Bangladesh

Rio + 20:

National Report on Sustainable Development

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Sheikh Hasina
Prime Minister
Government of the People's
Republic of Bangladesh

Message

I am happy to learn that the Ministry of Environment and Forests has prepared the Bangladesh National Report on Sustainable Development. This report shows the successes achieved so far by Bangladesh, and its commitment to pursuing sustainable development in all its aspects.

The report is an integrated, inclusive process involving economic, social and environmental aspects to meet the challenges of the future.

Efforts to achieve sustainable development have been reflected through national policies and plans in Bangladesh. The government has incorporated environmental and social issues into its economic policies, and has strengthened its commitment to sustainable development.

There is no alternative to achieving sustainable development for ensuring decent lives to the millions of people living in the LDCs. This National Report provides outlines of progresses, remaining challenges, priorities and Suture directions, including strategies, policies and actions, for sustainable development goals to be achieved.

Significant progress has been made in achieving most of the MDG targets within the given time-frame of 2015.

Bangladesh will continue to meet the challenges of creating a favourable social, economic and environmental condition that will support the overall sustainability of the nation. Resource limitation is a major hindrance towards meeting these challenges.

I call upon the international community to boost up their support and cooperation, and accomplish their commitments to the resource-starve countries in their efforts to achieve the sustainable development goals.

I find this National Report is both a critical evaluation of our achievements and detailing ongoing future directives. I extend my sincere thanks to those whose immense contributions and untiring efforts have made possible to publish this report.

Joi Bangla. Joi Bangabandhu

May Bangladesh Live Forever.

Sheikh Hasina

Abul Maal A. Muhith
Minister
Ministry of Finance
Government of the People's
Republic of Bangladesh

Message

I am pleased to learn that the Ministry of Environment and Forests is publishing a national report entitled "Rio+20: Bangladesh Report on Sustainable Development".

Bangladesh is the most densely populated country in the world excluding the city states. Natural resources in the country are severely under stress simply because of this reality. Bangladesh is also a victim of environmental degradation which takes place elsewhere in its neighborhood as well as in distant countries. It is tragic, indeed, that global warming may extend the sea over 20 percent of Bangladesh's territory displacing about 30 million people from their hearth and home. Even before Rio in 1992, Bangladesh has been taking action in the environmental front, because environmental threat is so serious in this country.

Sustainable development covers three different fronts: economic, social and environmental. Sustainable development raises cross-cutting issues which are of concern to various sectors of human interest. Bangladesh has, therefore, incorporated environmental concerns in its total planning process.

Bangladesh is doing reasonably well in the area of economic development and presently it has been withstanding global economic crisis with considerable success. But, there is no denying the fact that there are serious challenges in the economic front for this country. Endemic poverty is the most serious problem in this country. Controlling population growth is another serious problem. Illiteracy and good governance are also crucial issues. Yes, in recent times, in social and human development we made good strides. Empowerment of women progressed rapidly. Income inequality is also being reduced fast.

In Rio de Janeiro this year more than a hundred Heads of State and Government are assembling to move forward sustainable development in our globe. Twenty years ago, such a summit in Rio adopted Agenda 21. This time a much broader agenda requires to be ironed out and adopted. Millennium Development Goals (MDGs) certainly created hope and confidence among the developing countries. Rio+20 has to look beyond the MDGs.

Bangladesh expects to achieve most MDGs on lime, i.e., by 2015. It looks forward to better times in the coming years. It has to find gainful employment for its vast Labor force. It has to improve its living style by inculcating its core values and enriching its culture and history. It has to expand its productive capacities. It has to enhance the quality of its human resources. It has to protect its territory from the ravages of rise in sea water level and pollution of the atmosphere. Green development within its own territory does not guarantee the country a happy future. For wholesome development, action by other members of the global community is extremely important. Indeed, without globally concerted efforts sustainable development is just unattainable.

Rio+20 hopefully will provide the forum as also the spirit for a global consensus on sustainable development. Such a success is earnestly craved by Bangladesh.

Abul Maal A. Muhith

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

Message

It gives me immense pleasure to know that the Ministry of Environment and Forests is going to publish a report titled "Rio+20: Bangladesh National Report on sustainable development as a part of forthcoming Rio+20 Conference." I express my sincere thanks to the ministry for such a time worthy report. It is indeed a laudable initiative.

The concept of sustainable development necessarily includes economic, social and environmental issues. Provision of social services along with a growing economy and clean environment has recently been recognized as the pre-requisite for sustainable development.

Bangladesh being a least developed country with meager natural resources is facing tremendous problems due to increasing population pressure. Country's geographical location also contributes to vulnerability to natural disaster. Despite such problems and challenges, Bangladesh's progress in socio-economic and environmental sectors has drawn worldwide attention. I call upon the concerned ones to frame long term strategies in line with relevant

action plans of sustainable development and to implement those in a sustainable manner.

I believe the National Report developed by the Ministry of Environment and Forests will be very useful with its vision oriented contents. General Economics Division (GED) of Bangladesh Planning Commission has already developed National Sustainable Development Strategy (2010-2021) addressing priority strategic areas along with different cross-cutting issues with a view to achieving sustainable development of Bangladesh.

I hope the National Report would highlight Bangladesh properly in the Rio+20 Conference and I wish it a grand success.

Air Vice Marshal (Retd.) A K Khandker

Dr. Dipu Moni, MP
Minister
Ministry of Foreign Affairs
Government of the People's
Republic of Bangladesh

Message

I am glad that the Ministry of Environment and Forest has taken the lead in the preparation of the Bangladesh National Report on Sustainable Development with details of success, gaps, prospects and challenges in achieving sustainable development in the country. This bears a testimony of Bangladesh's commitment to achieving the goals that we set 20 years ago in Rio.

Since independence, Bangladesh has taken multiple initiatives to ensure economic progress and social development. Bangladesh is committed to achieving the MDGs within the given time frame. We have focused on promotion of rights of women and children and on the socio-economic development of various disadvantaged groups. We can boast of our achievements in reducing maternal and child mortality rates as well as ensuring high enrolment and gender balance in education sector. Poverty has reduced substantially in the last two decades. While we have registered good economic growth and social development in the recent years, we are endeavoring to create gainful employment for our people, enhance food security and to ensure equitable growth.

Given the resource and capacity constraints, maintaining progress remains an uphill task for a country like Bangladesh. We face the double jeopardy as adverse impact of climate change holds back our development efforts. International support in finance, technology transfer and capacity building can help us close the gaps. This is more so when we seek to follow a low-carbon development path, without compromising on the imperative to reduce poverty and maintain sustained economