilling to work, but because they have low educational achievements to begin with. Here we notice that the literacy rate of woman is low, and at the same time, female labour force participation is low; and these two may have actually accentuated each other, since women may have low interests in achieving high literacy rates in the first place if they find that not many women are successfully working in the labour market. We need to add that, at least in recent times, both female literacy rate and female labour force participation rate are increasing, possibly reinforcing each other in a positive manner. If we find differences in values of these variables in sub-national level, we may argue that this is also a contributing factor to regional disparity since some regions will have less of this issue and there are some regions whereas there are some other regions where this problem will be acute.

Appendix Table 2.11 exhibits literacy rates of districts in 1991 and 2001. From the table, we notice that, overall, the rate is increasing in districts. An additional point to note is that, female literacy rates were even lower as compared to male literacy rates in 1991, but the increases in the case of the female literacy have been actually higher in the case of most of the districts. At the overall national level, the literacy rate (above 7 years of age population) was 32.4 per cent (out of which male rate was 38.9 per cent and female rate was 25.45 per cent) and by 2001, this overall rate increased by 13.75 percentage points (male rate increased by 11.37 percentage points and female rate increased by 16.35 percentage points). Thus female literacy is actually catching up with male literacy rate in recent time, but still the rate was 8.47 percentage points lower in 2001; apart from the fact that all these rates are much lower compared to expectations (since this considers population at the point of 7 years and above, recent increases in child school enrolment have directly bolstered these figures).

Sherpur, Jamalpur and Cox's Bazar are districts with lowest levels of literacy rates in the country. Between 1991 and 2001, the improvements in the literacy rates in these districts are moderate; even then improvements in terms of female literacy rates are better as compared to that of their male counterparts. Even though these regions are categorised as included within laggard regions in terms of a number of indicators, there is no particular reason that can explain why the literacy rates are so low in these regions in the first place. Sunamganj, Kurigram, Meherpur, Kishoreganj and Lalmonirhat are some other districts next in the upward ranking of literacy rates. On the other end of the list, the districts are Barisal, Chittagong, Khulna, Bagerhat, Pirojpur, Jhalokati and Dhaka. Dhaka, Chittagong and Khulna are growth poles by themselves and it is expected that their ranking would be high.

On the other hand, Barisal, Bagerhat, Pirojpur and Jhalokati are not considered among the more economically prosperous regions. Yet their literacy rate indicators are much better compared to those of many other districts; this provides another unsolved puzzle in the regional disparity discussion.

2.4.7 Growth of Farm and Non-farm Incomes

One partial explanation for regional disparity in terms of household income is the differences in growth of farm and non-farm incomes of households. Since farm and non-farm income potentials vary with regions, it is expected that regional income that arises from farm and non-farm sources would differ by regions.

Since regional income data have been collected by BBS only up till 2000, it is difficult to assess the breakdown of regional income data with respect to farm and non-farm income sources for recent years. For that reason, one alternative that we can pursue is to observe the growth pattern of regional income in agricultural and non-agricultural categories up till the point where regional income data is available, say, 1995-96 to 1999-2000. Appendix Table 20 provides a data set like this, where all 64 districts' regional agricultural and non-agricultural income (in Taka, at 1995-96 constant prices) has been reported; the last two columns provide information for exponential growth rates of agricultural income and non-agricultural income within these five years. The figures for regional agricultural and non-agricultural income (from industry and services sectors combined) have started from different levels in the initial year for every district, and have taken different growth paths, and together these figures add up to the regional income figures at the final year. The growth rates of regional agricultural income levels have been found to be statistically significantly lower compared to the growth rates of regional non-agricultural income levels (p-value of t-test of mean (diff)<0 is 0.06). Therefore, we find that the non-agricultural income has been increasing at a higher rate compared to the regional agricultural income during the reference period. Another noticeable feature is that while regional per capita agricultural incomes across districts did not have major differences within districts, there were large differences in terms of per capita non-agricultural income across districts, and this difference continued to grow over time. For example, in 1995-96, the range of regional per capita agricultural income was between TK. 346 (Dhaka) and TK. 6,343 (Rangamati) whereas the range of regional per capita non-agricultural income was between TK. 1,170 (Bandarban) and TK. 31,963 (Dhaka). Therefore, the larger segment of differences in regional per capita incomes was derived from differences in per capita non-agricultural incomes in particular. The differences in regional per capita income figures increased by the year 1999-2000 since the non-agricultural income, the major component of the regional income, actually grew at a higher rate as compared to the

the agricultural income, the smaller component. This implies, at least for the reference period, those regions which could provide greater scope for growth of non-agricultural income (such as income from manufacturing and services), per capita income increased sharply, and other regions lagged behind.

Since regional income data is not available from 2000 onwards, we have to depend on other data sources, such as the Household Income and Expenditure Surveys of recent years (i.e. HIES 2000 and 2005) to examine the issue of growth of agri- and non-agricultural income. Appendix Table 2.17 provides national, urban and rural-level average household monthly incomes and as expected these are growing over time. The average urban household monthly incomes have always been higher as compared to those of rural households, the ratios in favour of urban ones are in the order of 1.55, 2.17, 2.05 and 1.72 for 1991-92, 1995-96, 2000 and 2005 HIES surveys respectively. Interesting observation is that the urban-rural household income ratio has decreased between 2000 and 2005 HIES surveys, from 2.05 to 1.72. Thus here is an indication that rural households have been able to better accelerate their earnings between 2000 and 2005. The average household size is lower for the urban households, thus there has been an even larger gap in terms of monthly income per member in favour of the urban households (ratio is 1.78 in 2005).

Appendix Table 2.18 provides a different set of data with respect to the percentage share of income of households by sources of income at national, urban and rural levels. We notice that share of agricultural sector earnings in total household income has always been higher for rural households' vis-à-vis urban households, but even that share is decreasing for rural households in recent times. For example, in 1991-92, 40 per cent of rural households' income was derived from agricultural sources, and the corresponding percentage for urban households was only 5.9 per cent. In comparison, by 2005, 29 per cent of rural households' income came from agricultural sources and the corresponding figure for urban households was 5.8 per cent. Rural households are increasingly depending on business and commerce (from 12.4 per cent in 1991-92 to 17.3 per cent in 2005) and professional wages and salaried income (from 21.1 per cent in 1991-92 to 28.1 per cent in 2005) sources.

2.4.7.1 Growth Rate of Agricultural Wage Rates

Rural poverty is closely associated with agricultural wage rate data. We examine movements of agricultural male daily wage rates (without food) in former districts; we have a continuous series of monthly data for former districts from 1993-94 to 2006-07 (Appendix Table 2.19). We report averages, standard deviations and coefficients of variation of six monthly wage rates from July to December in

each of the former districts, for 1993-94 and 2006-07. In 1993-94, some regions reported much higher wage rates as compared to the national average, such as Chittagong, Rangamati, Comilla and Khagrachari; whereas some other regions reported lower rates, such as Rangpur, Pabna, Dinajpur and Jamalpur. We can add that there were some regions where variability of daily agricultural wage (within reference of six months) in terms of coefficient of variation was found to be more prominent, e.g. Patuakhali, Jamalpur, Khulna and Kushtia. There were variations within months in terms of wage rates as well; July rates differ from December rates, but we do not find any systematic pattern. We notice that there are no systematic patterns of exponential growth rates of agricultural wage rates between 1993 and 2006 in the regions, but to note that December rates grew at slightly higher rates as compared to the July rates in most of the regions. As we now examine the July 2006 to December 2006 wage rates, we find that these rates have grown over time, but the relative positions of regions in terms of average rates did not change that much. Again, Rangpur, Pabna and Dinajpur are among the lowest wage rate areas in the country; by this time, Rajshahi, Kushtia and Jessore also joined the lowest ranks. All these regions are on the western side of the country, whereas the eastern side exhibited better performance in this respect. Values of coefficient of variation are generally lower in 2006-07 as compared to 1993-94; this might imply that average monthly variability of daily agricultural wage is on the decline in most of the regions. Some regions such as Patuakhali and Jamalpur have exhibited large reduction in terms of coefficient of variation, whereas some other regions such as Comilla have exhibited even an increase in terms of coefficient of variation.

Appendix Table 2.19 exhibits that regions with lower levels of agricultural wage rates are typically the same regions where poverty rates are found to be high, i.e., former districts of Rangpur, Dinajpur, Pabna and Rajshahi. On the other hand, former districts of Chittagong and Chittagong Hill Tracts have maintained their positions as the leading agricultural wage regions in the country and at the same time poverty reduction trends are also considered to be strong in these regions (to note that here we have only "nominal" level of wage rates, not adjusted for local food and non-food price indexes, so we do not have "real" measure of agricultural wage). This way trend of agricultural wage has been considered as a reliable indication of trend of poverty alleviation in the respective regions (see Kam *et al.* 2004).

2.4.8 Energy

Energy is one major issue in the discussion of regional disparity. As there are differences in availability of energy for different regions of the country, this difference itself becomes a factor in determination of economic growth since energy

is a primary ingredient for growth of industry and services in particular. Appendix Table 2.13 provides data for itemwise consumption of energy in Bangladesh in recent years. We notice that the principal source of energy is electricity and its' use is increasing over time. Gas is another important source of energy; this is followed by petroleum and coal.

2.4.8.1 Electricity

The demand for electricity has been on the increase in the rural areas for household, agriculture, manufacturing and other uses. Even then the coverage of electricity in the country is alarmingly low, since only 45 per cent of the total population has been covered till now. Currently, the per capita electricity production in the country is only 172 kilowatt hours, which is much lower compared to other developing countries (Bangladesh Economic Review 2009).

By the years 2004-05, 47,612 villages had electricity, and this number increased up to 50,724 by 2008 (Bangladesh Economic Review 2009), which is still only approximately 58 per cent of the total number of villages in the country.

Appendix Table 2.15 provides data for rural electrification in the country. Primary responsibility of rural electrification lies with the Rural Electrification Board (REB). Progress of additional coverage of villages from 1999-2000 to 2004-05 is exhibited in panel (A) of the table. We notice that the progression varies by year; the last four years' progress within the referenced period has been rapid. If we examine the panel (B), we notice that the growth rate of consumption of units of electricity also varies by year; some rapid growth year such as 2002-03 is followed by some particularly slow growing year, such as 2006-07. We can also examine the sectoral shares of different uses in panel (B). Domestic use component is slowly gaining in terms of percentage shares, whereas industrial use component is losing percentage share of rural electrification, although in terms of absolute number of units, there is still an 88 per cent increase of units for industrial use between 2000-01 and 2007-08. It required to be further investigated whether lower growth of industrial use of electricity is an indication of lower overall growth of industries in the rural areas.

Appendix Table 2.14 exhibits maximum demand for electricity data for Eastern zone and the Western zone. This shows that major portion of electricity demand has been from the Eastern side of the country since this side contains the capital city and the main port city and surrounding industrial areas in both of the locations. From the point of view of electricity demand issue this data broadly matches with the "east-west" divide argument of the regional disparity issue.

2.4.8.2 Natural Gas

Besides electricity, natural gas is also an important issue in regional disparity. Availability of this energy source plays a crucial role in develoing regional economies. There are substantial differences in terms of availability of natural gas in different regions of the country. Large areas of the northern and the southern parts of the country still do not have natural gas coverage. This could explain a large part of difficulties that these regions are facing in keeping pace with other areas in terms of establishment and maintenance of manufacturing units.

Appendix Table 2.16 provides a different aspect of natural gas use. This exhibits production and sales of natural gas from 1990-91 to 2007-08. In earlier years nearly half of natural gas extracted was used for electricity generation; this has decreased by some margin in recent times. Production of fertiliser was the second category of use of natural gas in initial years within the reference period; share of this use also declined in recent years. The captive category, the industry and household consumption, have gained in terms of share of natural gas uses in more recent years.

2.4.9 Transport and Communication System

Road transport has expanded quite extensively within the country. With the construction of the Jamuna Multipurpose Bridge, the northern areas have been connected with the capital, which definitely has contributed to the regional development of the northern areas. The proposed Padma Bridge would substantially improve connectivity of the western and southwestern parts of the country with the capital city as well.

Appendix Table 2.12 provides data of road density of 64 districts in terms of meters of road per square kilometer area. The lowest level of road density is reported in the district of Rangamati, which is quite logical in the sense that this is a hilly area. We can add that within the same former Chittagong Hill Tract region, the other two districts, Bandarban and Khagrachhari, have been placed at the 19th and the 47th places respectively. Therefore, it is to be examined why Rangamati has the lowest road density value in the country. Shariatpur, Khulna, Sunamganj, Jamalpur, Thakurgaon and Patuakhali are other lowest road density areas of the country. Feni, Gopalganj and Pirojpur are districts with highest road density values. We mention that we are examining roads maintained by the Roads and Highways Department only, not the records for rural roads and town roads maintained by the Local Government and Engineering Department (LGED). Apparently there are some inconsistencies in the compiled data as well.

Appendix Table 2.29 provides data for railway system in the country. There is a tendency for reduction in terms of outreach in the trend data, both in terms of

number of stations and number of route kilometers. In addition to this, there has not been an increase in the number of pessangers (this account for only the air conditioned, first and second class, but not the third class). Therefore, railways sector is exhibiting a clear tendency of contraction. This is a cause of concern since we note the usefulness of the railways subsector as a means of cheap transport for people of laggard regions.

The country has a long tradition of waterways in the form of communication. Appendix Table 2.30 provides a long trend data for inland waterways communication system. The data exhibits that there have been fluctuations in this sector, rather than an upward movement over time. Pessanger services provided services for a high number of pessangers during the years of 2002-03 to 2005-06, and then it reverted back to levels close to the previous ones. Ferry services have exhibited upward movement, while the expansion has been slow in recent years. If we set this data with resepect to the rapidly expanding population of the country, we may find that this subsector is contracting in terms of per capita amount of service provided.

An important arena of communication infrastructure is the port facilities. Between the two ports, Chittagong and Mongla, the former has retained the major share for long time in terms of both imports and exports. One point to notice is that the share of Mongla port is actually shrinking, both in terms of the absolute values and the relative shares. Mongla port is fast losing its importance as against the Chittagong port. This actually may have contributed to the previously mentioned "east-west" divide in the country: port of the western part is becoming practically nonexistent day-by-day and port of the eastern part is taking almost all the shares of international trade traffic. The rapid loss of importance of Mongla port needs to be reverted back if we need to broadly address the "east-west" divide issue in the future.

2.4.10 Access to Growth Poles

A different factor that may have contributed to the differences in regional indicators is the issue of the "east-west" divide. If we examine the map of the country, we notice that the mighty rivers Jamuna, the Padma and the Meghna have sliced the country into three pieces. Three divisions are on the western side of the rivers, and these are Rajshahi, Khulna and Barisal. On the eastern side of the rivers, there are three more divisions, and these are Dhaka, Chittagong and Sylhet. Only the greater Faridpur area of the Dhaka division is located on the western side of the rivers. Thus there is a natural barrier within the country in the form of rivers and even till today the barrier is difficult to surmount.

A number of indicators presented in this report and other reports indicate that on a broad scale the divisions of Rajshahi, Khulna and Barisal are lagging behind and the divisions of Dhaka, Chittagong and Sylhet are economically more advanced (see Appendix Table 2.31). A major reason behind this difference is that both the capital city Dhaka and the port city Chittagong are located on the eastern side of the natural barrier, and there are no cities on the western side which are as comparable to these cities. Both of the abovementioned cities have large industrial areas surrounding each of them, and trade and services have flourished in these locations as well. The differences between these city locations and other lagging regions in terms of living standards are also noticeable. One study mentions that households in Dhaka metropoliton city on an average have a consumption level that is 78 per cent higher than that of the rural households in Rajshahi division (Shilpi 2009). Shilpi (2009) terms the western side of the rivers as the "less integrated region" (LIR) and the eastern side of the rivers as the "integrated region" (IR) since the areas on the eastern side are better integrated with the major growth poles of the country, namely Dhaka and Chittagong, and similarly less integration is noticeable for the western side. Appendix Table 2.31 reveals that poverty reduction (upper level poverty) has been more successful in the IR region as compared to the LIR region between 2005 HIES and 2000 HIES. On an average, distance to Dhaka city has been found to be smaller for the IR region and larger for the LIR region; and this situation did not change over time either (296 km for a LIR mouza contrasted with 170 km for an IR mouza). Also, there are some differences in terms of percentage of mouzas with electricity connections, presence of Bangladesh Krishi Bank, any Commercial Bank, Grameen Bank, market or bazaar and any bank in the mouza.

The major assumption behind the "access to growth poles" explanation of regional disparity is that, historically, major growth poles have been located on the eastern side of the major flow of rivers Jamuna, Padma and Meghna; and spillovers from these growth poles could not penetrate on to the western side of the country primarily because of the natural barrier. Therefore, roads and bridges, to improve interconnectedness of these two regions, would need to be considered a major policy direction. The proposed Padma Bridge would be one giant step forward in this direction.

2.4.11 Health and Education Infrastructure and Related Factors

2.4.11.1 Health Infrastructure

Infrastructure for health services is an important tool to increase the accessibility of health services to the poor. Inadequate workforce in the health sector and the lack of physical infrastructure are the key challenges for the government. As showed in Table 2.33, density of physicians and personnel for

nursing and midwifery services is quite low in Bangladesh, in comparison to other South Asian and low-income countries. The indicator for physical infrastructure–hospital beds per 10,000 populations–is also significantly lower than these countries. Therefore, it appears that the government has to allocate a significant proportion of its resources for the development of the health sector of the country.

TABLE 2.33
HEALTH WORKFORCE AND INFRASTRUCTURE, 2000-2007

Country	Health Workforce Density (per 10,000 population)					Hospital beds
	Physicians	Nursing and midwifery personnel	Dentistry personal	Community health workers	Other health service providers	Hospital beds per 10,000 population
Bangladesh	3	3	<1	2	3	3
India	6	13	1	1	16	7
Pakistan	8	5	1	4	2	10
Sri Lanka	6	17	1	-	3	29
Low-Income	4	10	1	4	3	12

Source: World Health Statistics 2009.

TABLE 2.34
HEALTH WORKFORCE IN BANGLADESH, 2009

Workforce	Density (per 10,000 population)
Doctor	2.6
Nurse	1.4
Dentist	0.2
Health Inspector including Assistant H.I.	0.3
Family Planning Inspector including Assistant H.I.	0.3
Family Welfare Assistant (FWA)	3.1
Family Welfare Visitor (Women)	0.4
Trained Birth Attendant (Women)	0.2

Source: Ministry of Health and Family Welfare (2009).

Annual development expenditure of the government does indicate that the expenditure on health, population and family welfare increased significantly over the years–its share increased from 7.25 per cent in 2000-01 to 11.37 per cent in 2007-08. Table 2.34 presents a more detail picture of the existing workforce in the

health sector of Bangladesh. Inadequacy of workforce in the health sector is much worse than showed in Table 2.34. A report presented by the Ministry of Health and Family Welfare showed that only 2.6 doctors are offering services per 10,000 population.

The private sector health service providers also occupy a significant share of the market for health services. The growth of the private sector is significantly high–the number of private hospitals or clinics increased by 3 times and number of hospital beds increased by 2.5 times during 1997-98 to 2005-06 periods (Table 2.35). Though the growth of number of public sector hospitals has been slow (5 per cent), number of hospital beds in the public sector increased by 30 per cent over the same period. The latter observation is mainly due to enhancement of existing public facilities with increasing number of hospital beds. Expansion of private sector does help satisfying a part of the rising demand for health services, but the poor and low-income people hardly have any access to private sector facilities.

TABLE 2.35

NUMBER OF HOSPITAL/CLINICS AND BEDS, 1997-98 AND 2005-06

Hospitals/clinics	Total	1997-98		2005-06	
		1,258	100.0	2,519	100.0
	Public	645	51.3	678	26.9
	Private	613	48.7	1,841	73.1
Beds	Total	40,477	100.0	66,717	100.0
	Public	29,106	71.9	37,661	56.5
	Private	11,371	28.1	29,056	43.5

Source: Key Findings on Private Health Service in Bangladesh 2007, BBS.

In order to generate a significant impact on health outcomes, health facilities should be close to the rural population. Upazila health complexes are the closest health facilities to the rural households where they can consult with physicians and get admitted for treatment if necessary. However, most of these health complexes do not have enough resources and specialised doctors required for treatment of complex diseases. Another critical problem for accessing upazila health complexes is the poor communication system in rural areas, which not only requires significant amount of travel time but also imposes significant travel cost. From the data we find that Gaibandha and Sirajganj districts of Rajshahi division and Maulvi Bazar district of Sylhet division have a very low density of female family planning personnel relative to other districts. Though some small private clinics are growing in few upazila head quarters, such facilities are only accessible to richer households.

TABLE 2.36
DIVISION WISE DISTRIBUTION OF REGISTERED PRIVATE HOSPITALS/CLINICS, 2007

Hospital (No. of bed)	Dhaka	Rajshahi	Chittagong	Barisal	Khulna	Sylhet	Total
251-500	14	3	0	0	0	0	17
101-205	12	2	5	0	0	0	19
51-100	12	6	8	0	0	0	26
21-50	65	11	35	2	5	3	121
1-20	698	428	263	34	416	133	1,972
Total	801	450	311	36	421	136	2,155

Source: MICS 2006.

Table 2.36 exhibits that more than 90 per cent of the private sector hospitals are very small with number of beds between 1 and 20 in each hospital. Only three per cent of these hospitals have beds over 51. Number of hospitals in the private sector is very low in Barisal compared to all other divisions. Another interesting observation is that Rajshahi stands second in the list, followed by Khulna, Chittagong and Sylhet divisions.

2.4.11.2 Education Infrastructure

In section 2.3.2 it is found that there are significant district level variations in education outcomes. Households' poverty and level of education are linked with high drop out and low educational attainment. There are other important factors beyond household income and related socioeconomic characteristics that are also relevant for regional variation in education outcomes. Regional variation in availability of institutions and quality of education are important determinants of low completion rates in schools.

At present there are 82,218 primary level educational institutions in Bangladesh. About 46 per cent of these institutions are government, 24 per cent are registered non-government one per cent are non-registered non- government primary schools. Remaining 28 per cent are categorised as other primary level institutions. Table 2.37 shows concentration of government primary schools in different divisions. Availability of government primary school per 100,000 population is the highest in Sylhet division followed by Barisal division and the lowest in Dhaka Division. However, density of government primary school (per square kilometre) is the highest in Dhaka division and the lowest in Khulna division. Since we have division wise data only on government primary schools, the data presented in Table 2.37

provides us only a partial view in the absence of all other types of primary level institutions.

TABLE 2.37
CONCENTRATION OF GOVERNMENT PRIMARY SCHOOLS BY DIVISION, 2005

	No. of Govt. primary school	Primary school available (Per 100,000 Population)	Density (per 100 square km)
Barisal	3,309	35.28	24.3
Chittagong	7,445	26.83	22.0
Dhaka	9,989	22.34	32.2
Khulna	4,321	25.83	19.4
Rajshahi	9,262	26.71	26.9
Sylhet	3,346	36.63	26.6
Total	37,672		25.5

Source: Education Survey and Authors' Calculation.

Data on division wise post primary institutions are collected from National Education (Post Primary) Survey 2005. Division wise availability and density of secondary schools, colleges and madrasas are presented in Table 2.38. Regional difference in terms of availability of educational institutions delineates a scenario unmatchable with the other forms of disparity observed in this study.

TABLE 2.38
CONCENTRATION OF SECONDARY SCHOOLS, COLLEGES AND MADRASAS, 2005

Division	Availability of institutions (Per 100,000 population)			Density of institutions (Per 100 square km)		
	Secondary Schools	Colleges	Madrasas	Secondary Schools	Colleges	Madrasas
Barisal	17.1	2.6	12.8	11.7	1.8	8.8
Chittagong	9.8	1.7	5.3	8.0	1.4	4.4
Dhaka	9.3	1.7	4.3	13.5	2.4	6.2
Khulna	16.0	2.9	7.1	12.0	2.1	5.3
Rajshahi	17.1	3.0	9.0	17.2	3.0	9.1
Sylhet	8.4	1.4	3.4	6.1	1.0	2.5
Total	12.5	2.2	6.5	12.1	2.1	6.2

Source: Education Survey and Authors' Calculation.

Availability (number per 100,000 population) of the secondary schools and the madrasas is significantly higher in the economically lagging divisions of Rajshahi, Barisal and Khulna. On the other hand, both availability and density of secondary schools are the lowest in Sylhet division. In line with Sylhet, Chittagong division has also low availability as well as low density of secondary schools. Rajshahi division surpasses all other divisions in terms of availability of colleges (per

100,000 population). Since population in Dhaka division is significantly higher, availability of secondary schools per 100,000 population is lower than all other divisions (except Sylhet).

2.4.12 Financial Infrastructure

Financial institutions (e.g. banks, MFIs) can play an important role in reducing poverty and regional inequality. Typically, bank branches tend to be high in economically advanced regions since demand for financial services increases with economic development. On the other hand, in absence of financial services economic opportunities remain limited in economically backward regions. High density of bank branches is indicative of vibrant economic activities, while low density of bank branches not only reflects meager economic activities but also signify poor prospect. There are significant disparities in availabilities of bank branches among different regions. Density of bank branches varies from as high as 11.5 (number of branches per 100,000 population) in Dhaka district to as low as 2.33 in Kurigram district. Table 2.39 shows districts with density of bank branches less than 4 excluding the districts with 100 or more branches. The lowest 10 districts include 4 from Dhaka and Rajshahi division each and other two are from Khulna and Barisal division. In terms of number of bank branches, two hill districts–Khagrachari and Bandarban–are ranked at the bottom of the list with only 22 and 24 branches respectively. Partly this could be explained by difficulties in communication system in the hilly areas. However, from the district tables it is not possible to differentiate bank branches between the urban and the rural areas. Available data show that the growth of deposits and advances is slower in the rural areas than their urban counterparts, resulting in a gradual decline in share of rural areas.

Microcredit programme included the rural poor into the formal financial services and promoted non-farm income generating activities. In general, microfinance coverage is expected to be high in poor areas since poverty alleviation is its stated objective. However some of the poorer districts have very low coverage of micro credit programmes–such as all the three hill districts of Chittagong division and Habiganj and Sunamganj districts of Sylhet division and Mymensingh district of Dhaka division have high incidence of poverty (HC>0.47) but have low coverage of micro credit programmes. We have data on number of different microfinance institutions operating in different districts. But data on number of MFI branches in each district are not available. Therefore, Table 2.40 reflects concentration of microfinance institutions in different areas rather than availability of branches in these areas.

TABLE 2.39
DENSITY OF BANK BRANCHES
(BRANCHES PER 100,000 POPULATION), JUNE 2009

Rank	Division	Districts	Number of reporting branches	Branches per 100,000 population
1	Rajshahi	Kurigram	48	2.33
2	Dhaka	Sherpur	37	2.57
3	Dhaka	Netrokona	58	2.59
4	Rajshahi	Gaibandha	70	2.86
5	Dhaka	Kishoreganj	84	2.88
6	Barisal	Bhola	58	2.99
7	Rajshahi	Lalmonirhat	41	3.26
8	Dhaka	Jamalpur	80	3.31
9	Khulna	Satkhira	74	3.47
10	Rajshahi	Nilphamari	63	3.51
11	Sylhet	Sunamganj	81	3.56
12	Dhaka	Madaripur	47	3.57

Source: Scheduled Bank Statistics, April-June 2009, Bangladesh Bank.

TABLE 2.40
CONCENTRATION OF MICRO FINANCE INSTITUTIONS
AND HEAD COUNT INDEX, 2006

Number of MFIs less than 50				Number of MFIs greater than 100			
Division	District	MFI excluding sadar	HC	Division	District	MFI excluding sadar	HC
Khulna	Meherpur	17	0.121	Dhaka	Netrokona	103	0.316
Khulna	Narail	24	0.455	Rajshahi	Sirajganj	109	0.525
Dhaka	Rajbari	34	0.436	Khulna	Bagerhat	111	0.430
Chittagong	Bandarban	35	0.693	Khulna	Khulna	112	0.545
Chittagong	Lakshmipur	36	0.343	Khulna	Jessore	130	0.557
Chittagong	Feni	39	0.125	Rajshahi	Naogaon	134	0.495
Rajshahi	Lalmonirhat	39	0.535	Dhaka	Mymensingh	135	0.596
Chittagong	Khagrachhari	40	0.389	Rajshahi	Bogra	142	0.477
Dhaka	Madaripur	41	0.386	Chittagong	Comilla	144	0.308
Dhaka	Shariatpur	44	0.329	Dhaka	Kishoreganj	146	0.258
Khulna	Chuadanga	45	0.331	Barisal	Barisal	150	0.577
Barisal	Jhalakati	46	0.470	Rajshahi	Dinajpur	169	0.500
Rajshahi	Thakurgaon	46	0.529	Dhaka	Tangail	171	0.404
Rajshahi	Nawabganj	47	0.422	Chittagong	Chittagong	187	0.256
Chittagong	Rangamati	48	0.412				

Source: PKSF (2006).

The left part of the Table lists the districts where less than 50 different MFIs are working as well as head count indexes for each districts. The right part of the Table

shows the districts where more than 100 different MFIs are operating. In the left part some of the high poverty prone areas (e.g. Bandarban, Lalmonirhat) have small number of MFIs, likewise in the right part a large number of MFIs are working in some of the high poverty prone areas (e.g. Mymensingh, Jessore). On the other hand, some of the less poverty prone areas (e.g. Chittagong, Kishoreganj, Comilla) have very high concentration of MFIs. Therefore, concentration of MFIs is not typically high in high poverty prone areas rather some of the better off areas have concentrations of a large number of MFIs.

2.4.13 International Migration and Foreign Remittances

According to the Ministry of Expatriates' Welfare and Overseas Employment, 5.58 million Bangladeshi workers were working abroad as of June 2009. In the fiscal year 2008-09, the country received 9.7 billion dollars as workers' remittances, which is 151 per cent higher than that of 2005. Such a high growth of workers' remittances not only protected the country from macroeconomic imbalances but also contributed to well being of remittance receiving households. Since households having expatriate workers are highly concentrated in some areas of the country compared to others (as showed in Table 2.41), the excluded or marginally included regions have gained little from inward foreign remittances. It is clearly evident that Chittagong and Dhaka divisions dominate the share of expatriate workers. Around 78 per cent of total expatriate workers are from Dhaka and Chittagong divisions, whereas share of Chittagong division is 42.2 per cent and that of Dhaka division is 35.7 per cent. In terms of total population, Chittagong division (7.7 per cent) has the highest proportion of its population working abroad followed by Sylhet division (4.28 per cent) and Dhaka division (4.04 per cent). On the other hand, less than one per cent of Rajshahi division and little less than 1.5 per cent of Khulna division's population are working abroad.

TABLE 2.41
DIVISION WISE DISTRIBUTION OF EXPATRIATE WORKERS, 1976 TO 2007

Division	Number of Expatriates	As per cent of population	As per cent of total expatriates
Barisal	193,510	2.06	4.0
Chittagong	2,135,498	7.70	42.2
Dhaka	1,806,593	4.04	35.7
Khulna	235,546	1.41	4.7
Rajshahi	316,300	0.91	6.3
Sylhet	391,087	4.28	7.7
Total	5,078,534	3.57	

Source: GoB (2008) and Authors' Calculations.

In order to understand whether there is significant variation in the share of expatriates workers within divisions and whether such variation is correlated with poverty outcomes in districts, a simple correlation analysis is conducted. It is observed that there is a statistically significant negative correlation between district level poverty head count rates and share of expatriate workers. That is poverty prone districts are less likely to have higher share of migrants abroad. In other words, foreign migration is correlated with lower poverty rates in districts with higher share of foreign migrants. In Table 2.42 shows district wise distribution of migrant workers where it is evident that most of districts of Rajshahi divisions have less than one per cent of their population working abroad. Though Chittagong division has the highest share of expatriate workers, three hill districts of this division have very small number of expatriate workers.

TABLE 2.42
DISTRICT WISE DISTRIBUTION OF EXPATRIATE WORKERS, 2008

Rank (Ascending)	Division	District	Number	As per cent of expatriates	As per cent of population
1	Rajshahi	Panchagarh	741	0.01	0.08
2	Chittagong	Rangamati	556	0.01	0.09
3	Rajshahi	Lalmonirhat	1,481	0.03	0.12
4	Rajshahi	Nilphamari	2,778	0.05	0.15
5	Rajshahi	Kurigram	4,815	0.10	0.23
6	Chittagong	Khagrachari	1,667	0.03	0.27
7	Rajshahi	Rangpur	8,148	0.16	0.28
8	Rajshahi	Dinajpur	8,889	0.18	0.29
9	Chittagong	Bandarban	1,296	0.03	0.38
10	Rajshahi	Thakurgaon	5,926	0.12	0.43
11	Dhaka	Netrokona	10,555	0.21	0.47
12	Khulna	Khulna	13,148	0.26	0.49
13	Rajshahi	Rajshahi	14,829	0.29	0.57
14	Dhaka	Sherpur	8,518	0.17	0.59
15	Rajshahi	Gaibandha	15,740	0.31	0.64
16	Rajshahi	Sirajganj	24,258	0.48	0.77
17	Barisal	Patuakhali	13,333	0.26	0.80
18	Khulna	Satkhira	19,814	0.39	0.93
19	Khulna	Chuadanga	10,925	0.22	0.96
20	Khulna	Bagerhat	17,592	0.35	1.00

Source: GoB (2008).

2.4.14 Sector wise Allocation of Public Expenditure

Public expenditure allocation is an important component in the regional disparity discussion. Public expenditure allocation, particularly on communication infrastructure, provides a signal for private investments to proceed to a region as well. Thus differences in public expenditure allocation to different regions are expected to accentuate the differences in regional disparity.

For Bangladesh, detailed examination of public expenditure in terms of regional allocation has been a recent phenomenon. It is very difficult to ascertain distribution of public expenditure in terms of regions in earlier data. We examine trend data on actual revised expenditure of Annual Development Programme (ADP) for reference period of 1999-2000 to 2007-08. We notice that the ADP actual expenditure is increasing over time, but there are fluctuations. In the years of 2001-02 and 2006-07, there have been declines in ADP expenditures compared to the respective previous years. If we examine the sectoral percentage shares, we notice that percentage shares of agriculture have been within 3.1 per cent to 6.6 per cent, but from 2005-06 onwards, these have been above 5 per cent. Rural development and institutions had shares around 11 to 14 per cent up till the 2004-05, and from 2005-06 onwards these habe been above 15 per cent. Thus we notice that both agriculture and rural development and institutions have received greater emphasis in priority of expenditure of ADP. Electricity, transport, education and religion, health, population and family welfare are priority sectors in ADP expenditure. As mentioned, the government documents do not exhibit the district-wise breakdown of this data; they mention the title of the project, expected completion data, cost of project, and so on.

2.4.14.1 Social Safety Net Programmes

The social safety net programmes are specifically designed to reach the vulnerable population of the country. Since the scale of operations of these programmes are small compared to the overall requirements of the poor and the vulnerable throughout the country, these programmes by themselves may have limited role in determining regional disparity in income and well-being. Even so, these programmes are expected to be channeled for reducing severe manifestations of poverty in the most vulnerable areas. Therefore, regional distributions of these programmes are expected to be matching with spatial poverty aspects.

As Appendix Table 2.32 exhibits, distribution of benefits of the social safety net programmes does not correspond with the regional disparity aspects, at least in the HIES 2005 survey documents. For example, a total of 13.06 per cent of surveyed

households throughout the country have received benefits from the social safety net programmes—around 16 per cent rural households and 6 per cent of urban households received benefits. In Khulna and Rajshahi divisions the percentage figures of households receiving benefits are lower than the national average, whereas the percentage figures of benefit-recipient households in the Dhaka and Sylhet divisions are higher than the national average, and particularly, in the case of Sylhet division, the percentage figure is substantially larger than the national average (22.42 per cent households received benefits as compared to the national average of 13.06 per cent). Here is a mismatch between the need of the poor people of the laggard regions and the amounts of benefits that actually have reached them. This issue of mismatch in the case of the social safety net programmes needs to be addressed during the Sixth Five Year Plan period.

2.5 ALLOCATION OF PUBLIC EXPENDITURE: RECENT TRENDS

2.5.1 Ministry of Finance's Data on Regional Breakdown of Public Expenditure

It is to be mentioned here that the public expenditure data in the government documents do not allow for regional disaggregation, since they are not specifically mentioned in the project descriptions. In addition to that, some projects have coverage of beneficiaries which transcend the district boundaries; then the question arises of how much of this allocation would be considered as allocation for each of these districts.

We can note that recently there have been substantial improvements with regard to this problem. The Finance Division of Ministry of Finance of the Government of the People's Republic of Bangladesh has examined district and division-wise disaggregation of the public expenditure data (of both development and non-development) for recent years (see Ministry of Finance's website).

We examine actual expenditure under ADP disaggregated by district in Apppendix Table 2.22, for the years of 2006-07, 2007-08 and 2008-09 (up to March of 2008-09). The lowest total amount of ADP in 2006-07 was spent for the district of Chuadanga, and this was followed by the districts of Jaipurhat, Thakurgaon, Narail, Magura and Rajbari. In terms of per capita figures, Gaibandha is the lowest per capita ADP expenditure recipient district (with only 660 Taka per capita), and this was followed by the districts of Thakurgaon, Chuadanga, Nilphamari, Rangpur and Mymensingh. Now if we contrast this with the lowest total amount recipients' list of 2007-08, we find Joypurhat, Narail, Meherpur, Thakurgaon, Chuadanga and Rajbari; the lowest per capita ADP expenditure went to the districts of Gaibandha, Thakurgaon, Dinajpur, Satkhira and Mymensingh. We notice that there is a specific

set of districts which are the lowest total as well as the per capita ADP expenditure recipients. On the other side of the sprectrum, there is also a common set of districts, such as Bogra, Sylhet, Comilla, Chittagong and Dhaka, which are often the highest total ADP recipient districts. In terms of per capita ADP figures, this abovementioned list also includes less populated districts such as Khagrachari, Bandarban and Rangamati. There is a systematic pattern in this data set: the pattern is that generally the "laggard" regions are low ADP expenditure recipients and the "advanced" regions are high ADP expenditure recipients. Therefore, public investment component in the annual budget to some extent is tilted towards the more advanced regions, and this might aggravate the growth of the laggard regions as well as regional disparity in the country. Even though officially declared ADP allocation data do not provide much information about regional disaggregation, a closer examination of the same data set reveals a pattern of regional inequality in ADP expenditure in favour of the more advanced regions at the cost of the laggard regions of the country.

The data for non-development expenditure also exhibits a similar type of result, but in this case Dhaka as the capital city holds a large share of this type of expenditure. This is expected since the main offices of the ministries are all in Dhaka city; therefore, the expenses of the main offices are included in the disaggregated district figure of Dhaka (see Appendix Table 2.23).

2.6 URBANISATION MANAGEMENT AND HOUSING SECTOR: EMERGING CHALLENGES

2.6.1 Rapid Urbanisation: An Emerging Concern

Urbanisation is linked with the economic development of the country; it increases with economic growth, industrialisation, concentration of the service sector and other related factors. Declining role of agricultural value added also contributes to the growth of urbanisation. The issue of urbanisation arises as a matter of concern when its rate of growth goes beyond the adjustment capacity of an economy. In Bangladesh, like some other developing countries, the causes behind urbanisation can be attributed to the growing economic disparity between the urban and the rural areas of the country. Rural poverty and lack of employment opportunities in the rural areas have forced the rural poor to migrate to the urban cities in search of employment.

The country's urban population has grown at a yearly average rate of 6 per cent since 1971, while the national population growth rate was 2.2 per cent during the

same period (World Bank 2007). The share of urban-based economic activities increased from 26 per cent in 1972-73 to over 42 per cent by 1998-99, and at the same time, the share of agriculture in GDP declined from 60 per cent to 26 per cent (World Bank 2007). The relative decline of agriculture as a major source of earnings to service and industry has contributed to relative lack of opportunities in the villages; and people have opted to migrate to the large cities in search of better economic opportunities. This phenomenon of rural-urban migration is nothing exceptional, and has been common to all over the world. What is alarming in the case of Bangladesh is that the rural populace has not opted to migrate to neighbouring small towns and secondary cities; instead, they have mostly opted to move directly to the large metropolitan cities. This is probably caused by the moribund state of the secondary cities and the small towns; which cannot offer the rural populace enough scope of employment and business. Thus urbanisation, in the case of Bangladesh, can be stated as both unhealthy and unplanned, and this is required to be addressed in the Sixth Five Year Plan framework as well.

TABLE 2.43
GROWTH OF URBAN POPULATION IN BANGLADESH, 1951-2001

Census year	Total national population (million)	Annual growth rate of urban population (per cent)	Total urban population (million)	Urban population as per cent of total population	Decadial increase of urban population (per cent)	Annual exponential growth rate of urban population (per cent)
1951	44.17	0.50	1.83	4.34	18.38	1.58
1961	55.22	2.26	2.64	5.19	45.11	3.72
1974	76.37	2.48	6.00	8.87	137.57	6.62
1981	89.91	2.32	13.58	15.54	110.68	10.03
1991	111.45	2.17	22.45	20.15	69.75	5.43
2001	123.10	1.47	28.81	23.40	27.38	3.25

Source: Islam (2006).

As we examine the data, we notice that urbanisation is taking place in the country at an exceptionally fast pace (Table 2.43). This can be safely claimed since growth rate of urban population has always exceeded the national growth rate of

population during the last six decades. The fastest rate of urbanisation occurred during 1974 to 1981 in the backdrop of the War of Liberation, formation of the new state, political turmoil, and subsequently it decreased to some extent. During the period of 1991 to 2001, the urbanisation rate has actually decreased to 3.25 per cent per annum, which is actually a lower number as compared to those of the previous five decades. One plausible explanation could be that rural economy also underwent noticeable improvements during this period, and thus could retain some of its population from migrating to the cities. Even this moderate number is higher compared to the national growth rate of population.

One noticeable feature of urbanisation issue is that the pattern of urbanisation that we notice here is more concentrated in mostly the large cities: Dhaka, Chittagong, Khulna and Rajshahi. Dhaka is the capital city, and has now been reported to carry a population of more than 15 million. Dhaka is conveniently located in the middle of the country and has the most advanced transportation networks with all the locations of the country. Dhaka and the surrounding areas have large industrial as well as financial bases which attract even more concentration into this area. Chittagong is the port city, and it is the second most important location in terms of rapid urbanisation. Rajshahi, Khulna, Sylhet and Barisal have also exhibited fair amount of urbanisation growth. On the other hand, there are about 300 smaller urban areas, which have not exhibited much growth, and have been reported to carry only a meager 4 per cent of the urban population (World Bank 2007 and Islam 2006).

2.6.2 Causes and Features of Urbanisation

The urbanisation literature identifies that high concentration of population in the urban areas is most advantageous to firm production (World Bank 2007). The literature argues that firms benefit from a large concentration of people in the urban areas. This benefit is in the form of a pool of skilled workers, a collection of complementary firms that can provide backward and forward linkages, ease of information collection within the indsutry, and a ready urban consumer market. This actually provides the firms with scope for economies of scale, so this is positive for growth and productivity. Again, there seems to be a limit beyond which urbanisation can turn out to be counterproductive. For example, rapid urbanisation may lead to too much concentration of people in a small location, creating a huge pressure on its infrastructure facilities. Traffic congestion, unhealthy and unsafe living condition may actually reduce well-being of the newly urbanised community.

As we follow the textbook discussion, Bangladesh seems to have crossed this limit of urbanisation and has reached a stage where the negative fallouts have taken over positive aspects of urbanisation.

In addition, rapid urbanisation creates a policy-making dilemma. The dilemma is that rapid urbanisation requires additional public fund to be spent on urban areas, implying lower amount of fund available for rural areas. Again, providing services only at the urban centres may attract far more people into those areas than that are practically manageable. Fund still has to be provided for the rural areas so that rural economy does not break down from lack of care and initiatives; people are forced to migrate to towns as a result. One solution is that if small towns and secondary cities are attractive for investment and employment opportunities, rural people may decide to migrate to the neighbouring towns and secondary cities rather than relocating themselves all the way to the metropolitan cities. This would reduce pressures on the metropolitan locations and help achieve a spatially balanced economic development. As we already mentioned, Bangladesh so far has failed to achieve this kind of spatially balanced economic development.

A World Bank (2007) report points out that the *market access* and *agglomeration economies* (indicative of presence of firms in own industry and of firms in related industries) are some major reasons why firms prefer to locate themselves in particular places rather than spreading themselves over the entire territory. On both counts, Dhaka and Chittagong are easily the foremost cities in the country, as they are linked with every other place and they have all kinds of supporting services for industries (such as commerce and banking facilities, and in the case of Chittagong, the port). On the other hand, small towns and cities are failing miserably to attract manufacturing investment into their areas since they cannot offer proper supporting facilities to the investors.

In this context, we point out that this rapid and unplanned urbanisation is linked with regional disparity that we have discussed in detail so far. The firms have a tendency to locate themselves to major metropolitan areas; similarly, people have a tendency to locate themselves overwhelmingly to those areas as well. If the issue of regional disparity would have been properly addressed by now, firms and people would have found opting for neighbouring cities and towns more attractive (provided they would have ample income earning opportunities) rather than moving themselves to large metropolitan cities.

2.6.3 Urbanisation Management: Present Situation

We notice that large metropolitan areas suffer from weak city management. Here are some issues that are relevant for informed policy-making regarding urbanisation management in the country.

A measure of urban concentration is the *primacy*, or the share of the largest city in the total urban population in the country. In Bangladesh, Dhaka's primacy rate is about 32 per cent of the total urban population—this is very high as compared to India's primacy rate of 21.94 per cent and Pakistan's primacy rate of 5.72 per cent (World Bank 2007). Despite the stated government objective of decentralisation, Dhaka retains all the major government establishments (Islam 2006). Other than Dhaka (about 15 million people), only the city of Chittagong (with four million people) has obtained some concentration of industry and commerce. Khunla is the third largest city with about 1.2 million people, whereas Rajshahi, located in the mid-west, is the fourth largest city with a population of 0.7 million. The cities of Sylhet and Barisal are divisional headquarters (and have been assigned the status of city corporation), but in terms of population they are not comparable to these, as already mentioned (Islam 2006). We notice that, much in line with our discussion of regional disparity, economically more advanced regions of Dhaka, Chittagong and Sylhet divisions contain both the most important cities of Dhaka and Chittagong; on the other hand, the laggard regions of Rajshahi, Khulna and Barisal contain cities of Khulna and Rajshahi (much smaller in size).

Outside of metropolitan cities, there are 305 *pourashavas* (or municipalities) and in addition 211 urban centres (with population in the range of 5,000 to 15,000); these are small urban centres scattered throughout the country. The non-metropolitan cities and towns, which have a district headquarters status, may be considered "secondary cities" (these have population in the range of 50,000 to 500,000) and the urban centres with less than 50,000 population can be considered "rural towns" (Islam 2006).

With regard to the power structure, we notice that there is an imbalance in the assignment of responsibilities. The central government is responsible for most of the responsibilities. On the other hand, local government authorities have limited power.

The local government institutions depend on the central government funds since their own revenue generation capacity is rather limited. The amount of tax collection by the local administration is low. Since they have limited power and

authority, the local populace themselves do not take local governments seriously, particularly in terms of tax collection and service provision (Islam 2006).

The functioning of the local government depends on the transfers sent by the central government because they do not have sound revenue generation capacity. The central government transfers fund to the local governments mainly in the form of: (a) transfers for investment expenditures in the ADP, (b) block grants to finance local expenditure, and (c) revenue budget transfers to finance recurrent expenditures, particularly salary for municipal employees (World Bank 2007). Data reveal that, with additional Pourashavas that have been created, total government grants per pourashava have fallen by more than half between 1996 and 2002 (Appendix Table 2.33). This indicates a poor state of the local governance in the country where the centre is unwilling to share power with the periphery.

2.6.4 Housing Sector

The issue of urbanisation management is closely associated with an additional concern—the issue of housing sector planning. The Constitution of the People's Republic of Bangladesh has recognised shelter as one of the fundamental human rights. Thus providing home to each and every household is a constitutional obligation of the government. But this is increasingly becoming difficult for the government to keep up to this obligation. While the population growth rate is around 1.48 per cent in recent times, rural-urban migration rate is quite high—this results in rapid and unplanned urbanisation as well need for constructing more and more houses, particularly in areas adjacent to cities. Some observers estimate that Bangladesh has to construct approximately 4 million new houses annually to meet the future demand of the next twenty years. Some other estimates place annual requirements for housing in urban areas to be in the range of 3 lakh to 5.5 lakh units (CPD 2004).

With the growth of population there is an intense competition for land for alternative uses—agriculture, forest, industry and homestead. This results in demand for high density settlements or high-rise apartments. In the country, the area allocated for human settlements and supporting services is around 30 per cent. With limited amount of land to begin with, this land is becoming increasingly inadequate for provision of housing for all. This results in an increasing trend for high-rise apartments at the outskirts of the cities as well as growth of urban slum dwelling where civic amenities are available at the minimum. Land prices at the metropolitan cities have reached astronomical figures (CPD 2004).

The twin issues of unplanned urbanisation and housing sector problem are evident in the case of the capital city of Dhaka in recent times. This is one of the fastest growing metropolitan cities in the world. Dhaka city has experienced an unplanned growth both through in-fill development and outward edge growth—not environmentally sustainable in most of the cases. The land prices of Dhaka city have become extraordinarily high. This astounding feature of land prices in Dhaka is principally caused by its natural state of being a floodplain surrounded by a criss-cross of rivers and lakes in all three sides except for slightly high land area in the north, and these rivers occasionally flood the lowlands surrounding the city (see Rahman 2004). Thus there is scarcity of land in the city and there have been allegations of weak land management practices by the only public office in charge, the Rajdhani Unnayan Kartipakkya (RAJUK). Some data indicates that RAJUK, since its inception in 1959, has been able to meet only 1 or 2 per cent of demand for serviced land within its jurisdiction (World Bank 2007). This is indicative that public efforts at providing and facilitating housing facilities have not been much successful. Thus the almost entire arena of housing sector has been in the hands of the private sector—leaving limited scope for the lower-income people for having housing services.

2.6.5 Plans for Tackling Urbanisation Management and Housing Sector Challenges

We emphasise on the statement that the twin problems of unplanned urbanisation management and housing sector challenges are ultimately results of the issue of regional disparity in the country. Therefore, addressing regional disparity and having specific plans of actions for tackling that issue would be needed to address these two issues as well. We consider some specific recommendations that may turn out to be helpful in this situation.

Firstly, the government has to decentralise administrative and economic activities into the small and medium urban centres other than the capital city of Dhaka for a balanced development of the country. This is a crucial requirement of the time that some administrative offices of the government are shifted to smaller cities. For example, government offices assigned for development of the northern and the western regions would be better suited in the cities of Rajshahi or secondary cities of Rangpur or Dinajpur, rather than in the capital city of Dhaka. The government has to address staff recruitment and incentive issues as well in order to successfully implement this course of action.

Secondly, there has to be concrete steps in order to strengthen local governance; more functions and authorities have to be handed over to them instead of retaining these in the hand of the centre, and more local tax and non-tax revenue generation capacity has to be arranged for them.

Thirdly, rural-urban migration issue can only be effectively solved only if we can address rural development issue with major emphasis. Some concrete steps are already undertaken, such as development of growth centres, etc.

Fourthly, there has to be a national land use planning policy which will give directions on how effectively to use land that we have in a systematic manner. This policy guideline will incorporate strategies for land development practices and policies to be practiced by the development authorities, such as RAJUK, CDA, etc.

Fifthly, transport and communication has to be further improved and thus market access has to be enhanced for small towns and secondary cities so that business expands in these cities and towns on their own. This will create an atmosphere where people of small towns would not feel dissociated from the ongoing national economic growth process, and would not want to relocate themselves in the metropolitan cities.

2.7 SPECIFIC TARGETS FOR THE SIXTH FIVE YEAR PLAN

2.7.1 Target Setting

We have discussed a number of factors that have contributed to the regional disparity aspects of Bangladesh. Our discussion on various issues reveals that the administrative divisions differ in terms of outcomes of regional disparity, most prominently in terms of income dimensions. We can also add that regional disparity may simply co-exist, or even aggravate, over the course of economic growth, unless specific corrective measures are taken to reduce the gap among regions. Here is a question of equity versus efficiency trade-off in public policy. While efficiency may suggest that private investments would concentrate in economically advanced regions, and move away from laggard regions on the other hand, equity requires that standard of living and well-being of citizens in the laggard regions are not undermined because of this. Public policy has a very important role to play in this situation. By addressing specific concerns of the laggard regions, and channeling public investments into these regions, public policy can reduce the gap among regions.

2.7.2 Special Fund for Addressing Regional Disparity: Cost and Financing

Our discussion leads to the conclusion that the regional disparity issue needs to be brought to the forefront in the country's policy-making arena, and measures need to be taken to address this issue. One plausible way this can be done is a separate clause addressing regional disparity in public investment projects as long as it is applicable. In addition to this, a separate fund would have to be kept in the ADP for addressing this regional disparity issue. This would require additional fund for ADP expenditure, and this additional fund is expected to be some reasonable percentage of overall ADP expenditure (for example, this fund could be 15 per cent of overall ADP, but this one would be in addition to the other regular ADP components, so that ADP itself will have to be raised by 15 per cent, say the new ADP allocation including regional disparity fund would be 115 per cent of the original business-as-usual ADP allocation). The reason that we have proposed 15 per cent fund is that per capita development expenditure in the laggard regions in general have been found to be approximately around 25 per cent lower than the per capita development expenditure in the more economically advanced regions (see relevant discussion of Section 2.5). We are proposing that per capita development expenditure has to be matched across all regions for the sake of spatial equity and reduction of regional disparity. Thus we propose, as a principle, equal per capita development expenditure for all, across advanced regions and laggard regions (to note that there is an exception to the cases of large cities, such as Dhaka and Chittagong, where fixed component requirements of large megaprojects may have to be implemented, so that per capita allocation could be different from other areas).

About the financing of this proposed special fund for addressing regional disparity (15 per cent of ADP compared to the business-as-usual scenario), we would recommend that the government has to borrow this fund from domestic and external sources. Since the return to this would be generated only in the medium to long term, the government has to incur this cost for the sake of meeting the overall broad objective of an *inclusive growth*. An alternative option is to cut down on the *less effective* sectors of ADP allocation, and bring the fund to this special fund for the laggard regions. This entails thorough research on examining ADP expenditure and effectiveness indicators (if there is any), which is beyond the scope of this study. We would only suggest that it has been commonly perceived that not all ADP allocations are bringing fruitful results, and it is about time to relocate funds with more achieveable and more focused targets and goals.

In this section, we construct some specific outcome indicators, to be termed as "targets" that are needed to be attained by the end of the Sixth Five Year Plan. This would be achieved by the regular ADP expenditure as well as the abovementioned special fund for addressing regional disparity issue. We propose four categories of targets: poverty line, income, health and education outcomes. In the following sub-sections, we discuss each of them by turn.

2.7.3 Target 1: Poverty Head Count Rates

The first target is directed towards the upper poverty line. In Table 2.44, we examine HIES 2000 and 2005 poverty line estimates and we project the year 2010 estimate of upper poverty line on the basis of the trend decline in between 2000 and 2005. This 2010 year estimate is the base for the Sixth Five Year Plan period, and we project 2015 figure on the basis of this.

We notice that the divisions of Barisal, Khulna and Rajshahi have poverty head count rates higher than the national average, and, on the other hand, Chittagong, Dhaka and Sylhet divisions have lower head count rates than the national average. The first target for addressing regional disparity is to reduce the gap between the poverty head count rates of laggard divisions with the average national head count rates by 2014-15, and this by 75 per cent, and finally readjust the projected national average head count rate (Table 2.44, top panel).

We follow the same procedure for poverty head count rates using the lower poverty line (Table 2.44, bottom panel). By the year 2014-15, head count rates by lower poverty lines in Barisal, Khulna and Rajshahi divisions are projected to fall to 19.1, 16.9 and 18.5 per cent, respectively. In that year the average national head count rate by lower poverty line is projected to be at 13.4 per cent. The three other divisions, namely Chittagong, Dhaka and Sylhet, have projected values of head count rates that are already lower compared to the national average.

A special fund specifically designated only for addressing regional disparity issues would be placed so as to reduce the gap between the values of poverty head count rates in the laggard regions and that of the national average, and this reduction is by at least 75 per cent. By reducing the gaps for the laggard regions, the projected national average has again been recalculated, from 13.4 per cent to 12 per cent (Table 2.44).

TABLE 2.44
TARGET 1.1: UPPER POVERTY HEAD COUNT

	2000			2005			2010 (Base)			2015 (Projected)			2015 (Target)		
	National	Rural	Urban	National	Rural	Urban	National	Rural	Urban	National	Rural	Urban	National	Rural	Urban
National	48.9	52.3	35.2	40	43.8	28.4	32.7	36.7	22.9	26.8	30.7	18.5	24.7	28.4	17.0
Barisal	53.1	55.1	32.0	52	54.1	40.4	42.5	45.3	32.6	34.8	37.9	26.3	28.8	32.5	20.4
Chittagong	45.7	46.3	44.2	34	36	27.8	27.8	30.1	22.4	22.7	25.2	18.1	22.7	25.2	18.1
Dhaka	46.7	55.9	28.2	32	39	20.2	26.2	32.7	16.3	21.4	27.4	13.1	21.4	27.4	13.1
Khulna	45.1	46.4	38.5	45.7	46.5	43.2	37.4	38.9	34.9	30.6	32.6	28.1	27.7	31.2	20.9
Rajshahi	56.7	58.5	44.5	51.2	52.3	45.2	41.9	43.8	36.5	34.3	36.7	29.4	28.6	32.2	21.2
Sylhet	42.4	41.9	49.6	33.8	36.1	18.6	27.6	30.2	15.0	22.6	25.3	12.1	22.6	25.3	12.1
	48.9			**40.0**			**32.7**			**26.8**			**24.7**		
TARGET 1.2: LOWER POVERTY HEAD COUNT															
National	34.3	37.9	20.0	25.1	28.6	14.6	18.4	21.6	10.7	13.4	16.3	7.8	12.0	14.5	7.0
Barisal	34.7	35.9	21.7	35.6	37.2	26.4	26.1	28.1	19.3	19.1	21.2	14.1	14.8	17.5	9.4
Chittagong	27.5	30.1	17.1	16.1	18.7	8.1	11.8	14.1	5.9	8.6	10.6	4.3	8.6	10.6	4.3
Dhaka	34.5	43.6	15.8	19.9	26.1	9.6	14.6	19.7	7.0	10.7	14.9	5.1	10.7	14.9	5.1
Khulna	32.3	34.0	23.0	31.6	32.7	27.8	23.1	24.7	20.3	16.9	18.6	14.8	14.3	16.9	9.5
Rajshahi	42.7	43.9	34.5	34.5	35.6	28.4	25.2	26.9	20.7	18.5	20.3	15.1	14.7	17.3	9.6
Sylhet	26.7	26.1	35.2	20.8	22.3	11.0	15.2	16.8	8.0	11.1	12.7	5.9	11.1	12.7	5.9
	34.3			**25.1**			**18.4**			**13.4**			**12.0**		

2.7.4 Target 2: Monthly Household Income

A different category of target is associated with projection of household income. In the HIES 2000 the average national-level household monthly nominal income was TK.5,842, and in the HIES 2005 the corresponding figure was TK.7,203. Assuming that the same trend would prevail, the national average household monthly income in 2010 is projected to be TK.8,881 and this would reach TK.10,950 in the year 2015. Assuming that the same proportionate gap would remain in between the national average and those of the other divisions, we find the projections for household income levels of all the divisions.

A special fund specifically designated only for addressing regional disparity issues would be placed so as to reduce the gap between the values of monthly household incomes in the laggard regions and that of the national average, and this reduction is by at least 75 per cent. After reducing the gap between the values in the laggard divisions and the national average, the latter term has again been calculated, from TK.10,950 to TK.11,239 (Table 2.45).

TABLE 2.45
TARGET 2: MONTHLY HOUSEHOLD INCOME (TAKA)

		Base	Projected	Target
	2005	2010	2015	2015
National	7,203	8,881	10,950	11,239
Barisal	6,094	7,514	9,264	9,686
Chittagong	8,654	10,670	13,156	13,156
Dhaka	7,949	9,801	12,084	12,084
Khulna	6,006	7,405	9,130	9,585
Rajshahi	5,864	7,230	8,914	9,423
Sylhet	8,315	10,252	12,641	12,641

Note: National average was TK.5,842 in 2000.

2.7.5 Target 3: Health Outcomes

Here we construct three targets for health outcomes to be achieved by the end of the Sixth Five Year Plan period, and these are in maternal mortality rate (Target 3.1), infant mortality rate (Target 3.2) and under five mortality rate (Target 3.3). Similar to the case of targets on income and poverty, the targets here are aimed at reducing gaps between the outcomes in the laggard regions and that of the national average.

TABLE 2.46
TARGET 3.1: MATERNAL MORTALITY RATE
(MATERNAL MORTALITY RATE PER 1,000 LIVE BIRTHS BY DIVISION)

Division	2010 Projected			2015 Projected			2015 Target		
	Total	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban
Barisal	5.2	5.2	4.9	4.8	4.8	4.6	3.5	3.6	3.4
Chittagong	2.9	3.2	1.8	2.7	2.9	1.7	2.7	2.9	1.7
Dhaka	2.6	3.0	1.5	2.4	2.8	1.4	2.4	2.8	1.4
Khulna	4.7	4.7	4.5	4.3	4.4	4.2	3.4	3.5	3.3
Rajshahi	3.4	3.7	1.4	3.1	3.4	1.3	3.1	3.4	1.3
Sylhet	5.3	5.5	4.3	4.9	5.1	4.0	3.6	3.7	2.9
National	3.4	3.6	2.4	3.1	3.3	2.2	2.9	3.1	2.0

TABLE 2.47
TARGET 3.2: INFANT MORTALITY RATE
(INFANT MORTALITY RATE PER 1,000 LIVE BIRTHS BY DIVISION)

Division	2010 Projected			2015 Projected			2015 Target		
	Total	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban
Barisal	37.9	39.8	27.0	30.9	32.4	22.0	30.9	32.4	22.0
Chittagong	34.2	35.4	29.6	27.9	28.8	24.1	27.9	28.9	24.1
Dhaka	40.3	42.1	33.8	32.9	34.3	27.6	31.5	32.9	26.4
Khulna	30.8	31.7	27.5	25.1	25.9	22.5	25.1	25.8	22.4
Rajshahi	41.1	42.7	33.1	33.5	34.8	27.0	31.6	32.9	25.5
Sylhet	40.8	42.1	33.8	33.3	34.3	27.6	31.6	32.5	26.2
National	38.0	39.7	32.4	31.0	32.4	26.4	30.0	31.4	25.6

TABLE 2.48
TARGET 3.3: UNDER FIVE (5) MORTALITY RATE
(UNDER FIVE (5) MORTALITY RATE PER 1,000 LIVE BIRTHS BY DIVISION)

Division	2010 Projection			2015 Projection			2015 Target		
	Total	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban
Barisal	53.6	55.7	39.0	40.1	41.7	29.2	38.6	40.1	28.0
Chittagong	56.3	59.0	46.3	42.1	44.1	34.6	39.1	40.9	32.1
Dhaka	50.3	51.5	47.4	37.6	38.5	35.5	37.6	38.5	35.4
Khulna	34.0	33.9	34.5	25.4	25.3	25.8	25.4	25.3	25.8
Rajshahi	55.1	54.8	57.2	41.2	41.0	42.8	38.8	38.6	40.3
Sylhet	48.8	53.7	17.3	36.5	40.1	12.9	36.5	40.1	12.9
National	50.9	52.2	45.9	38.1	39.0	34.3	36.7	37.7	33.1

2.7.6 Target 4: Education Outcomes

Here we construct two targets for education outcomes to be achieved by the end of the Sixth Five Year Plan period, and these are targets in net enrolment rates (in entering the primary education, in class I, combined of boys and girls) and survival rate in primary education (the rate at which a boy or a girl student who gets admitted in class I reach class V (not necessarily completes class V, which is a different indicator, called the completion rate)). The targets here are aimed at reducing gaps between the outcomes in the laggard regions and those of the national average.

TABLE 2.49
TARGET 4.1: NET ENROLMENT RATE
(Net Enrolment Rates (NER))

Division	2006	2007	2010 Projected	2015 Projected	2015 Target
Rajshahi	90.3	90.8	93.2	99.5	100.0
Khulna	95.3	94.3	97.6	100.0	100.0
Dhaka	89.4	89.9	92.3	98.5	100.0
Chittagong	90.5	89.8	92.8	99.1	100.0
Barisal	93.8	95.0	97.2	100.0	100.0
Sylhet	90.7	91.7	93.9	100.0	100.0
National	90.9	91.1	93.7	100.0	100.0

TABLE 2.50
TARGET 4.2: SURVIVAL RATE IN PRIMARY EDUCATION
(Survival Rate in Primary Education by Division)

Division	2006	2007	2010 Projected	2015 Projected	2015 Target
Rajshahi	45.5	47.5	48.7	51.2	55.3
Khulna	55.0	56.5	58.4	61.4	61.4
Dhaka	51.0	51.0	53.4	56.1	56.5
Chittagong	55.2	56.2	58.3	61.3	61.3
Barisal	52.7	57.7	57.8	60.8	60.8
Sylhet	45.6	50.1	50.1	52.7	55.6
National	50.7	52.2	53.9	56.6	57.9

2.8 PLAN RECOMMENDATIONS AND CONCLUSION

This study has formulated some specific targets to be achieved during the Sixth Five Year Plan (Section 2.7). This section suggests some policy related interventions that may be adopted by the Government in order to achieve these

targets. Available recent data from the Ministry of Finance indicate that laggard districts get relatively lower share of the development expenditures of the government in per capita terms. Laggard areas also have limited access to finance compared to the economically more advanced areas with substantially lower per capita deposits and advances as well as lower density of bank branches. Both the issues mentioned above bear critical policy implications for balanced regional growth strategies. Intensity of regional disparity in various socioeconomic aspects suggests that a separate division may be created within the Ministry of Planning to oversee the progress of regional development and formulate strategies towards equalising growth within the country. Any policy intervention at the regional level should be backed by adequate data and related information. In this backdrop, this study proposes some policy interventions that can help reaching the target within the stipulated period.

Here we put emphasis on some crucial sectors as our thrust areas recommended to be implemented during the Sixth Five Year Plan. These are as follows:

1. Access to electricity for laggard regions on a priority basis.
2. Access to natural gas for laggard regions on a priority basis.
3. Construction and maintenance of roads and bridges to connect with laggard regions.
4. Mongla Port needs to be revitalised for a more balanced regional growth.
5. Increased fiscal incentives and reduced bank interest rates against loans to be offered for private manufacturing investments to set up and operate in the laggard regions.
6. Social safety net programmes need to be more focused and made effective in its operation in the laggard regions.
7. Non-farm economic activities should be promoted in the laggard districts through providing training and financing facilities.
8. Number of migrants working abroad should be increased in laggard regions, and training and facilitating services for prospective youths would need to be enhanced.
9. Development of the secondary cities as viable locations for business and commerce.
10. Strengthening of the local government administration and assigning them greater authorities and responsibilities.
11. Relocating government offices and important setups from the capital city to divisional headquarters and facilitating smooth operations of these offices.

12. The government has to initiate integrated land development projects across the country with special emphasis on improving the socioeconomic conditions of the lower-income strata of the society, with provision of basic infrastructure (electricity, water and roads), income generating activities and development of human capital.

The following discussion elabourates on some of the abovementioned thrust areas.

2.8.1 Development of Infrastructure

Improvement of infrastructural facilities is one of the key interventions that can open the door of economic opportunities in the laggard regions. Following measures can be taken:

- Communication system between the better off regions and laggard regions should be improved in order to increase economic activities in the laggard regions. One of the major communication projects, construction of Padma Bridge, will open a new door of opportunities for the south-west region of the country.
- Appropriate measures should be adopted for utilisation of Mongla port. Creating export-oriented industrial zone near to Mongla port can be considered along with its international usage opportunities.
- Supply of electricity should be increased in the laggard regions on a priority basis since development of manufacturing sector demands access to electricity supply.
- Construction of gas transmission line to the laggard regions should be expedited.
- Both inter district and intra district road communication system should be developed to increase economic mobility within the laggard regions.
- Storage facilities for agricultural and fisheries should be increased according to the demand of such facilities in laggard regions where economic activities are mostly agricultural in nature. Such facilities should be enhanced in the remote areas so that farmers get most benefit from such facilities.
- Investment in infrastructural development in natural tourism areas such as Cox's Bazar, Sundarban, Kuakata, etc. is required to raise the flow of tourists in these regions.
- Intensity of bank branches should be increased in the laggard divisions to increase financial services for general people as well as investors of the regions.

- Communication system in three hill districts should be developed to create economic opportunities for these areas.

2.8.2 Industrialisation in Laggard Regions

Industrialisation has to be promoted in the laggard regions. Since private investment has less of an incentive to locate itself in the laggard regions, this process has to be implemented with the help of government support at least in the initial stage.

- Industrial policy should incorporate enough flexibility for investment in the laggard regions.
- Industrial zones should be established in laggard regions with all adequate infrastructural facilities so that entrepreneurs can get benefit from economics of scale. Construction of industrial park at Sirajganj should be expedited and other industrial zones should be established.
- Small and medium enterprises should be encouraged with low cost financing facilities. Rate of interest for bank finances should be lower in the laggard regions which will increase investment.
- Special fiscal incentive such as tax holidays should be offered for investment in laggard divisions.

2.8.3 Development of Agriculture and Rural Economic Activities

Even though the share of agriculture in GDP is shrinking over time, still this is the focus point of the rural economy. Special emphasis has to be given to development of agro-processing, non-farm economic activities in the laggard regions. Following steps can be taken:

- Rural areas of laggard regions should get special priority in agricultural credit disbursement and agricultural subsidy programme.
- Microfinance institutions should be encouraged to operate in poverty prone areas by providing special incentives, e.g. providing fund to MFIs at low rate of interest if they disburse this fund in poor regions.
- Policy measures are required to attract microfinance in environmentally vulnerable areas such as cyclone prone coastal areas, land logged and other flood prone areas and Monga prone areas.
- Non-farm economic activities should be promoted in the laggard districts through providing training and financing facilities. Partnership building between the government and MFIs/NGOs can play an important role in this regard.

- Local government institutions such as Union Parishads should be strengthened to conduct development activities of the government through these institutions.

2.8.4 Creating Opportunities for International Migration

The flow of remittance earnings is emerging to be one sure way of improvement of local economy. We notice that flow of remittance earnings is low towards the laggard regions, which is causing further backwardness of these regions. Following measures need to be taken:

- Number of migrants working abroad should be increased in laggard regions which receive meagre share of foreign remittances.
- Technical and vocational training institutions should be established in the laggard regions as per the demand of other countries.
- Special financing scheme should be directed towards prospective migrants from laggard regions.

2.8.5 Development of Secondary Cities as Viable Options for Industry and Commerce

Rapid urbanisation and fast expansion of Dhaka city contrasting with slow progress of the secondary cities have created a situation where people are not being able to extract benefits from the ongoing growth process. It is imperative now that the government takes special measures for the development of the secondary cities. Following measures can be taken:

- Local government has to be given more taxation and revenue-collection authority as well as more assignment of public services.
- Each town and city administration has to be asked for researching their own respective strength areas, and compete with each other in attracting domestic and foreign investments into their respective locations.

Technical and vocational training institutions should be set up with active participation of the local government bodies and local population, so that skilled manpower is created for use in the local market (this step is required since often it has been mentioned that skilled manpower availability is limited in the small towns).

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APPENDIX TABLE 2.1
ACREAGE AND YIELD RATE OF WHEAT IN GREATER DISTRICTS (1990-91 TO 2005-06)

District	Total Wheat (area in acres and production in metric tons)							
	Area 1990-91	Area 1995-96	Area 2001-02	Area 2005-06	Yield 1990-91	Yield 1995-96	Yield 2001-02	Yield 2005-06
Bandarban	0	0	0	0				
Ranking								
Chittagong	0	260	140	59		0.500	0.357	0.322
Ranking		*19*	*19*	*19*		*21*	*20*	*20*
Comilla	136430	115590	110120	72062	0.595	0.901	0.716	0.492
Ranking	*3*	*8*	*18*	*7*	*15*	*3*	*14*	*17*
Khagrachari	0	0	20	0			0.500	
Ranking			*20*				*18*	
Noakhali	810	1320	2140	482	0.259	0.530	0.449	0.417
Ranking	*18*	*18*	*18*	*18*	*19*	*20*	*19*	*19*
Rangamati	10	20	0	10	0.000	1.000		0.600
Ranking	*20*	*20*		*20*	*20*	*1*		*7*
Sylhet	21070	9870	8940	4252	0.576	0.713	0.852	0.558
Ranking	*15*	*17*	*16*	*17*	*16*	*15*	*9*	*12*
Dhaka	79530	84420	97730	36170	0.632	0.820	0.770	0.568
Ranking	*8*	*9*	*9*	*9*	*12*	*8*	*11*	*11*
Faridpur	112820	124690	130860	107901	0.599	0.719	0.713	0.582
Ranking	*5*	*7*	*5*	*5*	*14*	*14*	*15*	*10*
Jamalpur	57450	68810	79960	30730	0.684	0.762	0.790	0.599
Ranking	*10*	*10*	*10*	*11*	*7*	*11*	*10*	*8*
Kishoreganj	26510	35700	22210	15008	0.659	0.741	0.756	0.480
Ranking	*14*	*14*	*13*	*13*	*9*	*12*	*12*	*18*
Mymensingh	30600	35740	19560	12964	0.663	0.685	0.728	0.492
Ranking	*13*	*13*	*14*	*14*	*8*	*17*	*13*	*16*
Tangail	47460	61200	61990	31962	0.602	0.763	0.701	0.494
Ranking	*12*	*11*	*11*	*10*	*13*	*10*	*16*	*15*
Barisal	9850	14380	17150	7442	0.486	0.706	0.673	0.540
Ranking	*16*	*15*	*15*	*15*	*17*	*16*	*17*	*13*
Jessore	106010	161840	122840	71820	0.700	0.875	0.928	0.711
Ranking	*7*	*5*	*6*	*8*	*6*	*5*	*5*	*3*
Khulna	7760	12460	5460	4299	0.653	0.880	0.872	0.667
Ranking	*17*	*16*	*17*	*16*	*10*	*4*	*8*	*6*
Kushtia	111310	124770	112420	84099	0.650	0.862	0.929	0.717
Ranking	*6*	*6*	*7*	*6*	*11*	*6*	*4*	*2*
Patuakhali	540	5	0	0	0.444	0.600		
Ranking	*19*	*21*			*18*	*19*		
Bogra	51470	48700	50490	16096	0.790	0.962	0.906	0.704
Ranking	*11*	*12*	*12*	*12*	*2*	*2*	*6*	*4*
Dinajpur	206970	230650	353560	251198	0.757	0.732	0.954	0.589
Ranking	*1*	*2*	*1*	*1*	*3*	*13*	*2*	*9*
Pabna	75500	237860	208240	129231	1.571	0.682	0.900	0.742
Ranking	*9*	*1*	*4*	*3*	*1*	*18*	*7*	*1*
Rajshahi	125510	180590	218820	183680	0.735	0.853	0.939	0.696
Ranking	*4*	*3*	*2*	*2*	*4*	*7*	*3*	*5*
Rangpur	172440	180560	210460	124258	0.710	0.808	0.957	0.524
Ranking	*2*	*4*	*3*	*4*	*5*	*9*	*1*	*14*
Bangladesh	**1380050**	**1732430**	**1833110**	**1183723**	**0.728**	**0.790**	**0.876**	**0.621**

Source: BBS, Yearbook of Agricultural Statistics, Various Years and Authors' Calculations

APPENDIX TABLE 2.2
COMPOSITION OF LABOUR FORCE BY MAJOR OCCUPATIONS, 1999-2000 TO 2005-06 (NUMBER IN '000)

Major Occupation	LFS 1999-2000			LFS 2002-03		
	Total	Male	Female	Total	Male	Female
Total	**38978**	**31086**	**7892**	**44332**	**34478**	**9844**
Professional & Technical	1566	1192	374	1723	1319	403
Administrative & Managerial	188	173	15	96	92	4
Clerical Worker	1211	1081	130	1521	1336	185
Services Worker	2237	998	1239	1979	1027	951
Sales Worker	5762	5321	441	6547	6261	286
Agri., Forestry, Fisheries	19929	16109	3820	22764	16992	5772
Production, Transport Labourer & Others	8085	6212	1873	9693	7450	2243

Major Occupation	LFS 2005-06					
	Total	Male	Female			
Total	**47357**	**36080**	**11277**			
Professional & Technical	2231	1737	494			
Administrative & Managerial	223	201	22			
Clerical Worker	1015	872	144			
Services Worker	2757	1892	865			
Sales Worker	6710	6476	235			
Agri., Forestry, Fisheries	22926	15221	7705			
Production, Transport Labourer & Others	11493	9681	1812			

Source: BBS Labour Force Survey, Various Issues.

APPENDIX TABLE 2.3

BRIEF DESCRIPTION OF AGRO-ECOLOGICAL ZONES (AEZS) OF BANGLADESH

Bangladesh is mostly a plain land and has been divided into thirty AEZs (agro-ecological zones). Here is a brief introduction of these AEZs. This overview includes a brief introduction of the AEZs in Bangladesh (this discussion is based on 2005 Yearbook of Agricultural Statistics of Bangladesh, BBS, 2007 and National Agroforestry Working Group, Bangladesh (BARC 2005) web-site at http://www.nawgbd.org/frg.htm).

AEZ-1: *Old Himalayan Piedmont Plain*

Organic matter contents are relatively higher than the other floodplain areas. The soil has moderate natural fertility, except the coarse texture, and this fertility is well sustained. Soil fertility problems include rapid percolation of N, K, S, Ca, Mg and B.

Location: Most of Panchagarh and Thakurgaon districts and north western part of Dinajpur district.

Area (in acres, excluding river beds): 990.4 thousand

Land Type: Highland 58% and Medium Highland 34%

AEZ-2: Active Teesta Flood Plain

Organic matter content is low. Soil fertility level is, in general, from low to medium.

Location: Narrow belts within and adjoining the channels of the Teesta, Dharla and Dudkumar. In Nilphamari, Rangpur, Lalmonirhat, Kurigram and Gaibandha districts.

Area (in acres, excluding river beds): 205.1 thousand

Land Type: Highland 2% and Medium Highland 72%

AEZ-3: Teesta Meander Flood Plain

This is low in organic matter content on the higher land, but moderate in the lower land. Soil fertility level is in general low to medium.

Location: Most of greater Rangpur, eastern parts of Panchagarh and Dinajpur, northern Bogra and parts of Joypurhat, Naogaon and Rajshahi districts.

Area (in acres, excluding river beds): 2339.595 thousand

Land Type: Highland 35% and Medium Highland 51%

AEZ-4: Karatoa-Bangali Flood Plain

Organic matter content is low in ridge soils and moderate in basins. General fertility level is medium.

Location: Eastern half of Bogra and most of Sirajganj districts.

Area (in acres, excluding river beds): 635.555 thousand

Land Type: Highland 23%, Medium Highland 44% and Medium Lowland 14%

AEZ-5: Lower Atrai Basin

Organic matter, CEC and status of essential nutrients are low to medium.

Location: Naogaon and Natore districts and parts of Rajshahi, Bogra and Sirajganj districts.

Area (in acres, excluding river beds): 210.285 thousand

Land Type: Medium Highland 8%, Medium Lowland 21% and Lowland 65%

AEZ-6: Lower Punarbhaba Floodplain

Organic matter content is medium to high with high CEC and general soil fertility level is medium

Location: Extreme western part of Naogaon district and extreme northern part of Nawabganj district.

Area (in acres, excluding river beds): 31.875 thousand

Land Type: Medium Lowland 10% and Lowland 60%

AEZ-7: Active Brahmaputra-Jamuna Flood Plain

Organic matter content is low and fertility status is low to medium. Nitrogen is limited whereas the K, S and Zn status is low to medium.

Location: Eastern parts of Kurigram, Gaibandha, Bogra, Sirajganj and Pabna districts and western parts of Sherpur, Jamalpur, Tangail and Manikganj districts. In addition, some minor areas in Dhaka, Munshiganj, Narayanganj and Chandpur districts.

Area (in acres, excluding river beds): 788.265 thousand

Land Type: Medium Highland 37% and Medium Lowland 20%

AEZ-8: Young Brahmaputra-Jamuna Flood Plain

Organic matter content is low in ridges and moderate in basins. Soils are deficient in N, P and S but the status of K and Zn is medium.

Location: Western parts of Jamalpur, Sherpur and Tangail districts, parts of Manikganj, Narayanganj and Gajipur districts and a belt adjoining the old Brahmaputra channel through Mymensingh, Kishoreganj and Narsinghdi districts.

Area (in acres, excluding river beds): 1463.850 thousand

Land Type: Highland 18%, Medium Highland 42% and Medium Lowland 19%

AEZ-9: Old Brahmaputra Flood Plain

Organic matter content is low on the ridges and moderate in the basins; topsoils are moderately acidic but subsoils are neutral to reaction. General soil fertility level is low. The status of P and CEC is medium and the status of K is low.

Location: Large areas in Sherpur, Jamalpur, Tangail, Mymensingh, Netrokona, Kishoreganj districts and small areas east of Dhaka and Gazipur districts.

Area (in acres, excluding river beds): 1786.570 thousand

Land Type: Highland 28%, Medium Highland 33% and Medium Lowland 20%

AEZ-10: Active Ganges Flood Plain

Soils are low in organic matter and slightly alkaline in reaction. General soil fertility level is medium with high CEC but deficient in N, P and Zn contents. Boron status is medium.

Location: This region is along the Ganges and lower Meghna river channels from the Indian border of Nawabganj and Rajshahi districts to the mouth of Meghna estuary in Lakshmipur and Barisal districts.

Area (in acres, excluding river beds): 823.850 thousand

Land Type: Highland 12%, Medium Highland 32% and Medium Lowland 12%

AEZ-11: High Ganges River Flood Plain

Organic matter content in brown ridge soils is low and higher in dark gray soils. Soils are slightly alkaline in reaction. General fertility level is low although CEC is medium and K-bearing minerals are medium to high but the Zn and B status is low to medium.

Location: Nawabganj, Rajshahi, Southern Pabna, Kushtia, Meherpur, Jessore, Chuadanga, Jhenaidah, Magura, and northern parts of Satkhira and Khulna districts together with minor areas in Naogaon and Narail districts.

Area (in acres, excluding river beds): 3263.025 thousand

Land Type: Highland 43%, Medium Highland 32% and Medium Lowland 12%

AEZ-12: Low Ganges River Flood Plain

Organic matter content is low in ridges and moderate in the basins. Soils are calcareous in nature having neutral to slightly alkaline reaction. General fertility level is medium with high CEC and K status and the Zn and B status is medium.

Location: Natore, Pabna, Goalanda, Faridpur, Madaripur, Gopalganj and Sariatput, eastern part of Kushtia, Magura, and Narail, north eastern parts of Khulna and Bagerhat, northern Barisal and south-western part of Manikganj.

Area (in acres, excluding river beds): 1968.935 thousand

Land Type: Highland 13%, Medium Highland 29%, Medium Lowland 31% and Lowland 14%

AEZ-13: Ganges Tidal Flood Plain

General fertility level is high with medium to high organic matter content and very high CEC and K status but have limitations of high exchangeable Na and low Ca/Mg ratio. The Zn status is low to medium and the B and S status is high.

Location: All or most of Barisal, Jhalakati, Pirojpur, Patuakhali, Barguna, Bagerhat, Khulna, Satkhira districts including Khulna and Bagerhat Sundarban reserved forests.

Area (in acres, excluding river beds): 4217.100 thousand

Land Type: Medium Highland 78%

AEZ-14: Gopalganj-Khulna Beels

Organic matter content is medium to high and fertility level is medium. Soil has low bearing capacity when wet, potentially strong acid and low in P and Zn status.

Location: A number of separate basin areas in Madaripur, Gopalganj, Narail, Jessore, Bagerhat and Khulna districts.

Area (in acres, excluding river beds): 555.245 thousand

Area (in sq. k.m.): 2247

Land Type: Medium Highland 13%, Medium Lowland 41%, Lowland 28% and Very lowland 11%

AEZ-15: Arial Beel

Organic matter content generally exceeds 2% in the topsoils and the subsoils. Available moisture holding capacity is inherently low. They have high CEC, and general fertility level is medium to high.

Location: Munshiganj and Dhaka districts.

Area (in acres, excluding river beds): 35.585 thousand

Land Type: Medium Lowland 13% and Lowland 73%

AEZ-16: Middle Meghna River Flood Plain

General fertility level is medium with low N and organic matter contents. The P, Zn and B levels are low to medium.

Location: the region between the southern part of Sylhet basin and the confluence of the Meghna river with the Dhalaswari and Ganges rivers covering parts of several districts, Kishoreganj, Brahmanbaria, Comilla, Chandpur, Narsingdi and Narayanganj.

Area (in acres, excluding river beds): 384.250 thousand

Land Type: Medium Lowland 29%, Lowland 25% and Very Lowland 11%

AEZ-17: Lower Meghna River Flood Plain

General fertility level is medium to high with low to medium organic matter status.

Location: Chandpur, Lakshmipur and Noakhali districts.

Area (in acres, excluding river beds): 224.620 thousand

Land Type: Highland 14%, Medium Highland 28% and Medium Lowland 31%.

AEZ-18: Young Meghna Estuarine Flood Plain

General fertility is medium but low in N and organic matter. Sulphur status is medium to high.

Location: Chittagong, Feni, Noakhali, Lakhsmipur, Bhola, Barisal, Patuakhali and Barguna districts.

Area (in acres, excluding river beds): 2290.420 thousand

Land Type: Medium Highland 45%

AEZ-19: Old Meghna Estuarine Flood Plain

Organic matter content of the soil is moderate. Moisture holding capacity is medium. Topsoils are moderately acidic, but subsoils are neutral in reaction.

Location: Kishoreganj, Habiganj, Brahmanbaria, Comilla, Chandpur, Feni, Noakhali, Lakshmipur, Narsingdi, Narayanganj, Dhaka, Sariatpur, Madaripur, Gopalganj, and Barisal districts.

Area (in acres, excluding river beds): 1912.595 thousand

Land Type: Medium Highland 24%, Medium Lowland 33% and Lowland 21%

AEZ-20: Eastern Surma-Kusiyara Flood Plain

Organic matter content of soils is moderate. The reaction of soils ranges from strongly acidic to neutral.

Location: Sylhet, Moulvibazar, Sunamganj and Habiganj districts. Level of CEC and Zn are medium while the status of P, K and B is low.

Area (in acres, excluding river beds): 1142.120 thousand

Land Type: Medium Highland 25%, Medium Lowland 33% and Lowland 36%

AEZ-21: Sylhet Basin

The soil has moderate content of organic matter and soil reaction is mainly acidic. Fertility level is medium to high with medium P and Zn contents.

Location: Large parts of Sunamganj, Habiganj, Netrokona, Kishoreganj and Brahmanbaria districts.

Area (in acres, excluding river beds): 1130.015 thousand

Land Type: Medium Lowland 19%, Lowland 43% and Very Lowland 23%

AEZ-22: Northern and Eastern Piedmont Plains

Soils of the area are loams to clays in texture haing slightly acidic to strongly acidic reaction. General fertility level is low to medium.

Location: Sherpur, Netrokona, Sunamganj, Sylhet, Moulvibazar, Habiganj, Brahmanbaria and Comilla districts.

Area (in acres, excluding river beds): 997.810 thousand

Land Type: Highland 33%, Medium Highland 31% and Medium Lowland 13%.

AEZ-23: Chittagong Coastal Plain

Organic matter content is low to moderate and the status of Zn and B is medium.

Location: Feni, Chittagong and Cox's Bazar districts.

Area (in acres, excluding river beds): 919.230 thousand

Land Type: Highland 17%, Medium Highland 43% and Medium Lowland 13%

AEZ-24: St. Martin's Coral Island

The soils are on old and young coral beach sands. Calcareous alluvium is the only general soil type of the area. General fertility level is low with poor moisture holding capacity.

Location: St. Martin's Island

Area (in acres, excluding river beds): 1.975 thousand

Land Type: HL 33% and Medium Highland 63%

AEZ-25: Level Barind Tract

The soil has low moisture holding capacity and slightly acidic to acidic in reaction. Organic matter content is very low and most of the available nutrients are limiting.

Location: Dinajpur, Gaibandha, Jaypurhat, Bogra, Naogaon, Sirajganj and Natore districts

Area (in acres, excluding river beds): 1247.635 thousand

Land Type: Highland 30% and Medium Highland 55%

AEZ-26: High Barind Tract

General fertility status is low having low status of organic matter, including low status of P and K, and medium status of Zn and B. General fertility status is low having low status of organic matter, including low status of P and K, and medium status of Zn and B.

Location: Rajshahi, Nawabganj and Naogaon districts

Area (in acres, excluding river beds): 395.370 thousand

Land Type: Highland 93%

AEZ-27: North-Eastern Barind Tract

The region has silty or loamy topsoil and clay loams to clay subsoils and grades into strongly mottled clay.

Location: Dinajpur, Rangpur, Gaibandha, Joypurhat and Bogra districts.

Area (in acres, excluding river beds): 266.625 thousand

Land Type: Highland 36% and Medium Highland 56%

AEZ-28: Madhupur Tract

Soils in the valleys are dark gray heavy clays. They are strongly acidic in reaction with low status of organic matter, low moisture holding capacity and low fertility level.

Location: Dhaka, Gazipur, Narsingdi, Narayanganj, Tangail, Mymensingh and Kishoreganj

Area (in acres, excluding river beds): 1048.715 thousand

Land Type: Highland 56% and Medium Highland 18%

AEZ-29: Northern and Eastern Hills

This region includes the country's hill areas. The relief is complex. Hills have been dissected to different degrees over different rocks. In general, slopes are very steep and few low hills have flat summits. The major hill soils are yellow-brown to strong brown permeable friable loamy, very strongly acidic and low in moisture holding capacity. The soil pattern is generally complex due to local differences in sand, silt and clay contents of the underlying sedimentary rocks and in the amount of erosion that has occurred there over time. Brown hill soils is the predominant soil type of the area. Organic matter content and general fertility level is low.

Location: Mainly in Khagrachhari, Chittagong Hill Tracts, Bandarban, Chittagong, Cox's Bazar, Habiganj and Moulvibazar districts, small areas along the northern border of Sherpur, Mymensingh, Sunamganj and Sylhet districts in central and south eastern Sylhet and in the east of Brahmanbaria, Comilla and Feni districts.

Area (in acres, excluding river beds): 4490.150 thousand

Land Type: Highland 92%

AEZ-30: Akhaura Terrace

The general fertility including organic matter status is low. The soils are strongly acidic in reaction.

Location: Brahmanbaria district and minor area in Habiganj district.

Area (in acres, excluding river beds): 27.920 thousand

Land Type: Highland 55%, Medium Highland 11%, Medium Lowland 10% and Lowland 15%

Appendix Table 2.4
Population Growth in Greater Districts, 1974 to 1991

(population in '000)

Greater District	1974	1981	1991	1974 to 1981	1981 to 1991
Barisal	3928	4667	5413	2.49	1.49
Bogra	2231	2728	3434	2.91	2.33
Chittagong	4315	5491	6715	3.50	2.03
Chittagong HT	508	580	744	1.91	2.52
Comilla	5819	6881	8207	2.42	1.78
Dhaka	7611	10014	13232	4.00	2.83
Dinajpur	2571	3200	3983	3.18	2.21
Faridpur	4060	4764	5424	2.31	1.31
Jamalpur	2059	2452	3013	2.53	2.08
Jessore	3327	4020	4848	2.74	1.89
Khulna	3557	4329	5039	2.85	1.53
Kushtia	1884	2292	2801	2.84	2.03
Mymensingh	5508	6568	7994	2.55	1.98
Noakhali	3234	3816	4626	2.39	1.94
Pabna	2815	3424	4183	2.84	2.02
Patuakhali	1499	1843	2050	3.00	1.07
Rajshahi	4268	5270	6594	3.06	2.27
Rangpur	5447	6510	8015	2.58	2.10
Sylhet	4759	5656	6765	2.50	1.81
Tangail	2078	2444	3002	2.34	2.08

Note: Italic terms are exponential growth rates (in per cent).
Source: Statistical Yearbook of Bangladesh (2008).

APPENDIX TABLE 2.5

DISTRICT-WISE POPULATION DENSITY IN 2001 AND TOTAL FERTILITY RATE (TFR) IN RURAL AREAS, 2001 TO 2007

(population per square k.m.)

Ranking	Division	District	2001 Pop Dens.	TFR (Rural Area)		2005	2007
				2001	2003		
1	Dhaka	Dhaka	5802.999	2.54	1.82	1.89	1.69
2	Dhaka	Narayanganj	2860.526	2.65	2.02	1.94	2.21
3	Dhaka	Narsingdi	1749.343	2.97	2.99	2.68	2.83
4	Chittagong	Comilla	1489.465	2.69	2.50	2.26	2.51
5	Dhaka	Munshiganj	1353.927	2.26	1.98	1.85	1.58
6	Chittagong	Feni	1337.284	2.55	2.41	2.50	2.30
7	Chittagong	Chandpur	1314.554	2.68	2.63	2.97	2.76
8	Chittagong	Chittagong	1251.609	2.50	2.24	2.05	1.86
9	Chittagong	Brahmanbaria	1244.421	2.70	3.09	2.90	2.94
10	Dhaka	Sherpur	1229.808	2.53	2.70	2.67	2.96
11	Dhaka	Gazipur	1166.571	2.78	2.02	2.01	1.80
12	Rajshahi	Rangpur	1099.653	2.65	2.60	2.54	2.41
13	Rajshahi	Sirajganj	1078.062	2.53	2.36	2.55	2.56
14	Khulna	Kushtia	1074.028	2.07	2.27	2.35	1.99
15	Dhaka	Jamalpur	1036.909	2.40	3.02	3.62	3.15
16	Rajshahi	Bogra	1031.849	2.41	2.22	2.00	2.17
17	Dhaka	Mymensingh	1029.115	2.54	3.38	2.92	3.27
18	Chittagong	Lakshmipur	1024.055	2.62	3.58	2.88	3.51
19	Dhaka	Madaripur	1008.803	2.50	2.98	2.67	2.34
20	Rajshahi	Gaibandha	980.284	2.57	2.80	2.45	2.51
21	Dhaka	Tangail	964.265	2.28	2.99	2.16	2.47
22	Khulna	Jessore	962.992	2.40	2.37	2.42	2.21
23	Rajshahi	Nilphamari	956.760	2.58	3.07	3.08	3.07
24	Dhaka	Kishoreganj	951.300	2.74	3.21	3.97	3.54
25	Rajshahi	Rajshahi	949.730	2.47	2.18	2.06	1.98
26	Rajshahi	Lalmonirhat	938.240	3.13	2.62	2.82	2.50
27	Dhaka	Manikganj	932.511	3.07	2.20	1.91	2.24
28	Rajshahi	Pabna	917.334	2.28	2.23	2.48	2.54
29	Barisal	Jhalakati	916.777	2.27	2.46	1.95	2.14
30	Dhaka	Shariatpur	915.398	2.63	2.94	2.86	3.26
31	Rajshahi	Joypurhat	877.720	3.03	1.41	2.01	1.85
32	Khulna	Chuadanga	870.354	2.71	2.37	2.14	2.00
33	Dhaka	Rajbari	850.760	2.49	2.63	2.46	2.59
34	Barisal	Pirojpur	850.153	2.07	2.39	1.76	2.36
35	Dhaka	Faridpur	847.008	2.66	2.82	2.55	2.73
36	Barisal	Barisal	844.086	2.27	2.33	2.18	2.42
37	Rajshahi	Nawabganj	837.250	3.32	2.33	2.53	2.54
38	Khulna	Meherpur	822.626	3.07	1.76	2.53	2.17
39	Khulna	Jhenaidaha	805.711	2.66	2.47	2.47	2.31
40	Rajshahi	Natore	802.639	2.48	2.32	1.66	1.86
41	Khulna	Magura	785.510	2.82	3.31	2.63	2.41
42	Dhaka	Gopalganj	781.208	2.35	3.05	2.47	2.36
43	Rajshahi	Kurigram	780.488	2.70	2.69	2.90	2.92
44	Rajshahi	Dinajpur	768.537	2.87	3.22	2.49	2.35
45	Sylhet	Sylhet	732.875	2.35	2.31	2.34	1.96
46	Chittagong	Noakhali	715.635	2.45	2.82	2.66	2.67

(Cont. Appendix Table 2.5)

Ranking	Division	District	2001	TFR (Rural Area)		2005	2007
			Pop Dens.	2001	2003		
47	Chittagong	Cox's Bazar	711.878	3.07	3.75	3.61	2.53
48	Dhaka	Netrokona	707.473	2.84	3.75	3.55	4.18
49	Khulna	Narail	705.051	2.63	2.51	2.64	2.89
50	Rajshahi	Naogaon	696.070	2.39	1.96	1.67	1.76
51	Rajshahi	Thakurgaon	669.431	2.64	2.96	2.75	2.79
52	Sylhet	Habiganj	666.667	2.51	3.52	3.54	3.74
53	Rajshahi	Panchagarh	594.729	2.72	2.34	3.00	2.61
54	Khulna	Bagerhat	584.877	2.18	2.35	1.94	2.22
55	Sylhet	Moulavibazar	557.632	2.64	2.71	2.55	2.23
56	Sylhet	Sunamganj	546.070	2.64	2.98	3.66	2.13
57	Khulna	Khulna	541.278	2.34	2.45	2.19	2.25
58	Khulna	Satkhira	482.893	2.70	2.23	2.49	2.13
59	Barisal	Barguna	463.681	1.94	2.20	2.13	2.15
60	Barisal	Bhola	455.981	2.53	3.29	3.12	2.72
61	Barisal	Patuakhali	453.727	2.19	1.81	2.36	2.65
62	Chittagong	Khagrachhari	194.887	2.55	2.26	2.84	2.31
63	Chittagong	Rangamati	83.074	2.59	1.87	1.84	2.21
64	Chittagong	Bandarban	66.518	2.69	2.32	1.95	2.13

Note: Ranking in descending order of population density by district.
Source: SVRS (2007).

APPENDIX TABLE 2.6

LAND UTILISATION STATISTICS OF BANGLADESH, 1984-85 TO 2005-06

(in 000 acres)

Year	Single Cropped	Double Cropped	Triple Cropped	Net Area Cropped	Total Area Cropped	Intensity of Cropping
1984-85	11682	8199	1472	21353	32496	152
1985-86	11516	8492	1653	21661	33459	154
1986-87	10781	9189	1908	21878	34883	159
1987-88	9168	8949	2361	20478	34148	167
1988-89	8825	8908	2415	20148	33887	168
1989-90	8980	9191	2463	20633	34750	168
1990-91	8140	9634	2424	20198	34680	172
1991-92	7702	9623	2391	19716	34121	173
1992-93	6411	9996	2485	18892	33858	179
1993-94	7229	9497	2364	19090	33315	175
1994-95	7228	9530	2375	19133	33413	175
1995-96	7875	8702	2704	19281	33391	173
1996-97	7196	9722	2483	19401	34089	176
1997-98	7083	10094	2513	19690	34810	177
1998-99	7408	9914	2419	19741	34493	175
1999-00	7395	10246	2460	20101	35267	175
2000-01	7141	10293	2536	19970	35335	177
2001-02	7097	10200	2527	19824	35076	177
2002-03	7108	10193	2544	19845	35126	177
2003-04	7094	10212	2538	19843	35129	177
2004-05	7091	10082	2530	19703	34845	177
2005-06	7041	9841	2407	19289	33944	176

Source: BBS, *Statistical Pocketbook of Bangladesh*, Various Years.

APPENDIX TABLE 2.7
INTENSITY OF CROPPING STATISTICS OF BANGLADESH, BY FORMER DISTRICTS, 1999-00 TO 2004-05

Year	Single Cropped	Double Cropped	Triple Cropped	Net Area Cropped	Total Area Cropped	Intensity of Cropping
1984-85	11682	8199	1472	21353	32496	152
1985-86	11516	8492	1653	21661	33459	154
1986-87	10781	9189	1908	21878	34883	159
1987-88	9168	8949	2361	20478	34148	167
1988-89	8825	8908	2415	20148	33887	168
1989-90	8980	9191	2463	20633	34750	168
1990-91	8140	9634	2424	20198	34680	172
1991-92	7702	9623	2391	19716	34121	173
1992-93	6411	9996	2485	18892	33858	179
1993-94	7229	9497	2364	19090	33315	175
1994-95	7228	9530	2375	19133	33413	175
1995-96	7875	8702	2704	19281	33391	173
1996-97	7196	9722	2483	19401	34089	176
1997-98	7083	10094	2513	19690	34810	177
1998-99	7408	9914	2419	19741	34493	175
1999-00	7395	10246	2460	20101	35267	175
2000-01	7141	10293	2536	19970	35335	177
2001-02	7097	10200	2527	19824	35076	177
2002-03	7108	10193	2544	19845	35126	177
2003-04	7094	10212	2538	19843	35129	177
2004-05	7091	10082	2530	19703	34845	177
2005-06	7041	9841	2407	19289	33944	176

Source: BBS, *Statistical Pocketbook of Bangladesh*, Various Years.

APPENDIX TABLE 2.8
PER CENT OF HIGH YIELDING VARIETY (HYV) IN CROPPED AREA BY FORMER DISTRICTS, 2001-02 TO 2005-06

District	Crop	2001-02	2002-03	2003-04	2004-05	2005-06
Bandarban	Aus	20.897	22.008	21.919	22.842	23.642
	Aman	89.815	89.622	90.016	90.227	92.129
	Boro	100.000	100.000	100.000	100.000	100.000
Chittagong	Aus	51.294	55.284	58.193	65.898	71.612
	Aman	81.901	84.078	84.805	85.057	85.343
	Boro	100.000	100.000	100.000	100.000	100.000
Comilla	Aus	62.248	60.638	56.942	71.278	75.219
	Aman	47.586	49.759	49.005	58.482	56.319
	Boro	98.595	98.630	98.576	98.731	98.883
Khagrachhari	Aus	76.538	75.993	76.150	79.344	76.219
	Aman	93.443	93.679	95.366	94.282	95.085
	Boro	100.000	100.000	100.000	100.000	100.000
Noakhali	Aus	38.636	36.757	38.169	37.549	36.526
	Aman	33.567	33.614	35.287	33.685	35.125
	Boro	100.000	100.000	100.000	100.000	100.000
Rangamati	Aus	37.714	32.492	36.034	68.093	29.748
	Aman	98.130	98.240	98.170	98.032	98.132
	Boro	99.876	99.873	100.000	100.000	100.000
Sylhet	Aus	50.465	50.433	58.436	59.166	59.944
	Aman	35.650	35.438	36.002	41.720	44.699
	Boro	58.683	64.435	51.579	62.934	65.276
Dhaka	Aus	14.340	14.171	13.860	21.090	26.401
	Aman	34.390	35.872	38.282	39.760	44.176
	Boro	97.420	97.617	97.787	97.694	97.852
Faridpur	Aus	0.015	0.016	0.064	0.104	0.218
	Aman	14.792	18.089	16.669	20.082	26.086
	Boro	94.967	95.002	96.487	96.616	96.685
Jamalpur	Aus	30.600	34.773	30.639	33.905	56.238
	Aman	45.955	48.287	48.840	54.736	58.047
	Boro	96.925	96.654	97.575	98.076	98.533
Kishoreganj	Aus	69.422	73.351	69.085	69.878	78.712
	Aman	58.299	57.638	55.260	58.904	62.239
	Boro	92.598	92.955	93.105	93.773	94.993
Mymensingh	Aus	69.466	70.116	68.791	74.798	87.287
	Aman	48.363	49.510	52.155	52.436	56.269
	Boro	97.899	98.134	98.383	98.490	98.678
Tangail	Aus	17.423	20.869	19.531	29.110	43.291
	Aman	37.587	36.253	41.784	44.367	48.534
	Boro	99.022	99.141	99.195	99.353	99.363
Barisal	Aus	23.397	24.458	25.061	24.838	35.484
	Aman	5.373	7.234	8.284	8.297	14.636
	Boro	96.663	96.279	96.113	95.857	93.325
Jessore	Aus	42.505	45.486	42.236	55.322	60.966
	Aman	61.753	80.478	82.193	82.419	85.920
	Boro	99.420	99.553	99.601	99.680	99.754
Khulna	Aus	48.130	49.327	52.250	47.091	48.434
	Aman	50.426	49.859	52.330	54.904	58.780
	Boro	92.610	92.794	93.256	93.116	95.001

(Cont. Appendix Table 2.8)

District	Crop	2001-02	2002-03	2003-04	2004-05	2005-06
Kushtia	Aus	32.150	35.245	33.002	54.269	63.664
	Aman	93.838	95.364	95.464	96.994	98.506
	Boro	100.000	100.000	100.000	100.000	100.000
Patuakhali	Aus	16.758	18.480	25.149	32.110	31.928
	Aman	24.098	20.716	18.505	19.081	20.159
	Boro	30.769	29.365	26.887	28.116	1.899
Bogra	Aus	99.557	99.443	99.553	99.591	100.000
	Aman	72.285	72.193	73.915	71.550	82.528
	Boro	99.781	99.791	99.794	99.812	99.811
Dinajpur	Aus	89.712	89.956	89.348	89.351	100.000
	Aman	54.907	58.213	63.034	65.834	74.030
	Boro	100.000	100.000	100.000	100.000	100.000
Pabna	Aus	1.082	0.964	0.950	1.152	12.662
	Aman	49.228	49.321	48.166	49.953	52.011
	Boro	99.188	99.211	99.201	98.685	98.507
Rajshahi	Aus	47.452	53.424	54.319	64.781	70.831
	Aman	82.290	81.178	80.975	81.185	78.570
	Boro	99.783	99.804	99.830	99.903	99.919
Rangpur	Aus	38.120	35.419	16.724	14.019	17.634
	Aman	69.457	70.983	72.989	74.584	79.316
	Boro	99.867	99.857	99.696	99.806	99.804
Bangladesh	Aus	36.199	37.520	37.596	44.013	49.974
	Aman	50.010	51.711	52.591	55.039	58.823
	Boro	94.640	95.372	94.718	95.375	95.715

Source: BBS, *Yearbook of Agricultural Statistics*, Various Years.

APPENDIX TABLE 2.9

BORO ACREAGE AND CLASSIFICATION BY VARIETY, BY DISTRICT IN 2005-06

	Boro Total	**% of Boro Acreage (Area in Acres)**		
		Local	HYV	Hybrid
Bangladesh	**9273797**	**11.155**	**85.056**	**3.788**
Barisal Division	234986	16.294	80.271	3.435
Barisal	122234	6.641	92.703	0.656
Bhola	47635	18.165	69.117	12.718
Jhalokati	11235	30.236	67.165	2.599
Pirojpur	35177	30.381	68.550	1.069
Barguna	6708	30.799	66.130	3.071
Patuakhali	11997	44.745	52.430	2.826
Chittagong Div.	**1093358**	**8.450**	**88.935**	**2.615**
Bandarban	10857	11.173	85.714	3.113
Chittagong	143832	12.992	85.528	1.480
Cox's Bazar	80229	17.263	76.948	5.788
Brahmanbaria	215789	4.047	94.581	1.372
Chandpur	104537	6.489	92.138	1.374
Comilla	307271	4.821	91.317	3.862
Khagrachhari	29880	13.437	83.919	2.644
Feni	49402	2.747	96.160	1.093

(Cont. Appendix Table 2.9)

	Boro Total	% of Boro Acreage (Area in Acres)		
		Local	HYV	Hybrid
Lakshmipur	36754	8.788	86.695	4.517
Noakhali	78407	16.468	81.067	2.465
Rangamati	36399	18.665	80.513	0.821
Dhaka Div.	**2853896**	**10.765**	**86.506**	**2.730**
Dhaka	98256	28.545	64.738	6.717
Gazipur	109279	27.480	67.329	5.190
Manikganj	97267	2.935	96.482	0.583
Munshiganj	43836	5.991	92.826	1.184
Narayanganj	37667	13.635	82.773	3.592
Narsingdi	140747	8.336	89.348	2.316
Faridpur	75114	6.068	91.027	2.905
Gopalganj	127549	6.735	83.377	9.889
Madaripur	97997	10.090	88.931	0.979
Rajbari	32054	2.224	93.782	3.993
Shariatpur	53186	3.696	92.835	3.469
Jamalpur	245271	4.843	90.973	4.184
Sherpur	188531	9.914	85.555	4.531
Kishoreganj	315017	9.887	88.636	1.477
Netrokona	361441	17.792	80.512	1.696
Mymensingh	501537	12.000	85.925	2.075
Tangail	329146	4.517	95.163	0.320
Khulna Div.	**923778**	**9.145**	**81.041**	**9.814**
Jessore	219338	4.940	89.087	5.973
Jhenaidah	135482	10.181	82.667	7.152
Magura	55497	5.053	92.522	2.425
Narail	72623	4.130	55.181	40.690
Bagerhat	82612	20.123	61.653	18.224
Khulna	67349	20.714	67.273	12.012
Satkhira	106223	8.203	89.706	2.092
Chuadanga	79354	6.490	85.224	8.286
Kushtia	58010	7.650	85.994	6.356
Meherpur	47292	10.926	86.222	2.852
Rajshahi Div.	**3373074**	**5.559**	**90.897**	**3.544**
Bogra	387311	4.219	94.220	1.562
Joypurhat	173433	1.423	98.092	0.485
Dinajpur	404996	1.173	98.411	0.417
Panchagarh	67100	10.548	87.003	2.449
Thakurgaon	174329	1.369	98.039	0.592
Pabna	118869	16.071	80.335	3.595
Sirajganj	273478	3.917	92.268	3.815
Naogaon	421511	16.168	78.201	5.631
Natore	143387	9.872	73.908	16.220
Nawabganj	92585	4.070	95.581	0.349
Rajshahi	137152	4.060	87.158	8.781
Gaibandha	246525	3.665	94.881	1.454

(Cont. Appendix Table 2.9)

	Boro Total	% of Boro Acreage (Area in Acres)		
		Local	HYV	Hybrid
Kurigram	188720	3.774	89.878	6.348
Lalmonirhat	88701	3.355	91.461	5.184
Nilphamari	168548	5.037	91.970	2.993
Rangpur	286432	1.886	94.968	3.147
Sylhet Div.	**794706**	**40.851**	**55.805**	**3.344**
Hobiganj	216994	27.641	67.752	4.607
Moulavibazar	78807	37.308	60.566	2.127
Sunamganj	420539	44.058	52.611	3.331
Sylhet	78365	63.789	35.077	1.134

Source: BBS, *Yearbook of Agricultural Statistics*.

APPENDIX TABLE 10

PERCENTAGES OF NON-FIRM AND FARM HOUSEHOLDS BY LAND OWNERSHIP BY DISTRICT, 2005-06

	Non-Farm HH %	Farm HH %	Marginal 0.05-0.49 %	Small 0.50-2.49 %	Medium 2.50-7.49 %	Large 7.50+ %
Bangladesh	**46.427**	**53.573**	**38.629**	**49.854**	**10.344**	**1.173**
Barisal Div.	**26.869**	**73.131**	**47.128**	**39.325**	**11.937**	**1.611**
Barisal	25.958	74.042	48.587	42.967	7.871	0.576
Bhola	33.351	66.649	45.048	41.903	11.556	1.493
Jhalokati	23.127	76.873	53.534	34.705	11.103	0.659
Pirojpur	20.164	79.836	49.228	38.456	11.117	1.199
Barguna	21.641	78.359	43.898	38.165	15.486	2.451
Patuakhali	31.382	68.618	43.689	34.237	18.194	3.880
Chittagong Div.	**47.671**	**52.329**	**42.980**	**49.049**	**7.328**	**0.643**
Bandarban	30.665	69.335	21.214	42.810	29.719	6.260
Chittagong	70.818	29.182	45.123	48.339	6.078	0.460
Cox's Bazar	52.035	47.965	44.159	47.990	7.401	0.450
Brahmanbaria	41.010	58.990	32.747	59.730	7.006	0.517
Chandpur	41.797	58.203	53.679	43.071	3.144	0.105
Comilla	35.804	64.196	44.354	51.904	3.633	0.109
Khagrachhari	24.375	75.625	27.045	54.005	17.448	1.501
Feni	40.044	59.956	46.300	47.619	5.778	0.303
Lakshmipur	30.592	69.408	52.656	41.615	5.347	0.382
Noakhali	37.071	62.929	43.331	46.716	8.720	1.233
Rangamati	39.308	60.692	14.366	47.175	35.527	2.933

(Cont. Appendix Table 2.10)

	Non-Farm HH %	Farm HH %	Marginal 0.05-0.49 %	Small 0.50-2.49 %	Medium 2.50-7.49 %	Large 7.50+ %
Dhaka Div.	**55.181**	44.819	**37.295**	**53.002**	**8.879**	**0.824**
Dhaka	88.806	11.194	51.486	41.347	6.328	0.840
Gazipur	60.056	39.944	43.580	48.976	6.920	0.525
Manikganj	42.697	57.303	35.036	57.468	7.177	0.318
Munshiganj	59.729	40.271	47.290	45.261	6.875	0.574
Narayanganj	79.815	20.185	50.999	44.635	4.036	0.330
Narsingdi	46.735	53.265	42.895	51.874	5.052	0.180
Faridpur	42.013	57.987	32.679	55.153	11.410	0.758
Gopalganj	33.471	66.529	26.081	57.201	15.519	1.201
Madaripur	37.994	62.006	32.863	56.202	10.343	0.592
Rajbari	41.877	58.123	33.639	55.611	10.006	0.744
Shariatpur	27.832	72.168	40.450	52.078	7.088	0.384
Jamalpur	38.287	61.713	35.608	55.093	8.606	0.694
Sherpur	36.837	63.163	34.007	54.967	10.073	0.953
Kishoreganj	46.766	53.234	33.616	54.703	10.144	1.537
Netrokona	37.795	62.205	29.104	52.991	15.351	2.555
Mymensingh	42.161	57.839	34.888	55.417	8.969	0.726
Tangail	32.598	67.402	39.465	53.134	6.895	0.506
Khulna Div.	**40.853**	59.147	**40.186**	**48.238**	**10.504**	**1.072**
Jessore	38.824	61.176	41.588	49.622	8.082	0.709
Jhenaidah	32.978	67.022	35.595	52.271	11.278	0.856
Magura	33.488	66.512	35.741	51.753	11.911	0.594
Narail	22.027	77.973	30.317	53.794	15.080	0.808
Bagerhat	28.364	71.636	43.809	40.329	13.842	2.020
Khulna	63.847	36.153	42.808	43.384	11.708	2.099
Satkhira	45.461	54.539	50.094	40.456	8.309	1.141
Chuadanga	33.435	66.565	35.863	52.348	10.903	0.887
Kushtia	44.608	55.392	40.290	50.829	8.278	0.603
Meherpur	30.445	69.555	33.842	55.785	9.607	0.765
Rajshahi Div.	**42.941**	57.059	**34.651**	**51.879**	**12.006**	**1.464**
Bogra	43.022	56.978	36.772	53.709	8.918	0.601
Joypurhat	35.117	64.883	32.302	55.286	11.134	1.277

(Cont. Appendix Table 2.10)

	Non-Farm HH %	Farm HH %	Marginal 0.05-0.49 %	Small 0.50-2.49 %	Medium 2.50-7.49 %	Large 7.50+ %
Dinajpur	45.698	54.302	28.309	51.955	17.106	2.630
Panchagarh	36.488	63.512	25.835	54.849	16.701	2.615
Thakurgaon	30.058	69.942	24.253	54.697	17.925	3.125
Pabna	50.744	49.256	34.226	52.241	12.155	1.379
Sirajganj	48.882	51.118	34.978	53.980	10.125	0.917
Naogaon	35.334	64.666	30.359	51.426	15.819	2.395
Natore	37.392	62.608	36.158	49.751	12.131	1.960
Nawabganj	50.314	49.686	32.316	48.204	17.291	2.189
Rajshahi	44.788	55.212	40.399	48.966	9.617	1.018
Gaibandha	44.364	55.636	40.382	51.052	7.840	0.726
Kurigram	39.730	60.270	41.308	49.279	8.583	0.829
Lalmonirhat	38.849	61.151	39.161	49.922	10.080	0.837
Nilphamari	42.799	57.201	33.580	52.475	12.739	1.206
Rangpur	46.622	53.378	36.608	52.669	9.802	0.921
Sylhet Div.	**41.857**	58.143	**35.434**	**46.854**	**15.186**	**2.526**
Hobiganj	39.684	60.316	30.319	50.904	16.414	2.363
Moulavibazar	32.557	67.443	42.341	47.307	9.552	0.800
Sunamganj	41.821	58.179	21.157	52.120	21.344	5.380
Sylhet	49.648	50.352	46.896	38.051	13.462	1.590

Source: BBS, *Yearbook of Agricultural Statistics*, 2005-06.

APPENDIX TABLE 2.11
LITERACY RATE FOR PERSONS AGED 7 YEARS AND ABOVE BY DISTRICT, 1991 AND 2001

Ranking (from lowest as of 1991)		1991			2001		
		Both	Male	Female	Both	Male	Female
	Bangladesh	**32.400**	**38.900**	**25.450**	**46.150**	**50.270**	**41.800**
1	Sherpur	19.490	24.630	14.090	31.890	35.040	28.550
2	Jamalpur	21.480	26.640	16.000	31.800	35.440	28.020
3	Cox's Bazar	21.890	28.160	14.900	30.180	34.010	26.000
4	Sunamganj	22.290	27.550	16.730	34.370	38.070	30.470
5	Kurigram	22.330	29.860	14.700	33.450	39.420	27.550
6	Meherpur	23.110	27.360	18.620	37.800	39.890	35.600
7	Kishoreganj	23.270	28.460	17.840	38.270	41.350	35.110
8	Lalmonirhat	23.810	31.400	15.690	42.330	48.190	36.250
9	Bandarban	23.820	32.190	13.460	31.670	38.240	23.670
10	Nawabganj	23.840	28.450	19.100	35.920	37.370	34.440
11	Bhola	23.950	28.580	19.000	36.890	39.500	34.090
12	Gaibandha	24.340	31.630	16.930	35.730	40.870	30.510
13	Shariatpur	24.410	30.310	18.450	38.950	42.170	35.770
14	Hobiganj	24.550	30.410	18.540	37.720	41.760	33.620
15	Chuadanga	25.240	30.510	19.560	40.880	43.520	38.080
16	Nilphamari	25.350	33.160	16.980	38.840	44.730	32.580
17	Mymensingh	25.470	30.700	19.950	39.110	41.860	36.260
18	Kushtia	25.770	30.850	20.280	40.370	43.400	37.190
19	Jhenaidah	25.850	32.340	18.900	44.660	48.780	40.260
20	Netrokona	25.970	31.220	20.440	34.940	37.880	31.880
21	Khagrachhari	26.320	34.640	16.860	41.810	49.940	32.650
22	Rajbari	26.430	32.700	19.680	39.810	43.660	35.750
23	Brahmanbaria	26.590	32.660	20.320	39.460	42.260	36.690
24	Rangpur	26.700	33.520	19.400	41.910	46.500	37.060
25	Pabna	26.830	31.790	21.460	42.440	45.180	39.500
26	Manikganj	26.910	33.680	20.070	41.020	46.030	35.980

(Cont. Appendix Table 2.11)

Ranking		1991			2001		
27	Natore	26.950	32.990	20.550	41.550	45.450	37.410
28	Sirajganj	27.000	33.410	20.170	40.590	45.460	35.360
29	Thakurgaon	27.340	36.800	17.160	41.820	48.440	34.770
30	Faridpur	27.840	34.610	20.750	40.850	44.640	36.960
31	Magura	28.210	35.230	20.860	44.710	49.160	40.100
32	Naogaon	28.360	35.930	20.440	44.390	49.420	39.120
33	Bogra	28.410	35.400	21.000	42.890	47.990	37.530
34	Tangail	29.420	36.130	22.420	40.460	44.940	35.880
35	Narsingdi	29.570	35.030	23.660	42.910	46.140	39.500
36	Dinajpur	29.850	37.780	21.270	45.670	51.520	39.990
37	Joypurhat	30.170	37.470	22.190	49.620	55.010	43.950
38	Satkhira	30.540	39.730	21.000	45.520	51.840	38.910
39	Panchagarh	30.580	39.830	20.790	43.890	50.120	37.330
40	Rajshahi	30.590	37.640	23.160	47.540	52.270	42.480
41	Moulavibazar	30.840	36.830	24.560	42.060	45.590	38.450
42	Lakshmipur	32.250	38.790	29.740	42.940	44.250	41.660
43	Madaripur	32.560	39.960	24.890	42.140	46.870	37.290
44	Comilla	33.140	40.200	26.030	45.990	49.370	42.640
45	Jessore	33.370	41.020	25.070	51.290	56.150	46.090
46	Sylhet	33.850	39.870	27.490	45.590	49.430	41.550
47	Narail	35.650	42.230	28.930	48.560	52.380	44.690
48	Munshiganj	35.820	40.250	31.140	51.620	45.130	49.070
49	Patuakhali	36.410	42.650	30.050	51.650	55.540	47.730
50	Rangamati	36.480	45.820	24.680	43.600	51.470	34.210
51	Gazipur	36.610	43.160	29.350	56.400	60.470	51.900
52	Noakhali	37.070	42.950	31.480	51.670	53.510	49.900
53	Chandpur	37.810	42.720	32.990	50.290	51.910	48.740
54	Gopalganj	38.230	44.730	31.640	51.370	55.230	47.440
55	Narayanganj	39.840	46.230	32.240	51.750	55.930	46.900
56	Barguna	40.140	45.150	35.050	55.590	57.700	52.830
57	Feni	40.650	48.210	33.150	54.270	57.470	51.190

(Cont. Appendix Table 2.11)

Ranking		1991			2001		
58	Barisal	43.040	47.890	37.910	56.990	59.010	54.920
59	Chittagong	43.200	50.280	34.990	55.550	59.790	50.830
60	Khulna	43.860	52.160	34.560	57.810	63.260	51.830
61	Bagerhat	44.330	49.540	38.860	58.730	60.820	56.490
62	Pirojpur	48.610	52.890	44.270	54.310	65.580	63.020
63	Jhalokati	51.190	55.870	46.450	65.350	67.380	63.350
64	Dhaka	53.890	60.110	45.930	64.790	69.580	58.740

Source: BBS, *Statistical Yeabook of Bangladesh*, 2008.

APPENDIX TABLE 2.12

ROAD DENSITY BY DISTRICT, 2000 TO 2005

(in meter per square k.m.)

Ranking	District	Total R&H 2000	Total R&H 2004	Total R&H 2005
1	Rangamati	40.549	40.549	45.476
2	Shariatpur	41.731	41.731	34.049
3	Khulna	71.217	71.217	85.499
4	Sunamganj	72.207	72.207	78.777
5	Jamalpur	79.232	79.232	136.294
6	Thakurgaon	86.788	86.788	92.101
7	Patuakhali	87.051	87.051	93.847
8	Bagerhat	88.659	88.659	102.389
9	Panchagar	91.815	91.815	136.085
10	Habiganj	94.046	94.046	116.193
11	Narail	95.960	95.960	154.687
12	Netrokona	96.797	96.797	136.456
13	Chuadanga	97.582	97.582	79.603
14	Dhaka	102.459	102.459	216.694
15	Chapai Nawabganj	104.583	104.583	127.209
16	Dinajpur	105.876	105.876	116.414
17	Jessore	112.972	112.972	127.456
18	Tangail	113.064	113.064	120.422
19	Bandarban	113.641	113.641	102.853
20	Kurigram	116.725	116.725	152.983
21	Natore	117.616	117.616	167.526
22	Maulavibazar	120.043	118.971	97.328
23	Barguna	122.271	122.271	104.503
24	Noakhali	122.744	122.744	107.509
25	Nilphamari	123.705	123.705	77.386

(Cont. Appendix Table 2.12)

Ranking	District	Total R&H 2000	Total R&H 2004	Total R&H 2005
26	Sylhet	126.074	126.074	146.169
27	Naogaon	126.310	126.310	144.107
28	Joypurhat	131.606	130.570	199.523
29	Gaibandha	134.006	134.006	140.913
30	Rajshahi	134.607	134.607	155.289
31	Manikganj	137.781	137.781	160.167
32	Rangpur	139.948	139.948	125.230
33	Faridpur	140.376	140.376	141.269
34	Sirajganj	145.717	145.717	150.588
35	Lamonirhat	148.148	148.148	148.478
36	Kushtia	148.674	284.392	270.222
37	Mymensingh	148.980	148.980	116.186
38	Bhola	149.868	149.868	74.487
39	Brahmanbaria	149.974	149.974	149.595
40	Madaripur	152.838	152.838	135.930
41	Gazipur	155.083	155.083	260.511
42	Pabna	156.896	156.896	175.888
43	Cox's Bazar	157.705	157.705	215.405
44	Magura	159.199	159.199	239.485
45	Kishoreganj	160.283	160.283	162.361
46	Bogra	171.575	171.575	209.021
47	Khagrachari	174.074	174.074	128.185
48	Chandpur	174.883	174.883	204.043
49	Jhenidah	197.348	197.348	205.166
50	Barisal	198.137	198.137	121.265
51	Munshiganj	209.424	209.424	322.618
52	Jhalokati	212.401	212.401	229.604
53	Rajbari	215.371	215.371	141.707
54	Satkhira	225.233	225.233	192.972
55	Chittagong	232.444	232.444	179.152
56	Narsingdi	255.916	255.916	318.440
57	Sherpur	260.264	260.264	177.676
58	Lakshmipur	264.423	264.423	208.201
59	Narayanganj	276.680	276.680	399.183
60	Comilla	292.058	292.058	227.196
61	Meherpur	307.263	n.a.	n.a.
62	Feni	327.586	327.586	291.886
63	Gopalganj	334.228	334.228	189.570
64	Pirojpur	379.969	379.969	264.946

Source: BBS, *Statistical Yearbook of Bangladesh*.

APPENDIX TABLE 2.13

ITEMWISE CONSUMPTION OF ENERGY DURING THE LAST SIX YEARS

Item	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08
Electricity (MkWH)	13717	15330	16337	20954	21181	22632
Gas (MMCM)	11346	12106	12921	14020	15180	16483
Petroleum (Thousand MT)	3399	3657	3768	3781	3574	3626
Coal (Thousand MT) (import+ production)	229	261	74.4	303	388	n.a.

Source: BBS, *Statistical Yearbook of Bangladesh*, 2008.

APPENDIX TABLE 2.14

MAXIMUM DEMAND FOR ELECTRICITY

Year	Maximum Demand			
	East Zone	West Zone	System Total	% Change over previous year
1994-95	1472.000	498.000	1970.000	
1995-96	1497.000	590.400	2087.400	5.959
1996-97	1594.300	520.100	2114.400	1.293
1997-98	1559.600	576.500	2136.100	1.026
1998-99	1828.000	620.500	2448.500	14.625
1999-00	1878.000	787.000	2665.000	8.842
2000-01	2175.000	858.200	3033.200	13.816
2001-02	2447.000	770.500	3217.500	6.076
2002-03	2511.500	916.500	3428.000	6.542
2003-04	2640.000	946.100	3586.100	4.612
2004-05	2649.500	971.300	3620.800	0.968
2005-06	2809.000	973.100	3782.100	4.455
2006-07	2725.000	992.800	3717.800	-1.700

Source: BBS, *Statistical Yearbook of Bangladesh*.

APPENDIX TABLE 2.15
RURAL ELECTRIFICATION

(A) Electricification

Year	Number of Villages	Progressive Total of Villages
1999-00	50	35645
2000-01	152	35797
2001-02	3231	39028
2002-03	2786	41814
2003-04	2732	44546
2004-05	3066	47612

(B) Sector Wise Consumption (MWH) of Rural Electricity

Year	Total	Sectoral Shares (%)				
		Domestic	Industrial	Commercial	Irrigation	Others
2000-01	3385777	40.255	42.594	5.675	11.214	0.261
growth						
2001-02	3924498	42.643	42.240	5.669	9.195	0.253
growth	*15.911*					
2002-03	4888158	41.671	44.456	5.481	8.158	0.234
growth	*24.555*					
2003-04	5805167	42.638	42.527	5.515	9.086	0.234
growth	*18.760*					
2004-05	6457135	42.705	42.281	5.597	9.209	0.209
growth	*11.231*					
2005-06	7403017	43.045	41.262	5.972	9.520	0.201
growth	*14.649*					
2006-07	7443133	44.696	38.568	6.533	10.013	0.189
growth	*0.542*					
2007-08	7892908	49.399	32.587	7.805	10.027	0.181
growth	*6.043*					

APPENDIX TABLE 2.16
SECTOR-WISE USE OF NATURAL GAS (%)

(production and sales in billion cubic feet)

Year/ Sector	Natural Gas		Elect.	Captive	Fertilizer	Industry	Tea Est.	Brick	Commr	House	CNG
	Prod.	Sales									
1991-92	188.48	178.50	49.36	0.00	34.51	7.51	0.39	0.11	1.62	6.50	0.00
1992-93	210.98	194.50	47.97	0.00	35.58	7.81	0.36	0.10	1.23	6.94	0.00
1993-94	223.76	212.13	45.87	0.00	35.12	9.55	0.33	0.52	1.35	7.26	0.00
1994-95	247.38	235.58	45.59	0.00	34.17	10.29	0.25	0.47	1.22	8.01	0.00
1995-96	365.51	254.61	43.56	0.00	35.73	10.73	0.28	0.39	1.18	8.13	0.00
1996-97	260.99	245.79	45.09	0.00	31.67	11.64	0.29	0.20	1.83	9.29	0.00
1997-98	282.02	266.57	46.35	0.00	30.04	12.12	0.28	0.15	1.73	9.34	0.00
1998-99	307.48	292.11	48.21	0.00	28.31	12.25	0.24	0.12	1.61	9.25	0.00
1999-00	332.35	306.85	48.11	0.00	27.15	13.53	0.21	0.11	1.25	9.63	0.00
2000-01	372.16	348.69	50.27	0.00	25.36	13.76	0.19	0.13	1.16	9.13	0.00
2001-02	391.53	364.61	52.12	0.00	21.61	14.69	0.20	0.15	1.17	10.08	0.00
2002-03	421.16	401.04	47.51	0.00	23.91	15.90	0.18	0.13	1.14	11.17	0.06
2003-04	454.59	427.65	46.63	7.49	21.70	10.87	0.19	0.03	1.13	11.51	0.45
2004-05	486.75	456.30	46.25	8.30	20.59	11.33	0.18	0.00	1.06	11.50	0.79
2005-06	526.72	493.61	45.12	9.93	17.95	12.85	0.15	0.00	1.06	11.57	1.36
2006-07	562.22	536.21	41.23	11.66	17.43	14.45	0.14	0.00	1.06	11.80	2.24
2007-08	600.86	584.51	40.08	13.73	13.46	15.77	0.12	0.00	1.13	11.81	3.90

Source: BBS, *Statistical Yearbook of Bangladesh*.

Appendix Table 2.17

Household Incomes in HIES Surveys

Survey Year	Monthly Household Income Per Household	Number of Member Per Household	Monthly Income Per Member
National			
2005	7203	4.85	1485
2000	5842	5.18	1128
1995-96	4366	5.26	830
1991-92	3341	5.35	625
Rural			
2005	6095	4.89	1246
2000	4816	5.19	928
1995-96	3658	5.25	627
1991-92	3109	5.35	581
Urban			
2005	10463	4.72	2217
2000	9878	5.13	1926
1995-96	7973	5.30	1504
1991-92	4832	5.34	905

Source: HIES (2005).

APPENDIX TABLE 2.18

PERCENTAGE SHARE OF INCOME OF HOUSEHOLDS BY SOURCES OF INCOME

Survey Year	Total	Agriculture	Business & Commerce	Profession. Wages & Salary	Housing Services	Gift & Remit.	Others
National							
2005	100.0	20.0	23.1	31.3	6.7	9.8	8.7
2000	100.0	18.0	25.9	29.4	7.8	10.9	8.0
1995-96	100.0	26.3	20.3	30.3	6.8	9.1	7.2
1991-92	100.0	33.4	14.8	24.3	9.4	10.3	7.8
Rural							
2005	100.0	28.7	17.3	28.1	5.1	12.0	8.7
2000	100.0	25.5	22.4	27.7	5.0	11.0	8.4
1995-96	100.0	35.4	14.7	27.7	6.5	9.6	6.1
1991-92	100.0	40.1	12.4	21.1	9.1	10.6	6.7
Urban							
2005	100.0	5.8	33.1	36.9	9.5	5.9	8.7
2000	100.0	3.7	32.4	32.6	13.1	10.6	7.5
1995-96	100.0	4.8	33.4	36.6	7.4	7.9	9.9
1991-92	100.0	5.9	24.7	37.9	11.0	9.1	11.4

Source: HIES (2005).

APPENDIX TABLE 2.19

GROWTH RATE OF MALE AGRICULTURAL DAY LABOURER'S NOMINAL DAILY WAGE BY REGION, 1993/94 (JULY TO DEC.) AND 2006/07 (JULY TO DEC.)

Barisal	37.67	2.73	7.25	39.00	41.00	107.33	2.94	2.74	104.00	110.00	7.84	7.89
Patuakhali	34.17	8.50	24.86	43.00	41.00	106.00	3.41	3.21	105.00	100.00	7.11	7.10
Bandarban	56.50	1.22	2.17	57.00	54.00	114.67	2.58	2.25	115.00	118.00	5.55	6.20
Chittagong	61.83	2.48	4.02	64.00	62.00	124.83	4.49	3.60	120.00	130.00	4.95	5.86
Comilla	48.83	1.33	2.72	48.00	49.00	95.50	6.60	6.91	83.00	100.00	4.30	5.64
Khagrachari	48.83	1.33	2.72	48.00	49.00	116.00	2.00	1.72	116.00	120.00	7.02	7.13
Noakhali	44.33	2.34	5.27	46.00	47.00	112.67	2.07	1.83	111.00	115.00	7.01	7.13
Rangamati	50.33	2.34	4.65	51.00	48.00	118.50	1.22	1.03	120.00	117.00	6.80	7.09
Sylhet	44.83	2.93	6.53	42.00	49.00	105.33	3.98	3.78	100.00	110.00	6.90	6.42
Dhaka	44.17	0.75	1.70	44.00	45.00	106.33	2.50	2.35	109.00	110.00	7.23	7.12
Faridpur	33.00	0.63	1.92	33.00	33.00	99.17	3.76	3.80	95.00	105.00	8.47	9.31
Jamalpur	31.00	3.46	11.17	30.00	34.00	99.67	0.52	0.52	100.00	100.00	9.70	8.65
Kishoregonj	37.17	2.40	6.46	36.00	42.00	92.50	7.15	7.73	88.00	100.00	7.12	6.90
Mymensingh	34.00	2.00	5.88	33.00	34.00	94.50	4.64	4.91	95.00	100.00	8.47	8.65
Tangail	33.00	1.26	3.83	33.00	33.00	97.50	4.18	4.29	95.00	100.00	8.47	8.90
Jessore	31.83	2.14	6.71	31.00	32.00	85.00	6.32	7.44	80.00	90.00	7.57	8.28
Khulna	39.50	4.76	12.06	42.00	44.00	93.83	5.04	5.37	86.00	100.00	5.67	6.52
Kushtia	39.50	4.76	12.06	42.00	44.00	83.83	4.49	5.36	75.00	85.00	4.56	5.20
Bogra	34.33	2.88	8.37	35.00	32.00	89.33	5.89	6.59	80.00	95.00	6.57	8.73
Dinajpur	29.17	2.23	7.64	29.00	31.00	73.17	2.23	3.05	75.00	75.00	7.58	7.03
Pabna	28.33	1.37	4.82	28.00	28.00	84.83	3.19	3.76	90.00	85.00	9.40	8.92
Rajshahi	32.83	2.48	7.56	34.00	37.00	83.33	2.25	2.70	81.00	85.00	6.91	6.61
Rangpur	25.00	2.10	8.39	25.00	25.00	64.33	1.03	1.61	65.00	65.00	7.63	7.63
Nat. Avg.	**39.14**	**1.67**	**4.26**	**39.70**	**40.61**	**97.67**	**1.97**	**2.01**	**95.00**	**100.00**	**6.94**	**7.18**

Source: BBS, *Yearbook of Agricultural Statistics*, Various Years.

APPENDIX TABLE 2.20
GROWTH OF REGIONAL FARM AND NON-FARM PER CAPITA INCOMES BY DISTRICT AND DIVISION, 1995-96 TO 1999-2000

District & Division	Agri. Rpcinc. 1995-96	Agri. Rpcinc. 1999-2000	Non-agri. Rpcinc. 1995-96	Non-agri. Rpcinc. 1999-2000	Agri. Growth 1995-2000	Non-Agri. Growth 1995-2000
Barguna	5720.22	6745.74	6370.79	7502.13	4.21	4.17
Barisal	2951.60	3505.30	7304.80	8467.42	4.39	3.76
Bhola	5068.05	5792.74	6454.44	7523.46	3.40	3.91
Jhalokati	3296.05	3476.25	6377.63	7338.75	1.34	3.57
Patuakhali	6176.92	7176.16	7022.38	8211.26	3.82	3.99
Pirojpur	3539.50	3938.89	6466.39	7383.33	2.71	3.37
Barisal	**4329.59**	**4993.61**	**6795.62**	**7897.65**	**3.63**	**3.83**
Bandarban	5422.22	5544.83	1170.37	1362.07	0.56	3.86
Brahmanbaria	2711.74	3078.33	8431.58	9286.31	3.22	2.44
Chandpur	3134.33	3778.23	5888.84	6820.56	4.78	3.74
Chittagong	2350.81	2706.50	17784.84	20742.30	3.59	3.92
Comilla	3176.56	3443.43	6879.78	7537.17	2.04	2.31
Cox's Bazar	5292.73	6432.39	8670.91	9910.80	5.00	3.40
Feni	2738.58	3215.56	6496.85	7305.19	4.10	2.98
Khagrachari	3017.50	3323.26	7747.50	9011.63	2.44	3.85
Lakshmipur	5061.59	5645.63	6401.99	7420.63	2.77	3.76
Noakhali	3483.53	4233.21	6338.04	7419.93	4.99	4.02
Rangamati	6343.48	7277.08	13363.04	15754.17	3.49	4.20
Chittagong	**3269.15**	**3759.88**	**9880.09**	**11346.96**	**3.56**	**3.52**
Habiganj	3549.71	3846.49	7740.57	8606.49	2.03	2.69
Maulavibazar	3788.54	4065.27	6620.38	7435.93	1.78	2.95
Sunamganj	3560.20	3960.58	6089.29	6920.19	2.70	3.25
Sylhet	3249.80	3589.77	7893.17	9761.36	2.52	5.45
Sylhet	**3504.50**	**3832.85**	**7146.85**	**8352.00**	**2.26**	**3.97**
Dhaka	346.05	399.63	31963.08	36131.06	3.66	3.11
Faridpur	3176.47	3628.33	6788.82	7849.44	3.38	3.70
Gazipur	2242.55	2541.00	22356.38	25944.50	3.17	3.79
Gopalganj	3300.00	3857.60	6446.22	7373.60	3.98	3.42
Jamalpur	3112.68	3758.41	6655.87	7854.42	4.83	4.23
Kishoreganj	3754.41	4293.09	6291.57	7279.64	3.41	3.71
Madaripur	2780.99	3455.12	6009.09	7007.87	5.58	3.92

(Cont. Appendix Table 2.20)

District & Division	Agri. Rpcinc. 1995-96	Agri. Rpcinc. 1999-2000	Non-agri. Rpcinc. 1995-96	Non-agri. Rpcinc. 1999-2000	Agri. Growth 1995-2000	Non-Agri. Growth 1995-2000
Manikganj	3325.00	3825.18	4339.39	5378.42	3.57	5.51
Munshiganj	2285.71	2602.14	7690.23	8769.29	3.29	3.34
Mymensingh	4472.38	5252.11	6591.09	7756.33	4.10	4.15
Narayanganj	1020.83	1201.00	22325.52	26006.00	4.15	3.89
Narsingdi	2325.53	2737.69	10625.53	12328.64	4.16	3.79
Netrokona	5059.90	5714.90	6104.06	7124.52	3.09	3.94
Rajbari	3478.95	3995.05	6497.89	7569.31	3.52	3.89
Shariatpur	3379.05	3913.27	5903.81	6738.94	3.74	3.36
Sherpur	3455.38	4075.18	6101.54	7200.00	4.21	4.23
Tangail	2952.79	3228.25	6535.19	7589.47	2.25	3.81
Dhaka	**2683.09**	**3081.70**	**13285.22**	**15414.98**	**3.52**	**3.79**
Bagerhat	4617.79	5686.63	7055.21	8354.65	5.34	4.32
Chuadanga	3921.74	4671.43	7984.78	9348.98	4.47	4.02
Jessore	4216.60	4733.33	9034.85	10625.88	2.93	4.14
Jhenaidah	4579.35	5078.18	7122.58	8333.94	2.62	4.00
Khulna	3569.30	4233.99	13707.46	15099.21	4.36	2.45
Kushtia	3497.66	4125.97	8328.07	9801.66	4.22	4.16
Magura	4990.24	5744.83	6293.90	7439.08	3.58	4.27
Meherpur	4282.14	5044.07	7612.50	9172.88	4.18	4.77
Narail	5308.33	5950.67	6325.00	7466.67	2.90	4.24
Satkhira	4277.35	5223.56	6941.44	8202.09	5.12	4.26
Khulna	**4197.44**	**4908.92**	**8573.53**	**9991.67**	**3.99**	**3.90**
Bogra	3541.88	4173.70	6655.52	7954.74	4.19	4.56
Dinajpur	4227.69	4925.36	7095.00	8360.51	3.89	4.19
Gaibandha	3282.59	3707.98	5652.68	6599.58	3.09	3.95
Joypurhat	4470.45	5339.78	6740.91	8027.96	4.54	4.47
Kurigram	3383.06	4378.87	5927.87	7088.66	6.66	4.57
Lalmonirhat	3619.05	4235.45	6042.86	7270.00	4.01	4.73
Naogaon	4321.86	5068.32	5996.36	7124.05	4.06	4.40
Natore	4295.45	4969.57	7603.90	9230.43	3.71	4.97
Nawabganj	3349.63	3951.39	6171.85	7275.00	4.22	4.20
Nilphamari	3433.12	3985.89	6080.52	7133.74	3.80	4.07
Pabna	2805.02	3564.22	9964.84	11613.79	6.17	3.90
Panchagarh	4432.05	5201.22	6134.62	7345.12	4.08	4.61

(Cont. Appendix Table 2.20)

District & Division	Agri. Rpcinc. 1995-96	Agri. Rpcinc. 1999-2000	Non-agri. Rpcinc. 1995-96	Non-agri. Rpcinc. 1999-2000	Agri. Growth 1995-2000	Non-Agri. Growth 1995-2000
Rajshahi	2946.85	3058.21	9217.12	9785.82	0.93	1.51
Rangpur	3271.89	3712.50	7409.24	8783.71	3.21	4.35
Serajganj	2398.46	2856.36	8124.32	9404.00	4.46	3.72
Thakurgaon	4582.61	5320.49	7790.43	9083.61	3.80	3.91
Rajshahi	**3554.08**	**4206.85**	**7146.48**	**8455.33**	**4.31**	**4.29**

APPENDIX TABLE 2.21

ANNUAL DEVELOPMENT PROGRAMME (ADP), ACTUAL REVISED EXPENDITURE

SL.	Sector	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008
	Grand Total	**15471**	**16240**	**14090**	**15434**	**16817**	**18771**	**19473**	**17916**	**18455**
1	Agriculture	4.7	4.5	4.4	4.1	4.0	3.1	5.2	5.9	6.6
2	Rural Development and Institutions (with FFW)	12.2	12.1	11.1	11.2	13.8	13.3	15.8	17.1	15.1
3	Water Resources	6.9	6.1	5.4	4.7	4.0	4.9	3.2	2.3	3.7
4	Electricity	12.9	12.1	12.1	15.2	17.3	17.0	16.2	13.9	13.3
5	Oil, Gas and Natural Resources	4.3	2.5	3.1	4.4	5.1	4.5	1.6	0.7	1.4
6	Science and Technology	0.5	0.5	0.3	0.5	0.4	0.4	0.4	0.5	0.6
7	Transport	17.4	20.3	19.9	18.9	18.0	16.1	14.3	14.4	10.9
8	Communication	3.1	2.8	6.1	4.0	2.2	5.6	2.8	2.7	1.6
9	Industry	1.7	3.3	1.9	1.3	2.7	2.7	1.6	1.2	1.3
10	Education and Religion	12.8	13.2	14.2	15.4	12.3	10.5	13.8	15.5	15.6
11	Sports and Culture	0.5	0.7	0.5	0.5	0.6	0.6	0.8	0.4	0.4
12	Health, Population and Family Welfare	8.1	7.3	7.9	7.4	8.3	7.4	9.6	10.0	11.3
13	Social Welfare, Woman and Youth Development	1.1	1.1	1.1	1.3	1.0	0.9	0.9	0.8	0.7
14	Labor and Employment	0.1	0.1	0.1	0.2	0.2	0.4	0.4	0.3	0.4
15	Public Administration	0.8	0.7	0.6	0.4	0.7	0.9	1.3	1.7	3.2
16	Physical Infrastructure, Water Supply and Housing	7.0	7.5	6.6	6.2	5.8	7.2	7.6	6.9	7.1
17	Mass Media	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.3
18	Block Allocation	5.8	5.0	4.6	4.0	3.2	4.4	4.3	5.6	6.4

APPENDIX TABLE 2.22

ALLOCATION OF PUBLIC EXPENDITURE (DEVELOPMENT) RECENT TRENDS DEVELOPMENT EXPENDITURE (TAKA IN THOUSAND)

District	2006-07		2007-08		2008-09 (Upto March)	
	Actual	Per capita	Actual	Per capita	Actual	Per capita
Dhaka	18,440,244	2.035	16,832,243	1.857	6,457,023	0.713
Narayanganj	4,315,195	1.864	3,084,685	1.333	979,068	0.423
Munshiganj	3,608,165	2.619	1,787,134	1.297	774,149	0.562
Manikganj	2,378,153	1.738	2,161,739	1.580	758,914	0.555
Gazipur	5,109,497	2.362	5,100,798	2.358	2,411,477	1.115
Narsingdi	4,887,213	2.421	3,117,675	1.544	1,056,650	0.523
Faridpur	3,025,562	1.618	2,453,185	1.312	1,458,123	0.780
Rajbari	1,060,005	1.046	1,089,068	1.075	460,650	0.455
Gopalganj	1,818,880	1.466	1,777,569	1.433	909,587	0.733
Madaripur	1,489,019	1.220	1,457,036	1.194	760,147	0.623
Shariatpur	1,739,169	1.509	2,407,116	2.089	991,925	0.861
Tangail	4,160,525	1.187	3,495,794	0.998	1,364,073	0.389
Jamalpur	2,814,511	1.254	2,233,966	0.996	999,234	0.445
Sherpur	1,431,126	1.050	1,526,921	1.121	560,864	0.412
Mymensingh	3,975,613	0.832	4,395,705	0.920	1,906,972	0.399
Netrokona	2,602,165	1.229	2,385,643	1.127	1,327,527	0.627
Kishoreganj	2,466,505	0.893	3,167,648	1.147	1,307,185	0.473
Dhaka Division	**65,321,546**	**1.571**	**58,473,925**	**1.407**	**24,483,567**	**0.589**
Chittagong	13,159,876	1.869	9,590,203	1.362	6,021,030	0.855
Cox's Bazar	4,293,809	2.274	3,304,685	1.750	840,547	0.445
Rangamati	5,348,414	9.885	4,370,133	8.077	2,570,956	4.752
Bandarban	1,430,262	4.506	1,559,521	4.913	643,730	2.028
Khagrachori	1,656,434	2.960	2,307,560	4.123	803,826	1.436
Comilla	11,838,272	2.419	7,788,233	1.592	3,649,269	0.746
Chandpur	3,730,216	1.543	2,664,986	1.102	1,220,709	0.505
Brahmanbaria	3,117,586	1.221	3,186,584	1.248	1,712,356	0.671
Noakhali	3,094,904	1.128	4,509,121	1.643	2,613,490	0.952
Feni	2,353,311	1.782	2,180,674	1.651	1,537,114	1.164
Lakshmipur	3,621,558	2.283	3,188,340	2.010	1,135,729	0.716
Chittagong Division	**53,644,640**	**2.074**	**44,650,040**	**1.726**	**22,748,755**	**0.880**
Rajshahi	4,791,517	1.968	4,156,184	1.707	2,041,266	0.838

(Cont. Appendix Table 2.22)

District	2006-07		2007-08		2008-09 (Upto March)	
	Actual	Per capita	Actual	Per capita	Actual	Per capita
Naogaon	2,983,438	1.172	2,568,163	1.009	1,211,550	0.476
Nawabganj	1,474,330	0.972	1,462,892	0.964	592,038	0.390
Natore	2,665,674	1.646	2,137,338	1.320	823,199	0.508
Bogra	7,105,944	2.215	4,850,150	1.512	1,929,340	0.601
Jaipurhat	912,032	1.012	919,822	1.020	270,789	0.300
Rangpur	2,206,202	0.815	2,747,169	1.015	2,088,731	0.772
Nilphamari	1,296,114	0.775	1,546,051	0.924	1,116,180	0.667
Kurigram	2,544,704	1.334	2,362,608	1.238	962,512	0.504
Lalmonirhat	1,255,070	1.063	1,145,093	0.969	691,547	0.585
Gaibandha	1,501,548	0.660	1,520,869	0.668	896,907	0.394
Dinajpur	4,484,554	1.594	2,266,956	0.806	960,311	0.341
Thakurgaon	926,073	0.716	1,035,581	0.801	383,508	0.297
Panchagarh	1,288,769	1.448	1,648,536	1.852	458,360	0.515
Pabna	2,082,855	0.899	3,060,284	1.321	1,695,272	0.732
Sirajganj	3,259,726	1.137	2,682,750	0.935	2,188,241	0.763
Rajshahi Division	**40,778,550**	**1.268**	**36,110,449**	**1.123**	**18,309,750**	**0.569**
Khulna	4,444,806	1.755	4,938,189	1.950	2,641,141	1.043
Bagerhat	2,824,016	1.712	2,660,301	1.613	1,081,572	0.656
Satkhira	1,733,984	0.873	1,776,007	0.895	825,665	0.416
Jessore	2,738,257	1.041	2,611,890	0.993	1,000,467	0.380
Narail	926,937	1.246	957,107	1.287	396,365	0.533
Jhenaidah	2,692,028	1.601	3,482,324	2.071	1,047,228	0.623
Magura	1,030,843	1.175	1,419,556	1.617	529,338	0.603
Kushtia	2,288,937	1.235	2,174,427	1.174	1,012,267	0.546
Chuadanga	771,836	0.720	1,058,811	0.987	456,335	0.426
Meherpur	1,216,403	1.932	1,034,019	1.642	242,874	0.386
Khulna Division	**20,668,047**	**1.320**	**22,112,633**	**1.412**	**9,233,250**	**0.590**
Barisal	4,379,137	1.746	5,256,184	2.095	2,453,658	0.978
Pirojpur	2,240,765	1.894	1,945,643	1.645	901,750	0.762
Jhalokati	2,343,374	3.170	2,083,656	2.819	487,244	0.659
Bhola	3,782,708	2.086	2,794,800	1.541	983,647	0.542
Patuakhali	2,541,247	1.634	2,559,183	1.645	976,162	0.628
Barguna	1,530,710	1.694	2,940,816	3.255	1,229,515	1.361
Barisal Division	**16,817,941**	**1.933**	**17,580,282**	**2.020**	**7,031,976**	**0.808**

(Cont. Appendix Table 2.22)

District	2006-07		2007-08		2008-09 (Upto March)	
	Actual	Per capita	Actual	Per capita	Actual	Per capita
Sylhet	9,762,114	3.588	7,186,796	2.641	2,944,513	1.082
Sunamganj	2,784,917	1.299	3,422,981	1.596	1,425,804	0.665
Moulvibazar	3,574,250	2.082	2,549,813	1.485	858,688	0.500
Habiganj	2,616,422	1.398	3,074,534	1.643	1,003,285	0.536
Sylhet Division	**18,737,702**	**2.217**	**16,234,124**	**1.920**	**6,232,290**	**0.737**
Total	**215,968,427**	**1.631**	**195,161,453**	**1.474**	**88,039,589**	**0.665**

APPENDIX TABLE 2.23
ALLOCATION OF PUBLIC EXPENDITURE (NON-DEVELOPMENT)-RECENT TRENDS

(Taka in Thousand)

District	Non-Development Expenditure 2006-07		2007-08		2008-09 (Upto March)	
	Actual	Per capita	Actual	Per capita	Actual	Per capita
Dhaka	59,564,026	6.573	176,042,300	19.426	115,353,475	12.729
Narayanganj	4,776,192	2.063	9,725,487	4.202	3,753,456	1.622
Munshiganj	3,998,232	2.902	4,676,175	3.394	2,601,556	1.888
Manikganj	3,530,015	2.580	5,822,338	4.255	3,037,974	2.220
Gazipur	4,646,532	2.148	6,793,197	3.140	4,011,656	1.854
Narsingdi	3,392,393	1.681	5,427,377	2.689	3,219,235	1.595
Faridpur	4,631,367	2.476	7,919,647	4.235	4,536,314	2.426
Rajbari	1,972,198	1.946	3,344,852	3.300	1,922,152	1.897
Gopalganj	2,605,334	2.100	4,714,193	3.800	2,620,682	2.112
Madaripur	2,322,508	1.903	4,752,211	3.894	2,412,905	1.977
Shariatpur	1,863,769	1.617	3,287,122	2.853	1,872,599	1.625
Tangail	6,403,010	1.828	11,400,377	3.254	7,350,428	2.098
Jamalpur	4,150,260	1.850	7,509,901	3.347	4,690,191	2.090
Sherpur	3,043,221	2.234	5,433,713	3.988	3,685,212	2.705
Mymensingh	10,079,366	2.109	16,732,710	3.500	9,996,756	2.091
Netrokona	4,298,877	2.031	6,491,872	3.067	4,452,421	2.103
Kishoreganj	4,359,536	1.578	6,918,515	2.504	4,351,141	1.575
Dhaka Division	**125,636,837**	**3.022**	**286,991,987**	**6.904**	**179,868,154**	**4.327**
Chittagong	29,101,866	4.134	51,580,847	7.327	29,713,813	4.221
Cox's Bazar	3,321,118	1.759	4,885,977	2.587	3,032,323	1.606
Rangamati	4,919,122	9.091	8,054,117	14.886	4,672,369	8.635
Bandarban	2,551,877	8.040	3,996,785	12.592	2,423,338	7.635
Khagrachori	4,192,722	7.491	6,199,699	11.077	3,911,680	6.989
Comilla	10,296,224	2.104	15,797,756	3.229	9,246,500	1.890

(Cont. Appendix Table 2.23)

District	Non-Development Expenditure 2006-07		2007-08		2008-09 (Upto March)	
	Actual	Per capita	Actual	Per capita	Actual	Per capita
Chandpur	4,012,639	1.659	6,302,487	2.606	3,848,217	1.591
Brahmanbaria	4,735,247	1.854	7,421,897	2.907	4,721,487	1.849
Noakhali	5,208,772	1.898	7,802,074	2.843	4,760,609	1.735
Feni	3,315,810	2.511	5,207,015	3.943	3,109,696	2.355
Lakshmipur	2,730,444	1.721	4,060,148	2.559	2,527,661	1.593
Chittagong Division	**74,385,843**	**2.876**	**121,308,802**	**4.691**	**71,967,692**	**2.783**
Rajshahi	12,348,797	5.072	18,742,015	7.697	12,276,215	5.042
Naogaon	6,995,200	2.747	11,485,565	4.511	8,097,642	3.180
Nawabganj	2,803,236	1.847	4,647,310	3.062	3,057,969	2.015
Natore	4,179,074	2.580	5,659,003	3.494	4,112,502	2.539
Bogra	11,882,096	3.704	20,977,314	6.539	13,587,208	4.235
Jaipurhat	3,032,226	3.364	5,478,771	6.077	4,040,345	4.482
Rangpur	9,084,926	3.356	13,960,235	5.157	8,161,975	3.015
Nilphamari	3,361,684	2.009	5,338,669	3.190	3,651,741	2.182
Kurigram	4,863,391	2.549	7,595,793	3.981	4,654,112	2.439
Lalmonirhat	3,124,353	2.645	4,234,044	3.585	3,113,174	2.636
Gaibandha	5,044,991	2.216	8,091,431	3.554	5,082,706	2.233
Dinajpur	10,849,365	3.856	16,182,157	5.751	11,419,897	4.058
Thakurgaon	5,577,280	4.314	8,091,431	6.258	6,013,355	4.651
Panchagarh	2,470,366	2.775	3,776,423	4.242	2,631,984	2.956
Pabna	5,844,561	2.522	10,502,034	4.532	6,631,034	2.862
Sirajganj	5,034,754	1.755	8,729,987	3.044	5,904,685	2.059
Rajshahi Division	**96,496,300**	**3.001**	**153,492,180**	**4.773**	**102,436,543**	**3.186**
Khulna	12,791,992	5.050	23,633,624	9.331	13,059,507	5.156
Bagerhat	3,854,165	2.337	6,306,712	3.824	3,041,017	1.844
Satkhira	3,538,735	1.782	6,329,945	3.188	3,930,806	1.980
Jessore	6,840,897	2.600	11,525,695	4.380	6,831,421	2.596
Narail	1,847,467	2.484	3,048,455	4.099	1,834,782	2.467
Jhenaidah	3,428,031	2.038	5,796,289	3.447	3,646,960	2.169
Magura	2,109,441	2.403	3,952,431	4.503	2,229,036	2.540
Kushtia	4,375,839	2.362	7,711,958	4.162	4,809,293	2.596
Chuadanga	2,326,678	2.170	3,894,701	3.632	2,579,387	2.405
Meherpur	1,226,084	1.947	1,916,373	3.043	1,152,335	1.830
Khulna Division	**42,339,327**	**2.704**	**74,116,182**	**4.734**	**43,114,544**	**2.754**
Barisal	8,786,177	3.503	15,592,179	6.216	8,476,248	3.379
Pirojpur	2,775,939	2.347	5,948,360	5.028	2,689,361	2.273
Jhalokati	2,140,150	2.895	3,445,529	4.661	1,676,558	2.268

(Cont. Appendix Table 2.23)

District	Non-Development Expenditure 2006-07		2007-08		2008-09 (Upto March)	
	Actual	Per capita	Actual	Per capita	Actual	Per capita
Bhola	2,761,153	1.523	4,619,149	2.547	2,731,960	1.507
Patuakhali	3,095,919	1.991	6,338,393	4.075	2,898,442	1.864
Barguna	1,790,977	1.982	3,665,186	4.057	1,727,416	1.912
Barisal Division	**21,350,316**	**2.453**	**39,608,796**	**4.551**	**20,199,985**	**2.321**
Sylhet	9,161,888	3.367	14,309,434	5.259	8,365,839	3.075
Sunamganj	3,048,529	1.422	4,876,824	2.275	2,867,580	1.337
Moulvibazar	3,220,271	1.876	4,863,448	2.833	2,928,870	1.706
Habiganj	3,392,772	1.813	4,293,182	2.294	2,829,328	1.512
Sylhet Division	**18,823,461**	**2.227**	**28,342,888**	**3.353**	**16,991,617**	**2.010**
Total	**379,032,083**	**2.863**	**703,860,835**	**5.316**	**434,578,535**	**3.282**

APPENDIX TABLE 2.24
ACREAGE AND PRODUCTION OF RICE IN GREATER DISTRICTS (1990-91 TO 2005-06)

District	Total Rice (area in acres and production in metric tons)							
	Area 1990-91	Area 1995-96	Area 2001-02	Area 2005-06	Yield 1990-91	Yield 1995-96	Yield 2001-02	Yield 2005-06
Bandarban	49000	58260	50110	38206	0.764	0.774	0.859	0.835
Ranking	*21*	*21*	*23*	*23*	*8*	*9*	*17*	*21*
Chittagong	1078760	907090	1033630	1007742	0.762	0.973	1.040	1.052
Ranking	*15*	*16*	*16*	*16*	*10*	*1*	*3*	*12*
Comilla	1693970	1811660	1758020	1560697	0.794	0.747	1.010	1.097
Ranking	*4*	*3*	*4*	*6*	*3*	*11*	*6*	*7*
Khagrachari	34160	29910	59910	78108	0.925	0.889	0.948	1.084
Ranking	*23*	*23*	*21*	*21*	*1*	*2*	*12*	*9*
Noakhali	1282520	1200080	1176830	1087020	0.587	0.615	0.835	0.843
Ranking	*9*	*9*	*13*	*13*	*20*	*20*	*20*	*20*
Rangamati	43200	50350	52340	56390	0.774	0.791	0.986	0.963
Ranking	*22*	*22*	*22*	*22*	*6*	*8*	*8*	*16*
Sylhet	2228500	2204750	2133850	2108852	0.612	0.659	0.864	0.925
Ranking	*2*	*1*	*2*	*2*	*19*	*18*	*16*	*19*
Dhaka	1204440	1033540	1202530	1063917	0.764	0.746	1.065	1.118
Ranking	*11*	*14*	*11*	*14*	*9*	*12*	*1*	*5*
Faridpur	1292670	1171660	1259160	1134246	0.528	0.476	0.766	0.958
Ranking	*8*	*10*	*10*	*11*	*22*	*23*	*21*	*17*
Jamalpur	775900	847360	846560	849743	0.695	0.677	0.933	1.071
Ranking	*17*	*17*	*18*	*18*	*15*	*17*	*14*	*10*

(Cont. Appendix Table 2.24)

District	Total Rice (area in acres and production in metric tons)							
	Area 1990-91	Area 1995-96	Area 2001-02	Area 2005-06	Yield 1990-91	Yield 1995-96	Yield 2001-02	Yield 2005-06
Kishoreganj	1237720	1334890	1267680	1230882	0.765	0.852	1.029	1.195
Ranking	*10*	*8*	*9*	*9*	*7*	*4*	*4*	*1*
Mymensingh	1190030	1135730	1301270	1270531	0.633	0.656	0.946	0.971
Ranking	*13*	*11*	*8*	*8*	*18*	*9*	*13*	*15*
Tangail	708100	636640	757470	714475	0.653	0.727	0.996	1.107
Ranking	*18*	*19*	*19*	*19*	*16*	*13*	*7*	*6*
Barisal	1536400	1375590	1512520	1497400	0.563	0.496	0.666	0.735
Ranking	*5*	*5*	*6*	*7*	*21*	*22*	*22*	*22*
Jessore	1317040	1369730	1636180	1582275	0.787	0.844	0.977	1.190
Ranking	*7*	*7*	*5*	*4*	*4*	*5*	*9*	*2*
Khulna	1203620	1078780	1105790	1117000	0.645	0.701	0.843	0.955
Ranking	*12*	*12*	*14*	*12*	*17*	*15*	*19*	*18*
Kushtia	586780	518320	601790	575524	0.703	0.720	0.959	1.023
Ranking	*20*	*20*	*20*	*20*	*14*	*14*	*10*	*14*
Patuakhali	971780	1027230	1060660	1041475	0.430	0.528	0.626	0.659
Ranking	*16*	*15*	*15*	*15*	*23*	*21*	*23*	*23*
Bogra	1111430	1039260	1187030	1210934	0.886	0.886	1.049	1.119
Ranking	*14*	*13*	*12*	*10*	*2*	*3*	*2*	*4*
Dinajpur	1425510	1370300	1477960	1578019	0.738	0.701	0.857	1.029
Ranking	*6*	*6*	*7*	*5*	*12*	*16*	*18*	*13*
Pabna	704710	638790	887640	900754	0.741	0.771	0.953	1.093
Ranking	*19*	*18*	*17*	*17*	*11*	*10*	*11*	*8*
Rajshahi	1771560	1631660	1909170	2040576	0.779	0.807	1.022	1.148
Ranking	*3*	*4*	*3*	*3*	*5*	*6*	*5*	*3*
Rangpur	2338460	2145650	2265650	2273645	0.735	0.791	0.908	1.060
Ranking	*1*	*2*	*1*	*1*	*13*	*7*	*15*	*11*
Bangladesh	**25786260**	**24617230**	**26543750**	**26018411**	**0.692**	**0.718**	**0.915**	**1.020**

Source: BBS, *Yearbook of Agricultural Statistics*, Various Years and Authors' Calculations.

APPENDIX TABLE 2.25

DISTRICT AND DIVISION-WISE SHARE OF MANUFACTURING IN REGIONAL GDP, REGIONAL PER CAPITA INCOME IN 1999-2000 (IN 1995-96 CONSTRANT PRICES) AND REGIONAL PER CAPITA MANUFACTURING INCOME IN 1999-2000

	Mansh	Mansh	Mansh	Mansh	Mansh	Rpcin	Rpcmin
	1995-96	1996-97	1997-98	1998-99	1999-00	1999-00	1999-00
Barisal	**3.822**	**3.850**	**4.073**	**3.873**	**3.829**	**14883.744**	**569.956**
Barguna	2.315	2.398	2.350	2.263	2.241	16850.160	377.622
Barisal	6.727	6.546	7.000	6.741	6.737	14195.546	956.348
Bhola	2.703	2.704	2.965	2.754	2.732	14967.387	408.922
Jholkati	3.494	3.675	3.942	3.692	3.614	12981.010	469.176
Patuakhali	2.188	2.244	2.358	2.196	2.147	16943.104	363.734
Pirojpur	3.578	3.709	3.792	3.838	3.613	13255.865	478.954
Chittagong	**15.022**	**15.121**	**15.599**	**15.311**	**15.227**	**16803.493**	**2558.724**
Bandarban	0.179	0.225	0.239	0.247	0.260	15979.950	41.551
Brahmanbaria	10.596	10.552	10.671	10.833	10.814	14405.268	1557.813
Chandpur	5.308	5.514	5.189	5.276	5.257	12482.908	656.198
Chittagong	27.699	27.703	28.389	27.894	27.822	25190.259	7008.348
Comilla	6.904	7.118	7.513	7.351	7.306	12420.117	907.430
Cox's Bazar	6.802	6.647	6.701	6.326	6.310	17360.581	1095.389
Feni	8.085	8.366	8.766	8.421	8.411	12458.965	1047.927
Khagrachari	2.678	2.710	2.793	2.688	2.618	10480.833	274.337
Lakshmipur	2.668	2.842	3.132	2.830	2.767	14867.072	411.336
Noakhali	5.441	5.559	5.710	5.420	5.461	13093.260	714.993
Rangamati	5.396	5.604	5.758	5.427	5.373	17751.178	953.848
Sylhet	**6.931**	**7.030**	**7.299**	**7.181**	**7.129**	**13332.018**	**950.416**
Habiganj	3.855	4.014	4.120	4.109	4.133	13670.925	565.005
Maulavibazar	7.988	8.083	8.477	8.259	8.285	12851.773	1064.764
Sunamganj	6.067	6.050	6.278	6.252	6.279	12068.367	757.815
Sylhet	9.069	9.178	9.527	9.239	8.982	14368.081	1290.546
Dhaka	**22.900**	**22.813**	**23.399**	**23.300**	**22.983**	**20310.262**	**4667.957**
Dhaka	33.856	33.592	34.156	34.065	33.914	36554.420	12396.937
Faridpur	5.950	6.094	6.152	6.130	6.109	12606.973	770.189
Gazipur	39.878	39.655	40.176	40.582	40.330	30291.160	12216.470
Gopalganj	5.551	5.730	5.869	5.768	5.741	12999.493	746.284
Jamalpur	6.186	6.193	6.380	6.159	6.094	13141.986	800.926
Kishoreganj	4.827	5.038	5.189	5.034	4.983	13225.601	659.071
Madaripur	5.344	4.994	5.765	5.313	5.281	12229.171	645.800
Manikganj	9.799	9.456	10.100	10.036	9.936	14011.345	1392.224
Munshiganj	13.321	13.706	13.737	13.963	13.782	12930.577	1782.149

(Cont. Appendix Table 2.25)

	Mansh	Mansh	Mansh	Mansh	Mansh	Rpcin	Rpcmin
	1995-96	1996-97	1997-98	1998-99	1999-00	1999-00	1999-00
Mymensingh	3.708	3.974	4.054	3.888	3.744	14590.104	546.281
Narayanganj	38.059	37.925	38.511	38.576	38.338	27269.410	10454.562
Narsingdi	25.780	25.217	25.314	25.311	25.032	16859.689	4220.285
Netrokona	2.341	2.465	2.542	2.444	2.374	14486.057	343.859
Rajbari	7.549	7.697	7.822	7.762	7.577	13052.271	989.005
Shariatpur	5.249	5.336	5.517	5.434	5.349	11944.775	638.922
Sherpur	4.461	4.437	4.512	4.386	4.440	12974.144	576.050
Tangail	8.400	8.312	8.636	8.535	8.338	12574.159	1048.496
Khulna	**9.842**	**9.823**	**10.164**	**9.887**	**9.820**	**16654.195**	**1635.468**
Bagerhat	3.864	3.882	4.058	3.804	3.769	16759.071	631.610
Chuadanga	7.542	7.489	7.673	7.509	7.372	14587.719	1075.436
Jessore	13.441	13.456	13.833	13.717	13.693	16946.023	2320.360
Jhenaidah	7.491	7.718	7.915	7.603	7.628	14984.171	1143.043
Khulna	13.560	13.370	14.055	13.664	13.556	22015.941	2984.439
Kushtia	14.251	14.241	14.462	14.138	13.994	15529.479	2173.168
Magura	4.988	5.021	5.033	4.953	4.963	14888.652	738.931
Meherpur	9.863	10.168	10.344	9.950	9.969	15255.044	1520.779
Narail	3.288	3.299	3.341	3.299	3.270	15349.409	501.932
Satkhira	6.363	6.318	6.612	6.293	6.243	14656.739	915.049
Rajshahi	**7.374**	**7.320**	**7.477**	**7.243**	**7.160**	**14082.854**	**1008.283**
Bogra	4.995	5.015	5.072	4.915	4.917	13886.254	682.791
Dinajpur	5.487	5.450	5.669	5.484	5.448	14698.460	800.762
Gaibandha	3.262	3.265	3.474	3.321	3.287	12105.018	397.930
Joypurhat	5.383	5.328	5.435	5.226	5.150	15456.431	795.931
Kurigram	2.697	2.606	2.540	2.508	2.515	13054.500	328.340
Lalmonirhat	1.983	1.967	1.965	1.893	1.869	12158.263	227.257
Naogaon	2.529	2.555	2.635	2.499	2.488	14110.731	351.104
Natore	8.721	8.847	9.495	8.935	8.793	15815.368	1390.611
Nawabganj	2.933	3.005	3.075	2.905	2.866	11890.009	340.796
Nilphamari	2.092	2.065	2.105	2.040	2.006	12191.163	244.608
Pabna	20.265	19.984	20.257	19.934	19.747	17316.408	3419.397
Panchagarh	2.664	2.699	2.701	2.586	2.576	13008.663	335.060
Rajshahi	7.228	7.379	7.447	7.164	7.040	15854.792	1116.187
Rangpur	5.532	5.520	5.690	5.566	5.562	13584.865	755.537
Serajganj	21.399	21.324	21.391	20.776	20.360	13205.137	2688.534
Thakurgaon	3.178	3.225	3.285	3.163	3.158	15355.025	484.878

Source: BBS, Regional Income Data 1995-96 to 1999-2000, and Authors' Calculation.

APPENDIX TABLE 2.26
ECONOMICALLY ACTIVE POPULATION (15+) (IN '000) AND LABOUR FORCE PARTICIPATION RATES, 2005-06

Division/ District	Economically Active Pop.			Participation Rate		
	Total	Male	Female	Total	Male	Female
Bangladesh	**49461**	**37330**	**12131**	**58.47**	**86.80**	**29.17**
Chittagong	**9661**	**7254**	**2405**	**57.09**	**84.83**	**28.73**
Bandarban	127	82	45	69.21	86.48	50.71
Brahmanbaria	1138	753	385	69.17	89.35	47.99
Chandpur	659	617	42	45.62	84.18	5.95
Chittagong	2908	2128	780	57.43	82.68	31.32
Comilla	1949	1393	556	59.03	85.49	33.26
Cox's Bazar	913	570	343	76.09	90.16	60.41
Feni	334	271	63	42.87	74.58	15.16
Khagrachari	165	138	27	54.60	88.03	18.48
Lakhsmipur	414	383	30	45.33	87.24	6.42
Noakhali	829	766	62	47.37	84.26	7.39
Rangamati	225	153	72	66.11	87.71	43.25
Dhaka	**15621**	**11657**	**3967**	**58.52**	**86.51**	**30.02**
Dhaka	3498	2758	741	52.12	81.82	22.17
Faridpur	674	541	133	56.24	85.99	23.40
Gazipur	991	603	388	71.51	88.89	54.86
Gopalganj	356	317	40	45.94	81.21	10.34
Jamalpur	1077	599	479	84.86	92.24	77.13
Kishoreganj	896	718	179	55.14	87.84	22.10
Madaripur	471	359	111	58.64	88.35	28.11
Manikganj	613	420	193	66.00	88.00	42.73
Munshiganj	471	380	91	51.44	86.46	19.12
Mymensingh	1658	1204	453	61.43	88.69	33.80
Narayanganj	849	705	145	51.98	85.95	17.78
Narshingdi	660	537	122	54.21	85.79	20.71
Netrokona	752	586	166	58.18	87.74	26.59
Rajbari	377	310	67	57.38	90.30	21.32
Sariatpur	420	317	103	58.50	86.71	29.24

(Cont. Appendix Table 2.26)

Division/ District	Economically Active Pop.			Participation Rate		
	Total	Male	Female	Total	Male	Female
Sherpur	666	374	292	84.00	92.02	75.57
Tangail	1192	929	264	57.54	89.80	25.40
Khulna	**5722**	**4451**	**1271**	**57.250**	**87.360**	**25.930**
Bagerhat	592	440	152	59.39	86.37	31.17
Chuadanga	402	302	100	60.79	88.94	31.04
Jessore	925	723	202	56.57	86.70	25.20
Jhenaidah	584	498	87	53.91	88.22	16.71
Khulna	924	768	156	53.46	87.14	18.46
Kushtia	758	513	244	65.29	87.40	42.62
Magura	330	269	61	55.30	88.62	20.88
Meherpur	244	170	74	67.12	90.84	42.02
Narail	287	226	61	55.66	84.28	24.60
Satkhira	676	542	134	53.96	87.53	21.10
Rajshahi	**11282**	**8784**	**2500**	**58.39**	**88.26**	**26.68**
Bogra	1013	822	191	53.09	85.89	20.06
Dinajpur	1146	763	383	68.09	89.83	45.94
Gaibandha	647	568	80	49.82	87.84	12.19
Joypurhat	268	239	29	51.37	88.35	11.54
Kurigram	601	517	84	52.59	87.79	15.16
Lalmonirhat	439	333	107	60.99	88.91	30.82
Naogaon	774	658	116	54.19	90.21	16.60
Natore	499	420	79	53.90	86.74	17.91
Nawabganj	523	414	110	57.98	90.61	24.57
Nilphamari	529	492	37	51.77	91.11	7.71
Pabna	1004	686	318	67.25	86.29	45.55
Panchagarh	424	254	169	75.59	87.20	63.00
Rajshahi	782	669	113	54.26	88.11	16.60
Rangpur	821	727	94	51.62	90.62	11.93
Sirajganj	1196	868	328	63.75	87.22	37.24
Thakurgaon	616	354	262	76.56	86.33	66.39
Barisal	**3554**	**2583**	**970**	**61.55**	**86.94**	**34.61**

(Cont. Appendix Table 2.26)

Division/ District	Economically Active Pop.			Participation Rate		
	Total	Male	Female	Total	Male	Female
Barguna	415	261	154	70.82	88.47	52.98
Barisal	890	698	191	54.43	83.41	23.98
Bhola	895	590	305	71.45	89.34	51.51
Jalokati	235	201	34	49.84	86.18	14.37
Patuakhali	723	501	222	66.92	88.92	42.95
Perojpur	396	332	64	52.91	86.74	17.52
Sylhet	**3621**	**2603**	**1019**	**61.56**	**87.82**	**34.91**
Hobiganj	884	601	283	68.05	92.25	43.68
Moulavibazar	714	500	215	64.00	91.09	37.82
Sunamganj	971	685	286	65.15	88.68	39.81
Sylhet	1052	817	235	53.19	82.45	23.82

Source: BBS, *Labour Force Survey 2005-06.*

APPENDIX TABLE 2.27
UNEMPLOYMENT RATE (15 YEARS AND ABOVE) BY DIVISION AND DISTRICT, 2005-06

Division/ District	Unemployment Rate (15+) (in per cent)								
	Bangladesh			Urban			Rural		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
Bangladesh	**4.254**	**3.349**	**7.040**	**4.305**	**3.546**	**6.676**	**4.238**	**3.287**	**7.151**
Chittagong	**4.782**	**4.453**	**5.780**	**5.175**	**5.003**	**5.819**	**4.670**	**4.304**	**5.779**
Bandarban	2.362	2.439	2.222	0.000	0.000	0.000	3.093	3.279	2.857
Brahmanbaria	1.406	0.664	2.597	1.613	1.087	3.125	1.381	0.756	2.550
Chandpur	4.097	3.890	7.143	3.659	2.778	11.111	4.159	4.044	6.061
Chittagong	5.330	5.028	6.154	5.384	5.762	4.101	5.284	4.183	7.576
Comilla	4.002	4.523	2.698	5.769	5.000	8.333	3.848	4.478	2.308
Cox's Bazar	0.986	1.404	0.292	3.614	3.175	0.000	0.843	0.984	0.311
Feni	20.060	11.808	55.556	11.628	5.263	60.000	21.306	12.876	55.172
Khagrachari	3.636	2.899	7.407	6.667	5.405	12.500	2.479	1.980	5.263
Lakhsmipur	10.386	9.399	20.000	1.852	2.041	25.000	11.389	10.778	19.231
Noakhali	6.031	4.439	25.806	6.250	3.077	21.429	6.142	4.708	27.083
Rangamati	3.556	4.575	0.000	7.273	8.696	0.000	1.765	2.778	0.000

(Cont. Appendix Table 2.27)

Division/ District	Unemployment Rate (15+) (in per cent)								
	Bangladesh			Urban			Rural		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
Dhaka	**5.928**	**3.354**	**13.486**	**4.361**	**2.872**	**8.819**	**6.799**	**3.630**	**16.003**
Dhaka	2.344	2.647	1.215	1.950	2.148	1.192	7.090	8.586	2.899
Faridpur	2.819	3.512	0.752	1.149	1.667	0.000	3.066	3.534	0.943
Gazipur	23.108	3.483	53.608	15.718	3.716	40.559	28.986	3.268	61.382
Gopalganj	3.933	4.101	2.500	2.857	4.167	0.000	4.037	4.110	3.333
Jamalpur	0.464	0.668	0.209	0.000	0.000	0.000	0.556	0.795	0.252
Kishoreganj	7.589	5.153	17.318	4.237	3.125	8.696	8.098	5.466	19.231
Madaripur	2.972	2.786	3.604	11.538	9.524	30.000	1.914	1.893	0.990
Manikganj	17.455	6.429	41.451	14.286	14.286	16.667	17.647	5.882	42.246
Munshiganj	11.253	12.105	7.692	14.815	13.333	22.222	10.817	12.275	6.098
Mymensingh	2.232	2.492	1.545	2.730	2.959	2.419	2.125	2.413	1.216
Narayanganj	4.829	3.688	10.345	6.250	4.450	12.712	2.295	2.518	0.000
Narshingdi	3.636	2.421	9.016	1.818	1.000	0.000	4.000	2.740	9.821
Netrokona	7.181	3.413	20.482	9.459	5.455	20.000	7.090	3.202	21.233
Rajbari	2.653	2.258	5.970	1.786	2.564	5.882	2.804	2.214	6.000
Sariatpur	3.333	2.839	5.825	5.405	7.692	0.000	3.394	2.414	6.452
Sherpur	0.450	0.802	0.000	0.000	0.000	0.000	0.504	0.896	0.000
Tangail	12.584	3.660	44.318	16.505	3.540	31.183	11.854	3.558	50.877
Khulna	**2.866**	**2.561**	**3.934**	**4.362**	**3.952**	**5.611**	**2.442**	**2.205**	**3.406**
Bagerhat	3.716	2.955	5.921	5.195	4.762	7.143	3.301	2.387	5.797
Chuadanga	0.995	0.993	0.000	1.905	1.299	0.000	0.673	0.889	0.000
Jessore	1.946	1.660	2.970	0.943	1.575	0.000	2.388	1.846	5.128
Jhenaidah	1.027	1.004	1.149	2.151	1.639	0.000	0.815	0.688	1.818
Khulna	5.952	4.818	11.538	6.767	5.594	11.650	4.835	4.130	11.111
Kushtia	1.319	1.754	0.410	1.563	2.041	0.000	1.299	1.724	0.437
Magura	2.121	0.372	8.197	2.857	0.000	14.286	1.695	0.415	7.407
Meherpur	1.230	1.765	0.000	4.167	5.000	0.000	0.913	1.333	0.000
Narail	3.136	2.655	4.918	0.000	0.000	0.000	3.462	2.899	3.774
Satkhira	4.438	4.244	4.478	8.696	7.692	28.571	4.127	4.175	3.937
Rajshahi	**2.819**	**2.823**	**2.800**	**3.050**	**3.136**	**2.796**	**2.772**	**2.751**	**2.804**

(Cont. Appendix Table 2.27)

Division/ District	Unemployment Rate (15+) (in per cent)								
	Bangladesh			Urban			Rural		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
Bogra	3.060	2.920	3.665	2.759	3.509	0.000	3.111	2.966	4.403
Dinajpur	0.960	1.048	0.783	1.744	1.852	1.563	0.821	0.916	0.627
Gaibandha	5.410	5.282	5.000	4.412	1.786	16.667	5.527	5.664	4.478
Joypurhat	1.866	1.674	3.448	3.704	4.167	0.000	1.660	1.395	3.846
Kurigram	1.830	1.161	5.952	0.000	0.000	0.000	2.227	1.345	10.204
Lalmonirhat	1.367	0.901	2.804	0.000	0.000	0.000	1.583	1.020	3.529
Naogaon	3.230	2.888	5.172	4.054	5.085	0.000	2.996	2.671	5.882
Natore	2.405	1.905	6.329	2.778	3.448	7.143	2.342	1.657	6.154
Nawabganj	6.119	5.314	9.091	5.385	7.368	0.000	6.107	4.702	12.162
Nilphamari	1.323	1.016	2.703	1.266	1.587	6.250	1.111	0.932	4.762
Pabna	2.988	4.373	0.000	1.523	1.282	0.000	3.346	5.094	0.000
Panchagarh	1.887	2.362	1.183	2.174	4.000	0.000	1.592	2.174	1.351
Rajshahi	4.476	3.587	9.735	4.235	4.082	4.839	4.622	3.302	15.686
Rangpur	1.462	1.100	5.319	1.596	0.730	1.961	1.580	1.017	6.977
Sirajganj	4.348	5.530	1.524	7.627	8.602	4.000	3.985	5.161	0.987
Thakurgaon	0.812	0.847	0.763	4.444	3.704	5.556	0.524	0.612	0.410
Barisal	**4.755**	**4.568**	**5.258**	**5.325**	**5.585**	**4.545**	**4.662**	**4.442**	**5.244**
Barguna	5.060	4.981	5.195	5.455	2.941	4.545	5.278	5.286	5.263
Barisal	4.607	5.301	2.094	5.696	6.667	2.632	4.241	5.009	1.961
Bhola	3.464	4.068	2.295	4.724	6.818	0.000	3.255	3.586	2.632
Jalokati	6.809	5.970	11.765	5.405	5.882	0.000	7.071	6.024	12.903
Patuakhali	5.809	4.591	8.108	6.452	4.545	11.111	5.598	4.595	7.843
Perojpur	4.798	3.012	14.063	2.941	1.786	8.333	4.878	2.909	15.385
Sylhet	**1.823**	**2.151**	**0.981**	**2.956**	**2.994**	**4.110**	**1.680**	**2.070**	**0.740**
Hobiganj	0.905	0.832	1.060	2.804	1.266	7.143	0.644	0.766	0.392
Moulavibazar	1.961	1.800	2.326	3.077	1.961	7.143	1.849	1.782	1.990
Sunamganj	1.545	2.044	0.350	2.299	2.817	0.000	1.471	1.951	0.372
Sylhet	2.757	3.305	0.426	4.082	4.511	0.000	2.544	3.216	0.452

Source: BBS, *Labour Force Survey 2005-06*, and Authors' Calculations.

APPENDIX TABLE 2.28
SHARE OF CHITTAGONG AND MONGLA PORTS IN BANGLADESH EXPORT AND IMPORT

(in thousand metric ton)

Year	Total Cargo	Chittagong Port			Mongla Port		
	Both ports	Total Cargo	Export	Import	Total Cargo	Export	Import
1991-92	9689	7038	770	6268	2651	595	2055
1992-93	9993	7614	1117	6497	2379	621	1758
1993-94	9849	7918	1189	6729	1931	468	1463
1994-95	12882	10055	1417	8638	2827	705	2122
1995-96	13028	10189	1451	8738	2839	396	2443
1996-97	13192	10498	1435	9063	2694	520	2174
1997-98	11254	8386	692	7694	2868	528	2339
1998-99	13835	10514	650	9864	3321	369	2952
1999-00	14336	11326	551	10775	3010	310	2700
2000-01	14961	12254	578	11676	2707	305	2402
2001-02	15673	13420	585	12835	2253	306	1947
2002-03	17034	15274	679	14595	1760	351	1409
2003-04	16600	15105	547	14558	1495	317	1178
2004-05	18530	17053	580	16473	1477	222	1255
2005-06	19401	17917	583	17334	1484	269	1215
2006-07	19076	18159	510	17649	917	253	664
2007-08	19028	18301	454	17847	727	209	518
exponential growth rate between 1991-92 and 2007-08:							
	4.31	**6.15**	**-3.25**	**6.76**	**-7.77**	**-6.33**	**-8.25**

percentage share of Chittagong and Mongla port in Export and Import cargo transport:
in 1991-92: Chittagong port had 56.41% of export and 75.31% of import volume
in 1991-92: Mongla port had 43.59% of export and 24.69% of import volume
in 2007-08: Chittagong port had 68.48% of export and 97.18% of import volume
in 2007-08: Mongla port had 31.52% of export and 2.82% of import volume

APPENDIX TABLE 2.29
BANGLADESH RAILWAY—NUMBER OF STATIONS, ROUTE KILOMETERS AND PASSENGERS

Year	Number of Stations	Route Kilometre	Number of Passenger (000)
1990-91	499	2746	48388
1991-92	489	2746	52295
1992-93	490	2706	50278
1993-94	489	2706	44515
1994-95	489	2706	39647
1995-96	489	2706	32710
1996-97	489	2706	37494
1997-98	477	2734	38300
1998-99	451	2734	36239
1999-00	455	2768	38634
2000-01	454	2766	41213
2001-02	454	2766	38716
2002-03	454	2490	39163
2003-04	454	2490	43435
2004-05	454	2490	42254
2005-06	454	2460	44520
2006-07	441	2460	45758

Source: BBS, *Statistical Yearbook of Bangladesh*, Various Years.

APPENDIX TABLE 2.30
BANGLADESH INLAND WATER TRANSPORT CORPORATION (BIWTC)
MOVEMENT OF PASSENGERS, VEHICLES AND CARGO

(in 000s numbers, persons or tons)

Year	Passenger Service		Ferry Service		Cargo	
	Passengers	Cargo	Passengers	Vehicles	Cargo	Service
1991-92	726	22	5968	606	1000	338
1992-93	606	24	7029	686	1000	242
1993-94	611	24	7852	778	1000	255
1994-95	672	24	9117	889	1000	272
1995-96	655	23	8894	920	1000	236
1996-97	771	18	11321	1125	1000	154
1997-98	878	15	10894	1126	1000	112
1998-99	969	18	5391	875	1000	136
1999-00	847	18	6520	942	1000	166
2000-01	859	16	8027	1065	1000	166
2001-02	957	14	9600	1139	1000	118
2002-03	1185	13	11400	1170	1000	80
2003-04	1115	14	13342	1172	1000	58
2004-05	1080	13	14000	1182	1000	57
2005-06	1114	14	17050	1274	1000	15
2006-07	940	17	17843	1370	1000	20
2007-08	886	16	17802	1449	1000	16

Source: BBS, *Statistical Yearbook of Bangladesh*, Various Years.

APPENDIX TABLE 2.31
SOME INDICATORS FOR EASTERN AND WESTERN REGION

	2000		2005	
	LIR	IR	LIR	IR
Head count ratio (upper poverty line)	53	46	50	33
Real per capita expenditure	727	800	1046	1207
Electricity in Mouza	67%	63%	80%	83%
BD Krishi Bank in Mouza	7%	17%	27%	45%
Commercial Bank in Mouza	17%	17%	25%	40%
Grameen Bank in Mouza	13%	13%	29%	40%
Market/Bazar in Mouza	53%	61%	64%	77%
Distance to thana HQ (km)	10.7	11.1	9.7	15.5
Travel time to thana HQ ('00 mins)	0.6	0.7	0.5	0.7
Distance to zila HQ (km)	27.7	33.0	28.6	33.5
Travel time to zila HQ ('00 mins)	1.1	1.2	1.0	2.0
Distance to Dhaka HQ (km)	296.2	169.7	294.4	168.7
Travel time to Dhaka HQ ('00 mins)	4.2	3.0	4.5	3.2
Any banks in Mouza	25%	24%	35%	46%

Source: Shilpi (2009), from HIES 2000 and HIES 2005.

APPENDIX TABLE 2.32

DISTRIBUTION OF HOUSEHOLDS RECEIVING BENEFITS OF SOCIAL SAFETY NET PROGRAMMES, 2005

Division	% of Household Received Benefit		
	Total	Rural	Urban
National	**13.06**	**15.64**	**5.45**
Barisal	13.34	14.79	5.00
Chittagong	11.05	12.89	5.72
Dhaka	14.33	19.98	4.94
Khulna	9.51	11.03	4.23
Rajshahi	12.35	13.02	7.71
Sylhet	22.42	24.31	11.25

Source: HIES (2005).

APPENDIX TABLE 2.33

REDUCTIONS IN CENTRAL GOVERNMENT TRANSFERS (GOVERNMENT GRANTS TO POURASHAVAS 1996-2002)

Year	Total Municipal Govt. Grants (million TK.)	Number of Pourashava	Average Govt. Grants for Pourashavas (million TK.)
1996-97	1200	133	9.02
1997-98	1050	160	6.56
1998-99	1150	181	6.35
1999-00	1250	213	5.87
2000-01	1300	226	5.75
2001-02	1300	252	5.16
2002-03	1200	276	4.35

Source: Ministry of Local Government, GoB, Dhaka in World Bank (2007).

APPENDIX TABLE 2.34

PROJECTED RURAL AND URBAN POPULATION OF BANGLADESH TILL 2020, ON THE ASSUMPTION OF TFR=2.1 BY 2011

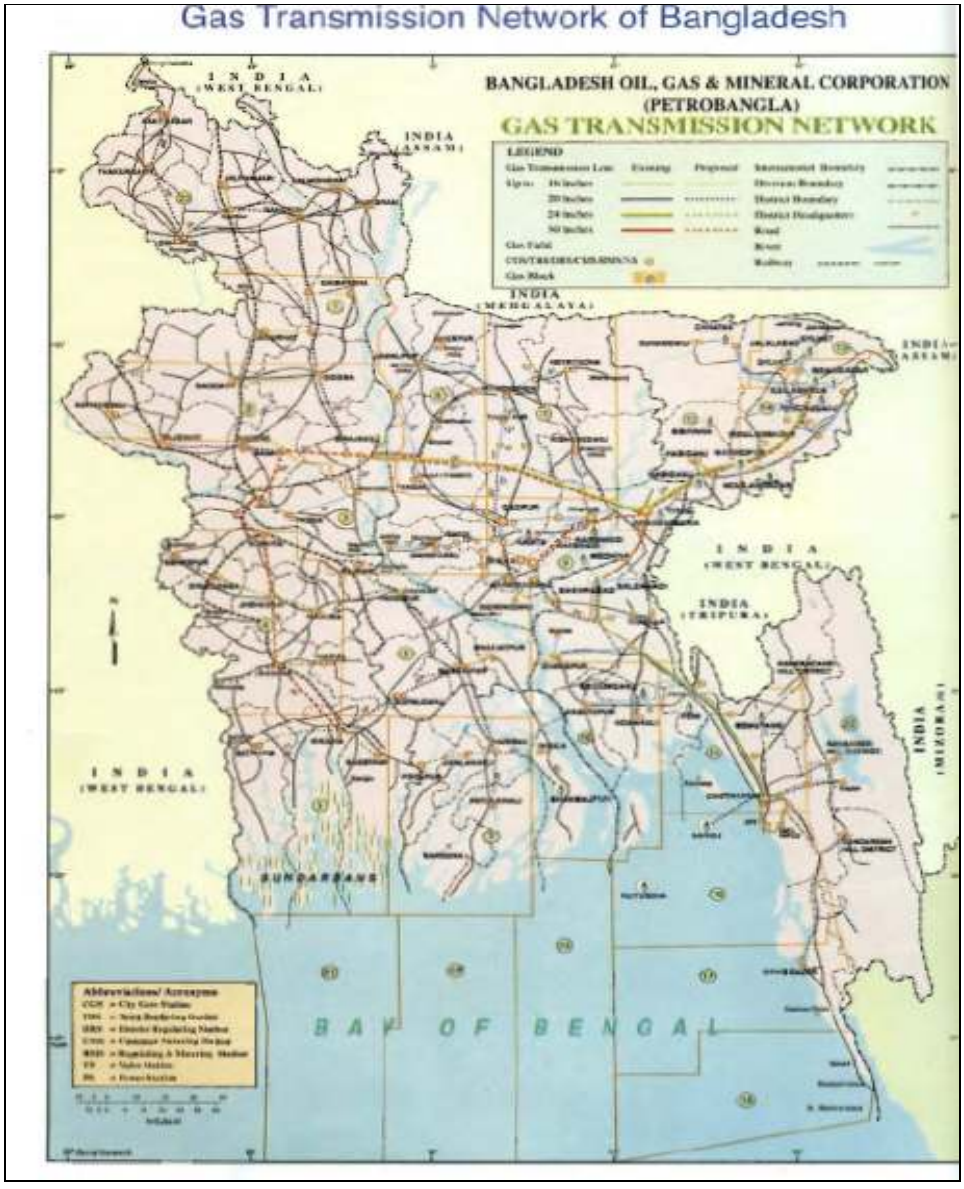
(population in millions)

Year	National Total	Urban Total	Rural Total	Urban % Share	Rural % Share
2001	130.02	30.47	99.55	23.43	76.57
2002	132.6	31.25	101.35	23.57	76.43
2003	135.12	32.2	102.92	23.83	76.17
2004	137.54	33.33	104.21	24.23	75.77
2005	139.76	34.62	105.14	24.77	75.23
2006	141.80	36.11	105.69	25.47	74.53
2007	143.91	37.65	106.25	26.16	73.83
2008	145.93	39.22	106.71	26.88	73.12
2009	147.86	40.82	107.04	27.61	72.39
2010	149.69	42.43	107.26	28.35	71.65
2011	151.41	44.06	107.35	29.10	70.90
2012	153.20	45.75	107.45	29.86	70.14
2013	155.06	47.51	107.55	30.64	69.36
2014	156.98	49.33	107.65	31.42	68.58
2015	158.96	51.22	107.74	32.22	67.78
2016	160.99	53.18	107.81	33.03	66.97
2017	163.08	55.21	107.87	33.85	66.15
2018	165.21	57.30	107.91	34.68	65.32
2019	167.37	59.40	107.92	35.49	64.48
2020	169.54	61.66	107.88	36.37	63.63

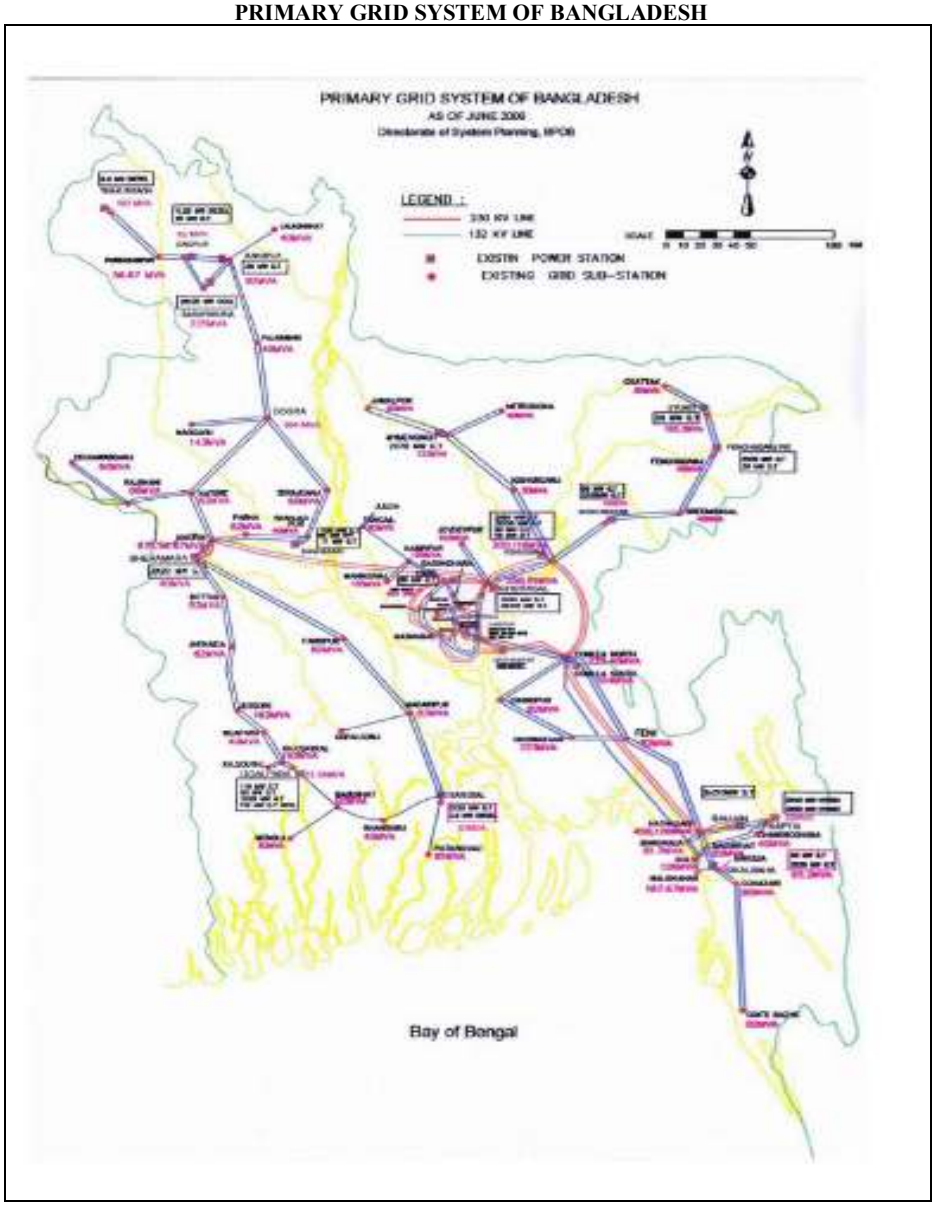
Source: BBS (2006).

APPENDIX MAP 2.1

GAS TRANSMISSION NETWORK OF BANGLADESH



APPENDIX MAP 2.2
PRIMARY GRID SYSTEM OF BANGLADESH



Chapter 3

Towards a Climate-Resilient and Climate Sensitive Development in Bangladesh

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Ahsan Uddin Ahmed
A K M Enamul Haque
Mohammad Qamar Munir

3.1 PREAMBLE

Bangladesh is highly dependent on natural resource management including land and water and their various uses for livelihood. Naturally, environmental issues become important in such a context. Environment therefore has been considered as a major issue of development concerns and been treated as such in various five year planning exercises in the past. However, one particular issue under the overall environmental problems has so far remained relatively less discussed in the planning exercises. This is the issue of climate change (CC) which is now a reality in many countries and an extremely difficult and complex development challenge as well. This paper tries to discuss and analyse the problem of CC from Bangladesh's development perspectives.

Even a few years back many, in this country as in others, had thought CC to be an esoteric topic of discussion and debate among experts. No more. People are already feeling the "heat," so to speak of, CC. While one may at one level consider CC like any other problem of environmental degradation, the problem runs far deep and its reach in destabilising many of the natural systems is potentially immense. But, more importantly, the destabilised natural system is expected to throw out of gear the human systems including economy, society and polity all over the world. This happens in two distinct ways.

There are changes that take place within the natural system which has a kind of long run impact from which it takes nature if remains unaided by human efforts to get back to earlier situation a very long time or not at all. This aspect has been given much of the attention in this paper. There is another kind of impact which can be said to be extreme events such as severe flood or cyclone and storm surges, the result of which is also devastating as well as life-threatening. This is the case of natural disasters. Such disasters, if they occur more frequently than before which

may be the case under CC, may have in the short run much more adverse impact than in the long. They also often involve the issue of human death and thus of lingering misery in the bereaved families. We have given less attention to these issues as disasters have received much more policy and academic attention which they deserve. But we want to explore the implications more of the longer term impacts. However, wherever possible we have flagged the issue of disasters along with others. The present paper, which forms a part of the background reports for the preparation of the upcoming Sixth Five Year Plan, aims to briefly describe, discuss and analyse the problem of CC and its implications for the development planning process in the country.

The paper tries to look into the following issues:

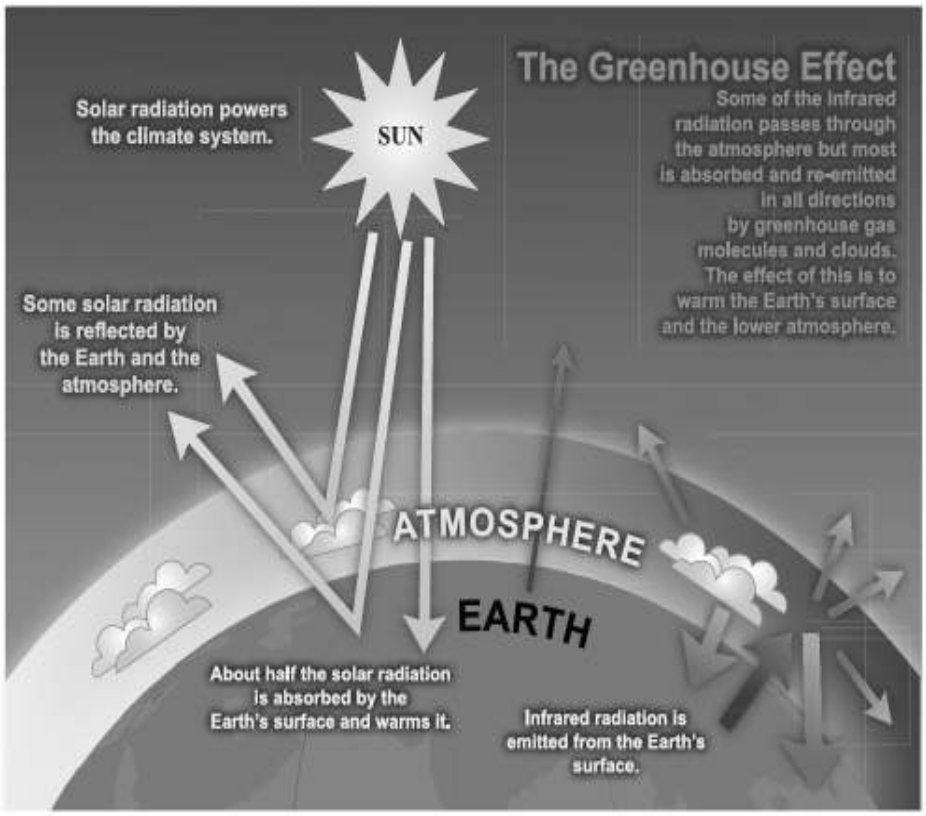
i. Review the evidence on global climate change and its likely impact (section 3.2);
ii. Review the evidence of climate change and the likely impacts and vulnerability in Bangladesh and identify gaps in knowledge which may be critical for an informed policy decisions for the Sixth Plan (section 3.3);
iii. Assess Bangladesh's stance related to Bali Action Plan and subsequent activities such as the Bangladesh Climate Change Strategy and Action Plan and analyse their implications for future development of major sectors and interventions (including investment) (section 3.4);
iv. Critically examine a typical ADP project portfolio and categorise the projects by major sectors in terms of their climate sensitive and climate resilient status and degree of vulnerability to climate change (section 3.5);
v. Prepare a resource envelope for the implementation of the Action Plan (section 3.6);
vi. Examine the prospects for international resource mobilisation through the UNFCCC and bilateral and multilateral channels and analyse the principles for determining the grant elements in the total resource inflow related to management of climate change (section 3.7);
vii. Review the present institutional set up of governance and management of climate change and identify its adequacy and limitations and suggest principles and necessary institutional framework for inter-sectoral coordination of investment and management of financing for climate-related projects (section 3.8);
viii. Examination of other issues relevant to climate change during the Sixth Plan by way of concluding remarks.

3.2 REVIEW OF EVIDENCE ON GLOBAL CLIMATE CHANGE AND ITS LIKELY IMPACTS

3.2.1 The Green House Effect and Climate Change

While the term green house effect has become common place, it would not be out of place here to first provide a very brief account of it and how human interventions have accentuated the process and brought in the present climate changes which may become more pronounced in future. The essential issues in natural green house effect are evident in Figure 3.1.

Figure 3.1: A Schematic View of the Green House Effect



The sun is the main source of warmth on earth. Roughly one third of the solar energy reaching earth is directly radiated back to space. The rest is absorbed by the

land and the oceans and thus warmed up. This heat is also radiated back to the atmosphere and clouds above the earth which then absorb the heat and send it back again to the earth's surface. This is the green house effect in essence.

The heat is trapped by the molecules of various gases in the atmosphere as it is trapped in a glass-walled green house for growing plants. Certain gases such as carbon di-oxide and methane as well as water vapour have strong heat absorbing capacity. (Nitrogen, the most abundant gas, has little green house effect). Without the green house effect of the atmosphere the earth would not have been habitable. But the human actions related to fossil fuel burning over the last one and a half centuries have raised the concentration particularly of CO_2 to a level that the warming trends have reached a critical level. At this level, the warming leads to changes in atmospheric and oceanic circulations leading to changes in the climate including precipitation patterns. All of these in turn lead to other physical and human system changes as these are sensitive to climate change.

3.2.2 Global Green House Gas Emission and Relative Roles of Countries

As stated above, certain gases, particularly carbon di-oxide and methane, exhibit green house effects. There are many other such gases. But these two, particularly carbon di-oxide concentration, have increased since the industrial revolution began due to increasing use of fossil fuels such as coal, oil and natural gas. Coal particularly is the most polluting and natural gas the cleanest among these fuels.

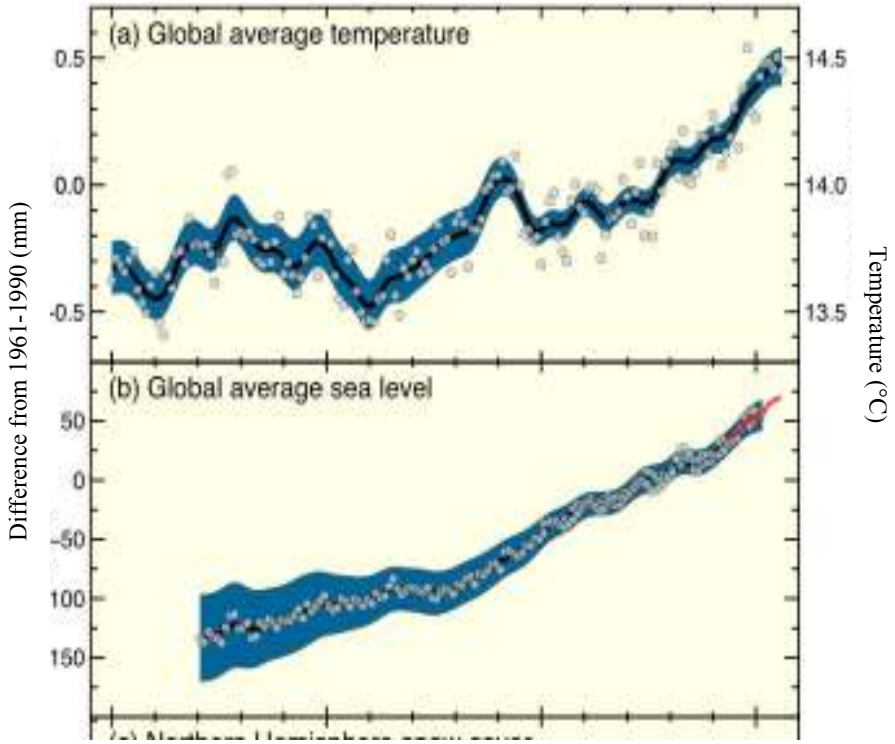
The level of emission is the highest among the developed countries. In 2008, developed countries emitted more than 18 billion tonnes–US, EU, Russia and Japan alone emitted more than 14 billion of this. Developing countries emitted more than 11 billion ton–China, Brazil, India accounted for more than half of this. China alone emits nearly 5 billion tons. Bangladesh's share is only 0.2 per cent at most of global total.

3.2.3 Scientific Evidence on Global Climate Change

In the Fourth Assessment Report of IPCC (AR4), scientists across the world have gathered and presented many evidence that clearly suggests that accelerated climate change has indeed been occurring since the industrial revolution and more specifically in recent decades (Trenberth *et al*. 2007). According to recent scientific evidence, global mean surface temperatures have risen till 2005 by 0.74°C ± 0.18°C over the last 100 years. The rate of warming is not linear, it is found to be almost double in the recent five decades compared to the last 100 years (0.13°C ± 0.03°C vs. 0.07°C ± 0.02°C per decade). The rate of warming is found to be the highest so

far during the last 5 years (over 2001-2005). Figure 2 shows the trend in global warming as well as the trend in sea level rise over the period since 1850.

Figure 3.2: Evidence of Temperature and Sea Level Rise



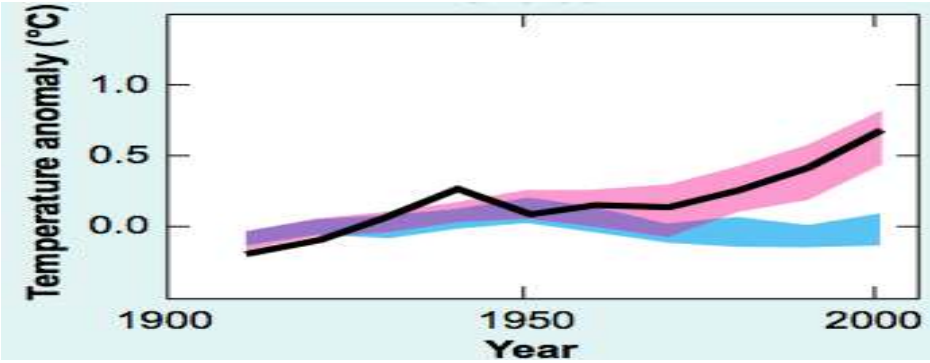
Source: IPCC (2007a), *Climate Change 2007: The Physical Science Basis; Summary for Policy Makers*, p. 6.

More importantly, scientists believe that the present trend in temperature rise are far above what would have had happened had there been no human-induced factors. This is clearly evident from Figure 3.

Scientists have also concluded in the AR4 that urban heat island effects are real but localised, and have not biased the large-scale trends (Li *et al.* 2004). At the same time, there is a consensus to conclude that the land regions have warmed at a faster rate than the oceans, while for the latter case both sea surface temperature (SST) and nighttime marine air temperatures have attributed the warming trend. It has been observed that the recent warming is strongly evident at all latitudes in SSTs

spreading over each of the oceans, though there is an inter-Hemispheric difference in warming rates. Arctic region showed much faster warming than elsewhere, which is almost twice the global average rate for the past 100 years. It is also evident from records that changes in extreme temperature indices are consistent with warming of the climate.

Figure 3.3: Simulated and Actual Changes in Global Temperature



Source: IPCC (2007a), p. 11.
Note: The blue band indicates what would have happened if the changes had been only natural; the red band indicates the situation which includes human intervention; the black line indicates decadal averages.

Evidence also points to changes in precipitation. A general increase in precipitation over land north of 30N has been found over the last century (i.e., between 1900 and 2005). However, a downward trend is also recorded in the tropics since the 1970s. Scientific records suggest that it has become significantly drier in the Sahel, the Mediterranean, southern Africa and parts of southern Asia and significantly wetter in eastern parts of North and South America, northern Europe and northern and central Asia (Klein Tank and Konnen 2003). Extreme heavy precipitation events (i.e. 1 in 50 year return period) are found to have increased substantially. Rarer heavy precipitation events are also found to be increasing. Despite such wetter conditions, in the tropics and sub-tropics droughts have become more pronounced since the 1970s.

There is evidence which suggests that large-scale global circulation such as ENSO interacts with more localised precipitation events. Scientists infer that changes in large scale atmospheric circulations have indeed happened (Quadrelli and Wallace 2004). There are scientific records to infer that intense tropical cyclone activity has increased since about 1970. Trends are apparent in SSTs and other critical variables that influence tropical thunderstorm and tropical storm

development. Globally, estimates of the potential destructiveness of hurricanes show a significant upward trend since the mid-1970s, with a trend towards longer lifetimes and greater storm intensity, and such trends are strongly correlated with tropical SST.

The above portrays what happened in the past. What about the future? The predictions based on different assumptions as summarised by IPCC are shown in Table 3.1. Obviously, there are a lot of uncertainties regarding how the future may evolve depending upon both natural and anthropogenic factors including actions related to reduction of green house gases. Yet, note that the upper sides of the ranges are extremely alarming including those for sea level rise. Particularly for temperature, the rises are in most cases far above 2 degrees Celsius. The possible impacts of such changes are mind-boggling to say the least.

TABLE 3.1

FUTURE POSSIBLE CHANGES IN GLOBAL TEMPERATURE AND SEA LEVEL RISE

	Temperature Change (°C at 2090-2099 relative to 1980-1999)[a]		Sea Level Rise (m at 2090-2099 relative to 1980-1999)
Case	Best estimate	*Likely* range	Model-based range excluding future rapid dynamical changes in ice flow
Constant Year 2000 concentrations[b]	0.6	0.3 – 0.9	NA
B1 scenario	1.8	1.1 – 2.9	0.18 – 0.38
A1T scenario	2.4	1.4 – 3.8	0.20 – 0.45
B2 scenario	2.4	1.4 – 3.8	0.20 – 0.43
A1B scenario	2.8	1.7 – 4.4	0.21 – 0.48
A2 scenario	3.4	2.0 – 5.4	0.23 – 0.51
A1FI scenario	4.0	2.4 – 6.4	0.26 – 0.59

Source: IPCC (2007a), p. 13.

a) These estimates are assessed from a hierarchy of models that encompass a simple climate model, several Earth Models of Intermediate Complexity (EMICs), and a large number of Atmosphere-Ocean Global Circulation Models (AOGCMs).

b) Year 2000 constant composition is derived from AOGCMs only. For an explanation of the scenarios, see IPCC (2007a), p. 17.

3.2.4 Impacts on Other Physical Systems

While assessing global-scale impacts of anthropogenic climate change, scientists concluded in the AR4 that it is likely that anthropogenic warming over the last three decades has had a discernible influence on many physical and biological systems (Root and Schneider 2002, Permesan and Yohe 2003, Root *et al.* 2003). There are evidences that physical and biological systems on all continents and in most oceans are already being affected by recent climate changes, particularly regional temperature increases. Scientists also concluded (with medium confidence) that despite continuous adaptation efforts and other non-climatic drivers, climatic effects on human systems are emerging. The direction of possible changes in the physical and human systems due to climate change and their likelihood are shown in Table 3.2.

There is a growing number of evidence that climate change is strongly affecting many aspects of systems concerning snow, ice and frozen grounds. There is emerging evidence that climate change can be attributed to changes in hydrological systems, water resources, coastal zones and oceans. Ground instability of permafrost regions provides a major example where glaciers are rapidly melting and creating lakes in mountain regions and limitation on mountain sports in lower elevation alpine areas (Watson and Haeberli 2004, Mölg, Hardy, Cullen and Kaser 2005).

Scientists provide evidence that the spring peak discharge is occurring earlier in rivers affected by snow melt, attributable to enhanced glacial melt. Lakes and rivers around the world are warming, with effects on thermal structure and water quality (Smith Ehang, macdonald and Hinzman. 2005, Le Trent, Pisaric and Smol. 2007, Karst-Riddoch *et al.* 2005). The effects of sea-level rise, enhanced wave heights, and intensification of storms are found in some coastal regions (Mimura and Nunn 1998, Saintilan and Williams 1999). Coastal erosions are also reported. Losses of coastal wetlands and mangroves are caused by sea level rise (Rogers, Wilton and Saintilan 2006).

Scientists conclude with very high confidence that recent warming is strongly affecting natural biological systems, which is evident from careful observations in a wide range of species in terrestrial ecosystems and also in marine and freshwater systems. Poleward and elevational range shifts of flora and fauna provide evidences in favour of such conclusions. Earlier, onset of spring events, migration and lengthening of growing season are amongst the best understood phenomena linked with changes in climate system. Changes in abundance of certain species, including limited evidence of a few local disappearances, and changes in community composition over the last few decades have been attributed to climate change (Permesan 2006).

TABLE 3.2

POSSIBLE IMPACTS OF CC ON PHYSICAL AND HUMAN SYSTEMS

Phenomenon and direction of trend	Likelihood of future trends based on projections for 21st century using SRES scenarios	Examples of major projected impacts by sector			
		Agriculture, forestry and ecosystems [4.4, 5.4]	Water resources [3.4]	Human health [8.2]	Industry, settlement and society [7.4]
Over most land areas, warmer and fewer cold days and nights, warmer and more frequent hot days and nights	Virtually certain	Increased yields in colder environments: decreased yields in warmer environments: increased insect outbreaks	Effects on water resources relying on snow melt: effects on some water supply	Reduced human mortality from decreased cold exposure	Reduced energy demand for heating: Increased demand for cooling: declining air quality in cities; reduced disruption to transport due to snow ice: effects on winter tourism
Warm spells/heat waves. Frequency increases over most land areas	Very likely	Reduced yields in warmer regions due to heat stress: wild increase	Increased water demand: water quality problems, e.g., aigal blooms	Increased risk of heat-related mortality especially for the elderly chronically sick, very young and socially isciated	Reduction in quality of life for people in warm areas without appropriate housing: Impacts on elderly, very young and poor.
Heavy precipitation events. Frequency increases over most areas	Very likely	Damage to crops: soil erosion, inability to cultivate and due to water logging of soils	Adverse effects o quality of surface and groundwater: contamination of water supply: water scarcity may be relieved	Increased risk of deaths. Injuries, infectious respiratory and skin diseases	Disruption of settlements, commerce, transport and societies due to flooding: pressures on urban and rural infrastructures: loss of property
Area affected by drought increase	Likely	Land degradation, lower yields/crop damage and failure: increased livestock deaths: increased risk of wildfire	More widespread water stress	Increased risk of food and water shortage: increased risk of malnutrition: increased risk of water-and food-borne diseases	Water shortages for settlements. Industry and societies: reduced hydropower generation potentials: potential for population migration
Intense tropical cyclone activity increases	Likely	Damage to crops: windthrow (uprooting) of trees: damage to coral reefs	Power outages cause disruption of public water supply	Increased risk of deaths, injuries, water and food-borne diseases, post-traumatic stress disorders	Disruption by flood and high winds: withdrawal of risk coverage in vulnerable areas by private insurers, potential for population migrations, loss of property.
Increased incidence of extreme high sea level (excludes tsunamis)	Likely	Salinisation of irrigation water, estuaries and freshwater systems	Decreased freshwater availability due to saltwater intrusion	Increased risk of deaths and injuries by drowning in floods: migration-related health effects	Costs of coastal protection *versus* costs of land-use relocation: potential for movement of populations and infrastructure: also see tropical cyclones above.

Rising water temperatures and other climate-induced changes such as salinity, oxygen levels, and circulation can be correlated with many observed changes in phenology and distribution of marine species. Plankton is found to be moved poleward by 10° latitude over a period of four decades in the North Atlantic. Scientific evidence suggests that warming of lakes and rivers is affecting abundance and productivity, community composition, phenology, distribution and migration of freshwater species (Batterbee *et al.* 2002, Karst-Riddoch, Pisanic and Smol 2005, Schindler, Rogers, Scheuerell and abrey 2005, Nyberg, Bergstand, Degerman and Enderlein 2001, O'Reilly 2007).

Scientists conclude that the recent warming has been of limited consequence in agriculture and forestry. The lengthening of the growing season has contributed to an observed increase in forest productivity in many regions, while warmer and drier conditions are partly responsible for reduced forest productivity, increased forest fires and pests in North America and the Mediterranean Basin. It is found from recent trends that heatwaves, droughts and floods make both agriculture and forestry increasingly vulnerable (Peng *et al.* 2004, Lotsch, Friedel, Anderson and Tucker 2005).

Changes in several aspects of the human health system have been related to recent warming (Rodo, Pascual, Fuchs and Faruque 2002). An increase in high temperature extremes has been associated with excess mortality in Europe (Luterbacher, Dietrich, Xoplaki, Grosjean and Wanner 2004). There is emerging evidence of changes in the distribution of some human disease vectors in parts of Europe.

3.3 IMPACTS IN BANGLADESH AND KNOWLEDGE GAPS

3.3.1 Impacts

3.3.1.1 Evidence of CC in Bangladesh

It is reported that the surface average temperature has been rising in Bangladesh, though there is no agreement among studies on the rate of change[1] (Quadir *et al.* 2001, Chowdhury, Quadir, Neelormi and Ahmed 2003). Available literature suggests that a general warming is expected in future, where the rate of warming will be higher for the winter months (i.e. DJF–December, January, February) than the monsoon months (i.e. JJA–June/July/August) (Ahmed and Alam 1998, Agrawala *et al.* 2003).

[1] The apparent reasons for non-agreement are the quality as well as the source of data, the level of effort to identify and exclude outliers and variation in methodology being applied.

There is a great deal of local-level perception-based evidence that the rainfall pattern has become erratic in recent years, if not in recent decades (RVCC 2003, AAB-SDRC 2005, Ahmed 2008). However, the official agency has ruled out any possibility of drastic change in rainfall patterns beyond climate variability. Intriguingly, a bi-modal shift in rainfall behaviour has already been reported (Chowdhury 2007), which may further be attributed to recent shifts in hydrological peaks in various rivers inside Bangladesh. Local level experience and anecdotal evidence clearly show that in both Gaibandha and Jamalpur, people now observe two to three flood peaks instead of one, as the latter had been regularly observed decades ago.

The literature on future rainfall projections, based on climate modeling exercises, clearly shows two distinct features: (a) the monsoon will be wetter (which is consistent with IPCC projections), and (b) the winter (already insignificant) rainfall will further diminish (Ahmed and Alam 1998, Agrawala *et al.* 2003). Islam's (2009) results may also be interpreted in a similar manner.

The above findings lead to a few inferences:

a) Wetter monsoon would lead to increased flood vulnerability, which will be compounded if the observed shift in the second rainfall peak in September persists (Alam, Nishat and Siddique 1998);

b) Drier winter months would give rise to higher evapo-transpiration in combination with higher temperature and diminishing rainfall, leading to further intensification of degree of aridity (phonological drought) (Huq, Ahmed and Koudstadl 1996, Asaduzzaman, Reazuddin and Ahmed 1997); and

c) Decline in winter rainfall would reduce flow in the rivers, which would aggravate saline ingress along the coastal region (BCAS-RA-Approtech 1994, Ahmed 2005, CEGIS 2006).

3.3.1.2 Increased Susceptibility to Natural Disasters

All the above phenomena clearly highlight the increased hazard susceptibility in terms of flood, drought and salinity ingress in Bangladesh. As it has been reported in many articles, floods will be more intense, will inundate more areas and occasionally will perhaps prolong to devastate people's livelihoods, national economy and infrastructure (BCAS-RA-Approtech 1994, Huq, Ahmed and Koudstaal 1996, Alam, Nishat and Siddique 1998, CCC 2009). Similarly, literature suggests that the central western region will be hit hard due to exacerbated drought and marginal farmers would not be able to maintain livelihood thrusts by switching

technologies to offset moisture stress (Ahmed 2005). Simultaneously, increased salinity would tend to reduce crop suitability throughout the southwestern region and perhaps appear to be a deterring factor for industrial activities in the affected areas (Ahmed 2005).

3.3.1.3 Coastal Impacts—Water Logging

A northward shift in isohaline lines under climate change would compound the already alarming effect of water logging in the southwestern region (Ahmed, Neelormi and Adri 2007). It has been reported that the SST along the northern Indian Ocean (i.e., Bay of Bengal) has gradually been rising steadily (Khole 2005). Though there is no evidence that the frequency of occurrence of cyclone along the Bay of Bengal has actually changed over the past five decades due to rising SST, it is argued by Ali (1999) that cyclone intensity might be increased by as high as 10 per cent due to increased warming.

3.3.1.4 Coastal Impacts—Rough Seas and Cyclones

Ahmed and Neelormi (2007) report that there is a strong correlation between increasing SST and the occurrence of too many rough sea events[2] in the recent years. Coastal fisher folks are not only facing extreme challenges to maintain livelihoods due either to incomplete fishing trips or to too many days lost for not being able to fish in the open sea, many have been tried to out migrate and faced extreme conditions in foreign jails. According to Nishat (2009), high wind actions have been causing economic damage to fisher folks by quickly damaging the traditional boats.

High wind actions have been eroding sea-facing coastal islands, even embankments located far inland than the open sea (Ahmed 2008). Sudden breaches in embankments have been destroying standing crops, inundating crop lands with saline water, thereby diminishing economic potential of the coastal lands, and forcing poor people to out-migrate from the affected areas by destroying their livelihoods (Ahmed and Neelormi 2008). The cases of Gabura and Padmapukur Union of Satkhira District have been providing evidence of increased wave actions due to increased SST.

It is rather premature to infer whether there is any increase in frequency of high intensity cyclones along the Bay of Bengal. There are many decadal-scale return

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[2] Identified by the issuance of signal # 3 by the port authority in Cox's Bazar and Mongla in order to save lives of people in the sea for various reasons/occupations, as per guidance of the Standing Orders on Disasters (MODM 2010).

periods of occurrence of high intensity cyclones, without the effect of higher SST. However, the contribution of higher SST cannot be completely taken out of the influence of it causing the occurrence of recent major cyclones such as *Sidr* (November 2007).

3.3.1.5 Impact on Agriculture and Economy

All the above changes in climate, its variability and associated physical changes are also going to affect agriculture adversely. Drought, heavy rains, salinity all will have adverse impact on food production in the country. Model based results indicate that the impact will be possibly more due to prolonged drought in many areas. This will particularly affect the dry period rice production, now the life line of Bangladesh, which is expected to decline by 3 per cent by 2030 and 5 per cent by 2050 (Yu *et al.* 2010). The overall impacts will be not simply losses in food and agricultural production, but also through the linkage effect on the overall economy. Thus the agricultural GDP loss is expected to be 3.1 per cent (US$ 7 billion in lost value added), while the overall GDP loss will be $26 billion over 2005-2050.

3.3.2 Gaps in Knowledge

There is no systematic analysis on future climatology by using globally acknowledged climate models useful at regional scales (i.e., below 50 X 50 km^2 grid). Moreover, the monthly averaged outputs provided by the Global Circulation Models (GCMs) and much simplified nested Regional Circulation Models (RCMs) (that too, without any validation procedure) cannot be utilised for agro-meteorological advisory. The gap, therefore, appears too big considering its economic and social implications.

Due to absence of localised hydrological analyses, it appears too difficult to project how the discharge requirement of certain chainage in any river would be changed under which climate scenario. Therefore, it appears too difficult to understand infrastructure vulnerability, especially in view of exacerbated floods.

The health related understanding is also too limited. The only analysis on human health did not consider the effect of general increase in population, which is why the results of increased intensity of diarrhoea and malaria due to rising temperature provide inconclusive results. The lack of health related data is a limiting factor, especially in terms of gender and age-segregated information is completely missing. Such gaps in data need to be addressed quickly.

The performance of agriculture sector, especially the crop production sub-sector, cannot be properly understood due to two contrasting features contributing

simultaneously. In one hand, the modernisation of agricultural practices including agronomic behaviour of farmers is contributing immensely to the increase in overall production despite loss of prime agricultural lands, and on the other hand, the interplay between general background warming and enhancement of photosynthetic conditions through the rise in CO_2 concentration might be giving rise to both positive and negative results in aggregate crop production. It is never certain which element is dominating now and, more importantly, will dominate in the future. The performance of crop production sector under various climate scenarios will have to be appreciated better in order to maintain food security in the future.

3.4 GLOBAL AND BANGLADESH RESPONSE TO CLIMATE CHANGE

3.4.1 Global Response—UNFCCC and Kyoto Protocol

As the evidence and impacts of climate change became increasingly clear through studies and research and deliberations at the global and national levels, demand arose for doing something about it. The first definitive action came in 1992 at the UN Conference on Environment and Development held in Rio de Janeiro. The Conference established the United Nations Framework Convention on Climate Change (UNFCCC, or, Convention) which came into force in 1994. Countries which have signed the Convention and ratified are called Parties (192 in number). A Conference of Parties (COP) takes place every year. The upcoming Copenhagen COP is COP 15.

Linked to the Convention, a protocol has been signed in 1997 in Kyoto (hence called Kyoto Protocol, or, KP), which came into effect much later in 2005. The KP is a legally binding instrument under which industrialised countries committed themselves to a lowering of emission on an average of 5 per cent below the 1990 level. The first commitment period ends in 2012. The KP has several market-based instruments to lower emission. Its main drawbacks are the low level of commitment and the exclusion of the USA, the largest emitter country. In fact, the KP targets have been hardly achieved. Many countries actually have overshot the 1990 level emission.

It is against such a background that the COP 13 had been held in Bali. It stands out as a landmark and the present negotiations have much to do with the decisions taken in Bali. The post-Bali submission of Bangladesh remains the watershed against which later activities including the integration of CC issues in planning for development have to be judged.

3.4.2 The Bali Action Plan and Subsequent Developments

The COP 13 in Bali saw some path-breaking changes in the negotiations for mitigation (i.e. emission reduction). The decision 1/CP 13 or the Bali Action Plan calls for a global shared vision and enhanced actions on 4 areas, mitigation (i.e., emission reduction), adaptation, finance and technology transfer and development as well as capacity development. The most interesting were the decisions 1(b) (i) and 1 b (ii) which dealt respectively with mandatory mitigation commitment by developed country parties and voluntary mitigation actions by developing country parties. All country parties are expected to reduce emission. Much of the debate that is going on since then revolves around these two provisions, the conditions under which these should be operational, the relationships of these with the commitments under KP beyond 2012 and of course the level of reduction pledged given the scientific evidence that there has to be drastic cuts in emission and its peaking within a few years (2015 to be exact).

At the same time, however, there has been some substantial progress in adaptation talks–how these can be facilitated and the resources that might be necessary, how to generate those and how to allocate the available resources among the adversely affected countries equitably. There has also been progress in technology transfer and development issues. While nothing is final yet, it is almost certain that substantial resources will flow under different circumstances, bilaterally and multilaterally, for adaptation and also for mitigation. Bangladesh will have to prepare itself for utilising such funds in the most effective way to quicken her process of development. And this has to be within the Bali Action Plan and Bangladesh's own ideas regarding the operationalisation of the Bali Action Plan (hereinafter BAP).

3.4.3 Operationalising Bali Action Plan in Bangladesh Context

The Bali Action Plan (BAP) makes it clear that the developing countries responsibilities and actions have to be looked at within the framework of sustainable development. Bangladesh, in subsequent submission regarding how to operationalise the Bali Action Plan (BAP), has put it in terms of ensuring four types of security. These are food security, water security, energy security and livelihood security (including health). Given that agriculture is expected to be heavily adversely affected, food security becomes the most important issue for Bangladesh. On the other hand, much of what happens to various sectors due to climate change relates to water, too much or too little of it or its spatial distribution between and within years. Furthermore, water is also a shared natural resource for Bangladesh with some of the country's neighbours, which calls for regional actions for ensuring availability. Water security is thus absolutely essential. Livelihood security relates

to the ultimate well-being of the people without which development is meaningless. As health becomes a major issue under climate change, this is also included as part of well-being under climate change.

The issue of energy security is interesting in Bangladesh context. Given that Bangladesh is low energy consumer while it needs energy increasingly for development, the country must be allowed to consume as much energy as necessary for development. While this may seem obvious, a potential conflict may arise with the decision 1b (ii) under Bali Action Plan (BAP) which calls upon all developing countries to contribute as their situations permit to lower emission, which means in many cases lowering energy consumption. But this may conflict with the right to development. Bangladesh has made it clear that while it will use energy in the most efficient way, it will not compromise with its need for energy for development. Indeed, the four securities are inviolate principles of development, which have been later incorporated in the Bangladesh Climate Change Strategy and Action Plan (BCCASAP) to which we now turn as the precursor of planning under climate change.

3.4.4 Bangladesh Climate Change Strategy and Action Plan, 2008 and 2009

Bangladesh prepared the Bangladesh Climate Change Strategy and Action Plan (BCCSAP) in 2008 and revised it in 2009. This is now an approved document of the Government. This is expected to be the blue print for subsequent integration of climate change issues such as mitigation, adaptation, technology transfer and development, and capacity building into the mainstream planning process.

The BCCSAP takes the Bangladesh submission on Bali Road Map, particularly the 4 securities, as the starting point and develops a strategy of sustainable development centred around the issue of climate change. Note that the strategy and action plan does not say anything about the non-CC related development strategy for planning. In fact, as has become apparent, all our development thinking and practice from now on has to centre around CC even when it is not affected by CC because the resource envelop for CC-centred planning will have obvious implications for allocations to non-CC projects and programmes.

On the basis of the 4 securities, the strategy is to safeguard the development prospects of Bangladesh in a way that the country becomes a middle-income one by 2021 and achieves the targets under MDGs as fast as possible. Under the action plan, there are six major themes and 44 programmes (Table 3.3). The very first relates to ensuring food and livelihood security. The programmes mainly fall under development of crop varieties and development of technology suitable for agricultural production under various adverse climatic conditions that are likely to

obtain in future. Three of the themes including food and livelihood security fall under adaptation, which is the prime need of the country. The other two adaptation programmes relate to construction and maintenance of necessary infrastructure, particularly those related to water management. The third important area is disaster management as disaster risk reduction and post-disaster rehabilitation are going to engage a lot of energy and resources of the country due to climate change.

Two of the themes fall under cross-cutting issues of capacity development and research and knowledge management. The last one is extremely important because a lot of the possible impacts of climate change are still unknown and uncertain. Continuous research will be necessary for understanding the unfolding situations as well as development of country-specific solutions to the emerging problems or adapting technology imported from elsewhere. It must be noted that many of these activities already exist in some form. What is needed is their consolidation and reorientation to the purpose at hand.

TABLE 3.3

BCCSAP 2009 THEMES AND PROGRAMME AREAS

Theme	T1: Food Security, Social Protection and Health
Programme	P1. Institutional capacity for research towards climate resilient cultivars and their dissemination
	P2. Development of climate resilient cropping systems
	P3. Adaptation against drought
	P4. Adaptation in fisheries sector
	P5. Adaptation in livestock sector
	P6. Adaptation in health sector
	P7. Water and sanitation programme in climate vulnerable areas
	P8. Livelihood protection in ecologically fragile areas
	P9. Livelihood protection of vulnerable socio-economic groups (including women)
Theme	T2: Comprehensive disaster Management
Programme	P1. Improvement of flood forecasting and early warning
	P2. Improvement of Cyclone and storm surge warning
	P3. Awareness raising and public education towards climate resilience
	P4.risk management against loss on income and property
Theme	T3. Infrastructure
Programme	P1. Repair and maintenance of existing flood embankments
	P2.Repair and maintenance of cyclone shelters
	P3. Repair and maintenance of existing coastal polders
	P4. Improvement of urban drainage
	P5. Adaptation against floods
	P6. Adaptation against tropical cyclones and storm surges
	P7. Planning and design of river training works
	P8. Planning, design and implementation of resuscitation of river and khals through dredging and de-siltation work

(Cont. Table 3.3)

Theme	T4. Research and Knowledge Management
Programme	P1. Establishment of a centre for knowledge management and training on climate change
	P2. Climate change modelling at national and sub-national levels
	P3. Preparatory studies for adaptation against sea level rise
	P4. Monitoring of ecosystem and biodiversity changes and their impacts
	P5. Macroeconomic and sectoral economic impacts of climate change
	P6. Monitoring of internal and external migration of adversely impacted population and providing support to them through capacity building for their rehabilitation in new environment
	P7. Monitoring of impact on various issues related to management of tourism in Bangladesh and implementation in priority action plan
Theme	T5. Mitigation and Low Carbon Development
Programme	P1. Improved energy efficiency in production and consumption of energy
	P2. Gas exploration and reservoir management
	P3. Development of coal mines and coal fired power stations
	P4. Renewable energy development
	P5. Lower emission from agricultural land
	P6. Management of urban waste
	P7. Afforestation and reforestation programme
	P8. Rapid expansion of energy saving devices e.g. Compact Florescent Lamps (CFL)
	P9. Energy and Water Efficiency in Built Environment
	P10. Improvement in energy consumption pattern in transport sector and options for mitigation
Theme	T6. Capacity Building and Institutional Strengthening
Programme	P1. Revision of sectoral policies for climate resilience
	P2.Mainstreaming climate change in national, sectoral and spatial development
	P3. Strengthening human resource capacity
	P4. Strengthening gender consideration in climate change management
	P5. Strengthening institutional capacity for climate change management
	P6. Main-streaming climate change in the Media

Source: MoEF (2009).

The last in the list of major theme is low carbon development and mitigation. Here again, the reference is to the decision 1b (ii) of the BAP. The developing countries are expected to develop their Nationally Appropriate Mitigation Action the implementation of which is contingent upon provision of financial resources and technology. Bangladesh expects to pursue a path of energy-efficient development path and seek resources and technology for the purpose. But this will not be at the expense of the required consumption of energy.

In Bangladesh the operational aspects of planning is to prepare the so-called annual development programme (ADP) which lists the investment and capacity building programmes and projects prepared and implemented under public management. If the BCCSAP is to be implemented, these programmes will also have to be part of the ADP as well as the private investment programme either on a

stand alone or a partnership basis. We therefore need to understand the present characteristics of the ADP as well as the extent of private investment from the view point of CC. This is done in the next section.

3.5 ASSESSMENT OF CLIMATE IMPACTS ON ADP OF BANGLADESH

3.5.1 ADP Sectors and Need for Revision of Projects

Considering the "block allocation" as a separate item, the development projects in Bangladesh are approved by the Ministry of Planning largely under 18 sectors. These are (1) Agriculture, (2) Rural development & institutions, (3) Water resources, (4) Industries, (5) Power, (6) Oil, gas and natural resources, (7) Transport, (8) Communication, (9) Physical planning, water supply and housing, (10) Education and religious affairs, (11) Sports and culture, (12) Health, population and family welfare, (13) Mass media, (14) Social welfare, Women affairs and youth development, (15) Public administration, (16) Science and technology research, (17) Labour and employment, and (18) Block Allocation. There are nearly 900-1000 different projects financed by the government in each year under ADP. Global warming or climate change is likely to affect the effectiveness of many of these projects.

For example, a project like building embankment requires adaptation to ensure that a bigger and a stronger flood that might occur in Bangladesh in future (due to climate change) cannot reduce its effectiveness in terms of protection of life and assets of the people living in the floodplains of the country. Similarly, a project like a hospital should be able to serve adequately the population when in future the incidence of certain diseases rise. Similarly, poverty reduction or employment generation projects need to be adjusted to accommodate larger number of people as the incidence of poverty will be on the rise in many communities due to climate change and the instability or collapse of cropping system. This means that these types of projects will require adaptations to ensure that the welfare as well as income and employment generation objectives of the projects are realised at the end.

On the other hand, that Bangladesh can also take measures to reduce its carbon emission by adopting a better technology or changing human behaviour, if so warranted, based on the climate change negotiations that are going on at the moment. For example, dairy farms could be designed to trap methane gas and reduce GHG emission. Similarly, energy projects could be redesigned to ensure co-generation using heat-trapping. These are examples of mitigation measures that can be adopted in some of the ADP projects. Such activities could form part of the

NAMA if Bangladesh wishes to pursue a low carbon development path which in principle the country does as evident from the BCCSAP 2008 and 2009.

Many projects may, therefore, need to be amended for mitigation and adaptation purposes without which the project themselves may not become economically viable under the changed circumstances. The question is, how many of the ADP projects are amenable to such modifications. In order to develop a general understanding on this, a review of development projects of 2004-5 and 2008-9 was made. Projects in two consecutive fiscal years are often similar due to time overlap during implementation and so projects from two fiscal years with a reasonable gap in years in between were taken for this analysis. A total of 1,901 projects were scrutinised to understand if the projects are designed today what type of measures should be adopted to make them climate-resilient and climate-sensitive and thus retain their welfare and growth impacts. Figure 3.4 summarises the result by sectors.

3.5.2 Projects Need Modification due to Climate Change

Figure 3.4 shows that projects in all sectors except in the sector of sports and culture require adaptation measures without which the projects will become ineffective under CC or may even be infeasible. Overall, nearly 40 per cent of the projects need to be modified for possible mitigation or adaptation options. As expected, there are substantial variations by sectors in need for such amendments. Projects in water sector are most in need of design changes or similar such changes. Agriculture and rural development follow somewhat closely. Transport and communication, water supply and sanitation as well as interestingly the power sector is also in need of change. One interesting observation is that labour and employment programmes are also in the same league as the big adapting sectors. This is so because many of these are anti-poverty programmes based on natural resource management of one kind or another (poultry-raising, home gardening, social forestry, etc.) which are likely to be affected adversely by climate change. In any case, the preponderance of so many projects needing redesigning means that the capacity of the officials of the government of Bangladesh needs to be improved dramatically to design projects with possible adaptation and mitigation measures as well as in their implementation, an issue which intends to take up later.

3.5.3 Cost of Projects at Risk due to Climate Change

In terms of the total investment funds which are at risk, Figure 3.5 shows the percentages of total costs of projects under 2008/09 ADP, which should be subjected to mitigation and adaptation measures. For example, in the agricultural

sector, out of total allocation of Taka 14 billion or so, more than 60 per cent relates to projects which need to be modified to take account of adaptation measures. In the case of rural development projects, a similar situation obtains. But in the case of water resources programmes and projects, almost the entire allocation needs to be rethought for incorporation of adaptation measures. Several other sectors such as oil and gas, transportation, water and sanitation and social welfare and women's affairs also are in similar situation. On the whole, of the total allocation, 40 per cent should have gone for projects which incorporate adaptation. Note that redesigning is necessary for mitigation mainly in the power sector which comes as no surprise followed by industries and agriculture to some extent. Cost for projects necessitating mitigation is about 15 per cent of total.

Figure 3.4: Per cent of ADP Projects that Need CC Adjustment

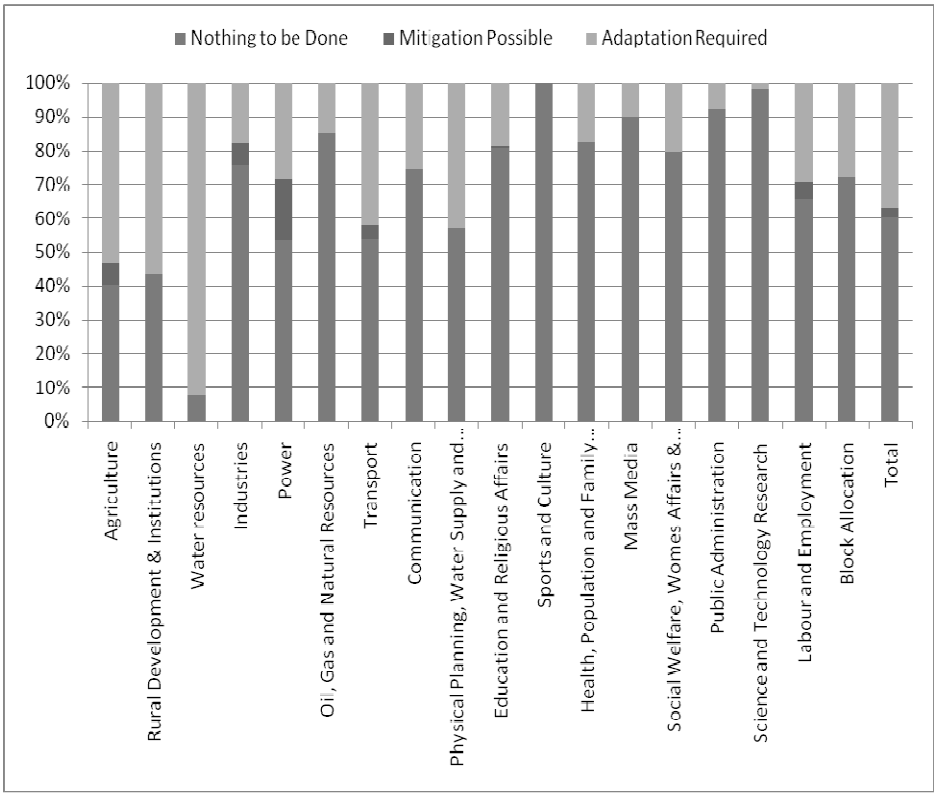
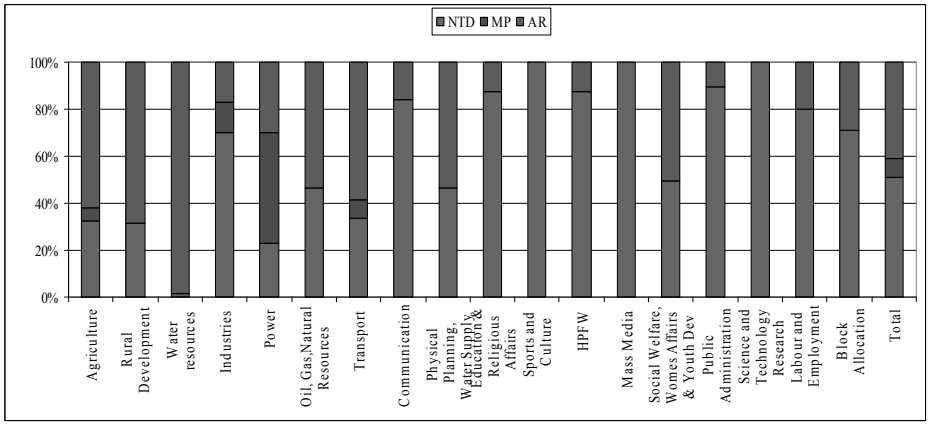


Figure 3.5: Proportion of Cost of Projects Needing Modification (based on 2008/09 ADP)



Note: NTD: nothing to be done; MP: mitigation possible: AR: adaptation required.

In 2008/09, Bangladesh had an ADP of nearly US$3.5 billion. Of that nearly $1.8-2.0 billion of investment is now at risk due to climate change. While a detailed estimate on the cost of adaptation and mitigation has not been studied in this paper, a rough estimate suggests that additional 30-50 per cent fund might be needed to retain the current level of benefits of the projects. This exercise shows that not only our investment in all the sectors are at risk, proper evaluation of climate impacts on projects will also affect the choice of projects as it would change their benefit-cost ratios. As a consequence, a large part of the investments made now in various sectors of Bangladesh economy under ADP may have little or no benefit.

3.6 RESOURCE ENVELOPE NECESSARY FOR ADAPTATION AND MITIGATION

3.6.1 Public and Private Investment

Investments may be either by the public or the private sector (households, firms) and in Bangladesh's case also by non-government organisations, which play an important role in programmes related to poverty alleviation and reaching necessary social services to the poor. The public investment programme is through the ADP, the characteristics of which have been analysed above. The public investment programme is, however, only just about a fifth of the total investment in the country. If NGO investment (on which little information exists) is disregarded, for the time being, the ratio of private to public investment is 4: 1. In that sense, had the total allocation in ADP had been realised, the total investment in the economy

would have been $3.5 billion and investments in projects needing adaptation would have been $1.8-2 billion.

3.6.2 Adaptation and Mitigation Costs

Taking a look back at the Action Plan and the proposed programmes for implementation, note that many are new ideas or much expanded than present such programmes. For example, take the case of research in agriculture for development of suitable cultivars with various desirable characteristics for adapting to climate change. Some similar programmes in the past have only recently come to fruition through the release of varieties resistant to moderate salinity and drought. Some are also of shorter duration lowering demand for water as well as of energy, thus helping mitigation. But more of these will be needed in future and the gestation period for development of such varieties is rather long, nearly 7-8 years. And we need to begin with their development as soon as possible. Huge skill development and creation of research facilities will be needed.

Infrastructure is one very investment-intensive plan of activities. Not just that one has to catch up with vital operation and maintenance issues, many while being repaired now will have to be practically rebuilt due to necessary design changes to adapt to climate change impacts. The cost of adaptation therefore may be rather high in many areas.

For ADP-based projects as they stand now, we therefore take roughly 50 per cent of the present allocation as the cost of adaptation because new including even O&M projects may need to be drastically changed while underinvestment in certain sectors over the years such as water and agriculture needs to catch up for sustainable development. In that sense, one may need near about US$ 1 billion a year for publicly funded projects alone for adaptation. For mitigation, much of it would be in the power sector and on a pro rata basis, just over 0.5 billion will be needed for all other sectors. But, as it is mainly for the power sector where new and costly projects will be needed, we take it to be US$ 1 billion per year. On the whole, therefore one would need roughly US$ 2 billion in the public sector alone for adaptation and mitigation together.

Note that the resource requirement for annual programmes as estimated by the BCCSAP 2009 as a ball park figure had been US$ 500 million for first two years to set up necessary institutional and other infrastructure and later US$ 1 billion per year for the first five years. The estimate made here is actually for a full development phase which may take sometime to achieve. In that sense, the estimate made by the BCCSAP 2009 can be said to be the necessary resource requirement at

the beginning years of implementation of adaptation and mitigation programmes under the public sector.

Add now the private sector which will have major projects in industry, power to an extent, transport, communication, etc. We take the adaptation cost to be at least 30 per cent of the total private sector investment, which is likely to be US$ 14 billion (= 3.5 x 4). We take a smaller percentage for adaptation because the private sector is an amalgam of many small, some medium (mainly industries) and comparatively only a few really big projects. The adaptation and mitigation needs may, therefore, not be as high as in the case of large infrastructure projects under the public sector. In any case, if the proportion of 30 per cent additional costs for adaptation is applied, the estimated adaptation cost will be at least US$ 4 billion. For mitigation, we take it to be the average of 15 per cent which is estimated thus to be just over US$ 2 billion.

So far we have disregarded the investments made by NGOs much of which will be affected one way or other by adaptation needs. The micro credit the NGOs provide are invested in mainly small but natural resource-based investments in poultry, livestock rearing, small businesses such as indigenous rice milling, food processing, sanitation and health and others. All these will be affected adversely by climate change directly or indirectly and thus would need to integrate adaptation to provide the intended flow of benefits in terms of poverty alleviation. In 2008, the total micro credit provided by major NGOs and the Grameen Bank had been of the order of Taka 134.76 billion or US$ 2.72 billion. Let us assume that only 80 per cent of this need to integrate adaptation costs into their design and resource requirements. What percentage of additional costs for adaptation to employ? We use the rate observed earlier for labour employment projects for poverty alleviation, which resembles the NGO operations most closely. The percentage is 20 per cent. The enhanced cost due to adaptation for NGO-supported investment thus comes to US$ 0.43 billion or say, US$ 0.5 billion per year at 2008/09 prices. We disregard mitigation here although many of the NGOs are involved in renewable energy popularisation.

The total cost of management of climate change thus comes to US$ 5.5 billion for adaptation (US$ 1 in public, US$ 4 billion in private and US$ 0.5 billion in NGO sector) and US$ 4 billion (US$ 2 billion each in public and private sector) for mitigation making US$ 9.5 billion in all per year. The estimated resource needs is gigantic indeed. Note, however, that these are rather very crude figures. One needs to actually examine the projects in implementation thredbare to understand how their designs need to be changed and what would be the costs. This should be the next step in integrating CC into mainstream planning.

One possibly needs to refer here to the domestic fund set up by the Government for adaptation to climate change. This is a US$ 100 million fund which may be accessed by public sector and NGOs. A substantial part of the money has been disbursed so far. But to what purposes and with what ensuing benefits or effectiveness is difficult to assess at the moment because of the lack of easily accessible information.

3.6.3 Adapting to Economic and Social Consequences of Response Measures and Adaptation to Mitigation in Agriculture and Other Sectoral Mitigation

Two of the sub-clauses under clause 1(b) of the Bali Action Plan refer to various sectoral approaches including mitigation in agriculture 1b (iv) and economic and social consequences of response measures in other countries. In both the cases, a major worry is whether these will lead to increased food insecurity. There is little or no national capacity to analyse well in advance the global dynamics of production and market availability of various food items, for which Bangladesh depends on international procurement. In view of the uncertain food security under climate change, a regular monitoring framework will have to be developed, which will help political decision makers to decide for early procurement, storage and distribution policies. This is obviously an adaptation activity which needs to be continuously kept in purview.

Similarly, there may be adverse consequences of response measures such as rising energy prices and consequent rise in food prices in the international market. Bangladesh's food security is likely to be threatened in such cases. The cost of securing food in periods of emergency under such conditions must also be treated as adaptation and paid for by the international community.

The social implications of climate change are perhaps least understood. The local level social capital, capacity to bounce back, human capacity to diversify their economic practices (especially under stress), the available natural capital and access of poor to such resources–all these aspects are generally least understood at community level. Access of marginal population to governance process, knowledge base, proper dissemination of early warning, etc. are almost forgotten elements knowledge base on which could substantially enhance people's adaptive capacity. These should also be treated as legitimate adaptation activities.

The addition of the necessary financial support for such measures would of course raise further the cost of adaptation. Even without them, whether the estimated resources will be available even at full development is one question. Note, for example, some of the initial ideas of resources such as those floated at the Commonwealth Heads of Government as an interim measure for each year up to

2020 (possibly mainly for adaptation) was only US$ 10 billion for all the developing countries in the Commonwealth. Later, during the Copenhagen Accord, the figure of US$ 30 billion for 2010, 2011 and 2012 has been discussed. The Copenhagen Accord also proposes a US$100 billion fund for every year by 2020 for the developing countries. However, the general demand by LDCs is much higher (see later). By now, pledges amount to more or less US$ 30 billion but the architecture to disburse the funds is yet to be finalised.

The second question is: can a country such as Bangladesh really absorb this level or even a third of the money for adaptation which may be more likely in future if the present negotiations result finally in concrete steps for resource mobilisation and allocation. Furthermore, if even a fraction of the money that is being promised begins to be channelised ultimately, there may be major macroeconomic repercussions in many small economies. Very few developing countries have the necessary financial infrastructure or management capability to absorb this level of resources. There is an additional question. As noted above, in the case of Bangladesh a large part of the money will actually have to be utilised by the private sector and the NGOs. There is no mechanism at the moment to coordinate this kind of resource transfer to the private sector in so many areas.

3.7 THE FEASIBILITY OF RESOURCE MOBILISATION

3.7.1 Resource Mobilisation on a Global Level

Various resource mobilisation ideas have been under debate for some time both in the climate change negotiations and in the academic circles. Noting that climate change is a major symptom of market failure in which the perpetrators of the problem do not pay while the victims suffer, the classical case of negative externality impinging on others, the economists prescription of course is to put a tax on the particular activity (i.e., fossil fuel burning) giving rise to the problem. The idea of a carbon tax, some time called the Tobin Tax (because eminent economist James Tobin first proposed the idea) is of course theoretically most valid here. However, these are domestic affairs of the countries concerned. Rather than advising the developed countries on how to curb the negative externality, what is being discussed in the climate change negotiations is the required amount of resources for adaptation and mitigation. There is also a discussion on generating resources at the same time at the international level.

The present position of the G77 and China is for the developed country to provide 1.5 per cent of their GDP as grant financing for adaptation. This comes to US$ 600 billion at the present level of GDP of these countries. The LDCs have proposed that 70 per cent of this resource will have to be allocated to the least

developed and most vulnerable countries such as the small island states. This money will be over and above the normal official development assistance (ODA). As indicated above against such demands, the Copenhagen Accord has promised US$30 billion now for three years and US$ 100 billion every year by 2020.

If only 0.5 per cent of the money demanded by G77 and China is ultimately raised and 30 per cent of that goes to LDCs, it would be US$ 60 billion per year. Bangladesh being the largest and most populous LDC should try to get at least 10 per cent of the resource which comes to US$ 6 billion, enough for her needs for adaptation as present understanding of adaptation needs indicate.

Mitigation is a different ball game all together. Nationally Appropriate Mitigation Actions (NAMAs) by developing countries are expected to be supported. But whether this shall be grant is not clear. Very likely these will be concessionary loans. Bangladesh, as an LDC, may also take part in NAMA. But her position as stated in the BCCSAP is that if the technology to be employed has to be state of the art, she would demand the additional funding necessary for deploying advanced technology over and above the conventional one to be provided as grant. Unfortunately, so far the ministries of energy and power have given little thought to this area for resource generation for investment.

3.7.2 Market-based and Other Bilateral Mechanism for Resource Mobilisation

Climate change is one of the most notorious examples of market failure. The western and other industrialised countries as a whole have failed to curb excessive energy consumption due to unsustainable life styles. Yet, they have refrained in general from putting a tax to regulate the market and lower emission.[3] At the same time, ideas have been floated and also been implemented in various forms to lower the cost of emission cut through the market mechanism.

The basic idea is to lower the emission in particular activities in countries not obligated to reduce emission and then credit that against finance and technology from developed country private sector enterprises which are obligated by law to lower emission. The use of developing country to cut emission is less costly than doing it in their own country.

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[3] The Carbon or Tobin tax (so named as initially proposed by James Tobin, an eminent economist.) at 1 per cent of the world GDP has also been in some form reiterated by others, most notably by Stern, Nicholas J., Stern Review on the Economic of Climate Change, H M Treasury 2006. Note that the recent proposals of 1.5 per cent and 1 per cent of GDP to be provided for adaptation (though refraining from suggesting how this has to be raised) is akin to the idea of the Carbon tax as a whole on developed countries.

The actual operations of using developing country emission reduction as offset for "immediate inability" of developed country enterprises go by various names such as carbon trade, clean development mechanism (CDM), Joint Implementation (JI, between developed countries and countries in transition), activities implemented jointly (AIJ) and others. CDM is particularly a KP-approved process and there had been several hundred CDM projects worldwide, many of these being in China.[4]

Unfortunately, so far the resources generated through CDM are pretty small compared to the need. On the other hand, this is money for mitigation. Money for adaptation is practically nil so far although a part of the CDM credit has been earmarked for adaptation. There had been ideas that once the LDCs prepare their National Adaptation Plan of Action (NAPAs), money would be available for critical projects. This was rather a paltry sum, 2-5 million US dollars only.

Ideas are now being floated by all and sundry for building up adaptation fund as stated above. But getting it operational and under a workable internationally accepted architecture may yet take a few years to materialise. In 2007, the Bali Action Plan endorsed three ideas floated earlier. These are levies on international maritime transport and aviation and REDD *plus* (reducing emission from deforestation and forest degradation and keeping it locked). No consensus has emerged on the first two yet, but prospects are bright. Several billion dollars a year may be raised through them.

For Bangladesh, REDD *plus* remains a distinct possibility. The idea is to get international financing and technology for rehabilitation of degraded forest and keeping the carbon locked in trees for a long time. There has been much opposition, particularly from the NGO community, to the idea because of fears of displacement of forest dwelling communities, particularly in Latin American countries. Since then various kinds of safeguards have been built into the idea for social protection as well as environmental and ecological integrity of the forest land (such as keeping the forest in its natural form rather than encouraging industrial plantation). Various countries have already begun piloting with encouraging results. It is highly recommended that the Forest Department prepares pilot projects under REDD and thus both adapt to and mitigate climate change with grant funds from other countries.

3.7.3 Grants vs. Loan

One issue that has been uppermost in the minds of the climate change negotiators from the very beginning had been the nature of the resource flows for

[4] Hence, the CDM is often jokingly called China Development Mechanism.

adaptation and mitigation. For adaptation, the situation is clear. The whole of it has to be grant. Even granting this, one or two issues have been raised. First, what about intellectual property rights on technology to be used. For adaptation at least, it has been suggested that this should be given free to LDCs. If the innovators are to be compensated, this should be done by the country which is providing the fund or if multilateral funding is made, the compensation to the innovator would be from that fund. This issue is still contentious.

The second issue relates to if full cost or only the incremental cost has to be paid for. In principle, the finance should be for the additional cost over and above the normal project cost without adaptation. Thus, the situation would vary from project to project. Some projects would be completely new and must be financed on a full cost basis. In other cases, it would be full incremental cost basis.

The third issue relates to REDD *plus*. This has been under mitigation but afforestaion is also adaptation depending on circumstances such as coastal forestry which safeguards the coastal areas against storm surges. How to deal with this issue is still unclear. More importantly, as it is also a mitigation issue, question has been raised if the carbon sequestered in the forest may be traded internationally. This is still contentious.

On mitigation, the LDCs are not obligated to take any measure on a mandatory basis. But they are encouraged to take voluntary mitigation actions upon provision of finance and technology. Question is, if it is not mandatory, should the finance for funded projects be grants or loans including concessionary loans. This issue is also still being debated. In fact, the BCCSAP 2009 has made Bangladesh position clear. Even if it is mitigation, anything above the ordinary has to be paid for on a grant basis.

The upshot of the above analysis and discussion is that very large sums of money would be involved in managing climate change, which would be a gigantic task both internationally and domestically. In particular, the institutional mechanisms within the country have to be fully geared up to the task at hand. We turn to this extremely important issue in the next section.

3.8 INSTITUTIONAL ASPECTS OF MANAGING CLIMATE CHANGE

3.8.1 Country Obligations under UNFCCC

Bangladesh signed the UN Framework Convention on Climate Change on 9 June 1992 and ratified on 15 April 1994. The signing and ratification put the country under certain obligations. These include:

- Adoption of measures to prevent and minimise the factors responsible for climate change;

- Adoption of appropriate policies to integrate UNFCCC obligations with national development programmes;
- Periodic national inventories of GHG emission;
- Periodic reporting on mitigation measures;
- Formulation and implementation of programmes for control of climate change;
- Incorporation of suitable policies for the control of climate change in national plans including education and training policies to enhance public awareness vis-à-vis climate change;
- Developing appropriate integrated plans for coastal zone management;
- Research and systematic observation to strengthen national scientific and technical research capacities;
- Undertaking research and impact assessment on the social, economic and environmental policies;
- Strengthening capacities within the means of the signatories keeping harmony and consistency with their national law and regulations;
- Multilateral consultative process for resolving issues arising out of implementation of the provisions of UNFCCC
- To bring to the attention of Conference of Parties (CoP) the communication and mechanism of implementation.

The CoP is mandated to periodically examine the obligations of the signatories, and prepare guidelines for inventories of GHG.

From the long list above, it may be obvious that managing climate change is a complex issue. Yet, the main aspects of climate change issues and their management may be summarised as:

1. International negotiations and country position placement to different international climate change fora
2. Country reporting to the UNFCCC
3. Country response as per decisions of CoP
4. Fund mobilisation, allocation, utilisation and related financial management
5. Climate change-proof, climate smart and climate-sensitive project preparation, implementation and monitoring.

One therefore sees not simply international negotiations on various issues and domestic actions, but also building a synergy between them based on country

development priorities, and financial, technological, human and institutional capacity. One or more suitably inter-linked institutional arrangement would, therefore, be necessary to be set up carefully. It is not that there are no institutions handling issues related to climate change, nor is it true that there is no institutional mechanism. To the itinerant observer, everything would seem to be fine. In reality, however, the situation is fragmented and the attempts so far in managing climate change had been *ad hoc* to say the least. It should be kept in mind, however, that the complexity and the all-embracing nature of climate change and its management has become clearer only over time. And so have been the institutional attempts at handling those. To recommend the way forward for institutional change, capacity-building and integration of climate change in the normal development thinking, process and implementation, one needs to first take a stock of what has happened so far and by whom.

3.8.2 Institutions Involved in Climate Change Management

The Rules of Business of the Government mentions climate change issues as falling under the mandate and responsibility of the Ministry of Environment and Forests (MoEF). However, as indicated clearly in the beginning on impact of climate change and the need for adaptation and mitigation by sector as well as formulation under the BCCSAP 2009, various other sectoral ministries have major roles in the management of climate change and its impacts as well as emission reduction. These ministries include the Ministry of Food and Disaster Management, Ministry of Agriculture, Ministry of Fisheries and Livestock, Ministry of Water Resources, Ministry of Land, Ministry of Health and Family Welfare, Ministry of Defense (both for security reasons and that the Department of Meteorology is under it), Ministry of Industries, Ministry of Power, Energy and Mineral Resources, Ministry of Foreign Affairs, and some others also involved with overall climate change management and cross-cutting issues related to climate change.

While the technical arms of these ministries, in the form of directorates and departments, are also involved, some are and have to be in the forefront. The related organisations are Department of Environment, Forest Department, Directorate of Agricultural Extension, Soil Resources Development Institute, Disaster Management Bureau, Bangladesh Water Development Board, Water Resource Planning Organization, Meteorological Department, and research institutions under the National Agricultural Research System (NARS). Other than these public organisations, there are other academic and research organisations, non-government organisations, and activists and professional bodies who take active interest in the climate change and its impact and its management.

The MoEF, established in 1989, is responsible for the formulation of climate change policies and strategies as well as for designing for effective management of climate change issues. It is also responsible for administering, restructuring, formulation and coordination of projects and programmes, and fund-raising. As per Rules of Business of the Government, MoEF is the national focal point of all Multilateral Environmental Agreements. The mandate seems to be very wide indeed. This may probably needs certain clarity as the workload for climate change management is going to be extremely heavy for MoEF which is a small ministry. We shall come to this issue later.

3.8.3 Past Ideas on Institutional Set up

Initially, the MoEF entrusted much of the work related to obligations under the UNFCCC to its agency, Department of Environment (DoE). The activities were related to three types of issues, viz., policy related to climate change, international negotiations, technical backstopping for programmes and projects related to climate change. However, no work on institution building has been taken up.

Over time, as realisation dawned that climate change issues need to be looked after in a more focused manner, the MoEF created a small cell in 2004 within the DoE named Climate Change Cell with support from DFID and UNDP. The Cell focuses on the following four main areas:

- Building the capacity of Government to coordinate and integrate the climate change issues in its activities;
- Strengthening knowledge management by stock-taking of existing knowledge and available information on impact prediction and adaptation to climate change;
- Awareness raising, advocacy and coordination with partners across Government, NGOs, civil society, private sector and development partners;
- Improving capacity to adapt livelihoods to climate change in the agriculture sector.

The Cell devoted much of its energy to follow the international negotiation about climate change but could not build a bridge to all relevant actors within the country. The Cell, however, published several documents and study papers on climate change.

During the preparation of National Adaptation Plan of Action (NAPA) in 2005, its work was carried out under a Coordination Cell with six working groups. One of these was on policy and institutions. Unfortunately, this was the only group which failed to produce any background report. Also, the NAPA exercise could not

visualise the enormity of activities that is coming up on climate change. So the NAPA while it came up with a list of projects for funding could not give any indication or throw light on strengthening or setting up a new institutional framework for climate change related activities such as coordination, intervention and implementation of projects and programmes among the sectoral ministries, professionals, researchers, civil society and NGOs and activists.

Another missed opportunity was the World Bank led Bangladesh Country Environmental Analysis (World Bank 2006). This also could not give any guideline for environmental (including climate change) governance and required institutional set up in Bangladesh. The CEA was focused more on enforcement. World Bank suggested the following:

- Enforce the Environmental Conservation Act and meet international obligations;
- Administer the environmental clearance process competently and transparently;
- Address major air and water quality management problems;
- Expand public awareness efforts;
- Build DoE capacity.

For institutional strengthening, CEA gave priority to make environmental assessments and information related to the environmental clearance process publicly available, including through the internet, and mandatory public consultation on environmental assessments of high-risk projects. Only two specific suggestions were made regarding capacity building: introduction of a cadre service for DoE and restructuring of DoE. Nothing was said specifically about climate change governance.

The nearest to analysing and recommending institution building and strengthening was made under the National Capacity Self Assessment Project of the MoEF. This project found certain institutional weaknesses in dealing with climate change issues in general. These were:

- Lack of coherent and effective institutional coordination as well as limited trained manpower;
- Lack of physical infrastructure and facilities limiting institutional performance in addressing cross-cutting issues on MEAs;
- Lack of strong coordination between institutions and adoption of an integrated approach fundamental in ensuring synergistic implementation of

the MEAs. This can be achieved by establishing and strengthening collaboration between institutions through formation of relevant committees and networks.

To remedy the problems, the Self-Assessment called for the development of guidelines for joint actions and mainstreaming of MEAs into planning processes. In addition, intervention and investments were also recommended for strengthening of human capacity and development of skill in relevant fields through appropriate recruitment and training, as well as improvement of the available physical infrastructure and facilities to build or promote coordination at national and district and lower administrative levels.

The abovementioned interventions and investments, it was hoped, would result in the establishment and strengthening of inter-institutional collaboration frameworks as well as strengthening executing institutions for the MEAs. Achieving this will require the active participation of key agencies under the ministries as well as NGOs, private sector and tertiary training institutions. MoEF and Department of Environment (DoE) would play the lead role in implementing the above interventions.

To put the above ideas into practice, the Self-assessment recommended the formation of a "Sustainable Development Commission" (SDC) for future sustainable environmental governance including climate change issues under the leadership of the Finance Minister. The recommendation also called for coordination and networking with concerned ministries and their agencies, training institutes, research organisations, individual academics and professionals, specialists, private sector, NGOs, and civil society bodies. The secretariat of the SDC would be in the MoEF. But it was apprehended that the existing set-up of the MoEF may not be able to provide such support to the SDC. Hence, a separate branch (Sustainable Development Branch) may be created under the MoEF to provide secretarial support to the Commission. The Commission would require a separate and definitive budget to carry out its mandates. So a separate budget line may also be created for the Commission under the MoEF.

The idea of a SDC is ingenious. But this is not workable unless sustainable development itself becomes the mainstream development thinking, process and practice, which unfortunately is not the case despite such promises repeated many times. Furthermore, while the idea of the Finance Minister as the head of the SDC is appealing on several administrative grounds including provision of funding, on grounds of principle, it should be the Minister for Planning. In any case, there had been so far little progress on the implementation of the idea.

More recently, the Government has prepared the Poverty Reduction Strategy Paper for the second time in 2008 (2nd PRSP). The Paper identified the problems related to climate change as:

- Mainstreaming adaptation to climate change into policies and programmes in different sectors;
- Enhancing resilience of urban infrastructure and industries to impacts of climate change;
- Development of eco-specific adaptive knowledge (including indigenous knowledge) on adaptation to climate variability to enhance adaptive capacity for future climate change;
- Promoting adaptation of coastal crop agriculture to combat increased salinity as well as adaptation to agriculture systems (including fish, livestock) in areas prone to enhanced flash flooding, etc.

The Paper, furthermore, suggested some multi-sectoral and cross-sectoral measures such as: capacity building for integrating climate change into planning, designing of infrastructure, conflict management and land-water zoning for water management institutions, coastal zone management, education and training, public awareness campaigns, insurance development for risk management, strengthening the legal system, strengthening fiscal measures, disaster management measures, scientific research and development (R&D) and technological innovation, and strengthening of monitoring, observation and communication systems.

Although the second PRSP marked and flagged the problems in detail, the required institutional arrangements were not given in detail or remained unclear. The Paper suggested making changes in existing institutional, administrative and organisational arrangements without clarifying what these should be and which problems of the present system do these respond to. The same can be said regarding the suggestion for harmonising national climate change committees and enhancing their degree of representation, power and functions with attention to coordination among these committees for better integration with different sectoral agencies and departments. Unfortunately, what these committees are is not clear as there are no such climate change committees now nor were there any at the time of the preparation of PRSP. But, more importantly, while the PRSP in essence captured the nature of the problems related to climate change management, so far there appears to be little follow-up on the suggestions made by it.

3.8.4 Institutional Set up in the BCCSAP 2009

The real impetus to the tasks related to climate change came upon the decisions CoP 13 in Bali in 2007. Just to reiterate, the pillars of Bali Action Plan are enhanced

national/international action on mitigation, enhanced action on adaptation, enhanced action on technology development and transfer to support action on mitigation and adaptation and enhanced action on the provision of financial resources and investment to support action on mitigation and adaptation and technology cooperation. To respond formally to the preparation and submission of the Bali Road Map for Bangladesh, the MoEF constituted four technical working groups on these four issues. There was also a fifth committee on awareness-raising. The committees were constituted of government officials, professionals, researchers, academics and civil society members.

The aforementioned technical committees have recently been replaced by a Climate Change Negotiation Committee with broadly the same persons as members with additions of a few more. The previous technical committees had provided and the present negotiation committee continues to provide valuable advisory service to the government in determining its stance in the international negotiations on the four elements of the Bali Action Plan. As these committees continued to work, it appeared that a coordinated strategy and action plan is necessary for a comprehensive management of the climate change issues. The idea of a Climate Change Strategy and Action Plan was thus born. The details of the BCCSAP have been given earlier. Note particularly, the theme under "Capacity building and institutional strengthening."

The Capacity Building and Institutional Strengthening Theme has six types of programme which are sub-divided into actions that may actually be one or more projects for implementation. Of the six programmes, the three on revision of sectoral policies for climate resilience, mainstreaming climate change into national, sectoral and spatial development programmes and Capacity-building and institutional strengthening constitutes the core.

To oversee the implementation of the approved BCCSAP-2009, several institutional arrangements had been indicated in the Action Plan document. The National Environment Committee headed by the Prime Minister is the highest body for strategic guidance and oversight. Under that committee there is a National Steering Committee on Climate Change for overall coordination and facilitation, which is headed by the Minister for Environment and Forests with membership drawn from secretaries of all relevant sectoral ministries. A Climate Change unit set up in the MoEF is expected to act as the secretariat to the National Steering Committee and to coordinate, integrate, and facilitate all climate change related matters in the country. This has now been established to work as the secretariat for fund disbursement from the domestic climate change fund. Climate change focal points or cells, some of which already exist in some of the ministries, were to be set

up in all ministries. These focal points were expected to coordinate their sectoral activities with that of the Climate Change unit in the MoEF. International negotiations remain the preserve of the MoEF in collaboration with the Ministry of Foreign Affairs.

So far only a few Climate Change focal points or cells have been established in the sectoral ministries. But how far these are active is not clear at the moment. But we believe that this is necessary for planning and budgeting the climate change activities within the sectoral mandates of the ministries. This needs to be coordinated/integrated with the present system of project planning within ministries. Exactly how this should be done needs to be studied for clear operational rules and guidance by the proper authorities. This also involves project approval process in the ministries. This issue will be discussed shortly.

3.*8.5 Ideas about Future Institutional Framework*

Before we move on to suggest how the planning for and approval of projects related to climate change may be done, we need to keep in mind the issue of finance. Earlier we have indicated the order of magnitude of the resources that Bangladesh might need for climate change adaptation and mitigation. These are extremely large funds. More importantly, any such support under the Convention or the Convention-mediated funding by the donor country and its output and outcome in the recipient country must be measurable, reportable and verifiable (MRV), as clearly laid down in the Bali Action Plan. And the procedures for MRV, which are still under negotiation, are expected to be quite explicit and transparent. That means there will have to be a strong institutional framework and transparent operational procedure for planning projects under such funding which is going to be the norm in a few years time.

During the preparation of the BCCSAP 2008, the Government of Bangladesh established a Climate Change Fund of nearly US$ 42 million, which has since been raised to US$ 100 million and then further to US$200 million during the last budget (2010-11). This is Bangladesh's own fund. Furthermore, there is now a Bangladesh Climate Change Resilience Fund exceeding US$ 100 million with contributions from development partners. While the detailed operational procedures of these funds are not known with certainty, one suggestion that we make is that the domestic fund should be utilised immediately for setting up the Climate Change Secretariat in the MoEF and also provide support for setting up the climate change cells or focal points in the ministries concerned. For now, the government has established a Climate Change Unit in the MoEF for coordinating the disbursements of funds from own domestic trust fund under a much simplified rules and

procedures. But a more full-fledged unit subsuming the fund disbursements is necessary. Only then the other institutional procedures may be studied and recommendations may be made so that international verification may be allowed for the support received and output of supported projects as and when these materialise.

One thing must be made clear. Unless we put in place a workable and transparent procedure for planning, designing, approving and implementation procedure for climate change projects, these are not going to be supported. We must, therefore, have proper and strong institutions in Bangladesh to prepare ourselves for the huge task that we have before us. In particular, the setting up of the Climate Change Secretariat (CCS) in the MoEF or transforming the present unit has become the paramount need to get the ball rolling. The CCS may have the following functions:

- International negotiations with the help of Ministry of Foreign Affairs;
- Inter-sectoral coordination of investments with the help of Economic Relation Division and Planning Commission;
- Management of finance for climate related projects with the help of different ministries and agencies;
- Reporting mechanism to Prime Minister, Parliament and accredited international bodies;
- Develop and practice mechanism to incorporate people's voice in decision-making in issues related to climate change.

3.8.5.1 Project Approval Process

A major question remains about the project approval process and implementation within the national planning process. Much thought needs to be given to it. But one issue remains clear. All climate change projects must be part of the ADP.

On the process of approval, for the time being, one way to expedite the process, which is rather very slow at present, is to raise the funding approval authority of the DPEC, which is only Taka 60 million at the moment. This may be raised to Taka 250 million for investment projects. Above that investment projects have to go to the Planning Commission for vetting. For technical assistance type projects, except in the case of complex projects and projects having security or similar considerations, the existing normal procedures may be followed.

At the Planning Commission, however, unless drastic procedural changes are made, it may again takes very long to approve investment projects. We suggest that the Planning Commission take a very hard look at the formats and procedures for

project approval, simplify it without losing the essential oversight and also build in transparency for subsequent MRV, if applicable. The project approval deadline for investment projects should not be more than 6 months, while for technical assistance projects it should not be more than 3 months.

There may be an alternative way of simplifying the process of project planning. It should be left largely at the hands of the sectoral ministries or when there are joint projects across ministries, one may be the lead ministry to coordinate the efforts. The Planning Commission may define certain parameters by type of project, which may be technical, economic, social or cross-cutting with acceptable lower and upper ranges. Such parameters may be reviewed and changed periodically every 3 years or so or if the situation so demands due to sudden or drastic changes in planning environment. For example, for setting up a new power plant with coal, the technical parameters may be defined in a way that the environmental impacts may not be beyond certain bounds or the cost of production per kwh may not be above certain amount of Taka. Once these parameters are given, the concerned ministry will observe those parameters in its project planning. Only if the parameters are exceeded for any reason, the Planning Commission will step in with the help of a pool of experts.

One problem with such a procedure is that many of the present Planning Commission staff will think it to be an attempt to make them unemployed. To avoid the criticism and the dissension, the first thing that should be pointed out that project planning by sectoral ministries will still leave the Planning Commission with the task of macro level planning. Secondly, as the ministries will have to prepare the projects on their own, they will be in need of more hands. Thus part of the Planning Commission staff may be shifted to the ministries concerned. Thirdly, the rest of the Planning Commission staff may be trained at home and abroad, if necessary for longer terms than usual, to create the types of expertise that will be needed to review and set planning parameters from time to time.

The issue of disbursements from the domestic climate fund merits some comment. At present, these are small amounts, no more than Taka 250 million for public sector projects and no more than Taka 50 million for NGO-led projects. These are first screened at the Ministry of Environment and then sent to a Technical Committee which is only technical in name but basically composed of secretaries of ministries with one representative from outside and one former secretary of the MoEF. This Technical Committee has little proper technical scrutiny capability. In any case, once this committee approves of a project, it goes to a Trustee Board composed mainly of ministers and one economist and one environment specialist. Rules have been changed recently so that the decision of the Trustee Board is final

and the project does not have to go to the Planning Commission for vetting. While the MoEF should be commended for its simplification of the process of project approval for disbursement from domestic climate fund, concerns are there regarding the transparency and effectiveness of the process to approve of projects, which may really help in combating climate change. In particular, such processes are unlikely to be accepted as a process of MRV for disbursements under the Climate Resilient Fund or any internationally disbursed fund.

3.8.5.2 Institutional Development

Two types of institutional development are being contemplated for some time. One is the establishment of an International Centre for Adaptation Research and Training under the Convention. COP 16 will take a final decision on this issue. If it does take a positive decision, Bangladesh should prepare itself for offering logistics and support for the Centre. This should be a well-planned exercise. The MoEF should move fast on this as only a few months are left before CoP 16.

The second institution that may be thought of is a Technology Facilitation, Assessment and Screening Centre under a suitable ministry (perhaps the Science and Technology Ministry). The assessment and screening services will be in high demand once the funds begin to flow. Bangladesh already has a workable research and technology development system in certain sectors such as agriculture. But this is rather weak in others. Such research and technology development systems need to be developed and could form one part of adaptation activity.

Finally, the national planning processes and the understanding on climate change, especially at local level, appear to be linked very weakly, if at all. The glaring example is the National Water Management Plan. While the Plan identifies "knowledge gap" in water sector vulnerability, it also promises a revision (and perhaps inclusion of climate concerns) after every five years. Such a "living plan" could not yet establish links between climate change and water related hazards and disasters. Such planning gaps need to be filled in without any further delay.

3.8.5.3 Benchmarks and Targets for the Sixth Plan

Climate change is not something for which any quantitative benchmark in physical terms can be set (but see below). However, note that we can still set targets regarding what we need to do. And here, as we have recently prepared and approved the BCCSAP 2009, the prudent course would be to follow that and examine which are the urgent tasks that need to be taken up and may be completed, by and large, within the next 5 years. Under such assumptions, we put the following as part of the targets of the Sixth Five Year Plan. We go theme by theme and programmes under

the BCCSAP 2009. Note that not all activities under the programmes can or need to be undertaken within the Sixth Plan period.

TABLE 3.4

BENCHMARK AND TARGETS FOR CLIMATE CHANGE ACTIONS BASED ON THE BCCSAP 2009

Theme	Programme	Benchmark	Target
Food security, social protection and health	Institutional capacity for research on climate resilient cultivars and dissemination	Capacity exists; certain new varieties released recently	Extension service to be geared up
	Adaptation against drought, salinity resistance and heat	Very limited experience	To be started
	Adaptation in fisheries sector	Very limited experience	Initial studies for ideas on adptation
	Adaptation in livestock sector	Very limited experience	Initial studies for ideas on adptation
	Adaptation in health sector	Very limited experience	Initial studies for ideas on adptation
	Water and sanitation programmes for climate-vulnerable areas	Limited experience	Immediate actions needed
	Livelihood protection in ecologically fragile areas	Little experience	Initial interventions to be made
	Livelihood protection of vulnerable socio-economic groups	Major experience	To be made immediately
Comprehensive disaster management	Improvement of cyclone and storm surge warning	Limited experience	Needs review for improvement
	Awareness raising and public dissemination	Some experience	Needs review for improvement
	Risk management against loss of income and property	Limited experience	Needs review and pilot intervention
Infrastructure	Repair and maintenance of existing flood embankments	Limited activity	To be taken up immediately
	Repair and maintenance of existing cyclone shelters	Limited activity	To be taken up immediately
	Repair and maintenance of existing coastal polders	Limited activity	To prioritise and taken up immediately
	Urban drainage needs assessment	Limited activity	To prioritise and taken up immediately
	Resusciation of rivers and khals through dredging	Limited activity	To prioritise and taken up immediately

(Cont. Table 3.4)

Theme	Programme	Benchmark	Target
Research and knowledge management	National Centre for research, knowledge management and training	-	Process to be started immediately
	Climate change modeling and their impacts	Limited human and institutional capacity exists	Training to be arranged for imparting skill
	Preparatory studies for adaptation against SLR	Capacity exists; limited experience of adaptation	To be initiated and continued
Low carbon development	Renewable energy development	Limited experience	To be expanded
	Management of urban waste	Limited experience	To be taken up immediately
	Afforestation and reforestation	Some experience	To be taken up immediately
	Rapid expansion of energy saving devices	Some experience	To be taken up immediately
	Improving energy efficiency in transport sector	Limited experience	To be introduced in phases
Capacity building	Revision of sectoral policies for climate resilience	-	Immediate need
	Mainstreaming CC in national, sectoral and spatial development programmes	-	Immediate need BCCSAP to be part of National Plan
	Strengthening human resource capacity	Limited capacity	To be started
	Gender considerations in CC	-	To be started
	Strengthening institutional capacity	Limited capacity	To be started
	Mainstreaming CC in media	Limited experience	To be started

It should be mentioned here that many of the agriculture and food production related issues have been discussed recently in the Food Security Investment Forum held in Dhaka in May 2010. Based on this, a broad Food security investment Plan has been approved by the Government. This now includes many of the elements of the Food security related issues under the BCCSAP 2009. Indeed, in the present budget the Government has already made increased allocations for R&D for some of the programmes discussed in the priority list.

3.9 CONCLUDING REMARKS

The CC impacts that Bangladesh may face are very daunting to say the least. Adaptation is the prime need right now as any delay will create havoc with the

growth prospects of the economy and deny millions of people even their basic necessities. International support will ultimately come but the immediate prospects are dim while Bangladesh needs enormous resources annually. Bangladesh has to do whatever she can do and soon start the process so that the absorption capacity of the amount of money that are being talked about.

The first priority in this situation for the Sixth Plan is to repair and maintain the coastal polders and defences which had been washed away first by Cyclone *Sidr* and then by Cyclone *Aila*. The second priority is to mainstream CC issues of adaptation, mitigation and capacity building into the development and planning process. This may need fundamental changes in the planning procedures, particularly in the project approval process, which need to be reviewed and a decision taken at the highest political level as soon as possible.[5]

[5] There is now an attempt at doing some of the preliminary works to such an integration of climate change issues into the development projects of the government.

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Chapter 4

Towards Digital Bangladesh: Prospects and Constraints in Developing the ICT Sector

Ananya Raihan

4.1 INTRODUCTION

4.1.1 Background

National Economic Planning in Bangladesh has gone through various stages of experimentation. After abandoning the national planning in 1997, the new government in 2009 decided to go back to five year planning instead of poverty reduction strategy (PRS) dictated by the international financial institutions. This is a welcome decision as the national planning is closely related to the national sovereignty and institutional mechanism is needed for appropriate long term and short term plan for economic growth and development, which cannot be dictated from outside.

Five year planning has gone through evolution–from pure command economic planning to planning of resources allocation for promoting growth and development in line with the national priorities, where role of private sector and other agencies is recognised. As a result, the planning process is now more as "indicative" rather than "normative".

National planning process for science and technology development needs to be revisited in the backdrop of change in global scenario as well as national priorities. Climate change and role of information and communication technology (ICT) are two major global phenomena, which have direct implications for national development priorities. On the other hand, food security and energy security have received renewed importance for environmentally sustainable development and rapid poverty reduction. Towards this end, role of science and technology, particularly information and communication technology, needs to be revisited for accelerating growth and poverty reduction.

Other than commendable progress in agricultural science and technology, initiatives and efforts remained fragmented and the attention towards building a system of research and development (R&D) remained sub-sided during the last four decades. The PRS also has taken agenda for science and technology casually. In this

backdrop, the government is going to launch Sixth Five Year Plan (2011-15) with an agenda for building "Digital Bangladesh." This papers aims to provide critical inputs towards development of an agenda for integration of science and technology, especially information and communication technology, in the process of economic growth and poverty reduction.

The objective of this paper is to explore the ways through which the benefits of science, technology and ICT can be effectively harvested in every conceivable area to increase productivity and efficiency. This paper is also for identifying the measures needed to facilitate the application of science, technology and ICT in moving towards Digital Bangladesh and serve as an effective tool for reducing poverty.

4.1.2 Methodology

Due to the limitation in time and budget it was not possible to carry an elaborate survey to capture current developments in the field of science, technology and ICTs. A checklist was developed for investigation [see Annex A]. Based on the checklist, secondary information, both published and un-published, was collected from various institutions. Key informant (experts)-debriefing was conducted for agreement on the framework of the paper and current scenario [see list of key informants in Annex B]. Key documents, particularly previous five year plans, I-PRSP, PRSP-I, PRSP-II were examined to understand the status of science and technology in the development agenda. Secondary resources were collected from various sources (both off-line [See Annex C] and on-line) on planning for science and technology.

4.1.3 Organisation of the Paper

The rest of the paper consists of two broad integral sections. Section 2 details on agenda for science and technology, whereas Section 3 elaborates on plans and programmes related to integration of information and communication technology in the five year agenda. An introductory section precedes the main two sections.

4.2 SCIENCE AND TECHNOLOGY

4.2.I Current Status and Implementation Issues

4.2.1.1 Review of Science and Technology in Previous Plans

Five Year Plans (1973-1997)

After the liberation war, the first holistic national economic development plan was introduced through First Five Year Plan (FYP) in 1973. Since then up to 1997 four such plans were formulated and implemented. One two-year plan was also

formulated for the years 1978-79. After 1995, another two-year plan was formulated for the period of 1995-1996. Allocation for science and technology during 1973-1995 is presented in Table 4.1.

TABLE 4.1
ALLOCATION FOR SCIENCE AND TECHNOLOGY IN FIVE YEAR PLANS

Plan	Total Allocation (BDT in Million)	Allocation for S&T	
		BDT in Million	Share (%)
First Five Year Plan (1973-77)	39, 840	232.60	0.58
Two Year Plan (1978-79)	32,610	391.60	1.20
Second Five Year Plan (1980-84)	1,11,000	1,290	1.16
Third Five Year Plan (1985-90)	2, 50,000	600	0.24
Fourth Five Year Plan (1991-1995)	3,47,000	540	0.16

The data show that while total estimated allocation under plans increased over time, both the absolute and relative allocations for science and technology reduced. The allocation for science and technology in the Fourth Five Year Plan was only 0.16 per cent of total allocation. It is obvious that with such allocation it is difficult to contribute to economic growth through innovations in science and technology.

The First Five Year Plan was formulated to use human resource and technology to meet basic needs. The Plan adopted some strategies to emphasise on research, which could make available products and services to the people quickly. Thus, under the First Five Year plan, Bangladesh Council of Scientific and Industrial Research (BCSIR) was established. BCSIR has patented 103 processes or production so far, based on the results achieved through research in the areas of natural resources and raw materials, food science and technology, fuel and energy, glass and ceramics, leather and animal by-products, natural drugs and pilot plant and process development. The programmes of Bangladesh Atomic Energy Commission (BAEC) during this period included nuclear science and technology, electronics and applied space research, nuclear bio-sciences, and exploration and exploitation of radioactive and heavy minerals.

The Two-Year Plan (1978-80) emphasised on completing projects undertaken during previous plan. Allocation for Science and Technology was 1.2 per cent of the total allocation for the whole First Five Year Plan.

Atomic Energy Research Institute was established during Third Five Year Plan (1985-90) period in 1987. Some important projects of this Plan were: (1) exploration of useful minerals in Bangladesh; (2) establishment of four new Nuclear medicine centres (NMC) at Barisal, Khulna, Rangpur and Mymensingh; (3) modernisation of existing NMCs at Dhaka, Chittagong and Rajshahi; (4) replacement of equipment in Atomic Energy Centre, Dhaka; and (5) construction of BAEC Housing Colony at Savar. During this Plan period, there were several projects on energy, food, medicine, chemicals and oils, industrial wastes, etc. This plan also included: a feasibility study for oceanographic research, a feasibility study for biotechnology, spill-over projects of National Museum of Science and Technology (NMST), procurement of books and equipment for BANSDOC and National Science Library, Bangladesh Space Research and Remote Sensing Organisation (SPARRSO) and Bangladesh Standards and Testing Institution (BSTI).

The core objective of the Fourh Five Year Plan (1990-95) related to science and technology was to develop scientific and technological research, planning and building institutions for different sectors. The Plan emphasised on institutional and human resource development to attain this objective. This Plan also aimed to work for the development of relatively capital-intensive technologies, such as those required for the capital goods sector and large industrial enterprises, improvement of appropriate traditional and indigenous technologies for small enterprises in both rural and urban areas were given special consideration. One serious shortcoming of the Plan was that there was no scope for the findings of research organisations to be practiced or implemented. Also, there was no connection between the industries and research; as a result, industries imported technologies from abroad, which could be supplied locally.

Under the Fourth Plan, two important projects were undertaken by the Bangladesh National Scientific and Technical Documentation Centre (BANSDOC). These were Development and Modernisation of BANSDOC, and automation and networking of Science and Technology Libraries in Bangladesh. Development of Projects invented by the Young Scientists were implemented by National Museum of Science and Technology.

Some very important steps were taken in promoting science and technology, namely, establishment and strengthening of Bangladesh Standards and Testing Institute, SPARRSO, a research programme on remote sensing technology and natural hazards and its main contribution was in weather forecasting, and Ministry of Science and Technology for providing support and services to the apex national

body for Science and Technology, namely, National Council for Science and Technology (NCST) and its executive body ECNCST.

During the two years between Fourth and Fifth Plans, there were 33 projects undertaken in the first year including 25 spill-over projects from Fourth Plan. And in the next year there were 34 projects included in the annual development plan (ADP), where 29 were ongoing and 5 were new.

Achieving self-reliance within the shortest possible time was the main focus of the Fifth Plan (1997-2002). Development of technologies specially required for the capital goods sector and large industrial enterprises, and improvement of appropriate traditional and indigenous technologies for small enterprises in both rural and urban areas were undertaken. The indicative work-plan in terms of physical components was prepared considering the situational context and the specific objectives of the Ministry of Science and Technology, Bangladesh Atomic Energy Commission, BCSIR, National Museum of Science and Technology, BANSDOC and SPARRSO. Establishment of Bangabandhu Sheikh Mujibur Rahman Novotheatre, overseas fellowship/scholarship programmes, establishment of National Institute of Biotechnology (NIB), creation of technology dissemination cell, establishment of the Institute of Mining, Mineralogy and Metrology, ICT training, radiation processing, modernisation of BCSIR laboratories and institutes have been ensured for contributing positively in science and technology.

I-PRSP

In the process of preparation of Interim Poverty Reduction Strategy Paper (I-PRSP) titled *A National Strategy for Economic Growth, Poverty Reduction and Social Development* in March 2003, the country shifted its focus of long term planning to short (two years duration) term plan. The commitment to poverty reduction since then continued to be pursued through a wide range of actions. Although it was mentioned in I-PRSP that a comprehensive participatory process had to be followed to deepen policy ownership in the formulation of a full-blown PRS, the resultant outcome did not reflect this.

Second PRSP

The government of Bangladesh revised the second Poverty Reduction Strategy Paper (PRSP) in 2009 in line with its Digital Bangladesh agenda.

The PRSP-II set aims to build knowledge-based society which accelerates growth and reduce poverty. The PRSP-II vows to improve quality of life of people of the disadvantaged strata through enhancing quality of education and health care by innovative application of ICT, enhancing productivity in agriculture through the

application of biotechnology and inspiring the creation of jobs through technological growth induced by a more reliable availability of power through the promotion and application of atomic energy. Development of modern biotechnology will be promoted in the areas of bio-fuel, bio-medical and agricultural research.

4.2.1.2 Review of Policies related to Science and Technology

In 1997, the government of Bangladesh officially recognised that ICT can make an important development impact, because it has the capabilities to overcome barriers of social, economic and geographical isolation, increase access to information and education, and enable poor people to participate in more of the decisions that affect their lives. ICT was seen as an indispensable tool in the fight against poverty and ICT has the potential to provide the nation with an unprecedented opportunity to meet vital development goals such as poverty reduction, basic healthcare, and education far more effectively than ever was thought humanly possible. ICT sector was, therefore, declared a thrust sector at that time.

In 2002, the Ministry of Science and Technology was renamed as the Ministry of Science and Information and Communication Technology. It is to be mentioned that by changing the name of the Ministry "technology" was left, i.e., other than ICT the importance of other technology was virtually overlooked.

National Science and Technology Policy

The existing science and technology policy of the country was adopted 24 years ago, in 1986. The vision of the policy was to meet the basic needs of human beings by harnessing the potential of science and technology. However, in the last two decades there have been dramatic changes in the global scenario as well as in the field of science and technology. Two significant milestones were the emergence of ICT and the potential of biotechnology. Thus, after 24 years there is dire need for a new policy towards objective of self-reliance and achieving Millennium Development Goals (MDGs). In devising a new policy, following issues need to be taken into consideration:

- The policy must have a termination period, and after that the policy must be updated. In this case, the different parts of the policy may have different terminal periods. And those parts must be updated accordingly. After developing any policy that should go through public consultation. The policy should be open for public consultation through Internet, newspaper, radio, television, and other mass media.
- This policy must be an "Umbrella Policy," which may encompass all other relevant policies for ensuring coherence among different policies.

- The vision of this policy should be to meet the challenge of 21st century rather than only basic needs.
- The policy should focus on developing indigenous production industry using indigenous resources so that the import cost would be reduced and maximum people would be able to get employment.
- The policy should ensure development of local industry based on local R&D and thus substitute import where possible.
- The policy should support research in the area of prevention and treatment of diseases having pandemic impact (e.g., malaria, bird flu, etc.).
- The policy should revisit re-opening of closed "Educational Material Board" so that educational institutions can access quality and appropriate educational materials for studying science, mathematics, engineering and other subjects requiring instruments.
- The policy should make provision to attract Bangladeshi researchers living abroad with appropriate laboratory facilities and benefits. Special programme should be undertaken for female researchers.
- The policy should ensure proper institutional system to protect copyright and patent.
- The policy should ensure that publicly funded research knowledge, inventions and findings should be published under public domain.
- The policy should ensure research to be undertaken for finding solutions to the new problems of agriculture, health and environment.
- The policy should focus on technology development for coping climate change and natural disaster.
- The policy should emphasise on technology innovation for rural communities.
- The policy should ensure proper financial and fiscal incentives for R&D.
- The policy should support international science congress, conference and science exhibitions to be held in Bangladesh.
- Allocation of R&D should be increased and it should be made 2-3 per cent of GDP.

National Biotechnology Policy

During the period of I-PRSP, Biotechnology attracted the attention of policy makers. Starting from 2004, the government took several steps to formulate a national biotechnology policy. In July 2006, the National Task Force on

Biotechnology approved the Draft National Biotechnology Policy-2006. As a part of the finalisation of the policy, the policy needed to be approved by the council of ministers. This never happened. However, the National Institute of Biotechnology (NIB) was established at Savar, Dhaka with adequate research and ancillary facilities. The Institute is aimed to conduct research in agricultural biotechnology, environmental biotechnology, medical biotechnology, recombinant DNA technology and biotech product and process development for socioeconomic development. During this period, some of the public universities started the formal courses in the field of biotechnology.

The draft biotechnology policy focused on the tools and techniques of biotechnology for poverty alleviation, health, nutrition and livelihood improvement, environment protection, and ensuring sustainable development. This policy needs to be examined further and the following issues should be considered before finalising the policy for approval of the Cabinet:

- The Policy should have clear resolutions on research misconduct.
- The Policy should have clear direction on setting up laboratories and their roles i.e. whether they will be hierarchically organised or geographically distributed independent entities.
- The import policy should include special provisions for importing chemical reagents needed for biotechnology research. The policy may provide incentive for producing them locally.
- The Policy should include guidelines on projects to preserve genetic profiles of endangered species.
- The Policy should provide clear stand on animal cloning, stem cell cloning and human cloning.
- The Policy should give clear indication on genetically modified organism (GMO).
- A permanent committee should be available for regular revision of the policy.

4.2.1.3 Institutional Arrangements for Fostering Science and Technology

The anchor government agency for science and technology is the Ministry of Science and Information and Communication Technology (MoSICT). The present MoSICT started its journey as a division named "Science and Technology Research and Atomic Energy Division" under Education and Cultural Ministry in March 1972. However, after one month the division was shifted to the Energy and Mineral Resources Ministry. In 1974, it became a part of the Ministry of Education, Science

and Technology Research and Atomic Energy. In 1976, appreciating the importance of science and technology, the division went directly under the President of the country as a part of the Cabinet Division. In March 1984, this became again a division under Ministry of Education. In 1983, the government constituted a National Council for Science and Technology (NCST), headed by the head of the government to provide directives to activities related to science and technology. Since 1984, the S&T division under Ministry of Education had been functioning as an independent division. One of the key roles of the division was to provide secretarial assistance to NCST. In 1993, the division was upgraded to an independent ministry (MoST). In April 2002, the ministry was renamed as Ministry of Science and Information and Communication Technology (MoSICT). The S&T part of the allocation for the business of the ministry, among others, includes the formulation and implementation of National Science and Technology Policy in line with national dreams and goals, implementation of the recommendations of NCST, provision of assistance to S&T-based organisations, allocation of grant for research, invention of appropriate technology and international cooperation in this field.

The ministry has seven agencies under its umbrella–Bangladesh Atomic Energy Commission (BAEC), Bangladesh Council for Scientific and Industrial Research (BCSIR), Bangladesh Computer Council (BCC), National Museum of Science and Technology (NMST), Bangladesh National Scientific and Technical Documentation Centre (BANSDOC), Bangabandhu Sheikh Mujibur Rahman Novo Theatre and National Institute of Biotechnology (NIB). Among these, BCC deals with ICT and all other agencies are related to S&T.

BAEC and BCSIR are the two principal organisations dealing with scientific and industrial research in the country. BAEC deals with research and development in peaceful application of atomic energy, generation of electricity and promotion of international relations congenial to implementation of its programmes and projects.

On the other hand, since its inception, BCSIR has been pursuing research and development activities in various fields of scientific and industrial interests of the country and has contributed noteworthy services to national causes. The Council has three regional research laboratories and five research institutes at present covering research activities of both fundamental and applied fields in food and nutrition, pulp and paper, fiber and polymer, glass and ceramics, renewable and conventional energy, drugs and medicines, biotechnology and tissue culture, leather technology, aromatic and edible oils, physical instrumentation and other major areas of research according to the need of the country.

The other major area of S&T research is the field of agriculture. The Bangladesh Agricultural Research Council (BARC), under the Ministry of

Agriculture, is the apex body of the national agricultural research system (NARS). The institutions under the NARS are: Bangladesh Agricultural Research Institute (BARI), Bangladesh Rice Research Institute (BRRI), Bangladesh Jute Research Institute (BJRI), Bangladesh Institute of Nuclear Agriculture (BINA), Soil Resources Development Institute (SRDI), Bangladesh Sugarcane Research Institute (BSRI), Bangladesh Livestock Research Institute (BLRI), Bangladesh Fisheries Research Institute (BFRI), Bangladesh Tea Research Institute (BTRI), Bangladesh Forest Research Institute (BFRI). It has the responsibility to strengthen the national agricultural research capability through planning and integration of resources. It is the umbrella under which the entire Bangladesh agricultural research is coordinated. This involves cooperative activities in several ministries of the government: Agriculture, Forest and Environment, Fisheries and Livestock, Rural Development, Education, Industries, Commerce, and Science and Technology. Though National Oceanographic and Maritime Institute of Bangladesh was established, it is yet to play the expected role in guiding relevant agencies in managing marine resources.

Bangladesh Medical Development Council (BMDC) has been established to coordinate the research in the field of medicine. However, there is no such coordinating body for the field engineering. The National Science and Technology Policy recommended a similar council for engineering research.

In 1986, the government established a Science Equipment Board to supply experimental equipment, charts, pictures and other tools that helped both students and teachers to their teaching and learning process. It was run by the Ministry of education and funded by Asian Development Bank. During the 1986-92 period, the Board designed, developed and produced about 100 different instruments, 600 charts and pictures and distributed those equipment in around 2,000 schools. These tools, charts helped the teachers in their classes, especially in the rural areas, to teach science. These also attracted the students' attention towards science. This initiative also brought scientists and businessmen together to produce such essential tools. However, in 1991-92, the government decided to close this Board for some unknown reasons.

Public and Private Universities

There are 31 public and 51 private universities in the country. Among public universities, 5 are dedicated for engineering education, 1 for medical science and others cover both general and science education. Dhaka University and BUET have few specific institutes dedicated to scientific and engineering research, respectively. The centre of excellence, a recent initiative of Dhaka University, has started some important research projects using state-of-the-art equipment. Besides, the Institute

of Appropriate Technology (IAT) of BUET is playing an important role in identifying appropriate and sustainable technology for the country. The research activities in this type of institutions are conducted by professional scientists and their projects are funded both internally and externally. Only few universities have graduate research programmes in science and technology. Of these, Dhaka University, Rajshahi University, Chittagong University, Jahangirnagar University, and Bangladesh University of Engineering and Technology offer graduate level courses on science and technology. The engineering colleges in the country were upgraded to engineering universities. As a result, number and quality of engineering graduates have gone up.

Non-government Initiatives in Science and Technology

There are a number of initiatives from non-government and voluntary sector in Bangladesh for promoting science and technology. Bangladesh Mathematical Olympiad (http://www.matholympiad.org.bd) is a good example of non-formal activitie related to promotion of mathematics education among the school and college students. It has been running successfully since 2001. From 2005, every year, the best performers of the National Olympiad participated in the International Mathematical Olympiad (www.imo-official.org), one of the most prestigious knowledge based competitions for the high school students in the world. In the year 2009, two of Bangladeshi students have achieved Bronze medal. The Bangladesh Mathematical Olympiad is organised and run by the Bangladesh Mathematical Olympiad Committee, a not-for-profit voluntary organisation. The event is being patronised by a private bank and a daily newspaper. A similar event in the field of informatics was also organised. However, the arrangement of Physics, Chemistry and Biology Olympiads is yet to attract the students' attention. A large number of students remain unaware of such creative competitions because of lack of enough organisers. The government is also reluctant to support this type of competition of creativity.

4.2.2 Issues and Problems in Development of Science and Technology for Growth and Poverty Reduction

Leadership: Ministry of Science, Information and Communication Technology (MOSICT) lacks human resource with understanding of process of scientific research. Frequent transfer of personnel in the Ministry creates problem. The lower administrative level has very inefficient staffs, which hinders efficient process flow in the administration.

There are four types of scientific research institutions in the country. The institutions hosted by the government, the institutions under public universities,

privately funded institutions and non-government research and development organisations. In only a few cases, the R&D institutions under the government are headed by practicing scientists who have also proven management capacity. This creates a situation of sub-optimal leadership at the top. It is expected that the top management of a research organisation should have a formal research background. Such problem is absent in the institutions under public universities.

Importance of Ministry for Science and Technology: As was mentioned earlier, the name of the Ministry does not reflect its mandate. "Technology" is missing from its name. Moreover, the Ministry receives less importance from the leadership in the government. As a result, resource allocation and deployment of leadership seldom show "residual" approach.

Disconnect between National Aspirations and Research Agenda: Bangladesh's accomplishments in transforming its devastated agricultural sector into one of the most productive farm economies in all of South Asia is a major development success story. Once racked by famine and dependent on food imports, the country is now self-sufficient in rice, is emerging as a significant exporter of high-value agricultural products, and is enjoying the second highest percentage growth in per capita income in South Asia. Its success is largely a story of close cooperation between the government of Bangladesh and its peoples with research institutions, and indigenous nongovernmental organisations as well as international agencies. Thirty years ago, almost all of Bangladesh's cereal production was from the monsoon crop. Now almost half is dry season, made possible by the development and release, by the public research institutions, of high-yielding rice varieties adapted to shorter days and cooler temperatures. It was through publicly supported agricultural research working in tandem with private investment for irrigation that made the jump in rice production possible (West 2009).

Similarly, organisations like the International Rice Research Institute (IRRI) and the International Maize and Wheat Improvement Center (CIMMYT) collaborated with Bangladesh's agricultural research system to introduce more sustainable and efficient rice, wheat, and maize cropping systems into Bangladesh.

Having said that, meeting the "basic needs" should not be anymore the agenda for research. As a country, there is a need for ambition in the science and technology, which is closely related to aspiration of becoming a middle-income country with rapid poverty reduction. For example, Bangladesh may aspire to have its own satellite, which would serve the purpose of economic growth through accurate and timely forecasting of natural disaster including flood and cyclone, accurate estimation of food production, data exchange of business, exploration of mineral resources, fishing for fishermen in the sea, etc. Changing needs demand

change in mandate of existing research institutions and building new ones. A system of regular needs assessment with at least twenty years of forecasting is required. In this regard, an institution for research intelligence is essential.

Decision Making Process: The dynamic and shortened life cycle of scientific research requires quick decision making system. The current process is very slow and inefficient, which hinders undertaking progressive research agenda. The research institutions need autonomy within the framework of national policy for science and technology.

Technology Generation and Dissemination: In the agricultural research and technology development and dissemination there is a very effective system of collaboration between the technology developing institutions and extension agencies, where non-government organisations play a very important role. For example, in a project under PETRRA seed health was improved with participation of IRRI, BRRI, CABI Bioscience, RDA, Proshika, GKF, BRAC, CARE, BAU, DAE and WAVE.

Lack of Proper Incentive Mechanism: People, who create intellectual property with financial value exceeding investment multiple times, do not have proper incentive mechanism. As a result, many scientists prefer to work for institutions abroad or for private institutions. The pay structure for research institutions should be determined autonomously so that adequate financial incentive can be provided to the able scientists.

Problem with Human Resource: There is no mechanism for dialogue or linkage amongst different ministries relevant to a common problem, e.g. agriculture and modern biotechnology, health and molecular biology or agriculture and industry. There is no systematic capacity building efforts for researchers and scientists with a long term vision. Identification of right people for research and building capacity systematically over the years under a long term plan is essential.

There is a great lack of capacity building not well-tailored with the theme of the projects under way apart from adapting new and state of the art technology. The in-house and overseas training facilities are inadequate for the scientists working in the field of cutting edge technology; many of the employees sent for short-term training do not return home after the expiry of the training period contributing to partial failure of a project. Major issues related to building appropriate human resources capable of meeting the changing demand of the country from science and technology are as follows:

- Inadequate Access to scientific Resources: Research institutions and universities do not have access to high speed Internet connectivity. As a

result, access to scientific resources is limited. There is no adequate budgetary provision for subscription of online scientific resources.

- Lack of Training: There is lack of training for teachers of colleges under National University as well as the new Science and Technology Universities in terms of upgrading and modernising syllabuses and teaching quality. University Grants commission (UGC) lacks in monitoring system ensuring quality-teaching methods in the universities. Also, there is very small coordination between the MOSICT and UGC. At the same time, UGC does not have the provision for recruitment of the best minds from biosciences, physical, social as well as finance and economics graduates at the UGC. Establishment of private universities without complete regulatory preparation created problems.
- Inadequate Fellowships: To encourage young scientists and researchers in different universities and research institutions, the government introduced the national science and technology fellowship (Now National Science and ICT fellowship) in the year 1977-78. Selected students studying in Masters or pursuing their M. Phil and Ph.D degrees receive this fellowship. Students studying in the field of inorganic science, organic science and agricultural science are eligible for the fellowship. The students receive a monthly amount BDT 3,000-7,000. In 2008-2009, 488 students were selected and an amount of BDT 24.5 million was distributed among them. In the year 2009-10, BDT 20.2 million was distributed among 409 students. Besides the NSICT fellowship, few corporate agencies also provide financial support to some researchers. Among this the Dutch-Bangla Bank fellowship is notable for the young scientists. However, this is not adequate both in terms of allocation and number. It is not possible to pursue scientific research with a monthly amount of BDT 7,000.
- From 1997 government has taken an initiative to provide special allocation financial grant for selected Science and Technology research projects. Both the organisations and the individual scientists are eligible to apply for their grant in the following six categories:
    - Biological Sciences
    - Environmental Sciences
    - Information and Communication Technology
    - Engineering & Applied Sciences
    - Physical Sciences, and
    - Inter-Disciplinary.

- Peer review committee, headed by the professors and scholars, selected projects according to the merit of subject, outcome and impact on the society. In 2008-2009, 147 projects were funded and BDT 120 million was disbursed. The allocation to each project varies from BDT 200,000 to BDT 2,000,000. In 2009-2010, BDT 140 million will be distributed among 187 projects.
- The proforma for research grants is not suitable for many projects. Lack of Professionalism: Due to lack of proper financial and intellectual incentives, there is a severe lack of professionalism in conducting research. Only those who choose to be a serious researcher in the future take the research-based courses. The absence of proper and rich graduate research programme in universities resulted in poor intake of scientists and technologists in national research organisations. On the other hand, lack of adequate financial incentives inhibits talented students to join science and research courses.
- Lack of System of Reward and Reprimand: There is no competition and awarding system starting from the school level to encourage people to come into scientific research. Annual National Science Fair is no more organised. There may a whole system of award and contest to promote innovation and attract talent into research.
- Science Education with Inadequate Facilities: Establishment of new departments and universities without ensuring appropriate space, teachers, equipment and internet connections is a reason behind degradation of standard of science and engineering education.
- Lack of Attention in Marine Resources: Bangladesh is blessed with 3rd largest aquatic biodiversity in Asia behind China and India. There are about 800 species of fresh, brackish and marine waters. Among the top ten aquaculture producing countries, Bangladesh's position is sixth (FAO 2009). Total fish production was 2.56 million tons in 2007, of which marine fish catch was 497,573 tons. However, industrial fishery based on trawl fishery (shrimp and fish) contributes only 6.6 per cent to total marine landings. It is a matter of great concern that there is a sharp decline in CPUE (catch per unit efforts) from 650 kg/day/boat in 2001-2002 to under 100 kg/day/boat in 2005-2006 targeting hilsa, skipjack tuna and mackerel. Old fashioned fisheries management, regulation and rules, i.e. Marine Fisheries Ordinance 1983 needs to be updated. Inadequate management of Fisheries and Ecosystem needs to be updated as per the requirement of NFP (1998) and MF-Sub Sec-Strategy Policy 2006. The research in the area of Marine Fisheries is also inadequate.

- Death of Popular Science: Today's scientific research demands talented students. To attract them to science and technology popularisation activities were launched in the early 1980s by the National Museum of Science and Technology. The National Science Fair, a competitive process of selecting the best young scientists and awarding them with suitable prizes, was also introduced. Such competition is not organised any more. Another activity was to help different informal scientific activities carried out by Science clubs and societies. A good number of such clubs came up at that time and a few of them continue till today. In the past decade the country observed that science clubs were busy with outer space observation, science fair, "Eso Nije Kori (Let's Do It)" fair, science quiz competitions, debates, essay writing, lectures, etc. There were also various competitions among the schools, colleges, science clubs, etc.
- Number of science clubs and their activities have been reduced drastically due to lack of patronisation. Only a few educational institutes arrange science fair regularly. There is no government initiative to arrange science quiz/project competition. In the past three years there were only 7 space observation camps all over the country. Number of popular science lectures was also reduced. The universities sometimes arrange such lectures with visiting professors. However, they are not attended by the interested and enthusiastic students because announcement for these lectures reaches them too late, if at all. Bangladesh Academy of Sciences has a role to play in encouraging such young talents through arrangement of such periodically arranged lectures.

Financing Research

There is a severe dearth of financial resources for up-taking research and development in various fields under a long term vision and plan. The R&D is solely dependent on government financing. Previous plans show that allocation for science and technology is scanty compared to total allocation for the whole period. There is a sever lack of efficient mechanism for dialogue between relevant ministries dealing with research and ministry of finance. There is lack of freedom and mechanism for scientific institutes to mobilise financial and technical resources from various sources, including private sector.

Inadequate Research and Laboratory Facilities: While lack of adequate research and laboratory facilities is a problem, in some cases existing facilities are not fully utilised because of the absence of skilled human resources.

Lack of Promoting Success in R&D: Most of the institutions do not have appropriate communication plan and system in place. The success of research

institutions does not reach general people, particularly new generation. As a result, young talents do not have any role model among the scientists and researchers. While scientific publications are generally in English, the need for local language scientific literature is ignored. For example the catalogue, website, or various publications of BANSDOC all are in English. So it is out of reach for most of the people.

Inadequate Collaboration: International and regional collaboration are essential to bring in new ideas and skills. However, existing act/rules sometimes prohibit the collaboration with international organisations and/or even with local private organisations. Inadequate collaborative projects between the universities and the research organisations widen the gaps between research institutions and the academia.

4.2.3 Options for Development in Science, Technology and ICTs

Approach towards Science and Technology Development

Science and Technology Agenda should consist of three components:

- Appropriate R&D agenda in line with national development aspirations;
- Appropriate institutional system for managing R&D;
- Appropriate resource allocation for accomplishment of the agenda.

Programmes and projects to be undertaken in the Sixth Five Year Plan should be of two types:

- Regular programmes and projects; and
- Mission mode projects. This is more like special milestone or flagship initiative to promote science and technology in new areas. “Manhattan project” during the second cold war for developing nuclear bomb is an example of mission mode projects.

Institutional Reform

With renewed emphasis on science and technology for national development both in the short to medium term and long term, setting up a system of appropriate institutional mechanism is important to reflect in Sixth Five Year Plan. A task force may be formed for developing appropriate institutional system by first two years of the Sixth Five Year Plan. Such institutional system may be led by an apex institution, 'autonomous from but related to' the Ministry responsible for science and technology. This apex institution will replace existing National Council for Science and Technology. This institution will have responsibility to formulating and implementing the new schemes for enhancing research infrastructure and for attracting new generation of students and faculty into research institutions and

universities. Appropriate allocation during the Sixth Five Year Plan period would be necessary to inject fresh vigour into research system of the country. Institutional reform programme may include the following, but not limited to, components:

- **Reforming a Few Ministries:** Ministry of Science and ICT may be divided into two full ministries: Ministry of Science and Technology, and Ministry of Information and Communication Technology. The new Ministry of ICT should be formed by merging Ministry of Post and Telecommunications and Ministry of Information. The new Ministry of Science and Technology should be a high-priority ministry with a selection of the best minds from biosciences, physical, social as well as financial and economics graduates.
- **Appropriate Human Resource in Ministries dealing with R&D:** A separate BCS-like exams intended for recruitment in research wings in relevant ministries, university research cells, UGC, etc. may be introduced. Competitive exams can also be arranged for awarding of research and Ph.D fellowships under the umbrella of research institutes, universities and joint programmes with sandwich Ph.D programmes with foreign research establishments.
- **Funding new infrastructure in the University System and in National Institutions**: Flexible mechanisms need to be evolved where funding is effected rapidly and installation and operation of equipment follow quickly. The apex institution should act as creator of facilities and as watch dog to ensure efficient operation.
- **Establishment of Higher Education Commission:** A higher education commission with two components needs to be set up, consisting of eminent scientists covering all branches, e.g. biological, physical, and mathematical as well as social science disciplines. One component is related to institutions up to the pre-university level and the other is related to university level institutions. The Commission will directly report to the government at an inter-ministerial level with the PM in the Chair, and therefore be in a position to acquire support of relevant ministries where action is needed and be able to monitor implementation. Both components of the Commission will work independently, but will, however, coordinate between each other. This Commission may work upon the following issues:
    - To form a small group with invited scientists to monitor and report on the science and technology (including agricultural, health, industrial, engineering and social) development in different countries relevant to our needs;

- To develop a few priority research programmes and projects which could lead to tangible benefit for the country;
- To invite industry and research/university scientists to dialogue to assess the needs of industry in establishing linkages, which would reduce industry's dependence on expensive imports of know-how and raw materials;
- To consider funding of relevant research work undertaken by industry;
- To work with public university authorities on ways to reduce their dependence on government funds. For example, increasing fees, but providing scholarships to needy students, and seeking R&D resources from institutions abroad and private sector as well.

- **Upgrading Selected Departments in Carefully Chosen Areas of Science:** To make the research internationally competitive, quantum of grant support to selected departments needs to be increased.
- **Establishment of BITs:** The UGC should establish 10 BITs similar to IITs in India with technical assistance from Indian government.
- **Support to Scientific Association:** There are a number of scientific associations which are not self sustaining and need more financial support to carry out their scientific activities. One such association is Bangladesh Association for Plant Tissue and Culture and Biotechnology, which receives sufficient number of scientific articles to bring out three issues a year but cannot do so for lack of funds.

Human Resource Development for Science and Technology

Based on the analysis of problems in human resource for science and technology, following measures are recommended under Sixth Five Year Plan.

Initiative for Recruitment of Faculty/ Scientists

Most pressing problem in research institutions is shortage of newly recruited faculty members, as a result, having decline of research profiles. For attracting quality human resources, including those from foreign research institutions:

- A new attractive recruitment policy needs to be introduced, which would stipulate ground rules different from those in force for recruitment for administrative positions. The apex science and technology institution with autonomy should be free to develop new schemes in which new recruits to the academic S&T system can be centrally funded and placed in institutions.
- Flexibility in salary support should be built in for attracting appropriate human resources.

- The initial invitation for joining the research institutions should accompany a start-up research grant in order to attract the best scientists to work in Bangladesh.
- Creating a prestigious chair in different departments of the university, where foreign eminent scientists will be invited to serve for 2-3 years, in order to modernise teaching and research.

Plan for Bringing Bangladeshi Scientists Working Abroad to Lead Specific Agenda Item

Creating a database of scientists and technologists of all disciplines with the help of the Bangladesh embassies and Office of the High Commission. The Global Network of Bangladeshi biotechnologists is such a website, but it is limited to scientists of that discipline only. Such a database will be of tremendous benefit to any ministry in need to prepare a comprehensive plan for attaining certain specific objectives.

Incentive Mechanism for R&D

It is necessary to stop promotion of university teachers on any other consideration other than combined merit of research and teaching, as it used to be in pre-Bangladesh period. There should not be any departure from the principle from the selection criteria followed throughout the world over if we want to keep abreast with them in academia. There would be formidable opposition from the interested circles but academic excellence is a must if we want to march forward.

A system of awarding and giving special incentives for the working scientist and technologists has to be developed. Government may think of a separate pay-scale and facilities for researcher and scientist like the judiciaries. In this regard linking the remuneration package for the scientists and technologists to their individual productivity and potentiality may be considered.

Increased Fellowship and Grants

There should be a plan to convert 50 per cent of public universities in the country to graduate research school. This requires allocation of adequate funding, with consequential increase in the number of teaching and mentor staff and physical facilities of the universities. It requires increase of the number of S&T fellowship/internship/scholarship and the amount of funding. Sufficient research funding needs to be made available so that their research work is not hindered for lack of equipment and chemicals.

Improve Effectiveness of Research Grants

For improving effectiveness of research grants, result based system of monitoring should be introduced.

Development of Research Talents

There should be an arrangement for 4-year prestigious Ph.D fellowships under sandwich programmes and tying these to research themes identified previously and also to the international laboratory links mentioned below. The system of administrative file movement for higher research in universities needs to be streamlined for quick approval and allocation of funds. An M. Phil or Ph.D title change or thesis correction before final submission can take from 2 to 6 months. Research experience under local conditions must be mandatory for recruitment of the best students as teachers for the university.

Research Time for Teachers

It is necessary to relieve senior active researchers from some of their responsibilities such as marking answer scripts, so that they find more time for their research including guiding students. It is a common knowledge that such responsibilities are discharged by teaching assistants under the supervision of the respective course teachers.

Attracting Young talents in R&D

The general perception among students about science is not positive. The perception is that careers in science are demanding and require a long time for entry into job market, that good employment opportunities do not exist for science degree holders (including those with Ph.D.) and even for those who are employed, the jobs are not monetarily rewarding. For attracting young talents to research in science and technology, the following programmes may be included in the Sixth Five Year Plan:

- The Ministry responsible for Science and Technology should offer attractive scholarships to students undertaking Science in S.S.C and H.S.C examinations.
- An attractive financial reward should be introduced for teachers of Science, Mathematics, English and other related subjects in the case of good performance of students in S.S.C and H.S.C examinations in the abovementioned subjects.
- The apex institution can make online scientific resources free of cost for all members of academia and research institutions.

Introduction of B.Tech. and M.tech programmes

B.Tech./M.Tch. programmes can be introduced, which create a "niche" in engineering education by emphasising areas that have stronger science base and are interdisciplinary in nature, such as optical engineering, materials engineering, biotechnology, bio-engineering, etc. B.Tech graduates can be directly enrolled into Ph.D Science Programme

Inter-institutional Linkage Programme

Academic research institutions and national laboratories play a major role in scientific research outputs. The university system does not contribute much to scientific research output in a major way. This is largely because of the decline in research activities in the science departments of universities. To enhance scientific activity within university system, a new programme to promote inter-institutional linkages should be introduced in the Sixth Five Year Plan.

Building System of Awarding Scientific Invention and Innovation

A prestigious award system should be introduced in Sixth Five Year Plan for various categories of scientific research on annual basis so that scientists are encouraged to conduct quality research and contribute to achieving national agenda.

Policy for International and National Collaboration

Collaboration with the international scientific and technological institutions and organisations needs to be encouraged. The concerned ministry should make sufficient budgetary allocations for their membership and funds to attend their important meetings. A case in point is the membership fee of the International Centre for Genetic Engineering and Biotechnology, Trieste and funding to attend the meeting of the Board of Governors. Almost every year concerned scientists are to approach the Government for renewal of membership and funds to attend its BoG meeting by the concerned representative of Bangladesh. Developing better relationship with the neighbouring and developing countries by sharing scientific methods, ideas, inventions, discoveries and taking initiative to bring and adopt new technologies from the developed nations.

Financing Science and Technology

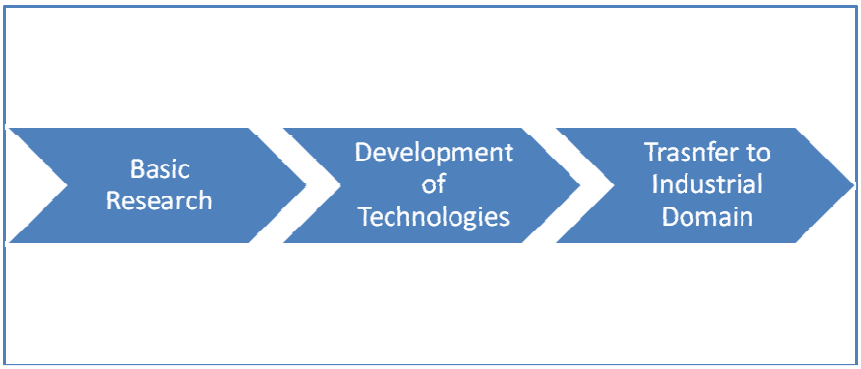
It is essential to increase public sector allocation for the advancement of Science and Technology. A target of allocating 2 per cent of GDP should be achieved in the next five years. The allocation needs to be clearly marked the R&D part of total allocation. As in ICDDR,B, all the senior teachers should be encouraged to apply for research grants institutions such as NIH, USDA, WHO, FAO, Ford Foundation, funding bodies from UK, Australia, European Commission, etc. so as to supplement their salaries instead of allowing them to be hired by private universities and foreign institutions.

Creation of separate endowment funds for the biological, physical and social sciences and inviting different foreign, industrial and philanthropic bodies to donate funds for research can also be an option.

In the Sixth Five Year Plan public-private partnership is an option to be explored for injecting financial resources in R&D.

Building Effective Linkage between Basic Research and Technology

New technology is closely related to basic research. Ideas of new technologies are generated by researchers working in basic research and these can spawn new products and processes. For such linkage, public-private partnership will be promoted.



The Sixth Five Year Plan should include:

Programme for Technology Business Incubators

Technology-business incubators will be established, so that the results of basic research can be transformed into new technology. The incubators will provide support to scientists to start businesses based on technology developed in the lab. This type of technology transfer can be very effective in terms of implementation, particularly for low initial capital start-ups.

Incentivise R&D in Industries

The Ministry of Finance should provide fiscal incentives to industries for producing products and services through R&D undertaken in Bangladesh or in collaboration with partners abroad. These industries should be encouraged to invite research students working in basic science related to new technology by some incentives. New techniques and methods are most easily transferred in this way.

New Infrastructure

Rapid advancement of science in all areas necessitates that research infrastructure be constantly upgraded and added. Creation of specialised laboratories and advanced instrument facilities is essential if Bangladesh's research is to play a role in achieving national aspirations. The proposed apex body may form a committee to identify needs for establishment of new infrastructure and allocate financial resources for their implementation.

Modernisation of R&D Facilities

The existing facilities in the R&D institutions need to be modernised. A research network among the different national organisations needs to be established. The capacity of BANSDOC has to be strengthened so that it could become the effective national S&T information centre.

Depoliticisation of R&D

For the continuation of research activities unimpeded, regime change should not have any effect as long as there is no compromise on the academic quality and administrative ability of the incumbent. It is urgent to work out on how to de-politicise universities.

Technology Transfer

Under the Sixth Five Year Plan a national centre for technology transfer should be established, which will cater the need for various industrial segments.

4.2.4 Goals, Policies, Targets and Strategies for Sixth Five Year Plan

Bangladesh has come back to the era of national economic planning through re-introduction of five year plan. Although this time the five year plan will not be "normative," rather it will be "indicative"–leaving room for participation of private sector, NGOs and development partners in meeting demands for goods and services by the citizens and businesses. An agenda for achieving "Digital Bangladesh" by 2021 has been declared as one of the major national goals. The Sixth Five Year Plan aims at fulfilling the dream and to build the proper foundation to achieve a knowledge-based society. There are three fundamental shifts in the long term planning process:

- The plan will be indicative;
- It will be part of long term perspective plan; and
- The goal of plan is to upgrade the status of Bangladesh from least developed country to a developing nation.

The Plan will have two dimensions: one is to create opportunities for investment by private sector, NGOs and development partners through creating enabling environment (both infrastructure and policy), which will need massive reform; and second, the government will invest to ensure constitutional obligations for offering public good.

Goals

The goals of Sixth Five-Year Plan for science and technology may be as follows:

- Contribute to poverty reduction through effective linkage of scientific inventions with implementation of development plans;
- Prepare institutional system with appropriate human resources through reform geared up towards undertaking ambitious, but at the same time aligned with national aspirations, plans for future planning periods.

National Priority to be Reflected in the Sixth Five Year Plan for Science and Technology

The following eight national priorities have been identified for reaching the target of vision 2021 a digital Bangladesh free from poverty:

- Food security
- Energy security: fuel, electricity and energy
- Population control: public health and family planning
- Employment creation: plastic, ceramic, food processing, pharmaceutical, garments, leather, shipyard, fertilizer. Heavy engineering and metallurgical industry; SME (small and medium enterprise) and rural industry; transportation; communication; residence and public work
- Converting human resources into human capital
- Mitigation and adaption with impact of climate change: flood control, water resources and coastal area
- Preservation of natural resources and prevention of environmental pollution
- Inclusive development (gender sensitive, inclusion of marginalised people, disabled population, ethnic minority).

Policy Framework

Formulation of new National Science and Technology Policy will top the agenda for five year planning, based on which the Sixth Five-Year Plan for science and technology will need a revision in its third year. During the first two years of the Sixth Five Year Plan, a perspective plan for 20 years will be prepared.

Besides updating of national S&T policy, appropriate laws and acts need to enacted, modified. The issue of knowledge transfer as well as adherence to the Intellectual Property Rights has to be given proper attention.

Target Areas in Science and Technology Development

It is important to identify target areas for science and technology development with a twenty year vision. In this line, it is important to identify thrust areas.

Basic Research

Considering national priority and need for food security and health security of the nation, Biology and Medicine Research is becoming very important in the context of new intellectual property rights regime where lives saving drugs are going to be expensive and detrimental to national agenda of poverty reduction. It is true that it is not possible within short time to come to a stage, when new drugs are possible to generate by our own scientists. However, a structured start may produce result in 20 years time. On the other hand, Bangladesh is one of the most vulnerable countries in terms of effects of climate change. Research in the area of biodiversity and conservation will be very important for the country.

Specific areas of focus may be Immunology and vaccine research; basic biology, biochemistry and drug design; genetics and genomics, ecology, biodiversity and conservation; plant molecular biology and basic research in agriculture; biotechnology; bioinformatics; and bioengineering.

Physical Science

Energy security has become more important for Bangladesh with global volatility in energy prices, depletion of fossil fuel resources globally, and need for renewable energy development for protecting planet earth from adverse impact of climate change. Thus, Bangladesh can focus, again with long term plan, research related to "fusion." Fusion is the ultimate source of energy with minimal environmental degradation. The atomic energy research needs to push to the fusion programme in the direction of commercial fusion reactors.

Chemical Science

Chemistry of energy conversion processes and harvesting of different forms of natural energies can be one priority in the area of Chemical Science. Other possible areas may be Chemical Biology with emphasis on biometric synthesis, molecular mechanism of drug action; Chemical ecology/ natural products.

Engineering Science

Engineering Science is going to one area where Bangladesh may target to export technologies and know-how's within 50 years. The focus areas in engineering science may be: Robotics, Parallel computing; cyber security; bioinformatics; signal processing and communication networks; wireless communication; Structural mechanics; earthquake engineering; prediction of natural disasters including earthquakes, cyclones, tsunamises etc.; early warning systems, structural engineering for resistance of natural disasters and loss mitigation

technologies; energy engineering, including energy generation (renewable/non-renewable), energy storage, efficient utilisation and pollution control technologies.

New Emerging Research Areas

There is a constant need to review developments at the cutting edge of basic research. A task force should be deployed to monitor global development in the R&D and bring in information for scientific communities on new area of development in science and technology.

Strategies

For analysing the history of technology dependence and aspirations of coming on the fore front of science and technology in a few areas, a three-prong approach needs to be undertaken:

- Technology import for immediate application in an area, where growth and development priority demand quick deployment;
- Technological collaboration with scientific institutions in the region and beyond for contextualising advanced research and development for the needs of the country;
- Inception of research and technology development in a few areas with a fifty year perspective plan, where Bangladesh wants to see her as one of the leaders and exporters of high-tech processes and products.

For this purpose, the Sixth Five Year Plan will include element of drastic change in the existing system for promoting science and technology, element of incremental change, and undertaking of ambitious programmes.

Science and Technology for MSME

As Bangladesh's economy is based on MSMEs, effective methods and plans of promotion of innovations in the MSME sector need to be devised in Sixth Five Year Plan. In doing so, strengths and opportunities as well as weaknesses and challenges need to be analysed.

The strengths and opportunities are:

- high contribution to domestic production
- significant export earnings
- low investment requirements
- operational flexibility
- location wise mobility
- low intensive imports
- capacities to develop appropriate indigenous technology
- import substitution.

Weaknesses and challenges faced by MSMEs are:

- poor financial situation and low R&D
- Poor adaptability to changing trade trends
- Desire to avoid risks
- Non-availability of technically trained human resources
- Emphasis on production and not on production costs
- Lack of management skills
- Lack of access to technological information and consultancy services
- Isolation from technology hubs.

The Plan may include the following:

- The Plan may announce a system of providing institutional support for encouraging innovation for MSMEs
- The Plan may also include programme for providing special support, both technical and financial, to innovators to set up enterprises.

More specifically, there may three specific components of the Plan for MSMEs:

1. Technology/knowledge-based new start ups (who need S&T inputs for incubation)

In Bangladesh, there is no technology business incubator (TBIs) for providing technology supports for MSMEs. For comparison, in India there are 20 incubators, in US over 1000, in Korea 300 and in Finland 100. Universities, engineering colleges, business schools should be preferred sites for TBIs. There is a difference in TBI and TIC (technology Innovation Centre). TBIs are located in educational institutions and aim at converting results of R&D to industries. TICs are located in SME clusters and provide them technical supports in technology uprgadation and new product development. In the Sixth Five Year Plan 10 TBIs may be set up. Other specific programmes for MSMEs:

- Ministry responsible for science & technology should launch Science & Technology Entrepreneurship Park, Technology Business Incubator, Small Business Innovation Research Initiative.
- Ministry of Industries (MoI) should launch food parks for promoting technology for food production.
- MoI may prepare sectoral technology profile. These technology profiles will help critically examining and addressing technology needs in line with the business requirements of respective sectors involving CII and UNIDO.
- Ministry of Education/UGC should include Entrepreneurship/Incubation into the engineering curriculum.
- Technical and vocational institutes need to be revamped for brining in school-dropouts and supply quality human resource for MSMEs.

- Appropriate mix of man-machine is important for avoiding complete automation, which is contrary to policy of labour-intensive economy.
- The Five-Year Plan should launch programme for building awareness related to IPR amongst MSMEs. Patenting should be encouraged by offering financial support/subsidies. Quality assurance, ecolabelling and barcoding of products should be encouraged in a big way.
- Continuing education programme should be launched for upgradation of skills at levels of technicians, supervisors, engineers and entrepreneurs.

2. Innovation Support for Processing and Packaging

Manufacturers of consumer products/ancillaries, driven by market demand (who need S&T interventions for innovation in process/product/packaging) need support in innovative ways of processing and packaging. Specific programmes/initiatives for this component may include:

- Ministry of Industries should launch Small Industries Services Institutes, Tool Rooms, Central Footwear Training Institutes, Product-cum-Process Development Centers, Regional Testing Centers and Field Testing Centers, CAD and CAM Centers, Product Development, Design Intervention and Packaging Scheme.
- Ministry responsible for Science and Technology should undertake programmes for technology development and demonstration and programme for "Techno Preneur" promotion.

3. Rural Technology

Science and technology intervention is useful in all areas of rural economy such as agriculture, physical and social infrastructure. However, most effective results would be obtained through rural technologies for non-farm rural enterprises, particularly for sustainable job creation in rural non-farm sector. Because task of development and application of appropriate technologies for non-farm rural enterprises lacks a definitive institutional framework in the government set-up, significant value would be added to existing developmental goals by establishment of new institution responsible for transferring technology to rural non-farm sector. Such an agency can be linked up with the employment schemes for rural unemployed people. Furthermore, non-farm rural employment is of increasing importance due to low employment elasticity in the farm sector and the phenomenon of "job-less growth" in industrial sector. Currently, development of rural technology is done by BCSIR, and S&T non-governmental organisations and IAT. All agricultural research institutions are major suppliers of technology to rural areas.

A dedicated agency for rural technology identification, development and promotion needs to be introduced. This agency can search out and link up thousands of disparate, small but sincere, groups working in far-flung corners of the country and provide them necessary support to implement technology transfer programme. R&D institutions and universities can supply technology to the new agency, which may be disseminated through grassroots partners including telecentres. There should also be a mechanism of field support for those grassroots partners. This institution can partner with telecentres for building their capacity to make them technology hubs for farmers, rural artisans and small producers.

Specific programmes for rural technology development may include:

- Training programmes on Packaging for Exports;
- Scheme of Fund for Regeneration of Traditional Industries;
- Food Processing & Training Centers;
- Support to Training and Employment Programme for Women (STEP);
- Intensive Dairy Development Programme (IDDP); and
- Fisheries Training and Extension.

Plan for Specific Thrust Areas

It is recommended to develop plan for specific thrust areas by working committees to be formed for each of them. Those working committees must comprise experts and stakeholders from diverse communities to ensure effective planning. In this part, some draft outlines are provided for three important thrust areas identified above.

Biotechnology

Induction of biotechnology is necessary for Bangladesh to maintain our agriculture remunerative and globally competitive in the face of major challenges such as declining per capita availability of arable land, low productivity levels of crops, livestock and fisheries; heavy production losses due to biotic (insects and other pests, weeds etc.) and abiotic (salinity, drought, alkalinity etc.) stresses; heavy post-harvest crop damage during storage and transportation; and declining availability of water as an agricultural input. Investment in agriculture-related biotechnology has resulted in significantly enhanced R&D capability and institution building over the years, but progress has been rather slow in converting the research leads into usable products. Uncertainties regarding IPR management and regulatory requirements, poor risk assessment, and effective management and commercialisation strategies have been the significant problems.

For ensuring food and nutrition security, value addition to primary agricultural produce through application of new technologies, employment generation, economic development and improved health and nutrition of all sectors of society

biotechnology is very important. In an emerging era of preventive health care, it is envisaged that improved food products can be developed, which promote well being and prevent diseases.

The mission mode projects in the area of biotechnology can bring about significant value addition, cost effectiveness and competitiveness in product and process diversity. Unlike the mission projects in developmental areas, biotech product/process development involves an elaborate pathway of innovation value chain over a period of 7-10 years with defined elements of basic research, translational research, development, verification and validation, prototype development, field trials, production/manufacturing and marketing.

In biotechnology research, problem arises concerning the protection of intellectual property for innovations in this field beyond legal and ethical questions. In view of the special quality of living organisms the scope of patents has to be clearly defined to find balance between innovation and public interest.

The mission mode project may include the following components:

- Bio-fortification of agricultural crops with better nutritional traits for iron, zinc, vitamin A, etc.;
- Nutritional improvement of vegetable crops with special impetus on underutilised (neglected vegetable crop) species from different regions of the country;
- Development of nutraceuticals/health food supplements/ functional foods with proven evidence of efficacy and safety.

Bioinformatics

Sixth Five Year Plan may include an initiative to establish a Centre for Bioinformatics under the National Institute of Biotechnology. For creating excellence in bioinformatics, following components may be included in the Plan:

- Preparation of a pool of experts on bioinformatics through collaboration with biotechnology research institutions in the region, particularly with India which obtains a very strong network of bioinformatics research institutions.
- Setting up supercomputing facilities for developing databases.
- Initiation of courses on bioinformatics in universities by inviting Bangladeshi scholars from abroad.
- Supporting Bioinformatics incubator facilities.
- Developing a resource pool of at least 10 Ph.Ds in the field of bioinformatics within the period of Sixth Five Year Plan.
- Making online courses on bioinformatics available through globally reputed institutions.

- Institutional mechanism may be put in place for testing public domain databases and software and making them available to the users from the academia and the industry. After such testing, these databases and algorithms may be graded so that scientists can use them with higher confidence.
- Commercial databases and software may be tested before the industry invests in the products. Such service will help the industry to reduce its costs and use only certified products.
- Giving priority to bioinformatics companies in high tech park.
- Facilitating collaboration between bioinformatics, agricultural scientists and plant molecular biologists. Special emphasis may be laid on adaptation to environmental stress.
- Another sector which merits attention is the documentation of the microbial wealth of the country and its possible utilisation. Here again extensive collaboration with microbiologists is important.

Bioengineering

Bioengineering covers a wide range of areas such as tissue engineering, biomaterials for therapeutics, biomedical sensors, biomedical devices and implants, etc. Bioengineering offers opportunities for indigenous development of critical implants and devices, advanced biomaterials for therapeutic applications, tissue engineered products, etc. in coming decades. The mission mode programmes in the area of bioengineering may include:

- Charting of a national programme on biodesign providing an incubator for generation of new ideas to develop novel biomaterials for therapeutic applications, design of indigenous devices and implants, tissue engineered products, etc.
- Establishment of a stable network amongst engineers, clinicians, basic scientists and the industry.
- Creation of partnership with universities, medical colleges, public research institutions having expertise in various disciplines such as chemistry, life sciences, molecular biology, medicine, engineering, etc.
- Initiation of programmes to facilitate indigenous production and evaluation of implants and devices which are currently available internationally but not available in the country at affordable cost.
- Establishment of a regulatory mechanism for testing and validation of bioengineered products and devices.
- Creation of improved vaccines to create effective single-dose vaccines; prepare vaccines that do not require refrigeration; and develop needle-free delivery systems for vaccines.

- Creation of new vaccines to devise reliable testing systems for new vaccines;
- Solving of how to design antigens for effective, protective immunity; and learn which immunological responses provide immunity. Priority diseases are: Dengue, Influenza, Tuberculosis, Malaria and emerging Indian pathogens.
- Participation in formation of regional biotechnology foundation in the region.

Marine Resources

Research on marine resources is an underserved area, which may be a major source of economic development and employment for the country. The Sixth Five Year Plan should undertake specific programmes in the area of marine resource management which may include:

- Research on protection of coastal breeding and nursery areas:
- Research programme on Integrated Coastal Resource Management by Integrated Coastal Zone Management (ICZM);
- Long term project on conservation of marine biological resources;
- Programme on protection of IUU (illegal, unreported and unregulated) fishing in Bangladesh waters;
- Programme on prohibition of pollutants discharge from ship breaking and other sources and their impacts; and
- Deep-sea resource survey every five years.

4.3 INFORMATION AND COMMUNICATION TECHNOLOGY

4.3.1 Framework of Integration of Information and Communication Technology in Growth and Poverty Reduction Strategy

4.3.1.1 Background

The concept of "Digital Bangladesh" won hearts and minds of citizens of Bangladesh since Vision 2021 of Awami League was published before the ninth national election held in 2008. The Vision 2021, built on various policy documents, both national and global, mentioned about the government's commitments towards ICT for development. Those commitments have been reaffirmed by the announcement of becoming a digital nation by 2021. In the first phase of World Summit on the Information Society (WSIS) in 2003, the government of Bangladesh pledged to build an equal information society. Bangladesh was one of the recommending countries to establish the Global Digital Solidarity Fund. As the

national five-year planning process was abandoned, the poverty reduction strategy paper (PRSP) identified a set of agenda for becoming a knowledge-based society, which included establishment of telecentres in all Upazilla by 2006. The ICT Policy 2002 announced to become a knowledge-based society by 2006; however, the ambition was not supported by deeds. The ICT Policy has been revised in 2008 and proposed by the review committee for adoption by the government. However, it was not adopted during the caretaker government. The ICT Policy has now been adopted by the new government in April 2009. The National ICT Policy 2009 reviews progress since adoption of the first ICT Policy 2002 and proposes a comprehensive agenda based on the recent technological developments and socio-economic reality. The policy document first time incorporates a methodological framework of the policy formulation and a comprehensive list of action items for implementation. In 2008 Bangladesh Computer Council (BCC) also developed two important documents: ICT roadmap and e-governance roadmap. Theoretically, a significant volume of work has already been done, which can feed the process of building a master plan for Digital Bangladesh for a period up to 2021.

4.3.1.2 A Framework for Knowledge-based Economic Development

For realising vision 2021, the country has only 11 years from now. This is not a long time in the context of history of a nation. However, the ambition spelled out in the Vision 2021 document needs special drive by the government. This short time span dictates designing of a comprehensive master plan with adequate elaboration of individual components of that master plan. That master plan should be developed on the basis of a framework. At the beginning of the background paper, it was deemed necessary to propose a framework which would be helpful for assessment of current scenario and identification of problems and issues. These two components would help to design short-term [up to two years] and mid-term [up to five years] agenda and identify stakeholders for each agenda and implementation mechanism, where possible.

The framework is built based on a few important documents: Vision 2021 laid in the Election manifesto of the ruling party Bangladesh Awami League, ICT Policy 2009, draft Strategy Paper which is under preparation by Access to Information Programme at Prime Minister's Office.

The ICT Policy 2009 appropriately identified the objectives of ICT in development. These are: (1) Social equity; (2) Productivity; (3) Integrity; (4) Education and research; (5) Employment; (6) Strengthening exports; (7) Healthcare; (8) Universal access; (9) Environment, climate and disaster management; and (10)

Support to ICTs. The proposed framework captures the objectives of ICT in development.

At the centre of the proposed framework is national information and knowledge system [NIKS], which is designed to provide the platform for developing and delivering services to all citizens, both corporate and individuals, both in rural and urban areas, particularly emphasising service delivery to poor and marginalised communities. In the model for ICT based economic development, the role of information has been considered as mission critical and the completion of process of creation of a "universal" national information and knowledge system [NIKS] is the core of all development activities. There are five components of the ICT based economic development framework, which are stemmed from the development of the NIKS. These are:

Connecting Citizens

There are three major sub-components of "connecting citizens" component:

- *Building an inclusive information and knowledge system:* Creating effective access to an information and knowledge system for all citizens through multiple channels of ICTs and access to appropriate local and locally relevant content in Bangla language.
- *ICT for Equity:* Deployment of specific programmes and projects for employment generation through ICTs, promotion of agriculture through ICTs, access to quality health care, community resources preservation and digital empowerment of women.
- *E-Participation:* Establishment of two-way channels to promote participation of grassroots in policy discourse and effective feedbacks to the policymakers on particular policy adjustments.

Human Resource Development

There are four sub-components of human resource development:

- *Building E-learning Infrastructure:* One school one computer lab, smart class room with e-learning facilities.
- *ICT education:* Creating facilities for ICT education for accessing information and knowledge for school children.
- *ICT based education:* Mainstreaming ICT in education process for collaborative learning of core courses.
- *Vocational ICT training:* Creation of facilities for youth to learn ICTs for jobs at home and abroad and self-employment.

Digital Government

There are three specific sub-components of "Digital Government"

- *Building sound legal and policy infrastructure of the NIKS:* Creating appropriate dynamic legal and policy system to unleash potential for participation of citizens, private sector, development agencies and government for creating new services.
- *E-Administration:* business process re-engineering for the government agencies for efficient and transparent decision making and accessing for improvement of transparency of the government.
- *e-Citizen Services:* Converting traditional service delivery mechanism into e-service delivery system to bring "service at the door step of citizens."

E-Business

There are five sub-components of e-business:

- Online transaction and payment infrastructure;
- Promotion of e-business and e-commerce;
- Automation of financial industry;
- Financing ICT industry;
- Enhancing competitiveness of business through business process re-engineering.

"Connecting citizens" mean all citizens of the country irrespective of their residence, age, economic condition, race, sex, ethnicity have access to ICTs for accessing information and knowledge required to perform their day-to-day activities. A robust ICT network and public access point are the key factors to make citizen digital. The digital citizens are not anymore poor because access to information and knowledge and education makes them able to make informed choice for selection of their representatives, exercise their rights and entitlement, increase economic opportunities and protect themselves from exploitation.

"Digital education" or "Human resource development" means the education system is restructured to ensure equity in terms of access to quality education. The quality of education is ensured through regeneration of dignity of teaching profession with appropriate skills development and upgradation system where ICTs play a vital role. The education system produces quality human resources for meeting the demand of domestic knowledge-based economy and also global demand for quality human resources. ICTs play a crucial role in ensuring quality education both for urban and rural people and ICT skill gap does pose a divide within the country. The government does not hesitate to allocate appropriate resources in building robust and modern education system.

"Digital government" means the government work flow is fully integrated with ICTs. The decision-making process is efficient as a result of government's business process re-engineering. The government can take informed and timely decisions on various policy matters as the data generation system is fully automated from grassroots to the national level. Digital government also means a transparent government through full implementation of "Right to Information" legislation, which also ensures participation of citizens in decision making process. The participation of citizen does not limit to decision making by citizens' representation in the parliament, rather a mechanism is present to capture opinions of various citizens groups and individuals through ICT and non-ICT tools. The transparency in operation ensures upholding human rights for all citizens including women, poor, marginalised and indigenous groups.

"Digital business" or "E-Business" means general economic activities are reengineered through integration of ICTs and ICT business can unleash its true potential with appropriate human capital created through digital education. Businesses irrespective of their size can avail ICTs for production and access to market domestically and internationally. Businesses also can transact and make payment off line and online, internally and globally.

Digital Bangladesh is thus another name of Knowledge based Bangladeshi society. The government has promised to get Bangladeshi citizens towards a digital Bangladesh by 2021, which is free from poverty.

Institutional and Financial Framework of Digital Bangladesh Agenda

There are two sub-components of this component:

- Intuitional framework for implementation of digital Bangladesh agenda; and
- Resource allocation and Fiscal measures.

4.3.1.2 Justification for ICT-based Growth and Development Agenda

The need for the ICT-based growth and development agenda is dictated by the following counter-intuitive points:

- Bangladesh people are not able to participate in the global ICT economy and knowledge-based society since they are not connected well;
- Rural Bangladesh suffers from the digital divide, being left further in terms of access to markets, education, social and health services; and
- Bangladeshi businesses are left out of the "new economy" suppliers who cannot connect with our companies may go elsewhere, and we may also

lose the market share to other countries who can better reach new customers.

The NIKS should not be seen as a channel for accessing information. Rather, access to content and data is increasingly a necessary condition for performing basic and important tasks in a connected economy. Information infrastructure is key to ensuring Bangladesh continues to play a competitive role in the world economy and to making sure that our people participate in the benefits offered by globalisation.

4.3.2 Polices and Institutions: Present Situation

4.3.2.1 Review of Policies related to Information and Communication Technology

Affordable, reliable connectivity and conducive regulatory environment are essential for making equitable access to information. While mobile telecommunication market showed vibrancy thanks to proper competition policy and increased affordability, the growth of Internet use is rather slow, mainly due to inappropriate licensing policy and high price of Internet connectivity. It was expected after Bangladesh getting connected to information super highway in May 2006 with SEA-ME-WE4 submarine cable, the quality of Internet connectivity would improve and cost would be reduced. However, it did not happen as expected. The cost of bandwidth for 1 Mbps duplex is now BDT 18,000, which was BDT 70,000 in 2007. Initially, only the state-owned telco BTTB was allowed to own the only sub-marine cable network against the provision of Subsection C of Section 49 of the telecom law. However, the government has taken initiative to offer license for sub-marine cable ownership in the private sector.

The Telecom Policy was introduced in 1998 and Telecommunication Act 2001 was enacted in 2001.The Act led to the formation of the Bangladesh Telecommunication Regulatory Commission (BTRC) in 2002. BTRC now has emerged as a vibrant institution. The licensing for international long distance telecommunications service (ILDTS) was offered in 2008 and three layers of gateways were established for channeling calls. However, this could not stop illegal VOIP as call termination rate for international calls is much higher than local call termination. Many value-added services, both voice-based and data-based, are prohibited under the current policy.

The NTP 1998 was a first step taken by government towards developing a clear policy stance in telecom. As a first effort it was largely open-ended and in some parts inconsistent with other aspects of the policy. There was also negligible focus on the technological convergence and in many ways the policy statement did not address the key challenges facing the industry, which are reform of BTTB,

privatisation and measures to encourage significant amounts of new investment. These changes happened outside of the purview of the Policy. In addition, the NTP was not specific with regard to actions required to achieve the goals set out. A prime example is the teledensity target. The target did not demonstrate how teledensity improvements would be achieved, such as through setting specific targets to operators. Despite those weaknesses, the NTP 1998 created confidence among the market players and actual progress exceeded expectations of the stakeholders.

Internet was launched by the private ISPs in 1994. The NTP 1998 was enacted four years after that. However, the role of Internet has been completely ignored in the country's first telecom policy (NTP 1998). It resulted diminishing the newborn Internet's economics due to BTTB's interferences. Two examples are:

- The ISPs were not allowed to choose the VSAT carriers other than the ones recommended by the government (BTTB).
- Besides paying the standard tariff to the VSAT operators [around USD 1,000 per month], the ISPs were mandated to pay royalty to BTTB [USD 7,000 per month, which was the highest in the world].

Bangladesh Computer Samity (BCS) strongly campaigned against this provision and succeeded amending it in February 2000. Since then, the ISPs have been paying license fees to the MOPT [US$ 3,500 per annum]. The broadband policy 2010 has been enacted recently, however, it is yet to be implemented for bringing policy predictability in the Internet market and protect investors' interest.

The government decided in June 1998 to withdraw all import duties and VAT from all computer hardware and software, which fortunately coincided with global reduction of prices of computer hardware. This has brought the prices of computers down to a level affordable by middle-income households.

The ICT policy was adopted in 2002. The Ministry of Science and Technology was renamed as Ministry of Science and Information and Communication Technology (MoSICT). The Ministry assigned BCC to undertake four projects to foster a sustainable e-readiness in Bangladesh. They are: S1-ICT Project [e-Governance]; S2-ICT Project [National ICT Roadmap Policy]; S3-ICT Project [Network Infrastructure]; and S4-ICT Project [Human Resource & Training]. However, the outcomes of the projects could not serve the national need.

In 2007, e-Gov cell was formed under Chief Advisors Office (CAO) to coordinate all ministries for successful implementation of e-Governance; and focal points in each ministry were appointed through assignment of a Joint Secretary to coordinate with the e-Gov Cell and within the ministry. In 2007, through a Gazette notification, the Government instructed ministries for allocation of minimum 2 per

cent of their annual development plan (ADP) for the ICT sector. In 2007-08, the largest ever ICT project was undertaken by the caretaker government for issuing Voter ID and National ID. An e-Government Horizon Scan report was completed in 2008. Based on the report, 39 "quick-win" e-government projects had been identified for implementation by June 2009.

The long standing problem was with ICT Act, 2006, which was shelved after its enactment. Failure in implementation hindered electronic and online payment system and introduction of e-commerce in the country as well as growth potential of international trade and efficiency gain is not being realised. The current government already has undertaken initiatives for introduction of e-payment and relevant circular was announced by the Bangladesh Bank. It is to be mentioned that for sound e-commerce and e-payment system digital signature certification should be in place and provisions for resolving litigations should be made through amendment of evidence act and penal code.

A number of issues are under progress: Online-payment system, alternative sub-marine cable, streamlining coordination of ICT relative activities, action plan with appropriate budgetary allocation for implementation of ICT roadmap and e-Government roadmap, implementation of "quick-win" projects, tax incentive for channeling resources for expansion of network of public access venues, licensing of 3G technology, mobilisation of USO fund for rolling out network in rural areas and expansion of network of public access venues, and designing specialised curriculum for training of manpower required for public access venues.

There is a growing realisation about the need to access to information for achieving national aspiration of a country free of poverty, and there is a sincere effort to make the policies more conducive for expansion of infrastructure and creating enabling environment. However, excessive trust on private sector may exclude poor people from the emerging national landscape of public access venues.

There are two policy documents and laws that are related to publication of books, one is National Book Policy and the other is Copyright Act, 2005. The intellectual property rights are a two-edged sword for a country like Bangladesh. On the one hand, the country needs an enforceable system of protection of intellectual property. On the other hand, such enforcement may hinder access to knowledge for common citizens, as the cost of proprietary software is very high. The TRIPS agreement will severely affect public access to information before and after 2013, which is a transition year of expiring exemption to Bangladesh, as a member of LDCs, from the obligation of the copyright system. The copyright system in its current form will hamper knowledge exercise in the country of South. It will be a

journey towards opposite direction in terms of building knowledge society because there is no chance that the countries will attain the capacity to comply fully with obligations within 2013.

4.3.2.2 Institutional Arrangements for Fostering Information and Communication Technology

Ministry of Science and Information and Communication Technology

Ministry of Science and Technology was renamed in April 2002 as "Ministry of Science and Information and Communication Technology." Although the name was changed, the mandate and scope of the activities of the ministry was not changed.

Bangladesh Computer Council (BCC)

BCC is an autonomous body under the Ministry of Science and Information & Communication Technology, Government of Bangladesh for encouraging and providing support for ICT related activities in Bangladesh. It is established by Act No. IX of 1990 passed by the Parliament. The main objective of establishing BCC was to ensure the effective application and expansion of the use of information technology. BCC has taken some projects to expand its activities; to expansion of uses of computer and IT in the country; development of skilled manpower; expansion of IT-based export business. However, the institution remained effective in terms of transformation of government and industry since its inception.

Ministry of Post and Telecommunications (MoPT)

The Ministry of Post and Telecommunications (MOPT) is responsible for facilitating the growth of telecommunication needs and introduction of new technologies.

Bangladesh Telecommunication Regulatory Commission (BTRC)

BTRC is an independent Commission established under the Bangladesh Telecommunication Act, 2001 (Act no. 18 of 2001). BTRC started functioning from January 31, 2002. The main vision of BTRC is to facilitate affordable telecommunication services of acceptable quality for all regardless of their location.

JRC Committee

A committee was formed in June 1997 by the Ministry of Commerce, Government of Bangladesh to look into the problems and prospects of export of software from Bangladesh. It was undertaken by JRC Commission in 1997 under the government initiative. JRC commission came up with 45 recommendations.

Support to ICT Task Force (SICT) Programme

To realise the goals set forth by the ICT Policy, an ICT Task Force was formed. In 2003, the government launched a Support to ICT Task Force (SICT) programme at the Ministry of Planning, with the mandate of providing administrative and secretarial support to the ICT Task Force in realising various ICT projects, particularly e-Governance. The Support to ICT Task Force (SICT) Programme was created by the government to provide various strategic and implementation support to some of the decisions taken by the National ICT Task Force, which is headed by the Prime Minister. Furthermore, another of its responsibilities is to provide support to the National ICT Taskforce to ensure access to information by every citizen to facilitate empowerment of people and to enhance democratic values and norms for sustainable economic development. The project was generally divided into two components for outsourcing purposes: software and training services, and hardware and networking equipment. The programme achieved limited success.

Bangladesh Computer Samity (BCS)

BCS is the national association of the ICT companies in Bangladesh. BCS was established in 1987 with eleven members. The total number of members stood at 590 in 2008. The body is run by a 7-number executive council elected every two years. The aims and objectives of BCC are as follows:

- To unite and encourage all computer vendors to join in one platform for achieving their common interest;
- To unite and encourage cooperation amongst companies, firms and industries;
- To seek cooperation among all the members in the ICT business;
- To safeguard the interest of its members and their development
- To boost/encourage, promote and diversify effective use of computer in Bangladesh;
- To render expert advice to the concerned authorities on computer technology and its implication on the economy of Bangladesh.

4.3.3 Current Status and Challenges in Development of Information and Communication Technology for Growth and Poverty Reduction

4.3.3.1 Connecting Citizens

Building inclusive information and knowledge system

The inclusive information and knowledge system includes both private and public access to various types of ICTs: computer, internet, mobile phone, radio, and television.

Current Status

Telecommunications sector in Bangladesh experienced a robust growth during the last one decade. While mobile teledensity had been predicted to reach 10 per cent by 2010 (Raihan 2007), actual teledensity by end of 2008 stood at 31.21 per cent, more than thrice the target (BTRC 2010). There are 52 million mobile phone subscriptions by the end of 2009. Competition policy and deregulation account for this phenomenal growth in the mobile sector. In contrast, the fixed/PSTN market observed a modest growth, only 17.82 per cent —1.19 million PSTN subscribers at the end of 2008 from 1.01 million in June 2006. Although the reason behind such sluggish growth was initially identified as lack of competition in the major market Dhaka city, the actual reason is issuance of too many licenses and uneven competition with mobile telecom industry. All PSTN operators are choking now competing with the mobile phone operators. The fierce competition among the mobile telecom operators led to a nosedive in call rates within the domestic market. Some operators offer calls for only 0.4 US cents per minute, the floor rate fixed by the regulator. Among South Asian countries, Bangladesh offers the lowest mobile phone call rates (Samarajiva and Zainudeen 2008).

In contrast to mobile service uptake, Internet adoption was slow mainly due to the high price of Internet connectivity. The expectation was that after Bangladesh got connected to the information super highway via the SEA-ME-WE4 submarine cable, the quality of Internet connectivity would improve and the cost would be reduced. Indeed, data transfer capacity went up to 14.78 gigabytes per second, 64 times higher than total capacity at the time of installation in May 2006. By June 2007, the utilisation was up to 3.28 gigabytes. But the state-owned telco, Bangladesh Telecommunications Company Limited (former BTTB), and subsequently Bangladesh Submarine Cable Limited (BSCL), kept the bandwidth price exorbitantly high. In response to lobbying by various stakeholders, BTCL reduced Internet tariff charges by 20-40 per cent in February 2008. Charges for monthly office use came down to about US$ 10 from about US$ 14.3, and the annual cost of leased Internet access up to 2 Mbps came down to about US$ 20,571 from about US$ 27,428. There is a special 75 per cent discount for research organisations and primary schools will get 64 kbps Internet connections free of charge. However, it is not clear how primary schools would avail the benefit. But industry stakeholders consider the revised rate to be still high compared to rates in neighbouring countries. The reduced rate is 10 times higher than the price for the same bandwidth in India. It also bears mentioning that the US$ 35.1 million investment cost of the existing submarine cable has already been recovered, which is a strong argument for further reducing Internet access rates to make them at par with the rates in other countries in the region.

Total bandwidth demand is expected to reach at least 15 Gbps in 2011, saturating the current capacity of the submarine cable. To prepare for this eventuality, BSCL signed a deal with the Power Grid Company of Bangladesh (PGCB) for backup fibre-optic connectivity. There are also offers for establishment of redundant fibre optic lines from various private sector companies or consortiums, including *Mahanagar* Telephone Nigam Ltd (MTNL), VSNL, Bharti, BSNL, Reliance Communications, VSNL International, Asia America Gateway Cable, SEA-ME-WE-3, SEA-ME-WE-5 and South Asia Subregional Economic Cooperation (SASEC).

BSCL is allowed to own the only submarine cable network in spite of a provision in the telecom law that states: If an operator provides more than one service, but there exists competition in the market in providing one of such services and no competition in the case of another service provided by him, then subsidy from the earnings of the service, which is subject to competition, shall not be allowed for the other service which is not subject to competition (Section 49, Subsection C, Bangladesh Telecommunications Act, 2001).

Exclusive ownership of the submarine cable's landing station has extended BSCL's monopoly to data connectivity and the Internet market. This monopoly is the primary reason for a sluggish growth in the use of the available bandwidth. In May 2008 the government decided to allow the private sector to install and operate a submarine cable, which was expected to reduce the price of Internet connectivity. However, the private sector submarine cable has not been materialised yet.

The government implemented International Long Distance Telecommunication Services Policy (ILDTSP) in the second half of 2008. However, illegal Voice over Internet Protocol (VOIP) services continued due to inappropriate pricing policy of internal and local call termination. The difference between international call termination rate (2.5 US cents/minute) and local call termination (less than 1 US cent/minute) provides incentives to illegal VOIP operators. The only way to resolve the situation is to reduce this difference. Sri Lanka is a bright example in this regard. Despite reduction of the international call termination rate, total revenue of Sri Lankan Telecom Authority increased. Because more people use IP telephony for calling abroad and receiving calls from abroad.

Dismal power supply situation in the country impacts negatively the growth of the ICT sector. Many domestic and international agencies are working to find solutions, with some focusing on alternative and cheaper power sources and others focusing on low-power ICT equipment.

Digital Content Initiatives

Digital content has become a major issue as PC penetration and Internet access have increased across the country. Without locally relevant content, ICTs are of no use to people. Content development is now a priority not only of the private sector and civil society organisations but also of government. The content issue has been highlighted in the Broadband Policy.

The most noteworthy government initiative is www.bangladesh.gov.bd, with content both in English and Bangla languages. The website of the Bangladesh Government Press or BG Press (www.bgpress.gov.bd) is facilitating access to government information. BG Press is the single point of publication of all gazettes and documents related to the functioning of the government and state. An earlier digital content initiative by government made government forms more accessible to citizens via the website www.forms.gov.bd. People access the forms through telecentres which charge a minimal fee for downloading and printing the forms. The downloadable forms include passport application, visa application, citizenship form, pension form, Internet connection (BTCL), birth registration, income tax return, and driving license. The availability of these forms online helps citizens' access government services in less time and reduces opportunities to bribe government officials. The website is bilingual. Those who cannot read can get the forms from telecentres, which are now becoming popular in rural Bangladesh.

In the non-government sector, D.Net was the pioneer in development of digital content in Bangla language. In 2003, D.Net started research on content development targeting the rural poor. Since then, a huge content base in Bangla has been developed. D.Net initially focused on the CD-ROM version of the content since Internet connectivity was not available in the rural areas at that time. But with the availability of access to the Internet through EDGE or GPRS from almost anywhere in Bangladesh, the Web version (www.jeeon.com.bd) is also available. The second largest Bangla website at present is www.abolombon.org. The website is dedicated to human rights issues and provides legal practitioners with access to the full text of laws, explanation of laws, addresses of legal redressal institutions, and the like. Another local language website is www.gunijan.org, which features eminent citizens of Bangladesh for the young to get to know them. Local digital livelihood content generation by NGOs gained further momentum in 2007. Among other Bangla language portals, www.ruralinfobd.com emerged in late 2007. It was developed for telecentre operators by a private sector entity named WinBD, with financial support from a donor consortium. UNDP has also sponsored the development of animated content in three areas: livelihood, indigenous knowledge, and conversion of content for visually impaired citizens. Bangla Wikipedia

(bn.wikipedia.com) is also getting richer with participation of large number of volunteers. Two Bangla blogs namely www.somewhereinblog.net and www.prothom-aloblog.com have become very popular among youth and professionals as well.

ICT for Equity

Equity issue has three layers. The first layer is whether ICTs can play a role in improved income stream through job creation and enhancing income opportunities, or, through reduction of cost of livelihood. The second is, whether ICTs can facilitate accessing better health care facilities, better quality of education. The third layer is access to information for empowerment, e.g. accessing rights and justice through accessing information on availability and eligibility of safety net and other benefits announced by the government.

Access to ICTs is just a first step towards creating equitable opportunities for citizens. It has two distinct elements: communication infrastructure including high speed broadband and physical access points. In a country where 40 per cent population lives below the poverty line, individualised access to ICTs for all citizens is a remote possibility in the near future. For creating access to ICTs for all, community based public access to ICTs is an interim solution. However, as share of population with mobile handset is increasing, services should be designed also for accessing through mobile phones.

Current Status

Teledensity has improved the during last one decade tremendously thanks to the proper policy and deregulation. From a teledensity of 0.5 per cent in 2001, Bangladesh achieved 32 per cent in 2009. However, teledensity is not probably an appropriate measure for access to telephony for Bangladesh, as one phone connection is being used by approximately 3 persons. Access to telephony as opposed to teledensity would be proper measure and in that case it would reflect the actual picture of access to telephony in the country, which would be much higher than 32 per cent . It is to be mentioned that actual teledensity might be less than 32 per cent as one person possesses more than one SIM card of mobile phone. Basically, it is the share of subscription rather and teledensity.

In Bangladesh, private sector and non-government agencies have been leading in creation of public access to ICTs through telecentres of various varieties and brands. The number of such telecentres is above 2,500. The government has also started establishment of telecentres in local government offices and other relevant institutions. Number of such telecentres exceeded 100 in 2009.

Services through ICT channels are important to reduce cost of livelihood. Till date, private sector online services perform better. An example is www.bdjobs.com, which was established in 2001 and which now has a monthly page view volume of 800 000 and 14000 daily unique visitors. More than 140,000 resumes are posted on the portal, which has over 2,500 corporate clients. More than 2,500 employers in Bangladesh have recruited more than 35,000 professionals at different levels through the bdjobs.com service.

A number of helplines are now offering consultation and counseling on various issues. Grameen Phone's 789 and Bangla Link's 789 for health, Bangla Link's 7676 for agriculture offer consultation with experts. D.Net's *Teletathya* (www.teletathya.com) is the oldest helpline in the country leveraging the mobile phone penetration since 2004. This helpline offers counseling on agriculture, health, education, human rights and information government services. it also offers directory services. BIID offers networking among farmers through its *'e-krishok'* initiative (http://biid.org.bd/ekrishok.html). Most significant e-health initiative till date is *Amader Gram* Breast Cancer Initiative (http://www.amadergramonline.net/publications/KT4D-BreastCancer.pdf), which offers free of cost diagnosis and treatment of breast cancer for women.

The most popular online information service provider is www.bangladeshinfo.com. www.bdresearch.org.bd is a web portal for researchers, academics, and policy makers. Currently, it hosts more than 2,000 papers, articles and book chapters on Bangladesh and South Asia published by prominent research and publication houses. The website has incorporated an innovative mechanism of selling research online through pre-paid cards.

Despite various initiatives, digital content availability is still insignificant compared to the needs, and the Sixth Five Year Plan should have a significant plan for promoting content development.

Intellectual Property Rights

Prohibitive price of proprietary software and anti-people intellectual copyright regime create barrier for establishment of knowledge society. For developing country like Bangladesh, alternative to such regime is open source software and open content. The open source and open content movement is gaining momentum in Bangladesh through the efforts of the Bangladesh Open Source Network (BdOSN). Its one of the major programmes is the Open Source Camp, which provides users with hands-on experience with GNU Linux, Open Office, Mozilla, LAMP/WAMP and Wikipedia. BdOSN also established the Open Source Support Centre in Dhaka in 2007. The centre, which is run by volunteers and which is the first of its kind in

Bangladesh, distributes CDs, books and other materials on open source and open content, and provides hands-on support to users. In addition, the Bangladesh Telecentre Network and BdOSN are working together to provide software and training to grassroots telecentre operators. BdOSN is also providing training on open source technology to 740 government officials.

The country needs policy for using open source software in all government agencies, where possible, for saving foreign currencies, as open source solutions are less costly.

Universal Access Policy

The country does not have universal access policy. Furthermore, the public access to ICTs created fully on commercial basis denies access to citizens who are unable to pay for services. A hybrid model proved to be better for creating balance between crucial information services which are less attractive in terms of income generation, and services which may generate income by serving better off part of a community. Income generating potential varies and there is high correlation between income potential and severity of poverty in a particular location. It is not justified that an Internet user in rural area pays the same amount paid by a person living in Gulshan. When someone drives a car, he/she does not pay for road. Then accessing Internet should also be free in the same vain. High speed Internet connectivity can change the whole scenario of access to education, health care and government services. Thus, one of the priority agenda for the government should be creation of Internet infrastructure and make the bandwidth free for rural population at least for the whole Sixth Five Year Plan period. The free bandwidth may be for maximum 512 kbps, which is adequate for accessing rich content.

The major impediment to accessing advanced services through the Internet is countrywide infrastructure of Internet and prohibitive cost. The new broadband policy is expected to ensure equitable access to information, knowledge and e-government services.

E-Participation

ICT creates opportunity for improving transparency as well as for participation of people in decision-making process. Web 2.0 tools in local language have become a powerful tool for inclusive policy making by creating a two-way channel. Bangladeshi citizens are very active in various global online platforms like facebook, LinkedIn and exchange ideas and promoting democratic practices. However, the government is not yet active on these social networks and does not promote participation.

4.3.3.2 Human Resource Development

Building E-learning Infrastructure

E-learning infrastructure is important for modernisation of education system as well as creating 21st century skilled human resources. It is to be mentioned here that many of the problems in education sector are not related to ICTs and actually sometimes ICTs are less priority agenda than those issues. For example, ensuring good facilities in the class rooms, providing respectable remuneration to teachers, hiring good quality teachers, providing up-to-date curriculum and training to teachers, de-politicisation of education system, and unification of various tracks of education are the priority items. Investment in ICTs in primary education system sometimes seems irrelevant. However, there may be pragmatic approach towards ICT integration in the education system. Instead of planning to provide computer for each child, there may be a good computer laboratory in each educational institution. All teachers may be equipped with computers and other learning aids for enhancing their skills and using them in the class room for enhancing learning experience of the students. Lack of adequate number of quality teachers may be temporarily solved through e-learning. Towards this end, some initiatives are already present both in the private sector and public sector.

The government has established 128 state-of-the-art computer labs in 128 educational institutions (secondary schools and colleges). A programmer has been appointed for each of the computer lab. The Ministry of Science and ICT is planning to establish more than 1,200 computer labs in secondary educational institutions. However, there is no sustainability plan how these labs will be operating after the project period ends. Moreover, there is no curriculum to be used in those labs. It is not clear whether the labs will also be used for teaching mainstream subjects. The biggest private initiative for creation of e-learning infrastructure was initiated by Volunteers' Association for Bangladesh New Jersey Chapter (www.clp.net.bd), a group of non-resident Bangladeshis, in collaboration with D.Net, a Bangladeshi research institution, promoting ICT4D. Another private sector initiative is the School Online Programme of Relief International, which has set up 27 Internet learning centres. British American Tobacco started an initiative titled "*Disharee"* however, it did not scale up. This programme trains the children of tobacco farmers with ICT skills and provides job counseling service.

The previous programmes of distribution of 10,000 computers to secondary schools did not produce any tangible result, as most of them remained in the rooms of headmasters and in the hand of teachers; students were not benefitted at all from

that programme. Hardware centric approach remains as the major problem of all past and current government initiatives.

ICT Education

ICT education in Bangladesh is generally concentrated at the tertiary level. Although there is an optional course on computers in the secondary schools, the course curriculum is outdated and there is little opportunity for hands-on practice. Skilled human resources are currently in high demand and short in supply. ICT graduates are not gaining the skills required by the private sector, and due to rapid growth and changing nature of the sector, this disparity will increase in the future. A study conducted in 2000 is still relevant for the ICT industry of the country, which identified the missing links in ICT skills for the industry (See Table 4.2).

At the same time, ICT students are graduating and unable to find employment. There is a great gap between the academic and professional sectors. The ICT topics taught widely do not always align with the needs and priorities of the private sector. Students learn the requisite theoretical and technical skills but not how and where to apply them: career counseling and formal contact with the private sector is non-existent or too general to be of any benefit to ICT students. Education in the ICT field is seen as formal and theoretical; as a result, it does not convey the real picture of the private sector.

TABLE 4.2
MISSING LINKS IN ICT SKILL DEVELOPMENT

Specialty required in Software Development	Concentration of training in Bangladesh
Software Architect	No
Senior Systems Analyst	No
Senior Software Engineer	No
Senior Database Designer	No
Senior Communications/Networking Designer	No
Transaction Systems Designer	No
User Interface Designer	Yes
Testing Designer	No
Project Manager	No
Senior Programmer	Yes
Database Programmer	Yes
Programmers	Yes
Communications Programmer	No
Documentation Specialist	No
Multimedia Programmer	Yes
Multimedia Designer	Yes
Media Specialist	Yes

Source: CPD (2001).

The students of primary schools become, in a very small way, aware of computers through their general science textbooks. A majority of schools in the country cannot afford to buy computers for their students. Though a small number of city-based schools have very limited computer laboratory facilities, they fail to make their students familiar with internet, e-mail and related technology because of the lack of nationwide telecommunication infrastructure and internet facilities. In addition, school teachers at these levels lack the minimum level of training on ICT.

Computer science was introduced as an optional subject for secondary level students in 1994, and about 150 schools were permitted to start up the subject. Many more schools have shown interest, and the quantitative expansion of ICT education at the secondary level is phenomenal. The National Education Policy has recommended compulsory computer courses from the secondary level of education. The Board of Intermediate and Secondary Education, Dhaka introduced computer science as an optional subject in 1991. More than 200 colleges have already introduced computer science as an optional subject for science stream students. Moreover, about 30 polytechnic institutes of the country (mostly located in Dhaka) are offering four-year diploma courses for those who have graduated from SSC in computer technology. Bangladesh Open University is now offering three-semester diplomas in computer applications.

ICT based Education

The lack of local educational content is a barrier to increase use of ICT in schools. To address this gap the Institute of Education and Development at BRAC University, in collaboration with Foundation of Education Research and Education (FERI) and D.Net, developed interactive digital content for Grades 6-10 students of Science and Mathematics. BRAC University has also developed a CD-ROM for English language learning based on the national curriculum. D.Net has developed "Computer Teaches Everyday English," an English language learning CD-ROM, for secondary school students. The CTEE has become very popular among the school children.

ICT in non-formal education (NFE) in Bangladesh is more vibrant. A study (Raihan 2007a) identified 23 organisations that are involved in developing various kinds of ICT-based learning materials for the NFE sector. The study found 195 such materials developed since 2004. Over 60 per cent of the materials are video, animation or a combination of the two. Video CD (VCD) is the most common format used since there is a higher degree of penetration of VCD technology in the rural areas. Over 60 per cent of the materials are intended for children, students and

youth groups and 18 per cent are for the disabled. There are no materials for the aged and for indigenous people. NGOs generally develop materials for their own outlets. Some also supply other NGOs either for free or for a nominal charge. A few NGOs sell their products through retail chains. The Bangladesh Centre for Communication Programmes (BCCP) outsources marketing and sale of their "*Nijeke Jano*" (Know Yourself) package to a commercial outfit. The UNESCO study shows that there is a demand for quality ICT-based materials and organisations are ready to pay for them. Although the current market size is relatively small and the number of developers is limited, there is a big opportunity in this segment of the market, with approximately 150,000 groups and organisations running NFE programmes of diverse types. Moreover, the plan to establish a network of telecentres by 2011 implies a significant expansion of the potential market for ICT-based literacy and skill training materials.

The developer institutions identified the following constraints to educational content development: lack of a ready market, inadequate and irregular funding, lack of proper facilities for developing high-quality ICT-based materials, lack of skilled professionals, inadequate experience of educationists in ICT-based materials development, low penetration of ICT, and power supply interruptions.

Vocational ICT Training

The ICT training bubble busted in the late 1990s in Bangladesh, when many international and regional franchisee holders opened lucrative and expensive ICT training. However, poor response from the job market and low quality of training spoiled enthusiasm among students in ICT as a career. Most popular training course is application packages, particularly MS Office. Training institutes also offer training on Photoshop, Dream waver, flash. Certification programmes such as MCSE, CCSP, MCDBA also popular amongst trainees. The enormous potential of ITES industry is still unleashed and vocational training in ICTs can play a big role in diversification of our export.

Information Networks in the Educational Institutions

Bangladesh National Scientific and Library Information Network [BANSLINK] was established under the auspices of BANSDOC for connecting the libraries of nine public universities and six other research institutions and government bodies using dial-up connection. The network is not working due to the shortage of fund. The facilities of BERNET are limited to only BUET and Dhaka University (Khan 2001).

Research and Development

Research and Development in the ICT sector is practically absent in Bangladesh. Currently, some educational institutions including Dhaka University, BUET, East West University and BRAC University have initiated research programmes in ICT related fields. These include machine learning, pattern recognition, speech recognition, automatic translation, computational algorithm, VLSI and 3-D vision. BRAC University conducts research in Bangla language computing, particularly on optical character recognition, text to speech application. Some government organisations including BANSDOC, BERNET, URC are also conducting research on IT development. Social R&D for ICT applications is conducted by D.Net, a non-government research institution.

Bangladesh National Scientific and Technical Documentation Centre (BANSDOC) was established in 1972 as a unit of Bangladesh Council of Scientific and Industrial Research (BCSIR). In 1987, BANSDOC and National Science Library (NSL) were amalgamated and the newly created organisation was renamed as BANSDOC owing the status of a premier national organisation and apex body in the country with the recommendation of the National Science and Technology Policy envisaged in 1987. According to the mandatory role and responsibility, BANSDOC deals with library, documentation and information services, products and systems in the field of information science, information and communication technology. BANSDOC houses the National Science Library (BANSDOC Library) that acts as a major information resource centre in the country in the field of Science and ICT. It has the finest collections in Information Science and Information and Communication Technology and a strong reference collection in general S&T aspects. It holds over about 19,000 books, about 425 periodical titles, both local and foreign, in the field of Science and ICT. A significant number of these foreign periodicals are received in electronic form in CD-ROMs. BANSDOC has set up an Electronic/Digital Library Division with facilities to access information from CD-ROMs. To support its ICT services, BANSDOC has set up an ICT based Cyber Service Centre which is well-equipped with the computer and online broadband connected networking facilities to ensure allout high quality cyber services to the users.

BANSDOC works closely with similar counterpart institutions in the countries over the world to bring about global information exchange. BANSDOC is associated with the activities of International Federation for Information and Documentation (FID), International Federation of Library Associations (IFLA), Commonwealth Library Associations (COMLA), SAARC Documentation Centre

(SDC), European Patent Office (EPO), European Commission (EC), UNESCO, ISESCO, etc.

The University Resources Centre (URC) and Bangladesh Education and Research Network (BERNET) were established for better coordination and cooperation between the universities and the University Grants Commission of Bangladesh. This has paved the way for our students, teachers, officers and researchers to enter into the world-wide information technology network. UGC can play a very important role in building up an online library or a portal to have access to the world class journals for research purposes. These journals usually are very expensive for subscription and sometimes not possible for a single university to become its member. As Bangladesh is lacking a lot behind in the field of research and as the universities do not share their research topics or outcomes, duplicity has become a common problem.

UGC can act as a coordinator for the universities by hosting the outcomes of different researches in their dynamic website. While boosting up the field of local researches, UGC can subscribe to the world leading journals and make the universities under it members so that they could have the access to these journals as well. UGC can also host in their website where the hard copies of the original local journals could be found, if not allowed to give out the full text of the research.

BERNET can act as a centrally controlling body for the knowledge share of the universities. It would have discussion with the universities having certain facilities to be shared with others so that others could also take the advantage rather than starting from the scratch. BERNET would also keep its role for providing internet connection for those in need of it.

4.3.3.3 Digital Government

Building Sound Legal and Policy Infrastructure of the NIKS

The foundation of national information and knowledge system (NIKS) is laid in the new ICT policy 2009. The policy framework for ICT and development is presented in Section 3.2.1. The section identified that while the broadband policy is already in place, there is a need for formulation of universal access policy for ensuring equity in ICT-based growth and development. Now, this section presents an ICT-friendly legal framework for the twenty-first century e-business based economy, which should encompass the following documents:

1. Contract Act 1872
2. Evidence Act 1872
3. Penal Code 1860

4. Patents and Designs Act 1911
5. Official Secrecy Act 1923
6. Consumers' Right Protection Act 2009
7. Labour Code 2006
8. Trade Marks Act 1999
9. Industrial Disputes Act 1947
10. Negotiable Instruments Act 1881
11. Bangladesh Bank Order 1972
12. Foreign Exchange Regulation (Amendment) Ordinance 1976
13. Money Laundering Prevention Act 2002
14. Income Tax Ordinance 1984

The International Long Distance Telecommunications Services Policy was declared in 2007 to bring discipline in the VOIP business. However, VOIP did not stop due to the high price differential between international and local call termination charge. The control over VOIP business in few hands could not improve the situation for citizens in terms of calling abroad and receiving call form abroad at a cheaper rate. The government is planning now to offer more number of licenses in this case and introduce licensing for IP telephony, which yet to bring any visible change in the long distance call scenario.

It is also felt that a technology convergence policy is needed to deal with multiple scopes for connectivity and hybrid ICT devices. The age old wireless act and telegraph act also need revamp to fit the needs of the twenty-first century.

E-Administration

The time-consuming business process in government agencies not only slow down the decision making process, it also adversely affects the productivity of the national economy as a whole. Organisations suffer from delay, as a result business organisations often face set back in the market competition. ICT can dramatically improve inter-agency coordination and increase efficieny within the agencies. Government-wide e-mail can provide rapid communications among individuals and groups, break down barriers to information flows between and within agencies, allow better management of complex interagency projects, and permit more communication between government officials and the public.

E-administration is important for improving in the decision making process of the government. Under the SICT programme 51 projects were undertaken. A few projects were related to network building among various government agencies. Now

more than 50 per cent ministries have their own Local Area Network (LAN). They are connected to Internet via dial up connection or broadband connection. Some ministries have also connected their zonal offices to LAN and the Internet. For example, Ministry of Primary and Mass Education has 30 computers in the ministry and 100 computers in primary education office, which are LAN connected. In Primary Education Ministry, 6 divisional offices and 16 district offices are connected with WAN through a central server.

SICT initiated 55 projects in different sectors. These projects were taken up from 14 different sectors which are: labour and employment, tourism, power energy and mineral resources, others, education, rural development, water resources, communication, industries, social welfare, agriculture, physical planning, law enforcement and security and public administration. Among these, the highest number of projects has been initiated for Public Administration.

The finance division of the Ministry of Finance developed customised software for budget planning, sensitivity and impact analysis, financial projections, and preparation of various reports. In addition, the Finance Division created software to facilitate interface between the development and revenue budgets. The Bangladesh Bureau of Educational Information and Statistics (BANBEIS), the statistical wing of the Ministry of Education, created Geographic Information System (GIS) map-based software that provides information on density of academic institutions in particular regions, individual institution-level data, and other useful educational statistics. The website of the Planning Commission has a useful searchable database of all annual development programme (ADP) projects undertaken in the last three years. The Commission has also established an intranet whose features include: file-sharing facilities through a Local Area Network (LAN), video conferencing, an electronic notice board, a digital library that stores policies, minutes of meetings, and other useful documents in searchable format, ADP database facilities, and application software for tracking the movement of files.

SICT programme was the largest of all programmes of e-Governance financed by the government. The experience of designing and implementation of the sub-projects was helpful in undertaking "quick-win" projects for e-governance.

Access to Government Information

Information is the currency of democracy. Government agencies are among the most prolific collectors and generators of information that is useful and valuable to citizens and business. Improvement of the nation's information infrastructure provides a tremendous opportunity to improve the delivery of government information to the taxpayers who paid for its collection and to provide it equitably,

at a fair price, as efficiently as possible. The Right to Information Act 2009 creates a binding framework for all government agencies to disclose all information except a few exceptions. The government should improve every step of the process of information collection, manipulation, and dissemination. The government should fund research programmes that will improve the software used for browsing, searching, describing, organising, and managing information.

The citizens' right to information should not be confined within the premise of access to information only for business needs, the citizens should also know how their money paid to government as tax and levies are spent. The ICT brings huge opportunity to improve transparency of government expenditure and deals within country and also cross-borders transactions. The government is the largest single buyer of different products. The government should play a key role in developing emerging markets for information technology by adopting ICT based transactions.

E–Citizen Service

Both government and non-government institutions offer online services, which range from information services to e-commerce. The government's SICT programme initiated and in some cases completed over 40 e-governance projects of varying sizes across many government agencies. The SICT programme ended in 2006.

One of the early successful e-government projects is the innovative Ministry of Religious Affairs website (www.bdhajjinfo.org), which provides information-based services to pilgrims, their relatives and friends, agents and government officials. The interactive website, which was launched in 2002, can be used for searching information about individual pilgrims, including their current location and status, for sending and receiving messages from individual pilgrims, and for accessing various information regarding rules and regulations. Another successful e-government project is the Rajshahi City Corporation's (RCC) Electronic Birth Registration System (EBRS) which provides citizens with a unique identity card that they can use for various services, such as education and health care. Since the card helps them get certain social services and benefits, citizens are now encouraged to register births, which was previously considered by many to be a worthless hassle. The electronic ID is used for immunisation purposes and also for getting admission to government primary schools in Rajshahi. The EBRS helps to keep track of each child registered through the system, starting from immunisation requirements to school enrolment status.

Another laudable e-government initiative is the publication of the salary status of school teachers (http://www.dshe.gov.bd/search.php). School teachers can now

check online whether their salary has been sent to the bank by the Directorate of Secondary and Higher Secondary Education.

As part of efforts to ensure free and fair national elections, the caretaker government developed a new voter list that also included photographs and finger prints. This was a response to the Election Commission's findings that there were 12.2 million fake voters in the old voter list.[1] The new voter list of some 80 million voters was prepared over 18 months by the Bangladesh Army with the support of UNDP, using 8,000 laptop PCs. This was the largest ICT project in the country with a successful accomplishment with fully national level expertise (Raihan and Habib 2007).

4.3.3.4 E-Business

Online Transaction and Payment Infrastructure

The ICT Act 2006 was long standing demand of Bangladeshi business community and citizens. The Act was placed to the Cabinet in 2002 and dust piled upon it for four years. At the very fag end of the law was enacted. After the enactment, it again was implemented for another three years. Bangladesh remained outside of the e-commerce due to failure in implementation of the Act.

The new government acted upon it and Bangladesh Bank allowed e-payment through Internet using credit cards. According to the law, digital signature will be acceptable for transaction and as evidence. However, for operationalisation of the law, a public key infrastructure authority needs to be formed.

Bangladesh's export earnings would enhance, through online trading system, not only for traditional products, but also for new products as well as services. The online payment system would facilitate small businesses to participate in global trading system. The IT-enabled services (ITES) would also boost up if online payment system is in place. Domestic business would also boost up through online payment system, a number of new financial products would ease the business for the large trading houses. In the time of global recession, the domestic trade boost would play a positive role.

Promotion of E-business and E-commerce

Due to lack of e-payment the potential of e-business and e-commerce remained untapped. Limited number of initiatives although survived through third party payment system located abroad. The lack of e-payment infrastructure deprived SMEs to harvest the benefit of e-commerce.

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[1] http://www.bangladeshnews.com.bd/2008/06/01/voters-number-to-fall-by-1cr/

The software export stood at US$ 2.5 million in 2000. This figure reached US$ 35 million in 2009. However, this does not reflect the actual potential of Bangladesh. In ICT Policy 2002, a US$275 billion market size for software was projected. However, low cost and low skill segment is only 20 per cent of this figure. Considering the cost portion of this 20 per cent and average 10 per cent growth rate of the market annually, the market size forecast is between 20 and 30 billion US$. For such a market size there are at least 50 developing countries, which are fighting for. So, a reasonable potential market share for Bangladesh may be around US$ 500 million. However, in a competitive environment, the mere existence of a market does not inevitably translate into a productive share for an aspirant. If we accept the hypothesis that we have a "comparative advantage" in our "intellectual" abilities, it is a "perceived advantage;" we need to transform it into marketable finished products that is conscious painstaking process to develop skills.

Export of software services, the model followed by India–the most successful producer–is beset by various constraints for Bangladesh. The opportunity to export software packages has been far more limited. Production of packages for the domestic market is difficult, given the domination of imported packages. Selling software services to the domestic market is the choice of most software enterprises, but it typically represents a survival strategy more than a development strategy. The potential area of concentration should be determined through a rigorous research on the following areas:

- Remote network consulting and management
- Finance and accounting
- HR services
- Software
- Website services
- Data search, integration and analysis
- Engineering and graphic design
- Customer interaction
- Remote education
- Animation
- Translation, transcription and localisation.

The multimedia data entry like medical data transcription, engineering data entry (designing of maps, architectural design, construction design, multimedia authoring, etc.) as a new industry has some prospects for Bangladesh.

Automation of Financial Industry

Financial industry in Bangladesh is always the leader in terms of adopting new technology for improvement of business process re-engineering and offering new services, to the consumers. Bangladesh's financial sector offers various ICT-based services, including ATM, POS, Internet banking, etc. The green signal to e-payment will allow banks to offer online transaction as well in the near future.

The role of central bank is crucial in ICT integration the financial sector. Until recent time, the central bank was hesitant in modernising its own business process and introducing ACH, which is the prerequisite for development of ICT based banking products. CIB data collection often is time consuming, which hinders efficient credit decision by banks. Bangladesh Bank has taken initiative to modernise CIB and introduce ACH. It already introduced MICR for quick cheque clearing.

Financing ICT Industry

Although ICT industry has a huge potential both in local market and international market, the sector is suffering from lack of financing. The major problem is a unique nature of input structure of the ICT industry. The main resource input for the ICT industry is human resources, whereas fixed cost component is comparatively low. As a result, the financial institutions fail to address this specificity of the industry and provide financial support at desired level. The NCBs, PCBs and NBFIs are now focusing more and more on the ICT sector and have opened advisory cells for prospective investors. All NCBs lowered the interest rate for ICT sector.

Worldwide, venture capital is the most appropriate finance for the startup of ICT business. This form of finance is not available yet in Bangladesh. The ICT industry requires huge working capital for providing salary of ICT professionals for a prolonged time due to the nature of product life cycle. As the industry structure is different than garments and other industry, the financial products to support ICT industry should be tailor made. Bangladesh Bank set up EEF for software industry in 2000. This positive step did not bring any fruitful result due to the adverse terms and conditions. Service delivery by central bank also probably created moral hazard problem.

Enhancing Competitiveness of Business through Business Process Re-engineering

In Bangladesh, the major sectors that possess the ICT resources are government, banks, commercial organisations, NGOs, and educational and training institutions. The major portion of the resources is concentrated in commercial sector. The

banking institutions are the largest user of licensed software; the number is almost three times higher than in government organisations. It is generally expected that government would be the largest user of licensed software. In the creation of local software market and development of a vibrant local ICT industry, the government, as the buyer, can play a significant role. In the use of customised software, the government owns the leading place, which is very much encouraging. ICT utilisation in the public and private sectors is concentrated mainly in office automation. ICT penetration in Bangladesh is very much concentrated in Dhaka city. Dhaka comprises 73 per cent of total ICT utilisation in Bangladesh. This utilisation ratio is an indicator of uneven development picture of the country.

Although the ICT penetration is concentrated in business sector compared to other sectors of the economy, the use of ICT in the business sector with an absolute measurement is still limited. The average PC–employee ratio in the businesses is only 1.27 considering the situation only in Dhaka city. Computer usage pattern in businesses is concentrated on word processing and e-mail. Apart from accounting purposes, computers are not used in a major way. Only 29 per cent of businesses, which have some computer use, use customised software.

ICT-based Services for MSMEs

In the area of small and micro enterprise development, information needs relating to *supply*, such as the availability and sources of finance, labour, technology, raw materials, and other enterprise inputs are important. Small and micro enterprise needs information about *demand*, including market opportunities and characteristics of this market demand like location, price, size, and quality. It also needs information about *other environmental factors* like competitors, laws, etc. it is almost impossible to generate such information by the poor. "New communications technologies are revolutionising access to information–but the revolution is likely to reach everyone but the poor". Such information can be comparatively effectively supplied through Internet based technology, where same information can be shared by as many as small and micro enterprises throughout the country.

Unfortunately, despite efforts from various agencies, MSMEs are yet to brace the benefit of ICTs to enhancing business opportunities. SME Foundation established information centres, which are malfunctioning. SEDF tried to improve business advisory service with limited success. Recently, BTN initiated ICT integration for MSMEs through telecentres; however, it is too early to comment about the effectiveness of this initiative.

4.3.3.5 Institutional and Financial Framework of Digital Bangladesh Agenda

Intuitional Framework for Implementation of Digital Bangladesh Agenda

In 1997 the government formed an ICT Task Force under the Prime Minister's Office (PMO) to foster mainstreaming ICT in development process. A Support to the ICT Task Force (SICT) programme was launched in 2001 to identify and implement e-government projects. The SICT Programme was hosted in the Planning Division, Ministry of Planning. Five years later, in May 2006, an e-Governance Cell under the Prime Minister's office was formed. In each ministry, a mid-level government official (at the level of Joint Secretary or Additional Secretary) was appointed to act as the ICT focal-point to coordinate e-governance activities and priorities within the ministry.

Although Ministry of Science and Technology was renamed as Ministry of Science and ICT in 2001, the mandate of the ministry is not changed during the last 8 years. As a result, the Ministry could not play visible role in the promotion of ICT sector in the country. Basically, this ministry should be primarily responsible for mainstreaming ICTs in economic growth and development.

The Bangladesh Computer Council (BCC) under the Ministry of Science and ICT is the main institution for promoting ICTs. It provides ICT training to government officials and citizens, incubates software companies, provides advisory support to government institutions regarding ICT related project implementation, provides connectivity to ISPs, and works for standardisation through such projects as the development of a local language keyboard.

The Ministry of Post and Telecommunication is responsible for building and maintaining telecommunication infrastructure. The Ministry of Education develops the curriculum for ICT education and spearheads the computerisation of schools.

The Bangladesh Telecommunication Regulatory Commission (BTRC) is the licensing authority and regulates telecom service providers, while the Ministry of Law, Justice and Parliamentary Affairs reviews ICT–related laws.

In the private sector, the Bangladesh Computer Society (BCS) and Bangladesh Association for Software and Information Services (BASIS) play a key role in promoting the ICT industry. The ISP association, Bangladesh also facilitates the growth of ICT in the country. Both BCS and BASIS organise annual exposition of software and applications and hardware. Bangladesh Computer Society played a key role in the elimination of import duties on computers in the early 1990s, which facilitated PC penetration in the country.

Public and private universities and institutes lead human resource development by offering advanced courses on ICTs. However, for various reasons ICT economy failed to attract fewer talented young people for job; as a result, foreign experts fill in the vacuum on the various nodes of value chain of ICT products and services. Quality of intake in tertiary education fell in general due to poor quality of produce from primary and secondary education. Furthermore, fewer students take science and mathematics in schools and colleges, which is a very dangerous trend. ICT education and e-learning is absent both in general schools and so called "English medium" schools. The pervasive spread of "tuition" business is the main culprit why education does not take place within classrooms. Poor compensation, involvement of teachers in numerous government tasks, inadequate teachers' training programme, poor quality of text book, corruption, etc. hamper building quality human resource. Lack of attention to rural-urban divide of facilities for teachers and students creates a sub-optimal army of human resources, which cannot compete for global job market.

Several institutions work in the area of ICT for poverty alleviation. *Amader Gram* and D.Net (Development Research Network) are two prominent institutions working for ICTs in the rural areas. D.Net is aiming to bring ICTs to the doorstep of poor people in the rural areas. It has developed a comprehensive volume of local language content on livelihood, making the Internet relevant to the common people (www.jeeon.com.bd).

ICT related endeavours are focused only on ICT economy and ICT education in tertiary level until recently. To bridge digital divide and make an inclusive use of ICTs for development, a movement for building an inclusive ICT-based information and knowledge system for all citizens has been gathering momentum since 2006. The Bangladesh Telecentre Network (BTN), a coalition of organisations emerged in 2007, is spearheading the movement to promote the telecentres in Bangladesh. It launched Mission 2011 (www.mission2011.net.bd), a movement to build a sustainable information and knowledge system for the poor and the marginalised by 2011, the 40th anniversary of Bangladesh. As of December 2009, 2,335 telecentres have been established in Bangladesh. Mission 2011 has attracted the support of the government and the international community.

Lack of Coordination

A number of government entities are involved in the process of policy making, monitoring, capacity building and implementing ICT related activities, very seldom interlinked and coordinated. However, for implementation of a master plan or road

map for making Bangladesh ICT–based knowledge society, coordination is a prerequisite to building Digital Bangladesh.

There are currently at least two ministries–Ministry of Post and Telecommunications (MOPT) and Ministry of Information (MoI)–which are involved in dealing with ICT–related infrastructure along with Bangladesh Telecommunications Regulatory Commission (BTRC). The MoPT deals with telecommunications including Internet and MoI deals with broadcasting, both radio and television. However, the technology trends dictate convergence of regulation of these two technologies. For example, IPTV (Internet Protocol TV) or IP radio is a reality across the world, in Bangladesh, under the current regulatory regime, would fall under the jurisdiction of both the Ministries and BTRC.

Although there is a Ministry of Science and ICT (MoSICT), its activities and terms of references do not explicitly include ICT as a whole. The Ministry of Science was just renamed in 2002 and did not get any attention during the Khaleda regime. Currently, the Ministry, through its wing, Bangladesh Computer Council (BCC), works for promoting ICT business sector and has some activities related to capacity building of the government officials. The only ICT incubator in the country located in *Karwan Bazaar* is set and managed by the BCC. The government has recently enacted High-Tech Park Authority Act 2010. It is hoped that establishment of attempt to High Tech Park (HTP) since last 12 years in *Kaliakoir* will be finally materialised. The ICT infrastructure, e-governance and ICT for development is beyond the scope of the Ministry. On the other hand, the Ministry of Commerce is also trying to promote ICT business through ICT Business Promotion Council (IBPC).

For taking care of e-governance related activities, there are two distinct government entities. The first entity is e-government cell, created in the Prime Minister's Office (PMO). The e-government cell is implementing "Access to Information" programme. Under the programme each Ministry has an ICT focal point for taking care of e-government related activities. The second entity is Support to ICT Task Force Project (SICT) under the Ministry of Planning. The creation of SICT is a result of tug of war between MoSICT and MoP, and MoP won the battle. Although the SICT was under the ICT Taskforce, the SICT was not bound to report to the Taskforce. Moreover, during the last 7 years only two meetings were held, which also shows the level of priority to build a knowledge-based society by 2006.

First of all, there was no need to create SICT under the MoP; it would be conveniently handled by the MoSICT's BCC. However, it did not happen as it was perceived that BCC did not have required capacity to do so. The creation of e-

government cell under the PMO took place also for the same reason. Additionally, it was thought that if the e-governance related activities come under direct supervision of the PMO, the e-governance implementation would be faster.

ICT for Development was totally not in the focus of the previous governments. Although the first PRSP planned to create telecentre in each Upazilla by 2006, not a single one was created by the government. D.Net established first telecentre in a Union Parishad in 2005, subsequently another two were created by UNDP in 2007. Solving a set of other important issues including unicode for Bangla computing, interoperability and connectivity for the rural areas remained out of focus. Recently, Ministry of Agriculture (MoA) and Ministry of Local Government and Rural Development (MoLGRD) have taken initiative to build telecentres in *Union Parishads* with support from UNDP and technical assistance of Bangladesh Telecentre network (BTN). Ministry of Education (MoE) distributed 10,000 computers in secondary schools without any holistic approach, and the result was a disaster; not a single student could benefit from those computers—either they remained packed in the rooms of headmasters, or they were used by a few teachers.

As a whole, there is a total chaos in ICT sector in the country, be it for ICT for development, for e-governance, education and health. Only ICT business sector received some coordinated support from MoSCIT and MoC. The institutions and agencies involved in ICT sector are presented in Figure 1.

Resource Allocation and Fiscal Measures

It is very difficult to identify allocation for ICTs in the national budget for two reasons. The budget for Ministry of Science and ICT is only a part of the whole allocation for the ICTs. Most of the ministries have some ICT component in their allocation.

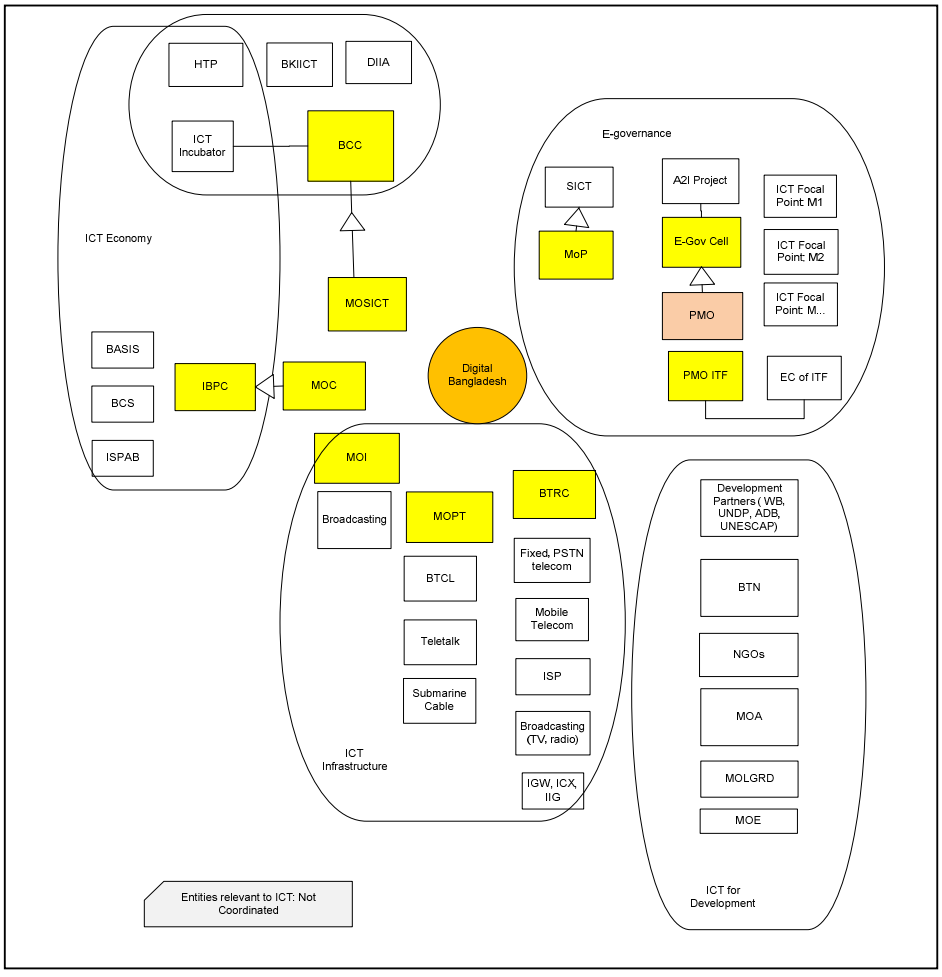
The problem with ICT related financial allocation is that it addresses only one part of the ICT-based project–the hardware. Because it is visible. However, other two components are generally ignored–software and human ware. It is considered as "invisible" expenditure, thus attention is less. If one analyses the failures in ICT projects both in the public and private sector, one can see that improper budget allocation for the later two components was the major reason. In 2005-08, the demand for allocation of 2 per cent of ADP for ICT was popular. Interestingly, it was possible to prove by the bureaucracy that the government allocates already 2 per cent of ADP for the ICT sector, which was essentially the cost of hardware only for various ministries and agencies.

It is time to layout a roadmap for Digital Bangladesh up to the year 2021 and estimate how much financial resources is required for realising that roadmap. After that, homework should be done about the sources of resources and strategy for their mobilisation.

SWOT Analysis

A simple matrix on SWOT analysis is presented below, which can be useful for crafting the Sixth Five Year Plan.

Figure 4.1: Current Institutional Architecture Related to ICT



SWOT ANALYSIS

Strength	Weakness
• Vision • Commitment at the highest level • Given priority to PPP with a new framework • Good number of people within the government with proper understanding of the need • Budget allocation	• Lack of cohesion • Lack of Clear Roadmap • Lack of adequate financial resources • Lack of initiative for institutional reform essential for accomplishment of Mission 2021. • Lack of appropriate human resources
Opportunity	**Threats**
• Scope for tapping of enthusiasm at grassroots level • Unleash potential of ICTs for poverty reduction and growth	• Politicisation • Mismatch between promise and actual action • Lack of political consensus needed for continuation of Digital Bangladesh Agenda even any other party comes into power

4.3.4 Options for Development in ICTs

4.3.4.1 Approach towards ICT for Development

In the long run, basic research in ICTs should be the target for the country. However, in the short run, particularly in the Sixth Five Year Plan, the approach should be an effective integration of ICTs in the daily life of citizens, operations of businesses and functioning of government and democratic institutions. Thus, effective application of ICTs is the focus of the Sixth Five Year Plan. This approach does not mean blind replication of ICT integration strategy applied elsewhere and making Bangladesh only a market for ICT hardware of multinational companies. The difference between ICTs and other technologies is that it creates scope for inclusive access to technology and is carefully designed.

4.3.4.2 A Comprehensive Master Plan

The Sixth Five Year Plan should be designed as a part of a Master Plan which can be developed for 11 years period (FY2010-FY2021). The Master Plan should be developed on the basis of existing works done by the ICT stakeholders in the country. The ICT Policy 2009 should be taken as a starting point for the

development of the Master Plan. Huge energy was given in developing the revised ICT policy by stakeholders from all four segments of Digital Bangladesh concept. The revised policy is also not a product from the vacuum. It captures works and recommendations from people of all walks of life during the last 20 years. The Master Plan should be designed in a way so that the Plan is incorporated into five-year planning process and annual national budget preparation process. Otherwise, the Master Plan will remain in paper only, which happened with the PRSP plans related to ICTs. The Digital Bangladesh Task Force (ITF) should be involved in the process of development of the Master Plan.

4.3.5 Goals, Policies, Targets and Strategies for the Sixth Five Year Plan

4.3.5.1 Goals

The following eight national priorities have been identified for reaching the target of vision 2021–a digital Bangladesh free from poverty:

- Food security
- Energy security: fuel, electricity and energy
- Population control: public health and family planning
- Employment creation
- Converting human resources into human capital
- Mitigation and adaption with impact of climate change: flood cntrol, water resources and coastal area
- Preservation of natural resources and prevention of environmental pollution
- Inclusive development (gender sensitive, inclusion of marginalised people, disabled population, ethnic minority).

Basic principles for ensuring success of Digital Bangladesh Agenda are:

1. Leadership
2. Vision
3. Ownership of the agenda
4. Political consensus
5. Availability of financial resources
6. Availability of human resources.

The availability of resources is a relative measurement that is why it has been put later on the list. A visionary leadership with a public mandate and domestic ownership of the agenda can mobilise and optimise the resources for implementation of the action agenda.

4.3.5.2 Research based Policies

National ICT Policy is the key document for initiating implementation of Digital Bangladesh Agenda. The Policy Agenda should be part of formulation of Sixth Five Year Plan. The Policy framework should include:

a. National ICT Policy 2009
b. Universal Access Policy (to be formulated)
c. Broadband Policy 2010
d. Convergence Policy (to be formulated)
e. National Telecommunications Policy (to be revised)
f. ICT Act 2006
g. Right to Information Act 2009
h. Privacy and Information Protection Act (to be enacted).

All policies should be formulated based on research and wide consultation and participation of people for all walks of life.

Items of Sixth Five Year Plan

Item	Description	Timeline	Accountable Agency (ies)
0.1	Formulation of Universal Access Policy	1st Year	MoSICT
0.2	Privacy and Information Protection Act	2nd year	MoSICT
0.3	Formulation of Convergence Policy	2nd year	MoPT
0.4	Revision of National Telecommunications Policy	1st year	MoPT
0.5	Revision of Right to Information Act 2009	2nd year	MoI
0.6	Revision of ICT Act, 2006	2nd year	MoSICT
0.7	Regular countrywide survey on ICT development and assessment of progress	Every two years	MoSICT

Time Line

The time before formulation and finalisation of Sixth Five Year Plan and first year of the Plan should be used for setting up a roadmap and complete policy framework considering the abovementioned policies.

4.3.5.3 Targets and Strategies Connecting Citizens

Item	Description	Timeline	Accountable Agency (ies)
1. Building an inclusive information and knowledge system: To ensure that by 2012, all Bangladeshis have access within their community to ICT			
1.1	Building a national partnership to establish an inclusive system of information and knowledge for all citizens through telecentres and other forms of public access, with special emphasis on marginaliSed groups and disability, which will be delivered using a rich combination of different business models, including - Entrepreneur/Value adding sector - Voluntary sector - Schools computer labs opened up to the community out of school hours - Government infrastructure (e.g. many post offices having been enhanced as e-post/Cyber Post/e-service hub for government/public service (e.g. direct foreign remittance, money transfer, bill payment), local government institutions have big establishments, public libraries are underutilised) - Through creation of information access through mobile telephone and community radio All the venues will be accessible to all citizens [See Annex A.4]	Over the period of five years	Multiple agencies

Item	Description	Timeline	Accountable Agency (ies)
1.2	Deployment free-of-cost broadband Internet connectivity across the country for offering e-learning, e-health and e-government services to the citizens. [See Annex A.5]	2nd year	Public-private partnership
1.3	Launch Citizens Helpdesk in public organisations. The host is not mandated to be physically located at the relevant public organisation. Telecom operators will have to provide low-toll/toll-free numbers for these call centres.	2nd year	Relevant government agencies
1.4	Expand the voter ID to National ID platform to be used for all citizens' services such as birth registration, passport, bank account, school enrollment, healthcare, vaccination,VGF/VGD and other social safety net programmes. [see details in Annex A.1]	3rd year	Cabinet
1.5	Deployment of Electronic Public Grants (safety net benefits) Delivery System	2nd year	Multiple agencies
1.6	Launching of a development TV Channel	3rd year	Public-private partnership
2. ICT for Equity			
2.1	Launching of multi-year localisation programme which includes research on Bangla language computing and Bangla content development.	1st year	Public-private partnership
2.2	Launching of a programme and system of protection of children from harmful content.	1st year	Ministry of Home Affairs
2.3	Deployment of public key custodian for ensuring network security. This is related to encryption standard and security related laws.	1st year	MoSICT, BTRC
2.4	Deployment of system for protection of information, data and programme from hacking, fraud and damage and introducing/spreading computer viruses.	2nd year	Ministry of Home Affairs

Item	Description	Timeline	Accountable Agency (ies)
2.5	Deployment of a robust, country-wide system of market information with daily price update of all markets in the country [See detail in Annex A.2]	Gradually over the five years	Ministry of Food and Disaster Management, MoA
2.6	Programme of digitisation of land record	Gradually over the five years	Ministry of Land
2.7	Launching of employment generation scheme for rural youth: info-lady, telecentre workers, BPO	Gradually over the five years	Public-private partnership
3. E-Participation			
3.1	Deployment of a system of public grievances and redressal and publication of results of those grievances through electronic means .	2nd year	Public-private partnership

Human Resource Development

Item	Description	Timeline	Accountable Agency (ies)
1. Building E-learning Infrastructure: One school one computer lab, smart classroom with e-learning facilities [see Annex A.6]			
4.1	Launch programme for ICT education in each secondary school which includes establishment of computer lab, teachers training, technical support system, up-to-date curriculum, community access for income generation	Over the five years	MoE, MoSICT, Public-private partnership
	Launch programme of e-learning which includes providing free broadband access to each school	2nd year	MoE
	Install computers, LAN, reliable high-speed Internet connectivity for tertiary educational institutions	1st year	UGC

Item	Description	Timeline	Accountable Agency (ies)
2. ICT Education			
	Redesign the ICT literacy curriculum for secondary and higher secondary syllabus at regular intervals based on the needs of an inclusive and cost-effective knowledge society.	1st year	NCTB
	Initiate ICT Professional Skill Assessment and Enhancement Programme (IPSAEP).	1st year	MoE, UGC
	Develop labour market information system to assess domestic and global labour demands for education planning.	1st year	MoP, MoE
	Periodic ranking of IT programmes of private and public universities by a competent body (including academia and industry) approved by UGC.	1st year	UGC
	Introduce and allocate fund for industry-ready applied research projects with mandatory industry and academia collaboration using government grant facilities.	1st year	MoE
	Ensure ICT literacy evaluation as part of public service entrance exams.	1st year	PSC
	Launch programme to convert all libraries into digital library.	3rd year	MoC
	Organise regular national, regional and international conferences.	2nd year	MoE, MoSICT
	Introduce funding for journal publications by academic and research institutions.	2nd year	MoE
3. ICT-based Education			
	Introduce ECDP for all poor rural children in regular and community schools for at least six months using multimedia tools	2nd year	MoE
	Launch a programme of ICT-based learning: Install computers, LAN, reliable Internet connectivity with reasonable speed and multimedia teacher training content for all secondary teachers' training colleges; with a special focus on Mathematics, Science and English	1st year	MoE

Item	Description	Timeline	Accountable Agency (ies)
	Launch a programme of ICT-based learning: Install computers, LAN, reliable Internet connectivity with reasonable speed and multimedia teacher training content for all primary teachers' training institutes, like PTIs, URCs and NAPE.	3rd year	MoPE
	Launch a programme of ICT-based learning: Establish smart classroom with flat screen large television and laptop for supplementing learning in the classroom with appropriate multimedia content.	Over the five years	MoE
	Organise regular national (including at grassroots level), regional, and international competitions on ICT related topics and support participation of national teams in international events.	2nd year	MoE
	Create central repository for e-Learning content for teacher training and for all students.	2nd year	MoE
	Provide Incentives for e-Learning content development.		
4. Vocational ICT Training			
	Install computers, LAN, reliable Internet connectivity with reasonable speed and multimedia educational content for TVET institutions.	2nd year	MTVEB
	Introduction of national certification examinations for different levels of ICT personnel/professionals.	2nd year	Multiple agencies
	Establishment of a central body for streamlining syllabus, evaluating eligibility of training instructors and for ranking of ICT training institutions.	2nd year	MoE
	Introduction of loan facilities for procurement of ICT equipment for government officials, students, teachers and working people.	1st year	MoF

Digital Government

Item	Description	Timeline	Accountable Agency (ies)
1. E-Administration			
8.1	Digitally publish all government. publications in Bangla using a standard encoding to guarantee document portability.	1st year	All government agencies
8.2	Mandate all public information to be made accessible through appropriate electronic means including SMS and other channels.	From 1st year over 5 years	All government agencies
8.3	Launching of online-data sharing and decision making system	3rd year	All government agencies
8.4	Create a national network for the government to connect the public organisations.	2nd year	All government agencies
8.5	Establish necessary policy framework and introduce IP telephony and video conferencing services in critical government offices.	1st year	All government agencies
8.6	Establish National Data Resource Centre to control and manage the public network and act as a system of national databases to store and supply national data	4th year	All government agencies, BBS, PPP
8.7.	Add a 50-mark examination (to the current 300-mark examination) for applied computer and Internet literacy for senior scale promotion examinations for cadre services.	2nd year	MoEst
8.8	Cease new stenotypist recruitment in the government. Convert all existing stenotypists to data entry operators through proper training.	1st year	All government agencies
8.9	Redesign ICT and e-Governance curriculum of government training academis with a distinct focus on change management and process re-engineering.	2nd year	MoEst, Cabinet, BPATC, PSC

Item	Description	Timeline	Accountable Agency (ies)
8.10	Deploy computer-based project planning and resource allocation system.	2nd year	MoP, MoF
8.11	Launch ICT Technical Clusters to cover all public sector organisations to be run by ICT professionals. Create ICT posts for this Cell. All ICT posts in the public sector should be declared technical posts. Create an ICT cadre in the long term.	2nd year	MoEst, Cabinet
2. E-Citizen Services			
9.1	Develop national web portal as a "one-stop shop" for delivering e-citizen services.	From 1st year over the 5 years	All government agencies
9.2	Enable payment of utility bills through mobile phones, banks, ATMs or other service centres from any location and at any time of the day.	From 1st year over two years	All relevant government agencies, PPP
9.3	Enable online status check of court cases	2nd year	MOL&PA, PPP
9.4	Enable electronic filing of GD and FIR	2nd year	MoHA, PPP
9.5	Introduce service to access public transport schedules, fares and ticket purchasing through the Internet and mobile phone.	1st year	MOC, PPP
9.6	Allow online registration and work permit for foreign investors.	2nd year	BOI
9.7	Introduce online tax filing for all citizens.	1st year	NBR
9.8	Introduce online application for licenses in business, vehicle registration, etc.	From 1st year over the 5 years	Multiple agencies
9.9	Introduce automation of all customs check points.	3rd year	NBR, Port Authorities, PPP
9.10	Automation of land record and registration system.	3rd year	MOLPA, PPP
9.11	Introduce online payment both for transaction within country and international.	2nd year	BB, PPP
9.12	Introduce online procurement system (in phases)	3rd year	All government agencies, PPP

E-Business

Item	Description	Timeline	Accountable Agency (ies)
1. Online Transaction and Payment Infrastructure			
10.1	Establish Digital Certifying Authority (DCA).	1st year	MoSICT, BCC
10.2	Develop capacity development programmes for the judiciary and the law enforcement agencies.	From 1st year over the 5 years	MoLPA
10.3	Launch legal reform to protect interest of stakeholders in e-commerce.	1st year	MoLPA
4. Promotion of e-business and commerce			
11.1	Establish an Authority/Body on ICT Industry development	1st year	MoC
11.2	Establishment of ICT Industry Development Fund	1st year	MoF
11.3	Establishment of Technology Park	1st year	MoSICT, BCC
11.4	Conduct research on global Human Resource needs vis-à-vis local capability to identify national focus	Every two years	MoE, MoC
11.5	Introduce free facilities for ICT industry/ICT for development agencies in TP for five years	3rd year	MoSICT, BCC
11.6	Conduct regular study on ICT economy	Every two years	MoC
11.7	Introduce of Venture capital Fund for ITES Industry	1st year	MoF
11.8	Arrange fairs, exhibitions and targeted workshops for local enterprises as well as road shows and other interactive programmes.	Every year	MoC
11.9	Implement ICT based model SMME (one for each category) at Dhaka and other divisional HQs.	1st year	SME Foundation, MoC, PPP
11.10	Create special promotional programme (by EPB, BMET, Probashi Ministry, and Foreign Labour wings, and Bangladesh Missions abroad) for high end overseas employment in IT.	1st year	MoC, MoFA

Item	Description	Timeline	Accountable Agency (ies)
11.11	Create strategic roadmap for Human Resources Development for the ICT industry (both home and abroad).	1st year	MoE, MoC
11.12	Encourage business process re-engineering for enhancing competitiveness of business		MoC, MoF
11.13	Develop agriculture, food and SMME related content in Bangla.	1st year	MoI, MoA, PPP
11.14	Develop network within communities to share indigenous knowledge and innovations related to pest management, crop preservation, etc.	1st year	MoI, MoA, PPP
11.15	Establish SME resource centre focused on agricultural needs spanning relevant supply chain in the local context.	1st year	MoI, MoA, PPP
11.16	Support the agricultural supply chain management system through business portals accessible through various electronic channels.	1st year	MoA, PPP
11.17	Provide training of extension workers and farmers on updated technologies, credit schemes, etc. using ICTs.	1st year	MoA, PPP
11.18	Utilise GIS based soil mapping system to analyse detailed data to provide information relating to crop suitability, land zoning, nutrient status and fertiliser dosage.	2nd year	MoA, SRDI, PPP
11.19	Provide access to m-banking for farmers and agro-businesses.	1st year	MoF, BB, telcos
11.20	Develop Internet and mobile-based trading platforms for agriculture produce for extended supply chain.	2nd year	MoC, MoA
11.21	Initiate a pilot project to promote sector based customised ERP.	1st year	MoC, PPP
11.22	Create and disseminate e-Learning resources on energy efficiency, ISO competencies, Lean Six Sigma, advanced production system, etc.	1st year	MoC, Industry associations
11.23	Implement ICT based automation and MIS model at division level.	2nd year	MoC, Industry associations, PPP

4.4 INSTITUTIONAL AND FINANCIAL FRAMEWORK OF DIGITAL BANGLADESH AGENDA

4.4.1 Building New Intuitional Framework for Implementation of Digital Bangladesh Agenda

Institutional restructuring is the key to realise the expectation of the citizens. A tentative outline for institutional restructuring is presented below.

a. **Creation of a "Digital Bangladesh Secretariat" under the Prime Minister's Office:** During the last tenure of *Awami League* Government (1996-2001) a National ICT Taskforce was formed to ensure accelerated ICT development in the country. Although the Taskforce was not abolished during the tenure of subsequent governments, the Taskforce remained dysfunctional. For undertaking a comprehensive plan and ensuring its smooth implementation, an executive wing of the Taskforce can be created. The executive wing may be titled as "Digital Bangladesh Secretariat" (DBS). The secretariat will have four distinctive wings in line with the conceptualisation of "Digital Bangladesh." The Bangladesh Computer Council (BCC) may be restructured and merged with the DBS. The activities related to ICT business promotion may be transferred to the Ministry of Commerce under ICT Business Promotion Council, which also may be renamed as "e-Business Cell."

b. **Single Point for ICT Infrastructure:** A strong Ministry of ICT may be the first step towards institutional reform. This Ministry will be the key Ministry for supporting the master plan through ensuring robust ICT infrastructure. The formation of a strong ICT Ministry may take place in the following manner:

i. To merge MOSICT and MOPT, because information and communication technology means telecommunications and Internet. The convergence of technology dictates that these two should be together.

ii. To take "Science" part out of MOSICT and merge with the Ministry of Education, which will take care of science and technology in general. The Ministry of Education, Science and Technology would be able to take care of science education and scientific innovations in general better, because there is a strong linkage between academia and scientific innovation. On the other hand, the "ICT", we are talking is more applied in the context of growth and socio-economic development.

iii. To take "Broadcasting" part out of the Ministry of Information and merge with the Ministry of ICT. Again, to tackle the convergence of technology one single authority would do better. This would avoid potential turf war among the ministries with the converged technology and services.

iv. To bring in BTRC under the jurisdiction of the Ministry of ICT. BTRC will also deal with the matters related to broadcasting.

c. **Single Point for all E-government Activities:** Being one of the four executive wings of the "Digital Bangladesh Secretariat," the existing *e-governance cell* may be renamed as *e-government cell* and will remain the focal point of all e-government related activities. The ICT focal points in all Ministries will be converted into "e-government focal point," which will be the coordinating point of all e-government related initiatives taken in each of the ministries and Digital Bangladesh Secretariat. The SICT under the Ministry of Planning should be abolished and all e-government related activities to be coordinated by e-government cell under the PMO.

d. **Creation of an "e-Citizen cell" under the PMO:** A new cell titled "e-Citizen cell" under the DBS will take care of access to ICTs by all citizens, particularly poor and marginalised population both in urban and rural areas. The Cell will coordinate with "E-Citizen Focal Points" in all line ministries, which will be created under this reform programme.

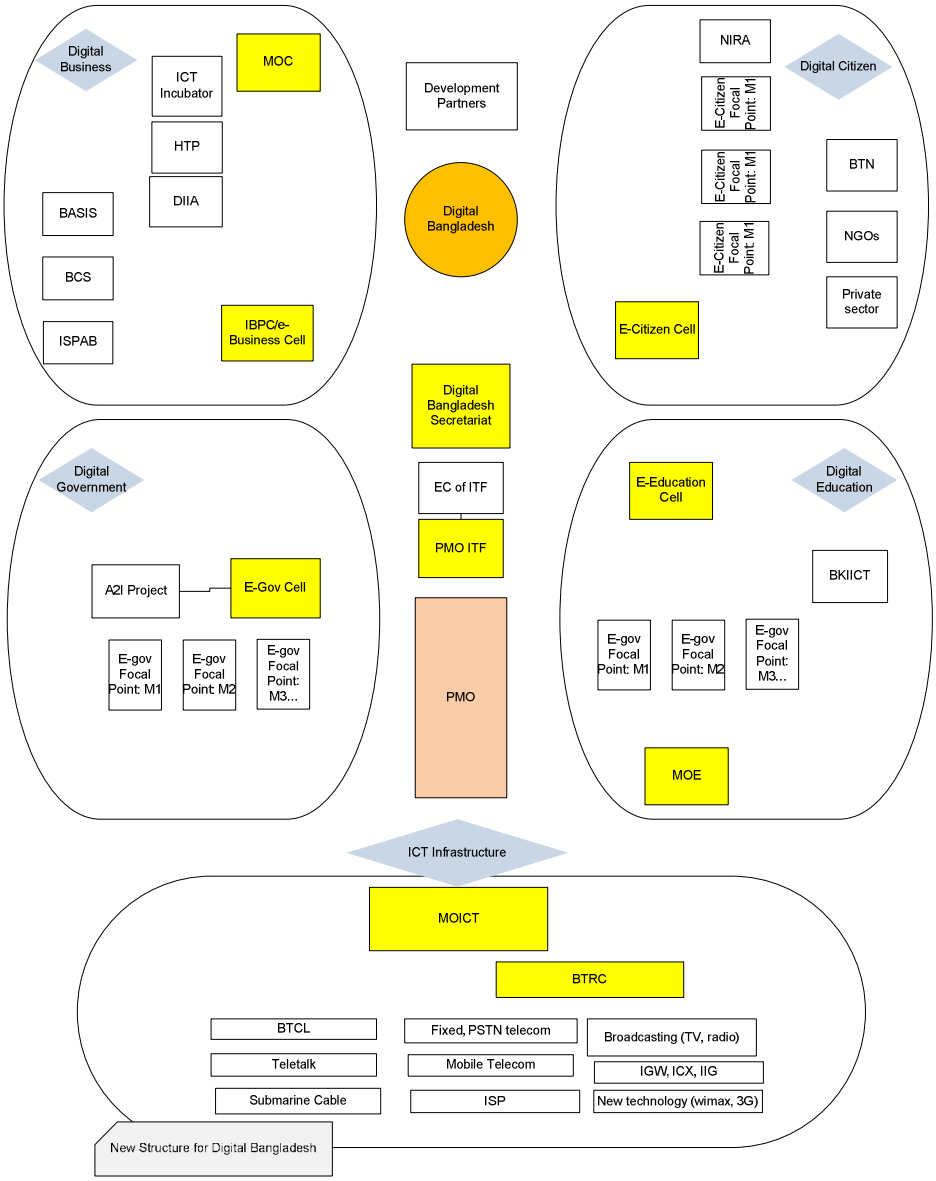
e. **Single Point for Coordinating ICT in Education:** Another new cell under the DBS can be created for coordinating mainstreaming ICTs in education system to be at par with the global demand for quality human resources. This cell will coordinate with focal points of the relevant ministries.

f. **Single Point for ICT Business Coordination:** The ICT Business Promotion Council can be converted into "E-Business Cell." The ICT Incubator and High-tech Park should go to Ministry of Commerce from BCC, may be under the IBPC. In this way, IBPC may find its role to promote private sector in a comprehensive manner.

The DBS will take regular guidance from the Digital Bangladesh Taskforce and place the proposals to the Cabinet of Ministers.

Figure 2 shows the new architecture of government machinery to implement Master Plan for Digital Bangladesh.

Figure 4.2: New Architecture for the Implementation of the Digital Bangladesh Master Plan



Source: Author's own.

4.4.2 Resource Allocation and Fiscal Measures

The ICT should not be considered just for export potential of software industry. There is no doubt about the importance of export potential at the advent of new threats to RMG sector, our major export earner, arising from new WTO regime after 2005. To achieve huge boom in ICT industry like in the RMG, the abovementioned action agenda should be followed with further consultation with the interest groups. However, for attaining long run benefit, a careful continuous integrated effort should be undertaken and it is not possible without proper financial and fiscal support. Understanding the constraints some re-allocation of resources in ADP is proposed. Besides, the government should actively seek foreign aid in promoting the ICT related development agenda. While flow of foreign aid is shrinking, Bangladesh should actively seek a portion of Digital Solidarity Fund, formed as a follow-up of WSIS. As a whole, a comprehensive exercise is required to assess the resource requirements and explore all possible sources: foreign aid, budget allocation in ADP, reallocation of revenue in education, surcharge, foreign loans, etc.

Some specific measures with time duration are mentioned below:

- Assess financial requirement for implementing the action agenda identified in the policy briefs and explore possible sources.
- Allocate enough resources for government institutions to pioneer business process reengineering.
- Create economic incentives for business for adopting ICT for medium and large firms.
- Attract more investment by allowing 100 per cent depreciation of ICT related investment.
- Create a special fund for supporting ICT research and development activities.
- Create a special fund of Tk. 500 million for giving low interest (6 per cent per annum) loans to teachers and students to be disbursed by commercial banks and to be subsidised by Bangladesh Bank.
- Support corporate initiatives through tax and other incentives that reward large companies doing the most to promote a best-wired work force, and encourage small companies to get up to speed.

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ANNEX A. ELABORATION ON SOME ACTION ITEMS

A.1. Integration of National ID Database: Feasibility

Bangladesh holds now the world's largest database created within a short time during the caretaker government side by side creation of a voter list with photograph. A free and fair national election was held using the database and the country received a pledge for Digital Bangladesh. Basically, Bangladesh Election Commission (BEC) undertook the voter ID project to address the requirement of many stakeholders including political parties for improved voter identification through either voter ID cards or a voter list incorporating photographs. The BEC considered options for national ID card, voter ID card, and Electoral Roll with photograph, and finally it was decided to prepare an Electoral Roll with photograph as the initial step towards a future national ID card system.

Now, a project for building institutional mechanism for providing national ID card to all citizens, touching the age of 18 on a continuous basis, can be the most important ICT project to be taken by the new government, which has far-reaching implications. First of all, such database will ensure a ready-made voter list for any election to be organized by the Bangladesh Election Commission.

Rationale

A few use of the national ID system are presented below:

a. **Birth registration:** If the nationwide system of National ID system is in place, then the government can launch a programme of compulsory birth registration for all citizens. For citizens under age of 5 years, the national ID system will issue a birth certificate, which will be compulsory for getting passport, getting entry into educational institutions, health care facilities, facilities under various safety net programmes of the government etc. At the age of 5 years, every citizen will get first national ID, which will have to be renewed every 5 years. Within five years of introduction of the system of birth registration, data of most of the citizens will be in the national ID system.

b. **Implementing subsidy programmes:** The government faces challenge in distribution of subsidies to various economic groups including farmers every year. The national ID database can be supplemented by a database of eligible people for getting various subsidies. If the primary database identifies a person as a farmer in primary or secondary occupation, the supplementary database can be built on that information with additional information (e.g. land registration and deed of transfer of land for cultivation).

c. **Implementing social safety net programme:** There are a number of social safety net programmes launched by the government and implemented by the local governments and other institutions. However, distribution of the social

safety net remains a problem mostly due to corruption and lack of coordination. Eligible people often remain outside of the programme. Identification of the beneficiaries of the social safety net programme will be easier using the national ID database.

d. **Immunisation programme:** Identification of target groups for immunisation programmes will be very easy as the national ID database will provide list of citizens, for whom such immunization is required.

e. **Expansion of Tax Base:** As the domestic resource mobilisation is getting important, such national ID database will be useful for tracing the tax evaders.

The success of the project will ensure a solid ground for equitable and participatory development needed for the country.

How to Build such a System

Our national ICT industry is capable for implementation of such project. If necessary, government agencies in other countries can help our local experts, not the opposite. For ensuring security, a number of redundancies will have to be deployed. Telecentres in local government institutions (*Zilla Parishad*, City Corporations, Municipalities, *Upazilla Parishad*, *Union Parishad*) can be used for regular update of the database. Telecentres in village level can also be used to decentralise the system. Community based committees must be involved to ensure accuracy of such database. For data entry, volunteers groups will need to be involved. Public-private-NGO partnership will be very effective to ensure smooth implementation of such database.

Risk factors

Compatibility of interoperability of the database must be ensured for integration of various national databases and enhancing data fields.

Duration

Initially 2 years will be adequate for development of a complete national ID database.

A.2 Market Price Information

The market price information is the single most important ICT initiatives for agriculture producers and consumers. The Department of Agricultural Marketing (DAM) of Ministry of Agriculture maintains a web-site in English which publishes market prices of agriculture produces. However, data are not up-to-date and in many cases not reliable. In most of the cases, data field is empty when a search is conducted. The telecentres can be assigned for collection of data on a prescribed format, which can be monitored by the Union Parishad. The data will be updated directly from the

telecentres and viewers can see it in Bangla. A system of reward and punishment may be applicable to ensure quality and timely data entry.

Duration

This can also be done immediately after establishment of telecentres in all union Parishad.

A.3 Online Tax filing

Mobilising domestic resources has become more important for the current government in the backdrop of the global financial crisis. In a country of 150 million individual tax payers are 2.2 millions. Estimates are there that if all tax eligible citizens pay due taxes, Bangladesh does to need financial resources for its national budget. However, citizens are reluctant to pay taxes for various reasons, including harassment and rent seeking behaviour of tax authorities. An individual citizen through this system can file tax return and pay online. If the NBR has doubt about any tax payer, it can investigate and take appropriate measures. This can be the first e-citizen project which will have significant visibility and at the same time largest benefit to the government is online tax payment system.

Duration

Implementing online tax payment system will take around six months to one year.

A.4 Building a network of telecentres as access point of government services

A network of telecentres in all local government institutions and public libraries will allow government to offer gradually all government services through internet. It will also allow informing citizens about various government schemes so that people can access them without scope of favouritism. A public-private-NGO partnership will ensure proper functioning of the telecentres. It is to be ensured that all citizens, particularly poor and marginalised people have access to services independent of ability to pay. As telecentres are public institutions, commercial operation will exclude common people from the services available through telecentres. Income from a few services may cover cost of operation partially and the rest will be covered from annual budget of the local government institutions. Establishment of telecentres will create opportunities for educated rural youth for ICT-based jobs, which will facilitate the government to implement the "one family-one employment" programme of the government. Furthermore, scope of ICT training will create users, which will eventually play a positive role in creating skilled manpower for export from rural areas. The government can partner with Bangladesh Telecentre Network (BTN) to roll out telecentres.

The telecentres will be the first step towards the Digital Bangladesh as it will be an infrastructure to offer many services. It will be truly a part of an inclusive information and knowledge system for the poor and marginalised.

Duration

A roll out plan of telecentres within first two years of the current government will create visible impact.

A.5. Internet Connectivity across the Country

The first two years should also be spent for building a country-wide network of reliable broadband internet connectivity. The following steps can be taken in this direction:

a. **Introduction of Differential pricing:** As the EDGE/GPRS/CDMA network is already available across the country, although not very robust, the BTRC can introduce differential pricing, e.g. cheaper connectivity for rural areas, and relatively costlier pricing for urban areas. As the urban-rural average per capital income ratio is 1:3, the price of internet connectivity in rural areas should be one-third of urban areas. This can be done immediately through directive of BTRC. When 3G and Wi-max technology will be available, the offer should be applicable also for those technologies.

b. **Free Internet Connectivity for Educational Institutions and Libraries:** The caretaker government announced that primary educations institutions will have free internet connections, secondary educational institutions will have connections at 75 per cent concession, and other educational institutions at 50 per cent discount, it is not clear who will give this connectivity, and how it will be ensured. The BTRC should give clear directive in this regard mentioning ISPs and procedure to avail such offer. The offer should also be extended to the libraries.

c. **Free Internet Connections for Telecentres:** The BTRC should offer free Internet connections from all telcos for all telecentres, irrespective of their locations. A clear directive in this regard makes the telecentres more financially sustainable. This is a long standing demand of the telecentre operators in the country. The government should create universal service obligation fund to support the ISPs, who will offer the free connections.

d. **Licensing:** The licensing policy of the BTRC was on a wrong footing, which created scope for sky-rocketing of license fees for Wi-max. As a result, the licensees are facing problem in rolling out the network. Furthermore, such high price for license will make the Wi-max connectivity unaffordable for rural people. The BTRC should review the license fee and call for fresh bidding for Wi-max licensing. Similarly, the license fee for 3G should be limited so that

operators can offer cheap connectivity. The BTRC's task is not to earn money rather than creating a vibrant connectivity network across the country so that economic, educational and other developmental activities create values for earning money for the government. The BTRC should also go for class licensing, which would ease life of technology providers.

e. **IP Telephony:** IP Telephony is still illegal in the country, prohibiting people to connect with their relatives and business partners at an affordable price. It is ridiculous that potential of new technologies is barred in the context of market discipline. Such bar does not match with the philosophy of Digital Bangladesh.

Duration

All the above mentioned tasks can be can be implemented within six month and does not have significant financial implications on the side of the government.

A.6 E-learning as an Intermediate Solution to Quality Education

Quality of education is now prime concern for the future of the country. The Vision 2021 will remain in paper if quality of education is not addressed. The core problems of education are less related to ICTs; rather ICTs can be an intermediate solution to core problems. The core problems are:

a. **Quality of teaching**: The quality of teaching is shocking in primary and secondary educational institutions. Qualified graduates from tertiary education do not feel to join the primary or secondary educational institutions due to poor compensation package and lack of dignity. The teachers in primary and secondary educational institutions are busy with government assignments, including conducting various elections, immunisation and other programmes. The solution lies in overhauling the system of compensation on a priority basis in a way that qualified graduates feel to go there.

b. **Skill upgradation of teachers**: The teachers do not have adequate facilities to upgrade their skills along with the upgradation of curriculum. ICTs may be helpful for teachers to improve their skills.

c. **Poverty and malnutrition:** Poverty and malnutrition push children out of the school. Mid day meal may be a solution, where community can also participate.

d. **Unattractive teaching approach**: Children do not find schools interesting due to lack of appropriate and modern teaching method.

e. **Teaching infrastructure**: Infrastructure in terms of building has been improved during last one decade; however in-class equipment and facilities are

not available, which are essential for quality teaching. Increase in investment is the only alternative.

While finding out quality teachers and providing them appropriate compensation are essential, for skill up-gradation of teachers and making learning attractive, ICTs may be an intermediate solutions. E-learning at the initial stage should focus teachers and subsequently students.

Chapter 5

Small and Micro Enterprises (SMES) Development in Bangladesh

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5.1 Introduction

Over the last twenty years or so Bangladesh economy has been growing at about 5 per cent per year on an average and there has also been a significant shift of the sectoral composition of gross domestic product (GDP) from agriculture to industry and services. Despite this sectoral shift, the overall performance of the manufacturing sector, especially small and micro ones, has not been satisfactory when compared with rapidly growing emerging economies of the world.

Vision 2021 sets a goal to lift Bangladesh to the middle-income group. It envisages achieving 8 per cent growth by the end of 2015 and 10 per cent in the following five years. To achieve this higher growth, output from industry is required to contribute about 40 per cent to the total output by 2021. At present the contribution of industry is about 18 per cent of GDP while small scale industry contributes about 5 per cent. Even if we assume the same proportion of contribution of small and medium & large industries to GDP, the contribution of small and micro industry has to be raised to about 11 per cent to achieve 10 per cent growth.

Since small and micro enterprises make up more than 90 per cent of the number of enterprises and employ about three-fourth of its labour force, including manufacturing, trade and service sectors, this sector can play the pivotal role in achieving targets set in Vision 2021. The Sixth Five Year Plan (SFYP) lays out the roadmap of small and medium enterprise (SME) sector to achieve higher equitable growth to fulfill the vision of elevating the country to the middle-income group by the end of 2021.

This background study is organised as follows. Section 5.2 provides an account how the definition of SME has changed over time and how it varies across institutions. Section 5.3 takes stock of the current structure of SMEs in terms of number, employment, size, location, export and financing. Section 5.4 discusses the overall as well as sectoral performance. Upon identification of both overall and

sectoral constraints in section 5.5 while section 5.6 takes stock of past government policies and strategies. Section 5.7 offers recommendations for the development of SMEs

5.2 DEFINITION OF SMEs

Classification of the size of industries based on some observed input (e.g. labour, capital) or output (value of final output) has always been a subject of debate. This classification varies across countries (e.g. poor vs. rich) and even across institutions or regulatory bodies within a country primarily because of heterogeneous objectives of classification across institutions. Ideally, one should use final output (or annual turnover) to classify the size of the industries as the same level of input may lead to different level of output because of varied levels of technology, managerial skill and other unobserved characteristics of the entrepreneur. Since authentic data on firm output and turnover are hard to come by in developing countries, classification is primarily based on more observable labour and capital.

5.2.1 Definition of the Ministry of Industries

The Industrial Policy 1999 of Bangladesh describes small industries as those employing less than 50 persons and having a fixed capital investment of BDT 100 million. Medium industries were defined as those having employed between 50 and 99 workers with capital investment between BDT 100 and 300 million.

The above definition was tailored to specific sector in SME Policy Strategies 2005 and later in 2008 Ministry of industry, in consultation with Bangladesh Bank, Board of Investment (BoI), and Bangladesh Bureau of Statistics (BBS) announced the following definition of SME.

TABLE 5.1
DEFINITION BY THE MINISTRY OF INDUSTRIES

Enterprise	Sector	Asset size	No. of employees
Small	Trade	Total fixed asset (excluding land & building) from Taka 50,000 up to Taka 5 Million	Less than 25
	Manufacturing	Total fixed asset (excluding land & building) Taka 50,000 up to Taka 15 Million	Less than 50
Medium	Trade	Total fixed asset (excluding land & building) Taka 5 million up to Taka 100 Million	Less than 50
	Manufacturing	Total fixed asset (excluding land & building) between Tk. 15 Million and Tk. 200 Million	Less than 150

Source: http://www.smef.org.bd/images/sme_definition.jpg

5.2.2 Definition of Bangladesh Bureau of Statistics (BBS)

BBS classifies the size of 'enterprise' solely based on the number of employees. Enterprise employing up to 9 employees is classified as "micro", between 10 and 49 as small and between 50 and 99 as medium.

5.2.3 Bangladesh Better Business Forum (BBBF)

In 2008 Bangladesh Better Business Forum (BBBF) proposed a new definition where service sector was incorporated, which was missing in the definition of Ministry of Industries. Recently Bangladesh Bank has taken the above definition of SMEs as a common definition.

TABLE 5.2
DEFINITION BY THE BBBF

Enterprise	Sector	Asset size	No. of employees
Small	Service	Total fixed asset (excluding land & building) Tk. 50,000-Tk. 5 Million	Less than 25
	Trade	Total asset worth Tk. 50,000-Tk. 5 Million (excluding the value of fixed asset)	Less than 25
	Manufacturing	Total fixed asset (excluding land & building) Tk. 50,000-Tk. 5 Million	Less than 25
Medium	Service	Total fixed asset (excluding land & building) Tk. 5 Million-Tk. 10 Million	Above 25 and less than 50
	Trade	Total asset worth Tk. 5 Million –Tk. 10 Million (excluding the value of fixed asset)	Above 25 and less than 50
	Manufacturing	Total fixed asset (excluding land & building) Tk. 15 Million -Tk. 20 Million	Above 25 and less than 150

Source: http://www.bbbf.org.bd/index.php.

Note that in literature SMEs are typically defined by small and medium enterprises. However, it is argued that SMEs should be defined to include only micro and small enterprises. The arguments are:

i. Medium enterprises face a similar policy and regulatory environment as large enterprises so they should be lumped together as BBS does.
ii. Micro enterprises are the largest class of enterprise in terms of size.
iii. It also gained prominence due to microcredit revolution.

This paper, therefore, focuses on the small and micro enterprises only. However, since this paper dwells on current literature and secondary data, there are definitional variations across sections and subsections. This paper has tried to be as explicit as possible in terms of definition used by other studies and reports.

5.3 STRUCTURE OF THE SMEs

Conceptually, structure of an industry implies detail description of inputs, outputs, technology, and governance (type of ownership, management, etc.) of that industry. Since data on technology and governance of SMEs are not available, this section focuses mostly on number of firms, inputs (labour and capital) and outputs of SMEs to describe the structure of this sector. Later we will also discuss, if there is any variations across regions, export share of SMEs and their financing.

The most reliable and recent source of data for SMEs is the Annual Establishment and Institutions Survey (AEIS) of BBS and this section is mostly based on AEISs. Hence, only BBS's definition of SME is relevant here. BBS conducted two establishment level census, one in 1986 and the other in 2002-03.[1] In 2005-06 it also updated the data but one drawback of this dataset is that it only considers enterprises with more than 10 employees, that is, micro enterprises are missing here.

5.3.1 Number, Relative Size and Employment

Table 5.3 presents the structure of enterprise in terms of number and employees. The number of micro enterprises which employs less than 10 employees made up about 98 per cent of the total enterprises in 1986. This share remained the same in 2002, making up 97.6 per cent of total enterprises. The share of small and medium enterprises, which employ between 10 and 100 employees, was only 0.0188 per cent of the total in 1986. It was a meager increase in the year 2002 to 0.022 per cent. Though we have data on small and medium enterprise in 2006, we cannot compare it with the previous year as we cannot calculate the total figures. During the period 1986-2002, the number of micro enterprises increased by about 6 per cent per year on an average, while the number of small and medium enterprises increased by about 10 per cent and the number of large enterprises increased by about 25 per cent. But during the period of 2002-06, the growth of the number of both small & medium and large enterprises slowed down significantly.

Therefore, we can summarise that

i. Enterprises with less than 10 employees have been the single most dominant size of the enterprises making up more than 90 per cent of the industry.

[1] The following sectors are excluded from the survey: Agriculture, Hunting and Forestry, Fishing, Mining and Quarrying, Electricity, Gas and Water Supply, Construction, Transport, Storage and Communication, Financial Intermediation, Public Administration and Defense, Compulsory Social Security and Extra Territorial Organisation and Bodies.

ii. The composition of the enterprises in terms of size has not changed much since 1986.
iii. The larger the size, the higher the growth of the number of enterprises during the period of 1986-02. This could be one indication of the growth of the industries. However, the growth rates tapered off in the subsequent periods.

Though micro enterprises made up about 98 per cent of the total enterprises, it employed about 76 per cent of total labour force employed in the enterprises in 1986. The rest was equally shared between small & medium and large enterprises. The average size of micro enterprise (number of employees per enterprise) was 2.31. Average size was 19.1 for small and medium enterprises and 412.8 for large ones. The share of employment of micro enterprises declined in 2002 to 67 per cent, while the share of employment of large enterprises increased more than the small & medium ones. During the 1986-2002 period, average size of micro and small & medium enterprises remained more or less the same, while it declined for the large ones. In 20 years, 1986-2006, average size of small & medium enterprises did not change but declined for large enterprises. From this analysis, we can sum up that

i. Micro enterprises are the biggest employer and they employ three-fourth of the total labour force of the enterprises.
ii. Average sizes of micro and small & medium enterprises have not changed much.
iii. Average size of large enterprises has declined, indicating the use of less labour-intensive technology over time.

TABLE 5.3
NUMBER AND EMPLOYMENT OF ENTERPRISES IN BANGLADESH, 1986-2006

Size of enterprises	1986			2002			2006		
	No. units (000s)	Employment (000s)	Average Size of unit (No.)	No. units (000s)	Employment (000s)	Average Size of unit (No.)	No. units (000s)	Employ-ment (000s)	Average Size of unit (No.)
Micro	2567	5904.1	2.31	3488.8	8119.3	2.33	n.a	n.a	n.a
Small & Medium	49.3	942.3	19.1	79.8	1717.9	21.5	84.6	1836.2	21.7
Large	2.3	949	412.8	5.7	2191.8	386.3	6.4	2474	385.9
Total	2618.6	7795.4	2.98	3574.2	12029.02	3.36	n.a	n.a	n.a

Source: FBCCI (2008).

5.3.2 Sectors within SMEs

Wholesale, retail trade and repair constitute about 40 per cent of the total SMEs, followed by agriculture (22 per cent) and manufacturing (14 per cent). Though Table 5.4 lumps medium enterprises with micro and small, it is indicative of the relative share of the sectors.

TABLE 5.4
SECTORAL COMPOSITION OF SMEs

Sectors	Share of Micro, small and medium enterprises (%)		
	Rural	Urban	Total
Agriculture	27	5	22
Fisheries	5	1	4
Manufacturing	14	15	14
Construction	1	1	1
Wholesale, retail trade, repairs	38	48	40
Hotels and restaurants	2	13	5
Transport, storage, communication	3	2	3
Real Estate, renting	3	3	3
Health and social work	1	1	1
Other service activities	2	4	3
Undefined	3	6	4
Total	100	100	100

Source: Daniels (2003).

There are no data available on the relative size of industries in SMEs. In 1998, JOBS (JOBS, 1998) carried out a study to identify the dominant sectors in SMEs. It ranked the sectors in descending order: bakery, specialised handlooms, dyeing and printing, footwear, plastic products, steel furniture, electrical goods, and engineering workshop. Recently SME Foundation carried out a detail study on six major sectors and these are agro-processing, leather and footwear, electrical and electronics, light engineering, designer goods and plastic which are the fastest growing SMEs in Bangladesh. Analysis on sectoral performance and its constraints is drawn heavily on the survey of SME Foundation.

5.3.3 Location

Data on location (district, sub-district) wise distribution of small and micro enterprises is not readily available. However, BBS's Annual Establishment and Institution Survey provides information of the division wise distribution of micro manufacturing having less than 9 employees (see Table 5A1 in appendix). It reveals

that about 46 per cent of micro manufacturing units were located in Dhaka and Chittagong divisions in 2002. Interestingly, Rajshahi division had 20 per cent, while more developed Sylhet had only 4 per cent of total micro manufacturing. In between, Khulna and Barisal had about 10 per cent each. This spatial distribution also varies between rural and urban areas.

TABLE 5.5
NUMBER OF UNITS AND LEVELS OF EMPLOYMENT BY ENTERPRISE SIZES, 2001/2003 (ALL NUMBERS ARE IN THOUSANDS)

Description	Urban			Rural			Total		
	Small	Medium	Large	Small	Medium	Large	Small	Medium	Large
No. of units	39.9	3.17	4.036	29	1.29	0.88	68.96	4.46	5.01
% of total number of units	50.9	4	5.1	38.1	1.6	1.11	87.9	5.7	6.4
employment	740.4	211.5	1712.7	516.8	85.85	234.7	1257.2	297.4	1947.3
% of total employment	21.14	6	48.9	14.8	2.4	6.7	35.9	8.5	55.6

Source: FBCCI (2008).

Table 5.5 shows how the distribution of the unit of enterprises and employment across rural and urban changes with the size of the enterprises. It shows that about 60 per cent of the total small and medium enterprises were located in urban areas and the rest in rural areas in 2001-02. In rural areas about 95 per cent of the enterprises are small ones. In terms of employment, rural enterprises employed about one-fourth of the total employment and about 40 per cent of small and medium enterprises. Average size of small enterprises in urban areas was 18.5 and it was 17.8 in rural areas. For medium enterprises these figures were 66.7 and 66.5 respectively. From the Table 5.5, we can summarise:

i. The positive correlation between divisional per capital income and number of unit of micro industries is not very strong because of Sylhet and Rajshahi. Economically more developed Sylhet has a tiny share of micro industries and it indicates that the source of economic progress lies elsewhere (e.g. remittances, etc.). Rajshahi, being an economically backward region, is the home of about one-fifth of total micro manufacturing units.
ii. About 40 per cent of total small enterprises were located in rural areas and these enterprises employed about 60 per cent of total employees in small enterprises.
iii. Almost all of the rural enterprises were small and medium enterprises.
iv. Average size of small enterprises was similar across rural and urban areas.

TABLE 5.6
AVERAGE SIZE OF EMPLOYMENT ON SMALL AND MEDIUM ENTERPRISES, IN URBAN AND RURAL AREAS AND BY TYPE OF INDUSTRIES, 2001/2003

Industries	Rural		Urban	
	Small	Medium	Small	Medium
Food and tobacco	17.4	63.2	19.6	65.9
Textiles	18.7	64.9	20.3	67.2
Apparels	21.5	60.7	17.7	71
Wood, leather, paper, printing	14	64.1	17.3	67
Chemical, plastics	20.4	60.4	19	67.5
Non-metallic mineral products	27.1	69.9	23.3	72.1
Fabricated goods, electrical, transport equipment	15.7	60.4	17.1	66.2
Mining, manufacturing	23.6	66.2	25.3	65.2
Services	17	67.6	17.6	65.9
Education and healthcare etc	16.9	62.6	19.9	66.1
All industries	17.8	66.6	18.5	66.7

Source: FBCCI (2008).

Table 5.6 shows how the average size of different industries varies across rural and urban areas. There are not much industry-wise differences of average size of small industries across rural and urban areas.

5.3.4 Export of SME Products

There is no publicly available data on the export of products from SMEs. Table 5.7 gives some estimates about the SME's share in total export. Note that SME is defined here as the number of workers between 10 and 99.

TABLE 5.7
IMPORTANCE OF SMES IN EXPORT RECEIPTS OF BANGLADESH, 2004/05

Name of sectors	Total Exports (US$ Million)	SMEs Export (US$ Million)	Proportion of SME exports
Woven garments	3598	450	12.5
Knitwear	2819	352	12.5
Leather	221	94	42.5
Jute goods	307	12	3.5
Fertilizer and chemical products	197	0	0
Footwear	88	44	50
Ceramic products	29	0	0
Engineering goods	85	20	22.25
Petroleum by-products	35	0	0
Handicrafts	5	5	100
Others	621	n.a.	n.a.
Total Exports	8652	977	11.3

Source: FBCCI (2008).
Note: All estimates are based on trade estimate, not based on any detailed survey.

Handicrafts, footwear, leather, engineering and garments are most export oriented SMEs. All the exports of handicrafts come from SMEs. SMEs also accounted for 50 per cent of footwear export, 42.5 per cent of leather export, and 22.25 per cent of engineering goods export in the years 2004-05.

5.3.5 Financing the SME Sector

The Government and Bangladesh Bank have taken up special programmes to provide financial assistance to expand SMEs through commercial banks. Alongside the disbursement of loans since FY2004-05, Bangladesh Bank has implemented a scheme of TK.100 crore for refinancing the scheduled banks and financial institutions as revolving fund. Recently, the scheme has widened with an enhanced allocation of TK.600 crore. Up to June 2009, TK.716.44 crore has been disbursed among different scheduled banks and financial institutions for refinancing potential entrepreneurs. In addition to this, IDA has provided US$10 million and the Government of Bangladesh has provided TK.112.32 crore through 'Enterprises Growth and Bank Modernization Project (EGBMP)'. With the stipulated revolving fund of TK.224.50 crore up to June 2009, refinancing facilities have been provided to different scheduled banks and financial institutions. Moreover, in an attempt to provide incentives to the sector, ADB has been providing an additional US$30 million to Bangladesh Bank. Up to June 2009, Bangladesh Bank has disbursed TK.334.25 crore for refinancing of this programme. Detailed refinancing of Bangladesh Bank to various financial institutions and banks is shown in Table 5.8.

TABLE 5.8
SUMMARY INFORMATION ON SME REFINANCING (UP TO JUNE 2009)

Refinancing Source	Amount Refinanced (in crore Taka)				No. of Beneficiary Enterprises			
	Working Capital	Mid Term Loan	Long Term Loan	Total Loan	Industrial Loan	Commercial Loan	Service	Total
Bangladesh Bank	178.48	336.4	201.56	716.44	1724	4150	1127	7001
IDB	61.51	96.4	66.59	224.5	89	1220	358	2477
ADB	138.68	112.82	52.75	304.25	728	1864	331	2923
Total	378.68	545.62	320.9	1245.2	3351	7234	1816	12401

Source: Bangladesh Economic Review 2009.

5.4 PERFORMANCE OF SMEs

As discussed earlier, the target of achieving double digit growth hinges largely on the performance of the small and micro enterprises. So far, small and micro enterprises have contributed only about 5.2 per cent to the total GDP in 2008-09 and this share has not increased much over the last decade (Table 5.9). In terms of value addition, the performance is also not very satisfactory as the growth of value

addition has declined in 1995-2000 from the period 1989-95 (Table 5.10). Over the period 1989-2000, value addition of SMEs had grown at an annual rate of 6.6 per cent, while in the later five years it grew at only 5.5 per cent.

TABLE 5.9
CONTRIBUTION OF LARGE & MEDIUM SCALE AND SMALL SCALE INDUSTRIES TO GDP (PER CENT)

	Large & Medium Scale Industry (%)	Small Scale Industry (%)	Total (%)
1999-2000	11.01	4.39	15.40
2000-2001	11.13	4.46	15.59
2001-2002	11.16	4.60	15.76
2002-2003	11.29	4.68	15.97
2003-2004	11.41	4.76	16.17
2004-2005	11.66	4.85	16.51
2005-2006	12.14	4.94	17.08
2006-2007	12.47	5.08	17.55
2007-2008	12.60	5.16	17.77
2008-2009	12.61	5.17	17.78

Source: Ministry of Finance (2009).

TABLE 5.10
VALUE ADDITION BY SMALL INDUSTRY AND ITS GROWTH

Year	Value added in small industry (million taka)	Yearly compound growth rate (%)
1989-90	45037	-
1990-91	48316	7.3
1991-92	51929	7.4
1992-93	55925	7.5
1993-94	60334	7.6
1994-95	65220	7.7
Annual Average 1989/90-1994/95	54460	7.7
1995-96	70619	8.3
1996-97	76091	8.0
1997-98	81240	7.6
1998-99	81849	5.8
1999-2000	85122	5.5
Annual Average 1995/96-1999/2000	78984	5.5
Annual Average 1989/90-1999/2000	65607	6.6

Source: Ahmed (2001).

5.4.1 Sectoral Performance

Though current overall performance of the SME sector is not adequate, there have been stark differences in performance across sectors. Moreover, sectoral composition of SMEs is so diverse that overall aggregate picture may sometimes be misleading as some sectors may completely outperform the rest. Therefore, it is imperative to paint a sectoral picture in order to be able to craft sector specific policies. A comprehensive report for six key sectors was prepared by SME Foundation and this paper relies mostly on this study for sectoral analysis. The paper is based on a survey carried out in 2006/2007. The sectors included in the study are:

i) Agro and Food processing
ii) Designer goods
iii) Electrical and Electronics
iv) Leather and leather goods
v) Light engineering
vi) Plastic

The following discussion provides the major findings of the survey report. Based on quantitative analysis the survey reports the size, employment, factor intensities and productivities and some other diagnostics. The survey followed the BBS definition in defining the micro, small, the medium, and the large enterprises.[2] The following paragraphs provide a brief discussion of the overall performance of these six sectors.

Table 5.11 describes the sectors in terms of gross value added by each firm. Gross value added is defined as the difference between gross value of output and the cost of all material goods and services that have been used in the production. The designer goods industry has the highest average per centage share that gross value added has relative to value of gross output for all firm size, including small and micro ones. The reason, as mentioned in the study, is that the industry has the lowest percentage share of materials in the total (see Table 5A3 in appendix). Plastic industry has the smallest value added among the sectors for all firm-sizes.

[2] Following BBS definition, micro, small, medium and large enterprises are those employing 1-9, 10-49, 50-99 and 100 or more workers respectively.

TABLE 5.11
GROSS VALUE ADDED RELATIVE TO VALUE OF GROSS OUTPUT IN SIX SECTORS

Firm Sizes	Agro & food processing	Leather & footwear	Designer goods	Electrical & electronics	Plastics	Light engineering
	All	All	All	All	All	All
Micro	40.4	47.33	74.1	38.82	32	58.4
Small	44.3	22.59	59.4	36.79	32.4	34.8
Medium	52.2	45.32	46.8	29.61	30.4	36.74
Large	51	56.95	60	34.61	35	31.03

Source: SMEF survey of six sectors, 2006/07

TABLE 5.12
EMPLOYMENT PER FIRM ACROSS FOUR SIZE CLASSES IN SIX SECTORS

Firm Size	Agro processing	Leather & footwear	Electrical & electronics	Light engineering	Designer goods	Plastics
Micro	5.9	5.9	6.3	4.6	6.5	5.6
Small	23.6	21.8	23.9	19.1	35.7	21.0
Medium	70.6	69.7	65.8	74.4	71.9	75.8
Large	254.2	620.8	170.3	196.9	666.7	261.2

Source: SME survey of six sectors, 2006/07.

Table 5.12 profiles the average firm size in terms of employment across six sectors. The designer goods industry has the highest average employment size, followed by leather and leather goods. Agro processing and plastics are in the middle, whereas light engineering is reported to have the smallest average size in terms of employment. Among the small and micro industries, designer goods industry employs the highest number of labour per firm. The designer goods industry also has more female workers compared to males (see Table 5A4 in appendix).

Products of electrical, light engineering and agro processing are mostly targeted for the domestic markets; revenue from domestic sales is higher in those industries. Revenue from export is higher in designer goods and in leather and leather goods industry. Table 5.13 and Table 5.14 report percentage revenue from domestic sales and from exports for the six sectors.

TABLE 5.13
PERCENTAGE OF REVENUE FROM DOMESTIC SALES

Firm size	Agro & food processing	Leather & footwear	Electrical & electronics	Light engineering	Designer goods	Plastic
Micro	100.00	15.38	100.00	100.00	16.67	100.00
Small	94.76	50.22	100.00	100.00	40.31	58.00
Medium	86.18	54.48	100.00	100.00	53.14	62.00
Large	86.00	90.00	100.00	100.00	39.25	37.00

Source: SMEF survey of six sectors, 2006/07.

TABLE 5.14
PERCENTAGE OF REVENUE FROM EXPORT

Firm size	Agro & food processing	Leather & footwear	Electrical & electronics	Light engineering	Designer goods	Plastics
Micro	0.00	84.61	0.00	0.00	83.33	0.00
Small	5.24	49.77	0.00	0.00	59.69	39.00
Medium	13.82	45.51	0.00	0.00	46.86	38.00
Large	14.00	10.00	0.00	0.00	60.75	57.00

Source: SMEF survey of six sectors, 2006/07.

It is noteworthy that more than 80 per cent of revenue comes from export of leather & footwear and designer goods of micro-sized industries.

Limited access to modern technology is a major challenge Bangladesh SME sector is facing. The SMEF survey reports on the state of the adoption of technology in six sectors. Table 5.15 presents the findings.

TABLE 5.15
AVERAGE NUMBER OF MACHINES IN USE ACROSS SIX SECTORS, 2007

Firm size classes	Agro processing	Leather & footwear	Electrical & electronics	Light engineering	Designer goods	Plastics
Micro	2.10	6.15	3.80	7.00	6.13	2.70
Small	4.20	9.93	7.80	13.20	8.44	6.70
Medium	6.60	21.95	11.20	17.18	19.17	16.00
Large	24.4	87.82	29.30	29.63	59.29	41.00

Source: SMEF survey of six sectors, 2006/07.

Table 5.15 presents the average number of machines per firm. Agro and food processing industry uses the smallest number of machines. Leather and leather goods industry uses the largest number of machines, followed by designer goods industry and this is true for small and micro enterprises too.

Table 5.16 reports the average capital-labour ratio for each of the six sectors. Capital-labour ratio is calculated as the replacement cost of machinery of the firm by dividing the employment size. The calculation shows that for small and micro industries, leather and plastic industry are the most capital intensive than others.

Table 5.17 reports the average labour productivity of each of the six sectors. Labour productivity is calculated as physical volume of the firm divided by the employment size. Plastic industry ranks the top for all firm sizes. Designer goods industry has the lowest labour productivity per worker among the sectors.

TABLE 5.16
CAPITAL-LABOUR RATIO ACROSS SIX SECTORS (TK. 000S)

Firm Sizes	Agro	Leather	Design	Electrical	Plastics	Light. Eng.
Micro	53.5	283.5	63.5	38.58	229	69.97
Small	80.12	248.8	93.7	27.99	243	75.99
Medium	160.51	289.1	284.6	30.37	438	63.12
Large	217.28	52.7	988.5	22.31	542	77.36

Source: SMEF survey of six sectors, 2006/07.

TABLE 5.17
LABOUR PRODUCTIVITY PER WORKER

Firm Sizes	Agro	Leather	Design	Electrical	Plastics	Light. Eng.
Micro	830.0	3081.89	78.6	1635	6812	2000
Small	967.6	3543.86	138	1076	7853	4110
Medium	396	6045.96	164.8	457	10636	2490
Large	784.7	3502.24	57.6	587	8501	2350

Source: SMEF survey of six sectors, 2006/07.

In short, the designer goods industry ranks the top in terms of gross value added, average employment size and revenue from export. However, capital-labour ratio is relatively high and labour productivity is relatively low in this industry compared to other industries in the study report. Leather and footwear goods industry produce for both domestic market and for export. Products of electrical, light engineering and agro processing are mostly targeted for the domestic market.

In terms of capital labour ratio, the agro and food processing industry is in the middle. However, labour productivity per worker is relatively lower in this industry compared to other industries. Plastic industry has the smallest value added among the sectors. The industry has the highest unit replacement cost, lowest labour productivity and the highest capital-labour ratio. Leather and leather goods industry is the second highest in terms of value added, employment and capital-labour ratio. Labour productivity is the highest in this industry among all the six. Light engineering industry has the lowest value added; employment per firm in this industry is the smallest.

The most important policy recommendations, as suggested by the survey respondents, are:

i) Reduction of import duties on inputs.

ii) More symmetrical VAT administration.

iii) Reduction of power outage.

A summary of the recommendations is presented in Table 5.18.

TABLE 5.18
POLICY SUGGESTIONS BY SURVEY RESPONDENTS (PERCENTAGE OF CASES IN AN INDUSTRY)

Suggestions	Leather & footwear	Electrical & electronics	Light engineering	Designer goods	Plastic	Agro & food processing
The VAT rate to be decreased		27.4				37.8
Import duties on inputs to fall	24.5	11.3	19.01	15.5	33.1	23.6
Power outage to be reduced	20.1	10.5	52.8	9.7	53.8	22.0
Interest rate to be decreased	12.5			20.4	16.9	20.4
Bank loan to be easily available	11.2	18.5	30.3	7.8	10.8	15.8
Decrease direct taxes			5.6		11.5	9.4
Increase production						7.8
Greater transparency in rules		6.2	4.2	12.6	16.2	7.8
Political Stability				3.9		6.2
Greater emphasis on training	0.71				10.0	6.2
Refrigerated space on cargo plane						3.2
Increasing buyers/ orders				8.7		
Arrangement of international fair				2.9		
Separate clusters	3.9	11.3	16.2		10.0	
Easy shipment	1.3				13.1	
Land for job worker	5.7					
Bigger protection from imports	10.5					
Upgrade technology	5.9	3.0				
Common facility center			5.6			
Others	3.7	25				

Source: SMEF survey of six sectors, 2006/07.

5.5 CONSTRAINTS OF SMEs

In order to reap the benefits from SME sector it is important to understand the strengths and weaknesses that may affect the growth of this sector. A large body of existing literature suggests numerous constraints Bangladesh SME sector is facing (Miah 2007, Ahmed 2006, Ahmed and Chowdhury 2009). The main constraints faced by SME sector can be categorised as structural as well as policy-induced. The former includes constraints such as lack of access to finance, to modern technology and information, to infrastructure, etc. The policy-induced constraints are associated with fiscal policies, trade policies. There are other constraints as well, which include definitional ambiguity, lack of participation of women entrepreneurs, lack of facilities in research and development and many others.

5.5.1 Structural Constraints

i) Access to financial services: Like in other developing countries SMEs in Bangladesh struggle to obtain credits and loans. Many financial institutions are reluctant to offer loans to SMEs as they are considered as high-risk borrowers. Even if they obtain loans, the interest rates are relatively high, which acts as an impediment to further investment in the SME sector. In most cases, start-up fund for business comes from informal sources.

ii) Access to infrastructure: The industries are not being able to utilise their potentials fully due to several infrastructural bottlenecks such as roads and highways, water, and recently unreliable power supply.

iii) Access to modern technology and expertise: Business planning skills are crucial for successful SMEs. Limited access to modern technology and training facilities are responsible for lack of expertise, innovation and ideas, resulting in poor marketing and promotional strategy. Consequently, Bangladesh SME products are unable to meet up sophisticated consumer preferences and they face severe competition with better designed but relatively cheaper goods from China, Taiwan, Korea, India, and Thailand.

iv) Access to information technology: SMEs have very limited access to information technology; only 15 per cent of them use computer and internet users are only 8-10 per cent (Ahmed and Chowdhury 2009). Due to this problem entrepreneurs are lacking updated information about market opportunities and are unable to provide services in compliance with the international standard requirements. To remain competitive in the globalised world, producers must constantly review and upgrade production process and marketing tools. Limited use of computers and internet act as constraints on this.

v) Non-price factors: SMEs in Bangladesh face significant challenges in domestic and international market for various non-price factors such as quality, health and safety and ecological compatibility of their products. Some of the common structural constraints faced by the SMEs include:

5.5.2 Policy-Induced Constraints[3]

i) Public Development Outlay: So far all five year plans and PRSP documents identified SMEs as priority area. However, allocation of public development expenditure in this sector is not consistently high enough. This contradiction between stated objective and actual allocation acts as a constraint in improving business confidence.

ii) Trade Policy: Scarcity of raw materials acts as one of the most important obstacles to attain positive growth of SMEs. Most SMEs depend on imported raw materials. Liberalisation of import regime helped them to import raw materials at low prices but at the same time domestic producers are exposed to competition of foreign goods. Drastic changes in policy (for instance tariff changes) act as another constraint because domestic producers do not get enough time to make adjustment in production plans and therefore fall further behind in the race with foreign goods.

iii) Fiscal Policy: SMEs require targeted fiscal incentives. In Bangladesh there is no such differential treatment in the case of tax incentives or business subsidies. Most small industries are in the form of sole proprietorship and therefore have to pay wealth tax on their business capital, whereas large industries are excused from such taxes because of their legal form as companies. For the same reason, the small industries cannot enjoy tax holiday whereas the large industries can. In the case of Value Added Taxes (VATs), most small industries practically pay the same 15 per cent as their large counterparts.

5.5.3 Other Constraints

Another important constraint is lack of participation of women entrepreneurs. Many small industries are run by women entrepreneurs. Registration as a SME is a cumbersome process due to legal, regulatory, and administrative constraints. Lack of transparency in the system is another problem. As a result, many entrepreneur, particularly women entrepreneurs, do not register and therefore miss out

[3] See Hossain (1998) for details.

government incentives. Other important constraints that slow down growth of SMEs include high transportation costs (Miah 2007), high employee turnover (Levy 2003), bureaucracy and corruption (Hossain 1998).

BBS and the Ministry of Industries define SMEs differently. Due to this definitional ambiguity, statistics on SMEs is not readily available, which acts as a major constraint for an in-depth analysis of this sector. Using a single uniform definition is essential for formulation of policies and their implementation.

Crafting effective rules, regulations and policies on SMEs critically depends on quality research and quality research depends on availability of updated quality data. All the current studies on SMEs are handicapped by outdated data and therefore, stock taking of SMEs is partial and incomplete. Any policy prescription based on outdated data can be misleading.

The International Consultancy Group (ICG) of the UK and Micro Industries Development Assistance and Services (MIDAS) conducted a survey in 2003. A summary of the major obstacles identified by the survey is presented in the table below (Table 5.19).

TABLE 5.19
CONSTRAINTS FACED BY SMEs IN BANGLADESH

	No problem (%)	Small problem (%)	Serious problem (%)	Total (%)
Electricity	44	20	36	100
Water availability	78	11	11	100
Sewer, rubbish disposal	89	7	4	100
Natural gas/fuel availability	87	5	8	100
Telecommunications	88	6	6	100
Floods and natural disasters	32	30	38	100
Access to land	80	11	9	100
Road conditions	41	26	33	100
Transportation to market	61	22	17	100
Access to use of equipments	94	4	2	100
Skilled labour	91	7	3	100
Access to appropriate buildings	89	6	4	100
Inputs/raw materials	83	12	5	100
Product development	95	4	1	100
Too many competitors	75	18	8	100
Anti-competitive practices	91	6	3	100
Lack of market information	90	8	2	100
Crime, theft and disorder	66	23	11	100
Access to finance	46	22	32	100
Company registration	99	1	0	100
Labour regulations	99	1	0	100

(Cont. Table 5.19)

	No problem (%)	Small problem (%)	Serious problem (%)	Total (%)
Tax rates, administrative of taxes	96	3	1	100
Copyrights and patents	99	1	0	100
Macroeconomic instability	91	6	3	100
Corruption	94	4	2	100
Political influence	94	4	2	100
Customs and trade regulations	99	1	0	100
Trade, international agreements	100	0	0	100
Others	99	0	1	100

Source: ICG/MIDAS Survey, 2003.

5.5.4 Sectoral Constraints

In this subsection we briefly discuss some sector specific constraints of agro-processing, electrical and electronics industry, plastic industry and designer goods industry. These sectors are regarded as thrust sectors of SMEs by SME Foundation.

5.5.4.1 Agro-processing

Lack of modern agricultural technology acts as a major constraint in agro processing and food sector. There are other constraints as well–limited research results in lack of innovative ideas, poor marketing and promotional strategy. Lack of commercial farming skills is another problem. Processed products need packaging material; domestic supply of this material is not up to standard and imported materials are subject to high duty and tax. The industry also faces high duty and tax on other raw materials (seed, fertiliser, chemical) and on spare parts. Crop failure due to frequent droughts is a common problem faced by this sector. Lack of appropriate regulations regarding food safety and hygiene practice is another problem this sector facing in domestic and international market.

5.5.4.2 Electrical and electronics industry

Lack of formal education and entrepreneur skill is a major constraint in this sector. It appears that distributors put enormous pressure on the producers for bigger share of profits. This coupled with lack of consumer awareness results in low quality product in the market. There are different interest groups who lobby for government policies to support imported goods. This brings a major challenge for the domestic producers of this sector.

5.5.4.3 Plastic industry

There is lack of adequate technical expertise to operate modern machineries. There is also not enough mold making facilities. Lack of appropriate facilities for

quality control and proper management of plastic wastes are the two other important problems.

5.5.4.4 Designer goods industry

Like other SMEs, lack of access to financial capital, power failures and non-appropriate tax policy are common constraints in designer goods industry. Lack of diversity and sophistication, lack of accessories, limited networking and lack of formal education and training in connection with design/fashion and on capacity building are some of the other constraints need to be addressed.

5.6 PAST STRATEGIES AND POLICIES

5.6.1 Institutions and Projects

Small and micro enterprises of manufacturing, service and trade sectors have been recognised by the government as principal driving force of the private sector led equitable growth of the economy. The past major government initiatives that pushed this sector forward include: (i) creation of Small and Medium Enterprise Cell (SME cell) in 2003, (ii) forming a National SME Task Force in 2003, (iii) crafting SME Policy Strategies 2005, (iv) undertaking the project–Small and Medium Enterprise Sector Development Programme (SMESDP) in 2006, and (v) establishing SME Foundation.

In 2003 government formed the National SME Task Force based in the office of the Prime Minister. This taskforce was instrumental in crafting SME Policy Strategies which for the first time prescribed 'targeted' policies and interventions to boost the SME sector. Government also constituted the SME Advisor Panel (SMEAP) where a large number of members came from the private sector.

The SME cell acted as the secretariat of the SMEAP and coordinated government projects. One such large project was the Small and Medium Enterprise Sector Development Programme (SMESDP) worth of US$50 million financed by the Asian Development Bank (ADB).[4] The credit component of this project (US$30 million) was implemented by the Bangladesh Bank through its Small Enterprise Fund (SEF). Bangladesh Bank selected 17 banks and financial institutions to disburse the credit.

Following SME Policy Strategies 2005, Government created an apex body named Small and Medium Enterprise Foundation (SMEF). This body is mandated to work with government and the private sector for the development of SMEs. The

[4] Table 5A2 in appendix provides a comparative picture of the major features of three projects assisted by development partners of Bangladesh.

Foundation would strive to provision one-window delivery of all promotional and administrative facilities, including some resources needed for capacity building in appropriate industry association(s) for SMEs in the country.

The following sub-sections briefly discuss government's tax policy for SMEs, Bangladesh Bank's SME credit policy and gender policy for SMEs.

5.6.2 Tax Policy

5.6.2.1 Value Added Tax

VAT is imposed on producer, manufacturer, importer, exporter or service renderer under the Value Added Tax Act 1991, on goods or specified services, at the rate of 15 per cent at every stage of transfer. Exemption is allowed to certain goods or services or certain taxpayers. All cottage industries, except those producing particular products, are exempted from VAT. But manufacturers, producers or service providers (other than cottage entrepreneurs), whose annual turnover does not exceed Taka 1.5 million, are required to pay Turnover Tax at the rate of 2.5 per cent instead of 15 per cent VAT. In addition, supplementary duty is imposed at variable rates on certain categories of consumption goods across all size categories.

Finally, excise duty applies to a limited number of items irrespective of size. Similarly, there is no differentiated treatment of SMEs either with respect to duty on capital machinery or direct taxes.

5.6.2.2 Tax Holiday

There are provisions of tax holidays for enterprises of all size categories subject to rules and procedures set by the National Board of Revenue (NBR). To avail tax holiday, enterprises recommended by the relevant sponsoring agencies have to get the approval of the NBR, which is a cumbersome and lengthy process. The tax holiday, however, is not available to sole proprietorship enterprises which are the usual form of small and cottage industries in Bangladesh.

5.6.2.3 Wealth Tax

Wealth tax is payable by an individual if his net wealth exceeds Taka 2.5 million. According to existing law, no wealth tax is payable by a company, the usual legal form of a large industry. On the other hand, the legal form of small industries is usually sole proprietorship, and hence these enterprises are subject to wealth tax on their business capital.

The 2008-09 budget suggested to continue no-income tax policy to keep the income of the manufacturing SMEs free from taxes by defining SME as overall turnover not exceeding Tk. 2,400,000.00. The Budget proposed:

a) Exemption of income tax from income of export of handicrafts.
b) Upper limit of investment in capital machinery to enjoy cottage industry benefit be increased from Tk. 700,000.00 to Tk. 1,500,200.00 and annual turnover limit be raised from Tk. 2,000,000.00 to Tk. 2,4000,000.00.
c) Withdrawal of VAT at the production stage of hand made buiscuits and fabrics from artificial fibre and thread using handloom to provide impetus to the small, labour intensive ad employment friendly industries.

5.6.3 Bangladesh Bank SME Credit Policies, 2010

As a part of achieving the goals of industrial policy and SME policy, Bangladesh Bank has been playing a pivotal role in easing the credit constraints faced by the SMEs. Bangladesh Bank in its SME credit policy has set a target to disburse 23,995 crore taka as SME loans in 2010. These loans will be disbursed to the small, medium and women entrepreneurs. In future, the banks and the financial institutions will have to set sector, zone and branch-wise credit disbursement targets and such reports will have to be sent to the corresponding branch offices of the Bangladesh Bank. The details of the credit disbursement targets set by the banks and the financial institutions are given below (Table 5.20).

TABLE 5.20
SME LOAN DISBURSEMENT TARGET SET BY BANGLADESH BANK

Sl. No.	Types of Bank & Financial Institutions	Target (Crore Taka)
1	Nationalised Commercial Banks	3,897
2	Specialised Banks	600
3	Private Commercial Banks	17,478
4	Foreign Banks	707
5	Non-Bank Financial Institutions	1,313
	Total	23,995

Source: Bangladesh Bank SME Credit Policy, 2010.

5.6.3.1 Targeting

The Bangladesh Bank has prescribed two important targeting policies for facilitating credit support for the SME sector which is described shortly below.

5.6.3.2 Area Approach Policy

The area approach policy will be used for financing the SME sector just as it is used for disbursing agricultural credit. The banks will disburse the loans through their branch offices which will consider the zonal industrial production and zonal industrial structure to identify the important credit constrained SME sectors.

5.6.3.3 Cluster Development Policy

A cluster is defined as a legal agglomeration of enterprises (mainly SMEs but often also includes some large industries) producing and selling a range of related and complimentary products and services. To foster the growth of the SME sector the banks and the financial institutions will adopt the cluster development policy for disbursing the loans which will be closely monitored by the Bangladesh Bank. The main objectives of the cluster development policy are-

-to strengthen the existing clusters;

-to nurture the new-born clusters;

-to develop a sustainable comparative advantage through technological improvement;

-to make the entrepreneurs more efficient;

-to minimise credit risk;

-to help the entrepreneurs in every step of the production process: from product development to product marketing.

The Cluster Development Policy involves the following steps-

-cluster identification;

-formation of the cluster-development committee;

-conduction of the base-line survey and diagnostic study;

-strategy planning;

-active operation according to the strategy;

-review and monitor.

5.6.3.4 Prioritising the Smaller Enterprises and Manufacturing and Service Sector

Within the SME sector, the small scale industries have more potential to generate employment than the larger ones to accelerate the growth of this sector.

For this reason the Bangladesh Bank has decided that the banks will have to disburse at least 40 per cent of their credit-disbursement target (for the entire SME sector) to the small entrepreneurs. The rest will be used for the medium entrepreneurs. Under the refinancing scheme of the Bangladesh Bank, the manufacturing and the service sectors are given more priority than the trade sector.

Financing

Collateral

Lack of collateral of the small entrepreneurs is considered as the major obstacle to widen the credit facilities for the SME sector. In the case of the agricultural credit, the sharecroppers are now getting loans without any collateral. Similarly, in the SME sector, the banks will disburse up to TK 0.25 lakh as loans to small and women entrepreneurs taking only personal guarantee as the collateral. Bangladesh Bank is now considering introducing "group collateral" or "social collateral" in its new credit policy for the SMEs.

Rate of Interest for SME Loans

Since the overhead costs are generally higher in the case of the SME loans, the rate of interest is generally high. However, Bangladesh Bank has already instructed the banks and the financial institutions to keep that rate at a tolerant level.

5.6.4 Gender and SME Policy

In line with Government's continued effort to ensure gender equality and women's empowerment through incorporation of gender equality issues in the National Strategy for Accelerated Poverty Reduction (NSAPR), the SME Policy of the Government also encourages women into business and motivates them to turn into successful entrepreneurs.

5.6.4.1 Special Programmes for Women Entrepreneurs

Bangladesh Bank has already taken necessary steps to ensure easy conditions and greater institutional and financial supports for women in SME:

i) The target of smooth and organised development of country's industry in SME sector, to ensure easy condition more institutions loan facilities from Bangladesh Bank refinance scheme's minimum 15 per cent is allotted of entire money for women entrepreneurs'.

ii) 10 per cent interest rate is applicable for women entrepreneurs.

iii) Banks/financial institutions will accept/receive and complete all types of loan applications on the basis of maximum priority for small and medium women entrepreneurs'.

iv) Banks and financial institutions will take necessary steps to facilitate the women entrepreneurs' activities in all types of advertisement in mass media.

v) If a loan receiver is a woman or if maximum proportion of the owner of loan receiver institution is a woman entrepreneur, the bank or financial institution will provide loan facilities up to Tk. 25,00,000 (Twenty Five lakh Tk. only) on the basis of personal deposits against refinance fund.

vi) Banks and financial institutions will set up special consultation centre and service centre and will ensure service-friendly behaviour with women through selective branches for women entrepreneurs.

5.7 STRATEGIES AND POLICIES FOR SME DEVELOPMENT IN THE SFYP

In order to achieve double digit growth, the contribution of small and micro enterprises to GDP should also be increased to double digit. This can be achieved through three major ways:

i. By increasing the number of micro and small enterprises through proper monetary and non-monetary incentives so that people with entrepreneurial capabilities are more willing to start small businesses.
ii. By scaling up the size of the existing micro and small enterprises.
iii. By enhancing the productivity of the existing micro and small enterprises.

Therefore, all the strategies and policies should aim at increasing the number, size and productivity of the SMEs. There are general policies and strategies as well as sector specific ones and both of them act as complementary to each other in achieving these three intermediate goals.

In order to increase the number of micro and small enterprises, it is critical to understand what factors deter a person with entrepreneurial capabilities to start a small business. Literature indicates that lack of financial capital, adequate skill and knowledge, technical and financial support from government and effective market information are the major deterring factors. Scaling up an enterprise crucially depends on the availability of capital and marketing strategies, while productivity enhancing depends primarily on skill, knowledge, adoption of better technology and ,of course, capital. Therefore, strategies and policies for SME development of SFYP underscore these broader factors as well as sector specific constraints. This

section proposes the broad recommendation, based on the constraints we learnt from section 5.

5.7.1 Credit

Availability of credit is the most important factor for SME development which helps grow, expand and enhance productivity of small and micro enterprises. Bangladesh Bank has already developed a comprehensive credit policy for SMEs. The SFYP, thus, incorporates this policy and expands and fine-tunes it where necessary. A number of specific issues require greater attention in order to make Bangladesh Bank's credit policy more effective to attain the desired target.

5.7.1.1 Targeting

Targeting is the most important part of the credit policy for SME development. Bangladesh Bank has adopted area and cluster approaches to target small and micro enterprises. In line with this approaches, SFYP recommends the following methods of targeting:

i. A census of small and micro enterprises containing detail information of inputs, outputs, technology and management.
ii. Like national ID card, issuing of identification card (SME ID) for small enterprises with registration number.
iii. Creating a database of SME ID and update it periodically (e.g. in every two years).
iv. Detail upazila level map of small and micro enterprises to identify cluster.

5.7.1.2 Development of New and Customised Products

"One size fits all" credit policy will not work for small and micro enterprises. One major criticism of microcredit disbursed by microfinance institutions is that it fails to tailor their products according to demand. Terms and conditions for credit (repayment period, interest rate, grace period, installment, insurance, etc.) taken for cow-fattening should be different from a credit taken for retail business. Therefore, SFYP recommends that

i. Terms and conditions of credit should be tailored to the purpose of use. Based on the upazila level map, a host of credit products can be developed.
ii. Terms and conditions of credit should also be customised to region also. The same credit product can have differential features based on region to reflect the local demand.

5.7.1.3 Interest Rates

In order to encourage people with entrepreneurial skill to start new business and also the existing entrepreneurs to scale up the production, subsidy on bank interest rate can be considered actively through both private and public banks. However, this may result in rechanneling or misuse of credit to non SME sectors. Therefore, monitoring the use of credit both at bank and borrower levels is also a critical part of the implementation of credit policy. Therefore, SFYP recommends

i. 10-15 per cent interest rate subsidy based on the priority sectors upon identification through SME ID.
ii. Since clusters create externalities, greater subsidy (e.g. 15 per cent) can be offered to small and micro enterprises which belong to a cluster.
iii. Greater subsidy for backward regions, disaster prone areas (e.g. Monga prone area, coastal area, etc.).

5.7.1.4 Monitoring

As mentioned earlier, without effective monitoring proper use of credit for the intended purpose cannot be ensured. A holistic mechanism has to be devised including new laws and regulations, monetary and non monetary incentives for the lenders so that they have incentives to monitor. Therefore, SFYP recommends

i. Tax subsidy (e.g. 1 per cent) for the banks with greater disbursement and targeting rate.
ii. Stern laws for banks for over reporting the disbursement of SME credit.

5.7.1.5 Capacity Building of Banking Sectors

Credit for SMEs differs from other conventional credit banks are use to lend. Banks are required to build and expand capacity to develop new products, to identify the potential borrowers, to disburse and collect loan in time, and to monitor the use of credit. Some banks have already created SME cell. Therefore, SFYP recommends:

i. Bangladesh Institute of Bank Management (BIBM) and Bangladesh Bank Training Academy (BBTA) in collaboration with SME Foundation can offer courses on SME credit to the bankers.
ii. Bangladesh Bank can persuade and also prepare regulations to ensure that all banks have a specialised cell for SMEs.

5.7.1.6 Credit through PKSF

NGO sector of Bangladesh has a long history in disbursing credit for small and micro enterprises. PKSF (Palli Karma Sahayak Foundation) is the wholesale credit seller who lends credit to its partner NGO-MFIs. In 2009, PKSF disbursed micro enterprise loan worth of Taka 1.95 billion to 0.14 million borrowers. Therefore, SFYP also considers PKSF as an important channel to disburse credit for SME development.

5.7.2 Tax Policy and Other Fiscal Incentives

Any tax policy or other fiscal incentives aiming at providing preferential treatment to smaller size of the enterprises should be careful about the potential disincentive to grow.[5] Since growth of the smaller enterprises to medium and larger ones is the most desirable objective of any industrial policy, monetary and non monetary incentives to the smaller enterprises should not act as an incentive to remain smaller. For example, if tax subsidy is huge for the enterprises employing 1-19 workers, but no subsidy for employing more than 20 workers, entrepreneurs may not want to scale up their enterprises beyond certain point. This may act as a disincentive to grow and is in contrast to the overall industrial policy of the country. This may also lead to under reporting of the size of the enterprises when monitoring by the government official is very weak. Two issues emerge from this discussion regarding operational point of view:

i. Some enterprises have more growth potential than others. Therefore, it is imperative to identify and classify the enterprises that have the potential to scale up and which do not have. Preferential treatments should be devised more carefully for the former than the latter.
ii. Any monetary incentive such as tax subsidy should increase linearly and progressively with the size of the firm. High degree of non linearity or discrete jump may in fact hinder the growth of the enterprises.

5.7.2.1 Tax (Income tax, VAT, wealth tax) and Tax Holidays

A large part of small and micro enterprises are part of the informal economy of Bangladesh. These enterprises do not have any legal identity and therefore, do not pay any tax even if their income is taxable. Cost of being legal (registration fees, tax, harassment, etc) can be much higher than being in the shadow economy. Therefore, in order to target the small and micro enterprises effectively, to bring them in the

[5] The same argument also holds for any interest rate subsidy.

formal sector, adequate incentives should be offered so that smaller enterprises are encouraged to have a legal identity. Therefore, SFYP recommends that

i. A definition based on annual turnover, not only on the number of employees, is required to classify the enterprises for tax purposes. One can define as many as ten groups based on annual turnover so that tax rates can increase linearly and smoothly with size without abrupt jump.

ii. Based on the distribution of enterprises in terms of annual turnover, the lowest group (e.g. micro enterprises) should be completely exempted from VAT. The difference of tax rates between two adjacent size-groups should not exceed 1 per cent. The fiscal cost of exemption and lower tax rates is likely to be outweighed by the benefit of larger number and greater size of the enterprises.

iii. Greater tax incentives for export oriented small and micro enterprises are recommended. For example, handicraft has higher export orientation than other SMEs. So, based on export share of total production, tax subsidy can be offered.

iv. 2-5 years of tax holiday can be considered for larger SMEs, especially manufacturing, which take time to take off and make profit.

v. In general, the legal form of small industries is generally the sole proprietorship and these enterprises are subject to wealth tax on their business capital. Exemption of wealth tax for smaller manufacturing can be considered.

5.7.3 Trade Policy

From the previous sections we have learnt that share of revenue from export in total revenue is also large for some small and micro industries. Therefore, these industries require greater policy support in terms of tariff and other trade policy related incentives. SFYP, therefore, recommends:

i. Identify the small and micro enterprises with larger export share in total revenue.

ii. Upon identification, import tariff for raw material can be reduced.

5.7.4 Skill Development

Skill development of the entrepreneurs and the workers of the small and micro enterprises is a precondition for the development of this sector. SFYP recommends:

i. Education policy and national skill development policy should reflect the demand for skilled labour in SMEs and how this demand can be met with current stock of training and educational institutes.

ii. SME Foundation with the help of the National Council for Skill Development and Training (NCSDT), Bangladesh Technical Education Board (BTEB) and Directorate of Technical Education (DTE) can offer specialised vocational training/courses at the upazila level based on the local demand.

iii. Upon identifying the clusters of enterprises, SME Foundation can collaborate with local vocational training institutes and NGOs to offer on-the-job training to the workers.

5.7.5 Gender Policy

It is argued that women are better manager than men and the microfinance revolution Bangladesh is a good example of it. As we argued before that in order to increase the share of the contribution of SME in GDP, it is essential to increase the number of the small and micro enterprises. Since women have natural entrepreneurial capability, policies should encourage and promote women entrepreneurs. Bangladesh Bank has already taken steps to ensure easy conditions and greater institutional and financial supports for women in SME (see section 6). SFYP highly recommends these measures.

5.7.6 Institutional Capacity Building

In order to put SME on the forefront of national policy domain and to implement the policies, institutional capacity of the relevant ministries, Bangladesh Small and Cottage Industries Corporation (BSCIC)/Small and Cottage Industries Training Institute (SCITI), Bangladesh Institute of Management (BIM), Bangladesh Industrial Technical Assistance Center (BITAC), National Productivity Organization (NPO) SME Foundation, etc. should be upgraded.

5.7.7 Development Budget

With targeted goal and precise roadmap, the government should calculate the budget needed for the next ten years for the development of SMEs in line with the Vision 2021. The major sources of fiscal burden for the government are:

1. Credit subsidy
2. Tax subsidy (income tax, VAT, import tariff)

3. Pay of officials, establishment and allowances of the related public institutions
4. Curriculum development, training, workshop and seminar
5. Capacity building of banks
6. Capacity building of public and private institutions related to SME
7. Capacity building of NGOs
8. Census, survey and quality research
9. SME ID
10. Advocacy and information dissemination through print and electronic media.

5.8 CONCLUSIONS

It is widely accepted by the researchers and policymakers that the vision of lifting the country to the middle income group largely depends on the performance of small and micro enterprises (SMEs). In order to attain double digit growth, the contribution of SMEs to national output has to be raised to double digit too. Currently, the contribution is just 5 per cent. Over the period 1989-2000, value addition of SMEs had grown at an annual rate of 6.6 per cent, while in the later five years it grew at only 5.5 per cent, which is not at all satisfactory. Though enterprises with less than 10 employees have been the single most dominant size of the enterprises making up more than 90 per cent of the industry, the growth of this class is less than the bigger ones.

Micro enterprises are the biggest employer and they employ three-fourth of the total labour force of the enterprises. However, average size of micro and small enterprises have not changed much. Average size of small enterprises was similar across rural and urban areas in 2003. About 40 per cent of total small enterprises were located in rural areas and these enterprises employed about 60 per cent of total employees in small enterprises.

There are also wide variations of performance among SMEs. Within SMEs, specialised handlooms, dyeing and printing, plastic products, steel furniture, electrical goods, light engineering, agro-processing, leather and footwear are considered as the fastest growing SMEs in Bangladesh. Leather and leather goods industry has higher labour productivity, value addition, employment and capital-labour ratio than most other SMEs.

Share of export from SMEs has also been growing. Handicrafts, footwear, leather, and garments are most export oriented SMEs.

Access to financial services, infrastructure, modern technology and expertise, and non-price factors such as health, safety and ecological compatibility are regarded as the major structural constraints. With regard to tax and trade policy, incidences of preferential treatment for small and micro enterprises are very low.

Development of SMEs critically depends on quality research and quality research depends on availability of updated quality data. Current data and research are outdated and lack quality.

Government has been keen to promote and develop SMEs and has taken a number of key steps including (i) creation of Small and Medium Enterprise Cell (SME cell) in 2003, (ii) forming a National SME Task Force in 2003, (iii) crafting SME Policy Strategies 2005, (iv) undertaking the project, Small and Medium Enterprise Sector Development Programme (SMESDP) in 2006, and (v) establishing SME Foundation. SME Policy of the Government also encourages women into business and motivates them to turn into successful entrepreneurs.

This paper takes stock of current situation of SMEs and prescribes strategies and policies for its further development in line with the vision 2010. It suggests policy for the factors that have direct bearing on the development of SMEs such as credit, tax, tariff, skill development, gender, and annual budget.

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APPENDIX

TABLE 5A1

REGIONAL DISTRIBUTION OF SMALL MANUFACTURING SECTOR FOR THE YEARS 1995-96, 1996-97 & 2002-03

	AEIS (Small Manufacturing Sector)		
	1995-96	1996-97	2002-03
No. of establishment	150,002	162,789	211,401
No. of establishment by administrative division			
Dhaka	51,598	48,414	61,574
Chittagong	12,831	32,830	56,382
Rajshahi	48,116	51,566	42,142
Khula	14,896	29,979	23,152
Barishal			21,578
Sylhet			6,573

Source: BBS.

TABLE 5A2

A COMPARATIVE NARRATION OF THE MAJOR FEATURES OF THREE PROJECTS ASSISTED BY DEVELOPMENT PARTNERS OF BANGLADESH

Metric	Katalyst	Sedf	Smesdp
Financial lead	Bilateral; grant money	Bilateral; grant money	Multilateral; loan money
Protagonist(s)	DFID,SDC,SIDA	DFID,IFC,SIDA	GOB,ADB
Tenure	5 year (2002-2007)	5 year (2002-2007)	31/4 years (2005-2008)
Outlay	US $ 25 million	US $ 25 million	US $ 5 million
Leadership	Expatriate advisors	Expatriate advisors	National decision makers
Expatriate person-months	Between 100 and 200	Between 100 and 200	7
Government's fiduciary responsibility	None	None	Government is responsible for project implementation
Loan component	None	None	Yes

Metric	Katalyst	Sedf	Smesdp
Flagship institutional stake	Spurring business service markets	Forging an efficient and market-oriented SME access to finance	A systems approach on four props: evidence-base, policy advocacy, technology support services and targeted credit wholesaling
Flagship legacy	Empowered input traders and other facilitators in impact sectors	Empowered PFIs; improved production process in light-engineering, for example	Small & Medium Enterprise Foundation, with an endowment of Tk. 2 billion, and a completely independent mandate from the Government
Impact on credit policy	Not known	Not known	One Bangladesh Bank circular(but yet to be 'enforced')
Impact on the budget	Not known	Not known	One minor impact
Gender equality institution	Not known	Not known	One(WEF) which is being rolled out, albeit slowly
ICTs as a catalyst	Static, one way web-site	Static, one way web-site	Dynamic, fully interactive information portal

(Cont. Table 5A2)

Source: FBCCI (2008).
Note: Numbers in this table relate to the period up to December 2007.

TABLE 5A3
MATERIAL COST AS PERCENTAGE OF TOTAL COST

Firm Sizes	Agro & food processing	Leather & footwear	Designer goods	Electrical & electronics	Plastics	Light engineering
Micro	72.9	83.7	40.87	71.7	76.7	76.89
Small	71.8	91	53.05	77	76.4	90.52
Medium	64.1	91.6	54.07	68.7	83.6	82.51
Large	62.5	86.9	53.53	78.4	74.4	81.13
Mi Small	71.9	90.9	52.68	75.8	76.5	89.99
Me Large	63.6	88.2	53.7	73	79.7	80.28
All	69.2	88.8	53.54	75.2	77.5	85.99

Source: SMEF survey of six sectors, 2006/07.

TABLE 5A4
AVERAGE NUMBER OF MALE & FEMALE WORKERS ACROSS FOUR SIZE CLASSES IN SIX SECTORS

	Agro processing		Leather & footwear		Electrical & electronics		Light engineering		Designer goods		Plastics	
Firm size	M	F	M	F	M	F	M	F	M	F	M	F
Micro	5.7	0.2	5.87	0	6.21	0.04	4.53	0	6.17	0.33	5.7	0.2
Small	21.7	1.9	21.65	0.19	20.8	3.11	16.05	3.02	22.69	13.02	20.4	0.75
Medium	57.5	13	60.57	9.1	54.18	11.59	64.35	10	49.53	22.36	71.5	3.4
Large	194.3	60	437.1	183.7	132.83	37.5	153	43.88	191.7	474.88	211.7	50.6

Source: SMEF survey of six sectors, 2006/07.

Chapter 6

IMPLEMENTING THE PLAN: THE CHALLENGES OF GOOD GOVERNANCE, IMPLEMENTATION CAPACITY, AND MONITORING AND EVALUATION

Minhaj Mahmud

6.1 INTRODUCTION

The challenges of good governance in Bangladesh are well known. It is recognised by the government that addressing the challenges through fundamental reforms of core institutions is *sine qua non* for the Vision 2021 and the underlying Five Year Plan. Likewise, an effective monitoring and evaluation system is crucial for the implementation of the Plan and the associated programmes. However, these are long-term challenges and require long-term coordinated and sustained efforts. Against this backdrop, this chapter focuses on governance challenges in Bangladesh, governance aspects of institutional development i.e. administrative capacity development issues and the institutional framework of monitoring and evaluation in tracking the Plan implementation. Finally it identifies reforms needed to address these Plan implementation challenges.

6.2 GOVERNANCE CHALLENGES IN BANGLADESH

By providing an analytical framework in assessing governance, we review the progress and challenges with various dimensions of governance in the country. We also explain the link between governance and development and the likely consequences for poverty reduction if the governance challenges are to be addressed. Then we identify some strategies for addressing the governance challenges during the Sixth Five Year Plan (SFYP) (2011-2015) period.

6.2.1 Governance:How Defined?

Governance has been conceptualised in a variety of ways and ranging from a very narrow to a very broad definition. In some cases, governance and development appears tautological in the sense that "well governed country is a developed country" and "a developed country is by definition a well governed country." Broadly defined governance reflects "all rules and procedures, formal and informal, in economic, political and administrative sphere, organisational entities entrusted

with formulating and implementing such rules of the game as well as macro, micro, or economy-wide polices." A recent World Bank study (Kaufmann, Kraay and Mastruzzi 2005) outlines the principal dimensions of governance or institutional quality that include: voice and accountability, political instability, government ineffectiveness, regulatory burden, rule of law and control of corruption. According to a narrow definition, governance characterises "the manner in which power is exercised in the management of a country's economic and social resources for development."

The governance issues, particularly the quality of government institutions might hold the key to understanding economic growth in developing countries. Impartiality of government institutions that implement government policies is imperative for good governance through which a country could achieve its policy targets and development goals e.g. poverty reduction.

6.2.2 Governance: How Measured?

The most widely used governance indicators are derived by the World Bank (see Kaufmann, Kraay and Mastruzzi 2005). The World Bank indicators are motivated by the broad definition of governance as "the traditions and institutions by which authority in a country is exercised" under three distinct dimensions political, economic and institutional each of which is represented by two indexes.[1]

The political dimension, which is indicated by two indexes, voice and accountability and political instability, relates to the process by which governments are selected, monitored and replaced.

The economic dimension, which is also indicated by two indexes, viz, government ineffectiveness and regulatory reform, is believed to represent the ability of the government to design and execute policies and deliver public services. Government effectiveness is a composite measure of efficiency and independence of the bureaucracy, the quality of the public service provided and the credibility of polices. The regulatory burden indicates the degree of market friendliness of the policies or the distortions introduced by them.

[1] However, these are not the only types of governance indicators available. There are other governance indicator data available. For example, Arndt and Oman (2006), UNDP (2009). The type of governance data available can be categorised as features of political system, features of legal and regulatory systems, investment climate surveys, and governance diagnostic surveys. For a summary, see Kraay (2008).

The institutional dimension of governance is summarised by the rule of law and control of corruption. The rule of law index reflects to what extent rules are adhered to, contracts are enforced and deviations are penalised. It encompasses the juridical environment in which the economic activities are carried on. The control of corruption refers to the extent to which incumbents use public office for private gain; it includes petty and grand corruption and the degree of state capture.

Among all these dimensions, government effectiveness and regulatory quality are the issues which generally concern people most as these affect them more directly in their everyday lives. If these are of high order and people are aware of their rights and can express their concerns forcefully, and if rules of law are applied impartially, corruption can often be curbed substantially. Corruption is seen as a major challenge for governance. For example, analysis of political corruption, particularly in countries where corruption is endemic, suggests a "vicious cycle wherein corruption breeds a climate of distrust that in turn feeds corruption" (Morris 2006). It is therefore an interesting question whether devoting additional resources to the existing legal and financial institutions will reduce corruptions.

Box 6.1: Worldwide Governance Indicators

Voice and Accountability: This captures the perceptions about the degree to which citizens of country are able to participate in selecting their government, including perceptions about freedom of expression, freedom of association and a free media.

Political Stability and Absence of Violence: This captures the perception on the likelihood of destabilising the incumbent government through politically motivated violence or terrorism or the likelihood of unconstitutional forces overthrowing the government of a country and thus creates a sense of insecurity for lives and property.

Government Effectiveness: This is basically the efficiency with which public services are delivered to the citizens by the civil service and its quality.

Regulatory Quality: Services provided by the government are, by and large, the results of certain policies or their lack. The regulatory quality tries to gauge how far policy- making is based on sound-judgement and how services or goods delivered by others as well as the government are of a minimum acceptable level of quality.

Rule of Law: Rule of law relates to the quality of the legal, judicial and security services provided by the State to its citizens and the extent to which these are applied impartially rather than in partisan manner.

Control of Corruption: This relates to the ability of the country concerned to curb the use of public resources for private gain as well as the capture of the State by oligarchs or a coterie of vested interests to force it to do its bidding for its unearned gains.

The World Bank indicators of governance under six dimensions (see Kaufmann, Kraay and Mastruzzi 2005) are estimated from information provided by 37 different sources produced by 31 different organisations including the World Bank on 353 variables measuring different aspects of governance. These data are condensed into six indexes mentioned above following an averaging methodology described in Kaufmann, Kraay and Mastruzzi. (2004). Thus it implies that the construction of governance indexes is not based on quantitative information on governance or institutions but rather on some qualitative (subjective) information and not free from bias.

The measurement of governance, as attempted by the World Bank and widely used by many researchers, raises lot of controversies. For example, based on the scores reported in Kaufmann, Kraay and Mastruzzi (2005), some controversial findings follow (for detail analysis see Iqbal and Shah 2008): Botswana is politically more stable than either Norway or Sweden; India is politically less stable than either Rwanda or Sierra Leone; Voice and accountability in China is worse than Zimbabwe.; Percentile ranking of China on political stability, voice and accountability and rule of law remains low and at the same level in 2006 as was in 1996. Government effectiveness and regulatory quality is lower in 2006 as compared to 1996; Bangladesh's scores on all aspects of governance deteriorated in the last decade.

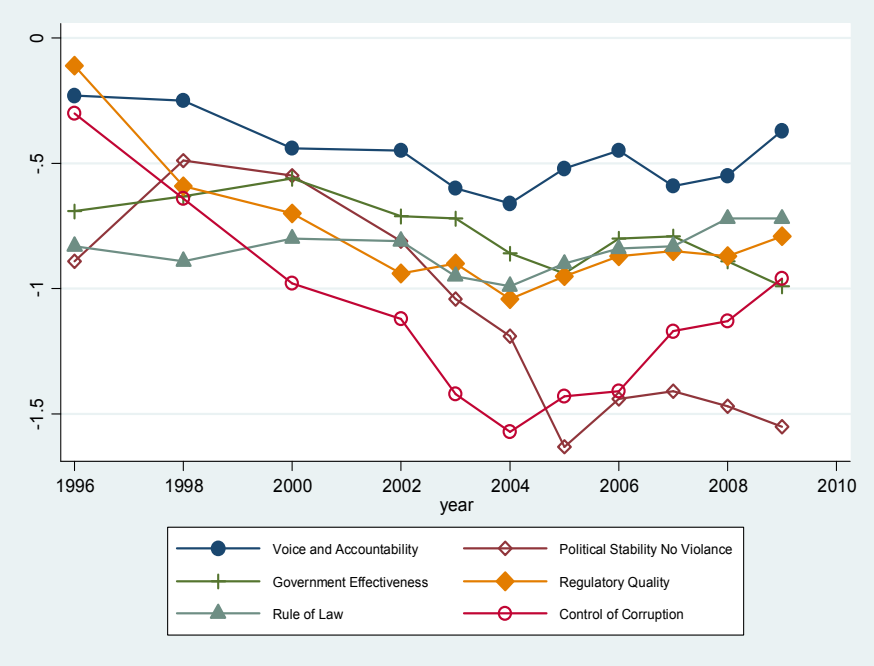
6.2.3 How does the Situation of Bangladesh Look Like in the Areas of Governance?

Before we look at the Bangladesh's performance based on World Bank's measure of governance, a note on the interpretation of values attached to the components is useful. The values of the components are normalised so that the mean of each of the components is zero. This means a negative value implies deterioration from the average, while a bigger negative value implies further erosion of governance.

As depicted in Figure 6.1, we observe that all the indicators of governance are negative throughout the period 1996-2009, implying a very weak state of governance in Bangladesh. In the case of political stability and violence, there has been a sharp decline of governance indictor. In other cases, except for rule of law and voice and accountability, there had been a clear deterioration in the indicator over time. In the case of anti-corruption measures, there had been a major fall but it improved afterwards apparently with the establishment of the Anti-corruption Commission and during the period of the caretaker government (2007-2008). For other indicators, there had been a decline up to 2004-2005, which thereafter show

signs of stability or slight improvement. Nevertheless one should cautiously read the patterns therein; the indicators imply very poor state of governance in the country. To achieve the millennium development goals (MDG) and to fulfil the Vision 2021, there must be clear improvement in the governance indicators and it is expected that the scores in all the components will rise at a respectable level before we celebrate the 50th years of independence of the country.

Figure 6.1: Governance Indicators: Bangladesh 1996-2009



Source: World Bank (2010).

6.2.4 How Governance and Development are Related?

The importance of political institutions and effective government for development has been recognised by Adam Smith and John Stuart Mill. In a study of long-run growth in forty non-industrialised countries from 1850 to 1950, Reynolds (1983) conjectured that the single most important explanatory variable was political organisation and the administration of government. As noted by North (1990), "the inability of societies to develop effective, low cost enforcement of

contracts is the most important source for historical stagnation and contemporary underdevelopment in the Third World." North's statement led economists and social scientists to seriously consider the importance of governance for development. Subsequently, there is now large literature on governance and development and cross country evidence shows that the quality of governance played a vital role in economic development (Barro 1991, Mauro 1995, Knack and Keefer 1995).

Studies found very close correlation between per capita income and corruption (governance). The direction of causality is, however, debated; there is disagreement whether higher income promoted less corruption or whether lower corruption led to higher income. Early studies acknowledged that corruption could act as grease that turns the wheels of development; that corruption is necessary to offset market or nonmarket distortions (e.g. see Huntington 1968). However, the opposite views suggest that lower corruption or better governance promotes higher income rather than vice versa (see Acemoglu, Johnson and Robinson 2001, Kaufmann and Kraay 2003, Rodrick,Subramanian and Trebbi 2002). Some authors also suggest that higher income contributes to a reduction in corruption, while at the same time, lower corruption promotes more rapid growth; this view allows external interference to control corruption.

Looking at the case of Bangladesh, while all the indicators of governance had been very weak and in some cases deteriorating, and when the country is being labelled as most corrupt, we have been experiencing a relatively higher and stable growth rate for several years. So one can obviously argue whether good governance matters at all for growth or development, or, is it the case that there may be areas where governance is not a major problem? This debate is not new and the experience of Bangladesh is perhaps known as a "puzzle" among development practitioners. Regardless of the direction of causality, higher institutional quality in the form of aforementioned governance indicators does lower the transaction cost as well as facilitate economic activity contributing to future growth and development. It has been observed that improvement in governance by one standard deviation cuts down infant mortality by two-thirds and raises income by threefold in the long run. Moreover, trust/confidence in institutions or institutional quality (governance) predicts interpersonal trust which in turn lowers transaction cost lubricating the economy (Arrow 1972); there is now much theoretical and empirical evidence that trust among people fosters cooperation and economic activity and hence it is important for development (Putnam 1993, Fukuyama 1995, Knack and Keefer 1997).

6.2.5 Addressing the Governance Challenges

The lack of good governance can be felt in all sectors of the economy to a varying degree of course and their manifestations are also different. Unless there is improvement in overall governance, poor people will suffer more from deprivation, service delivery will be remain poor, and economic opportunities will be limited. It is observed that a host of factors have impact on good governance. These include transparency, accountability, efficiency, organisational performance, etc. To achieve the goals of Vision 2021 and underlying development programmes, there is no alternative than improving governance, institutional quality and reducing corruption. The vision of good governance, as also outlined in the government's poverty reduction strategy document (NSAPRII 2009), is to ensure effective parliamentary process, establishing rule of law, ensuring pro-poor service delivery, strengthening local governance and a corruption free society ensuring social justice. Below we elaborate on these visions highlighting measures that could be implemented to have positive impact on our society by improving governance and some relevant progress therein. It should be noted, however, that following discussions, to a large extent, draws on the recently revised poverty reduction strategy (PRS) document (NSAPRII 2009) of the government.

a) Making parliamentary process effective

The parliament plays a pivotal role in promoting good governance. It can hold the government accountable through legislative debates-parliamentary committees are able to effectively scrutinise executive action and review public policy and expenditure of public funds and take parliament to people. Parliamentary standing committees are formed with opposition members being chair in important ones. However, the lack of active participation of opposition members in the committees followed by their absence in the parliament has failed to bring desired result in strengthening the democratic and parliamentary system of the country.

b) Strengthening local governments

As envisaged in the previous PRS documents of the government, the current local governance initiatives, if implemented, could develop effective systems of public participation as well as accountability that will ensure that government servants are responsible to elected officials, and elected officials are in turn responsible to their constituency. The government has already been taken steps to strengthen local government so that it could respond well to peoples' need by bringing services to their doorsteps. Strengthening of local government and decentralisation of power imply delegating powers of the central government with

the aim to address major issues like poverty reduction, good governance, infrastructure development and disaster management. Efficient and dedicated local government bodies can deliver services and generate social and economic awareness to achieve the national goals.

c) Reforming Public Services

The public service reform should be a defining priority as high performing civil service is fundamental to improving the governance scenario. The reform would include improving recruitment procedure, undertaking of continuous on the job training, defining civil service code of conduct to address problems of corruption and developing institutional mechanisms to reduce patronage political pressure.

d) Controlling corruption

Corruption creates distrust among people and is a major governance challenge in the country. The country has been branded as one of the most corrupt countries in the world based on all cross country perception surveys. Measures taken so far did not see much success under existing system affecting adversely poverty reduction programmes. It is important that governance be made compliant with the UN Convention against corruption, which government already ratified. It is crucial to allow the newly reformed Anti-corruption Commission (ACC) to function with constitutional guarantees about its powers, free from influences of the executive and lower judiciary. This should be guaranteed with support of formal rule and procedure which should be common knowledge of people. The ACC also must act transparently by publicising the legal privileges and constraints under which it operates and not penalise any person and organisation without following due process.

e) Legal and judicial system reform

The judicial system needs strengthening making it to protect vulnerable in the society by bringing dynamism in civil justice system. There is need for capacity development in civil justice delivery system to improve the quality and pace of delivery. The separation of judiciary from the executive has not yet brought expected result as there remains gray area of functions requiring training, despite clear demarcation between judicial and executive functions. In this context some desirable reforms would include:

i) Appointment of court Ombudsman as guaranteed by the Article 77 of the constitution.

ii) Reforming the recruitment and selection system ensuring competent judges are selected in a fair and competent manner.

iii) Establishment of separate pay commission for official of judicial services to combat corrupt practices and ensuring efficient service.

iv) Streamlining administrative procedure.

f) Promoting E- Governance

In recent years ICT sector has shown some promises, although adoption of ICT in all sectors has been limited. Recently national broadband policy has been framed. However, to promote E-Governance there remains to undertake yet lot of actions. Some recommendations in this regard would include:

i) Formulating strategy to get relevant information online by all ministries/agencies.

ii) Developing a legal framework requiring public notice in regulatory process.

iii) Developing administrative setup to monitor e-governance implementation.

iv) Introducing and facilitating e-governance in local government bodies.

g) Improving project implementation capacity

It is important that government continuously works on improving the capacity of project implementation. In this context following measures can be taken:

i) Shifting from the existing project approach which is linked with national development policies and bringing improvement in project quality.

ii) Project directors should be given more authority for accelerating the ADP implementation, while aid disbursement procedure should be simplified.

iii) Procurement of goods and services should be made in the appropriate time without any delay.

iv) The capacity of the ministry officials regarding project implementation should be strengthen.

v) Management information system should be introduced and made operational so that implementation status can be monitored at least on a quarterly basis.

h) Improving sectoral governance

It is observed that sectoral level corruption is a major governance issue. Therefore, sectoral level anticorruption strategies should be formulated that would focus on minimising risks alongside the flow of goods and services.

i) Access to information

There is no denying the fact that access to information creates opportunities and making information available to poor is fundamental to poverty reduction as these generate resources. Disseminating information effectively is crucial, where NGOs, CBOs, media, information technology assume greater role. Some progress in this regard is offing with the promulgation of right to information act as well as formation of information commission. Here providing training facilities for mass media to disseminate information at grassroots level could make a difference.

j) Ensuring Human rights

Notwithstanding laws exist prohibiting discrimination in society, lack of enforcement brings suffering for the weaker section of the society; they face the burden of injustice. Here the state's role is central and rights can be safeguarded with independent judiciary, adequate legislation and establishment of democratic institutions. Although National Human Rights Commission Ordinance 2007 has been approved and there now exists an independent human rights commission, violation of fundamental rights is commonplace in the country. Much has to be achieved in this regard.

6.3 DEVELOPING ADMINISTRATIVE CAPACITY

Here we link the governance aspect of institutional development to the specific issue of how to address the capacity constraint in Bangladesh. We aim to discuss areas where progress is feasible and identify the important specific policy actions that can be taken by focusing on few institutions including the main service delivery institutions. In doing so, we focus on the importance of devolution to local governments to implement the Plan programmes, particularly those related to basic service delivery, and identify key actions that can be taken during the Plan period to strengthen the local governments.

6.3.1 Service Delivery Situation

The poor quality of service delivery by relevant institutions can be attributed to the quality of civil servants as well as to the regulatory burden of governance (policies, rules and procedures). As documented in various reports of the Transparency International Bangladesh (TIB), widespread corruption in Bangladesh is not only specific to public institutions but corruption is also rampant in social sectors including education and health. Absenteeism of service provider is a serious problem in rural Bangladesh (Chowdhury *et al.* 2006). Moreover, the service quality of the providers in terms of impact on schooling and health outcomes is often weak.

These may result in lower trust and confidence in public institutions having serious policy implication. Higher perception of corruption is bad for growth, as it may reduce interpersonal trust; trust promotes growth by reducing transaction cost (Arrow 1972).

The poor health service delivery can be taken here, for example, as a major governance issue. The major governance challenges in the health sectors are accountability, absenteeism, weak monitoring and regulatory framework, and centralised administration (Ara 2008). It is observed that health sector is not accountable for service delivery to the citizens whereby citizens voice are given "deaf hear," officials are found not be performing the supervisory or monitoring role, decisions taken at the central levels are not in line with ground reality both in terms of supply and demand. Here lack of adequate training of physicians and nurses coupled with low monitoring and supervision results in very poor service delivery. The hospitals are not equipped to accommodate growing populations seeking medical treatment; poor diet for patients, inadequate beds, poor health facility, inadequate medical and surgical equipment, improper uses, mismanagement and corruption, poor staffing-all deserve considerable policy priority and support including decentralisation of decision making. In the absence of strong regulatory framework, the health care will tremendously suffer both in terms of quality and quantity.

The power sector is another example where lack of good governance by way of serious deficiency of institutional capacity has been compounded by failure to mobilise resources for investment and to manage the unbundling of production, transmission and distribution (Asaduzzaman 2009). This sector is circumstanced by inadequate capacity, leakage and losses. Entrusting generation, transmission and distribution to separate entities, private sector participation in power generation, and establishment of regulatory commission are few measures taken to improve accountability, transparency and regulatory quality. However, the speed of reform has been slow and gains in governance have been limited.

6.3.2 Capacity Development Issues

There is no denying the fact that improved governance is necessary for good service delivery, adequate security, and more economic opportunities for poor people. The public service reform should be a priority as governance cannot improve without a high performing civil service. As outlined in the revised PRS document (NSAPRII 2009), several areas of intervention are necessary to bring efficiency, transparency, accountability in public service management. This would include improving the recruitment procedure in a way free from politicisation so

that talented, high calibre persons are selected. More focus should be given on human resource development by providing training at the entry level as well as on continuous on –the- job training. This would also include development of code of conduct to address issues of corruption. Reform in institutional mechanism is needed to eliminate or reduce patronage, political pressure and nepotism. There is also need to bring procedural change so that civil servants could work with clear terms of reference promoting accountability. This would also involve creating appropriate working environment taking into account the pay reform commensurate with skills and responsibilities, streamlining non financial benefits and introducing performance based promotion as well as punishment. Moreover, strengthening the role of the Public Service Commission is vital for promoting excellence in public administration and governance

To develop capacity and efficiency of bureaucrats, it will be very important to design and facilitate on the job training for the civil servants.[2] The training module should be designed in line with the skill and knowledge requirements to perform diverse jobs during the initial period of services; the modules may include behavioural aspects of decision making in addition to general administration. For senior level officials, specialised training focusing on district level administration, development administration, and ICT use may be designed. For top rank officials training on policy administration, modern management practices should be given. Also, it would be necessary to institutionalise the citizen's charter to provide regular feedback on publicly driven and acceptable indices of good governance at all levels and reward units for meeting public expectations in service delivery and other aspects of governance.

We emphasize that capacity development should occur both at individual level and institutional level. This necessitates a new approach to human resource management pointing to importance of knowledge management. Individual level capacity development would ensure establishing the conditions under which officials are able to get on a constant process of learning -building on existing knowledge and skills and enhancing and using them in new directions. Institutional level capacity development is also based on a similar approach where focus should be given on administrative modernisation with priority on systems and processes that would ensure capacity development for policy support.

[2] See Alam (2006) for an elaborative discussion on the capacity development issues of Bangladesh Civil Service.

6.3.3 Devolution to Local Governance

There is no alternative to a strong local government apparatus where citizens' charter will have to be well defined, service delivery organisations to be promoted and motivated to select appropriate target groups and deliver timely service. Efficient and dedicated local government bodies can deliver services and generate social and economic awareness to achieve the national goals.

To realise the Plan programmes priorities should be given to capacity building of the local administration. This can be achieved through building planning as well as budgeting capacity. It is important to develop a well designed legal framework for decentralised governance, which includes the constitutional devolution of political, financial and administrative powers to lower level units. There is need for strategic decisions related to cost effectiveness and the delegation of responsibilities to ensure quality service delivery and accountability

We need to develop a stronger policy basis to increase transparency and improve accountability by developing indicators and standards for measuring performance in service delivery at local level. It is important to broaden the role of oversight institutions which would perform financial and service delivery audits, investigate corruption and irregularities and make the report available to public. Also, the capacity of all stakeholders, local government institutions' officials, and representatives from the public as well as community members needs to be built. It will also be necessary to involve local leaders in the process of utilising government resources.

6.4 MONITORING AND EVALUATION

This section reviews the monitoring and evaluation (M&E) framework and explains the need for moving to results framework. It draws on international best practices to identify the steps necessary for building result-based M&E. In doing so, it aims to identify challenges and the nature of reforms needed in tracking the implementation of the SFYP.

6.4.1 The Purpose of M&E

Monitoring and evaluation ensures accountability and transparency in public spending. Monitoring gives information on where a policy, programme, or project is at any given time (and over time) relative to respective targets and outcomes, whereas evaluation gives evidence of why targets and outcomes are or are not being achieved (OECD 2002). Evaluation is a complement to monitoring in that when a monitoring system sends signals that the efforts are going off track then good

evaluative information can help clarify the realities and trends noted within the monitoring system (Kusek and Rist 2004).

Governments use different tracking systems as part of their management of development programmes and policies. The "three legged stool," comprising of good human resource system, financial system and accountability system, is considered imperative for effective and efficient public sector management. A result-based M&E system does ensure feedback into the public management on the link between spending and achievements of goals. This implies inclusion of a "fourth leg" into the system that reinforces good governance (Kusek and Rist 2004). Governments were previously focusing on implementation focused M&E and these days the focus has tilted toward result-based M&E practices. The whole-of-government approach, adopted in some of the early M&E pioneer countries (e.g. Australia), involves a broad, comprehensive establishment of M&E across the government.

6.4.1.1 Why Result–Based M&E?

Implementation-focused M&E is mostly intended to investigate compliance but result-based approach focuses on outcomes and impact (Kusek and Rist 2004). Of particular emphasis here is the expansion of the traditional M&E function to focus explicitly on outcomes and impacts. In the backdrop of national and international stakeholders in the development process seeking increased accountability, transparency and, most importantly, results from governments and organisations, the result based system is taking its place in many countries. The result based system moves beyond the traditional input output focused M&E and when used effectively helps policy makers analyse outcomes and impacts. It turns out to be a powerful public management tool that can be used by governments and organisations to demonstrate accountability, transparency and results. The system can also bring about major political and cultural changes in the way governments and organisations operate-leading to improved performance, increased accountability and transparency, learning and knowledge.

The adoption and success of the approach lies in factors such as strong human resource, institutional and management capacity supported with strong financial, budgetary and auditing systems, integrity of the public service officials, a norm of accountability and transparency, and finally credible as well as legitimate political leadership (MacKay 2006).

6.4.2 M&E Framework in Bangladesh

In Bangladesh the main focus of M&E is on tracking spending. Government's Implementation, Monitoring and Evaluation Department (IMED) is the apex body that tracks the public sector development programmes.[3] The prime function of IMED is to monitor and evaluate the implementation of development projects to ensure their proper implementation. Monitoring is used to oversee the implementation process as well as identify the challenges in terms of quality, time and costs. In the process it also provides recommendations for improvement. Moreover, it plays the key role for the Central Procurement Technical Unit (CPTU) as per the Rules of Business (GoB). The Rules of Business of the government allocated the following functions to the IMED: (i) Monitoring and Evaluation of the implementation of development projects included in the Annual Development Programme(ADP), (ii) Collection and compilation of project-wise data for preparing quarterly, annual and periodical progress reports for information of the President, NEC, ECNEC, ministries and other concerned, (iii) Rendering such advisory or consultancy services to ministries/agencies concerned on implementation of projects as and when necessary, (iv) Field inspection of projects for on the spot verification of implementation status and such other co-ordination works as may be necessary for the removal of implementation problems with the assistance of related ministries/agencies, (v) Submission of project inspection reports to the President and Ministers concerned when attention at such levels is considered necessary, (vi) Matters relating to CPTU, (vii) Matters relating to The Public Procurement Regulations 2003, and (viii) Other similar functions as may be assigned to the Division by the Prime Minister from time to time.

6.4.2.1 How IMED Works?

The Key stakeholders for the IMED include NEC, ECNEC, ministries/divisions and other autonomous state bodies. The Project Inspection Instruction Manual (1995) and In-depth Monitoring Circular (2010) provide the guiding principles for implementation and inspection. The Public Procurement Act (2006) and Public Procurement Rules (2008) also play ancillary roles. IMED has a role in every aspect

[3] This section is based on the information available at IMED website, www.imed.gov.bd accessed on 23 November 2010. The IMED was established in 1975 as the Project Implementation Bureau (PIB) and was placed under the President's Secretariat. Later in 1977, it was placed under the Planning Commission as a separate Division and was renamed as IMED in 1982.

of the project cycle; from project preparation (pre-project) to project completion and impact evaluation. In the pre-project phase, IMED basically suggests improvement as member of the project approving committees of the Planning Commission and Departmental Project Evaluation Committees (DPEC) of the Line Ministries. During implementation phase, IMED monitors progress to ensure timely and quality implementation. It has evolved a system of information flow from projects, agencies and ministries for effective monitoring, which consist of: (a) periodic reports, (b) procurement reports, (c) field inspections, (d) monthly coordination/review meetings, (e) special meetings with the project directors. Information so collected are processed and analysed on a monthly, quarterly and annual basis to review implementation performance of ministries/divisions. This is followed by macro reviews at the NEC, the ECNEC and by the Prime Minister. In the post implementation phase, terminal evaluation reports are prepared by IMED on all projects immediately upon completion. It contains an analysis of the project progress with recommendations. It also commissions ex-post evaluation of selected projects for assessing their impacts on the community and the lessons learned are used in future project design and implementation.

6.4.2.2 Output of IMED

IMED monitors more than 1200 projects under the ADP and evaluates around 200 projects on an annual basis. Under the ADP implementation status IMED publishes monthly, quarterly and annual progress reports for all the ministries and also for the top 10 ministries with largest allocations. The main reports emanating from the IMED are: (i) Monthly performance evaluation of projects of the ministries/divisions, (ii) Quarterly performance evaluation reports of projects under ADP, (iii) Annual review report on ADP implementation, (iv) Annual project evaluation reports, and (v) Impact assessment reports conducted by the external bodies. The ADP Implementation status reports are essentially expenditure tracking at the ministry level. The quarterly reports go beyond reporting the numbers and provide a detailed analysis of the scenario. They include sectoral allocation, progress, and comparative analysis juxtaposing current year values with previous years. They include ministry-wise as well as economic category-wise analysis of disbursement and progress of allocation of the ADP funds. They also include coordination meeting findings and highlight the poor performances while explaining the underlying reasons.

The annual reports are much like the quarterly reports but provide a detailed review of the expenditure tracking scenario with comparative analysis amongst

various ministries and economic-sectors as well as year-wise review. The assessments include a review of the allocation and end-of-year achievements, thus ranking overall performance of all the ministries in terms of utilisation of the funds placed in the various projects under the ADP. This report highlights the problem areas for ADP implementation and provides recommendation. This report also uses the findings from external reviews and cites the various partnerships with private sector academic and research institutions. The evaluation reports include findings from various ADP funded development projects. The internal tracking and review of the expenditure programmes under the ADP programme are conducted by the IMED itself. However, with regards evaluation we can observe a pattern evolving where the IMED is using its own resources as well as external expertise from private consulting firms. There is evidence where the evaluation task was outsourced to external experts.[4]

The main thrust of IMED's monitoring activities is identification of implementation problems and their timely resolution to accelerate project progress. All the reports prepared by IMED contain identified implementation problems and suggestions for action. These are discussed in review meetings held at the Ministry, the NEC and the ECNEC. The process is expected to resolve project problems in time.

6.4.3 Framework for a Result-Based M&E System

The evolution of M&E ideology and approaches worldwide highlights an important issue that is countries are at different stages of development and differ in approaches. This implies that it is important to tailor activities within the context and not adapt to any best practice observed elsewhere considering the fact that countries differ in their political, socioeconomic context and composition. Here we briefly discuss the steps for building result based M&E based on best practices elsewhere. The discussion draws largely from Kusek and Rist (2004) and the references therein. We also highlight the challenges for successful implementation of result-based system in Bangladesh.

The ten steps outlined in Kusek and Rist (2004) for building result-based M&E system are as follows: (i) readiness assessment, (ii) agreeing on outcomes to monitor, (iii) selecting indicators to monitor, (iv) baseline data on indicators, (v) planning for improvement- selecting results targets, (vi) monitoring for results, (vii)

[4] The evaluation of the Water Supply in Coastal Belt (1st Phase) project was evaluated by Research Evaluation Association for Development (READ) Ltd, which is available at IMED website.

role of evaluation, (viii) reporting the findings, (ix) using the findings, and (x) sustaining the M&E system within organisation.

(i) Readiness Assessment

The readiness assessment tells about the context and/or preparedness i.e. about the political, organisational and cultural factors. The core issues here are (a) demand and incentives, (b) roles and responsibilities of the actors involved, and (c) capacity building of the actors involved. The World Bank (2002) has conducted a readiness assessment for Bangladesh (see Box 6.2), which highlights major challenges such as lack of capacity, organisational expertise and experience, absence of a *political champion* [5] as well as absence of regulatory framework that would ensure integration of M&E to the governance structure. It is also noted that independent academic/research institutions provide minimal opportunities for capacity building. The success of the whole M&E initiative hinges on capacity building within the bureaucracy; there is lack of capacity within the bureaucracy and we do not have enough in-country institutions to bridge this gap.

MacKay (2006) suggests reinforcing the capacity of the bureaucrats with training manuals, tool kits, etc. This is expected to generate the demand. The officials designing policy and making budget allocations should use the information generated through M&E.

However, the actors involved in M&E are not limited to bureaucrats but involve civil society, NGOs, researchers and think tanks, political party, parliament and the supreme audit body. Thus coordination amongst these actors through effective dissemination of M&E findings is desirable and likely to improve governance. This will bring in transparency and accountability within the public management and also develop a feedback mechanism. In Bangladesh, politicisation is considered as a major challenge and this is causing decline of the capacity of institutions designed to ensure accountability and governance (SoG 2006, 2008). The significance of a "political champion" becomes relevant here.

(ii) Agreeing on outcomes to monitor

Setting outcomes that will demonstrate success is the next step in building a results-based M&E system. In selecting the outcomes we can consider national priorities, international conventions, and political party's election manifesto. In this case, we can refer to millennium development goals and/or government's poverty

[5] The "political champion" is an important and significant actor in initiating, implementing and sustaining the M&E reform initiative (MacKay 2006, Kusek and Rist 2004).

reduction strategies, etc. A relatively well-designed structure can be developed through consultation with various stakeholders, CSOs, NGOs, independent academic/research institutions; The NSAPRII (2009) also highlights the scope for collaboration in the M&E related activities.

Box 6.2: The Readiness Assessment of Bangladesh

In the course of implementing the readiness assessment, Bangladesh posed a considerable challenge with respect to its readiness to design and build a results-based M&E system. In 2001, Bangladesh was ranked the most corrupt country of 91 countries monitored by Transparency International, with the most corrupt public sector listed as the law enforcement agencies, followed by education, local government, and health. In 2002, Bangladesh was again listed as the most corrupt of the 102 countries monitored. Corrupt systems keep information out of the public domain—and this is a major obstacle to M&E.

The readiness assessment found no champion for M&E anywhere in the national government, including central and sector ministries. No reform initiatives could be identified that could create incentives for linking these reforms to the creation of an M&E system. Furthermore, there were no legal or regulatory requirements for the use of M&E that could be identified.

There were some monitoring systems in rural parts of the country for education, electrification, and food subsidies. There was also some evidence that NGOs and the donor community were actively monitoring for results of development projects, but this had not influenced the government to do the same. The Bangladesh Bureau of Statistics (BBS) was found to be a strong state agency. If and when the government moves toward developing a results-based M&E system, the bureau could play a central role in the collection and analysis of data.

In terms of technical capability, the readiness assessment found weak capacity for M&E, and minimal technical training capacity in universities and research centres. The assessment also indicated minimal organisational experience in the national government with respect to managing credible information systems.

As a result of the readiness assessment, we found that it was not realistic and feasible to introduce a results- based M&E system into the national government at that time. Strong political support and sustained institution capacity building will be needed before such an initiative can be undertaken.

There is hope on the horizon for Bangladesh. Subsequent to the readiness assessment, the government developed a National Poverty Reduction Strategy that will include M&E components. The readiness assessment recommended five strategies to donors and NGOs working in Bangladesh to strengthen some of their capacity and work in small, targeted ways.

Source: Adapted from World Bank (2002).

(iii) Selecting key indicators to monitor success

For result-oriented M&E, indicators are crucial and outcomes are translated into outcome indicators. These indicators will inform us as to how the inputs and resources have succeeded (or failed) in achieving the desired outcome. It is suggested that an indicator, which may be either quantitative or qualitative, or both, should be CREAM—clear (unambiguous), relevant (appropriate to the subject), economic (available at reasonable cost), adequate (provides sufficient basis to assess performance) and monitorable (amenable to independent validation).

(iv) Baseline data on indicators

Data is integral to M&E exercise. The standard best practice is to begin with a pilot for the primary data. Most countries have national institutions, dedicated to data collection, that conduct regular surveys and census. In some cases, secondary data may serve the purpose.

In the context of Bangladesh, the World Bank assessment study acknowledges that BBS is a strong organisation and has the potential to serve the above purpose. However, the revised NSAPRII (2009) remains sceptical about the BBS's efficacy if overburdened with tasks (NSAPRII 2009). This can be addressed in collaboration with independent academic and research organisations (like BIDS). The government can develop a system following the example used in Chile, where the Ministry of Finance contracts out the data collection task through appropriate bidding process (see MacKay 2006).

(v) ***Planning for improvement-selecting results targets***

Target setting is the final step in building the performance framework. A target can be defined as an indicator that a society wishes to achieve using inputs in a given time. The relevant issues in setting target include comprehending the baseline effectively, bringing together human and financial resources, and setting of time frame. Any slack of human or financial resources during the period may lead to discontinuity, implying that the target outcomes will not be realised. The time frame can be quarterly, half-yearly, annual and even the target is set over a span of three to four years. However, longer time period could bring in uncertainty, particularly when natural disasters, political cycles are concerned. This process has its virtue when the legislature is strong, prefers a culture of transparency and accountability, and willing to monitor the public manager's work. The absence of proper checks and balances may hinder the whole process. We can perhaps use the public sector development work experience in Bangladesh as an example. There are wide-spread allegations of corruption, abuse and malpractices regarding the use of public funds

for development programmes. These programmes seldom yielded the desired outcome of improving people's lives.

(vi) Monitoring for results

The two key types of monitoring are implementation monitoring and result monitoring. The implementation monitoring uses means and strategies (inputs, activities and outputs available in work plans) used to achieve an outcome. The means and strategies are supported by management tools such as budgetary resources, staffing and activity schedules. Targets are set according to what the means and strategies potentially can yield. Result monitoring can simply be defined as aligning outputs with the results an organisation, sector, or a state intends to achieve. A useful tool here is the performance budget framework, which is basically an expenditure planning system that assumes sound macroeconomic and fiscal management, sector priority settings, and programme performance management. The success of monitoring lies in ownership, management, maintenance and credibility. The data quality triangle—validity, reliability and timeliness—is to be given due importance to ensure the credibility of the monitoring.

vii) The role of evaluation

Evaluation facilitates resource allocation decisions by enabling the choice of a competitive or best alternative. It helps to anticipate any emerging problem, analyse or re-think the causes of a problem and finally identify any redress mechanism. Evaluation can contribute to public sector reform and innovations. Any evaluation conducted should ensure technical soundness, comprehensiveness, impartiality, stakeholder's involvement and justification of money spent. The timing of evaluation is also crucial. For example, evaluation is imperative in the following cases: (a) divergence between planned and actual outcome, (b) presence of anomaly in design and implementation in outcome, (c) resource allocation is compromised for political reasons, and (d) there is conflicting evidence on outcomes.

viii) Reporting the findings

The fundamental purpose of any evaluation is to "deliver the message"—inform the appropriate audiences about its findings and conclusions. In some countries, such as Australia and Chile M&E reports are demanded by the legislature The Chilean case is regarded as a success story in institutionalising M&E (see Box 6.3).

ix) Using the findings

One major objective and usage of the M&E findings is to ensure transparency and accountability. These findings are supposed to improve the performance of

public service delivery. The performance evaluation implies that public sector managers will be under scrutiny and they will be expecting rewards for improved service and there will be penalty for poor performance. Since the private sector gets involved with the development process through public procurement, the M&E findings also keep the contractors under supervision. For example, in Australia, there are actual performance contracts with agencies that specify that annual budget allocation should be contingent on contracts being evaluated and results are monitored.

The usefulness of M&E findings can be seen in many areas; these can be used for justifying the budget request, providing data for in-depth evaluation, identifying the performance problems, responding to public demand for accountability, and building public trust. The M&E findings are factual evidences which can be used by the legislature in making the executive accountable. Dissemination of these findings through media and other means will generate greater scrutiny and feedback as well as enhance public trust of the government.

In order to be benefited from M&E findings some reforms are suggested (see Kusek and Rist 2004). These include: (a) Empowering the Media, (b) Introducing E-Governance, (c) Enactment of Right to Information, (d) Strengthening parliamentary oversight, (e) Strengthening supreme audit institution, (f) Publishing annual reports and budget information, and (g) Engaging the civil society and citizen groups.

x) Sustaining the M&E system within the organisation

The sustainability of the result-based M&E system will depend on some key issues. All the stakeholders i.e. the government, donors, civil society, NGOs and private sector would need to coordinate and reciprocate to ensure this. First, we need to ensure demand for an effective result-based M&E. The government in isolation cannot ensure the sustainability of demand. The other stakeholders have to reciprocate by imposing more pressure and feedback. The role of Planning Commission is crucial here. Secondly, one needs to ensure trustworthy and credible information. The official channels of collating information should be maintained and their dissemination should be ensured. The data should be valid, credible and time consistent. Lack of credibility in information flow will not only invalidate the M&E findings, but also reduce credibility of the system. Thirdly, we need to ensure accountability of the government machinery; by ensuring accountability of all the ministries/divisions, autonomous bodies, central and local government bodies, we can ensure the demand and incentive. Fourth, continuous capacity building effort is essential. The M&E tools are evolving and practices are taking new shapes. The

bureaucrats and the actors involved in M&E need continuous support in the form of training and capacity building. Without appropriately trained officials it will become increasingly difficult to run a result-based M&E system. Not least, we need to develop appropriate incentive mechanisms for the bureaucrats for compliance with the M&E system. Lack of incentives implies lack of morale and less productivity, which in turn will lead to poor M&E.

Box 6. 3: Chile's Whole-of-Government M & E System

Chile's M & E System, which is managed by its powerful Finance Ministry, has developed progressively over time, in response to fiscal pressures as well as changing landscape of public sector reforms. Also developed in an opportunistic manner the major milestones included the following (see Kusek and Rist 2004):

- Ex-ante cost benefit analysis is required for all government projects (1974).
- Performance indicators are collected for all government programmes (1994). Regular information is collected on about 1,600 indicators. These are used in the formal reports prepared for the Congress, and to provide key data for the various types of evaluation which are conducted.
- Comprehensive Spending Reports (1996).
- Government Programme Evaluations (1996). These are the nature of programme reviews, and about 160 have been conducted comprising clarification and agreement of detailed programme objectives, preparation of a log frame analysis, desk review, and analysis of existing data. Their average cost is about $11,000, and they usually take 4 to 6 months to complete.
- Rigorous impact evaluations (2001). These entail primary data collection, and often the use of control groups and difference-in-differences. Fourteen have been completed to date, at an average cost of $88,000 and taking up to 18 months to finish. About 60 per cent of the government's budget has been evaluated by means of either these impact evaluations or government programme evaluations.
- Comprehensive Spending Reviews (2002). These review all programmes within a particular functional area, and look at issues of inefficiency and duplication of *programmes. They include desk reviews, and have cost $48,000 on average. Five have been completed so far.*

Source: Adapted from Kusek and Rist (2004).

6. 5 CONCLUSIONS: REFORM PRIORITIES FOR ADDRESSING THE GOVERNANCE CHALLENGES

We observe that all the indicators of governance are negative throughout the last decade, implying a very weak state of governance in Bangladesh. To achieve

the goals of Vision 2021 and underlying development programmes, there is no alternative than improving governance, institutional quality and reducing corruption. The vision of good governance, as also outlined in the government's poverty reduction strategy document (NSAPRII 2009) includes ensuring effective parliamentary process, establishing rule of law, ensuring pro-poor service delivery, strengthening local governance and a corruption free society ensuring social justice among others. Improved governance is necessary for good service delivery, adequate security, and more economic opportunities for poor people. Hence several areas of intervention are necessary to bring efficiency, transparency, accountability in public service management. We emphasize that capacity development should occur both at individual level and institutional level. In addition, there is no alternative to a strong local government apparatus where citizens' charter will have to be well defined, service delivery organisations to be promoted and motivated to select appropriate target groups and deliver timely service.

The development and implementation of an effective M&E framework is *essential* for the successful implementation of the SFYP. Without a solid M&E capability, there is a risk that resources might get locked in, over the medium-term, into programmes that are not working or not relevant in the changing economic environment. The government of Bangladesh envisages a whole-of-government approach for result-based M&E, where the GED/NPFP is the focal point, and whereby an exhaustive input, output and outcome matrix compliant with the best practices elsewhere is to be developed. The supplementary legal framework exists that includes the Public Procurement Act and the Right to Information Act. Also, the government is contemplating on development of the e-governance framework for the country. The vibrant civil society, NGO community, independent think tanks, academic and research organisations and a vigilant media—all these provide the necessary environment for successful implementation of the result-based M&E practices.

However, lack of adequate capacity and awareness amongst the bureaucrats and parliamentarians on the M&E of the PRS is seen as the major challenge. The absence of a *Champion* from the legislature to take the agenda ahead poses additional challenge. The legislature assumes important role both in terms of institutionalisation of M&E practices and transparency and ex-post accountability. It is observed that a *champion* usually from the legislator plays key role in this regard; the case of Chile is a good example, where the M&E reports are sent to the Congress (MacKay 2006). The lack of political will resulting from the failure to understand the intrinsic merit of M&E practices can be a major challenge for

Bangladesh. This implies that the members of parliament would need useful information and briefing from the Parliament Secretariat regarding M&E and its intrinsic merit. There is also need to develop training modules and manuals for the bureaucrats for effective understanding of the result-based M&E system. Data generation for the huge set of indicators and their useful analysis is a formidable task, where re-thinking of strategies would be necessary. The NGOs and donors can assume important role both in the demand-side, by creating pressure on the government, and in the supply side by undertaking some of the tasks in collaboration with the government. Here the role of independent think tanks like the Bangladesh Institute of Development Studies (BIDS) is also very important. Efforts need to be taken to increase the demand of the public sector for M&E. In this context the CSOs, NGOs and media can play pro-active role. The best examples are Transparency International Bangladesh (TIB) and SUJON which are campaigning hard against corruption. We also need to seek strategies to ensure greater involvement of the mass people in M&E system. A well coordinated effort amongst all the stakeholders is therefore imperative for the success of the result-based M&E system.

Nevertheless the construction of a result based system is a serious undertaking this does not mean that the upcoming challenges cannot be addressed. Given time and financial resources devoted to develop expertise, strategies, experiences, such challenges can be addressed reasonably well. Needless to mention that capacity building at all levels and in all institutions involved in the monitoring and evaluation task will be necessary. The *readiness assessment* can be used as a tool for attendant capacity and institution building activities. A highly capable and respected civil service is essential for building and sustaining a home-grown M&E system which would produce information and evaluation findings that would be judged valuable by the key stakeholders and be used in pursuit of good governance.

There is need to strengthen the capacities of the BBS to conduct surveys, including the special ones, to produce quality data. Moreover, appropriate capacity building of the General Economics Division (GED) of Planning Commission will be necessary to enable it to guide the working groups and coordinate their activities and carryout the analytical works. There will also be need to bring skilled manpower at the ministry level. There should be workshops and training among all levels of public officials to create awareness and increase appreciation of M&E.

The Planning Commission (PC) may be required to perform a changed role. The M&E function of the PC will help define the effectiveness of the adopted policies and programmes in achieving the underlying policy and programme targets of

Vision 2021. The Vision 2021 calls for the development of long-term poverty reduction strategies and associated programmes and policies. This necessitates considerable analytical work, including the preparation of the macroeconomic framework, formulation of strategies relating to growth and employment, infrastructure development, human development, poverty programmes and safety nets, environmental protection and disaster management. The PC should be able to perform such tasks within its own capacity and necessary reform should be initiated without any delay. This implies that the PC would require structural changes and internal reorganisation. The M&E functions will need to be redefined and considerably strengthened as a core function of the PC, which has implications for reorganising IMED. Data and statistics are core requirement for good planning and M&E, which has implications for redefining the role of the BBS.

A strong M&E capacity in the PC is therefore an urgent national priority. Following a diagnostic of the present functions, roles and capacities of the IMED, the SFYP should aim to design a comprehensive M&E framework, drawing on international experiences. The success, however, would require a reorganised IMED; improved capacity and performance of staff; strong in-house capacity at the PC to undertake effective M&E of sectoral policies and programmes; and demonstrated capability to initiate a few reviews of major public sector programmes. These should see the Planning Commission demonstrating its capacity to serve as a think tank to the government, which would undertake development strategies, provide sound technical analysis of government's policies and programmes of government, and conduct monitoring and evaluation of those programmes.

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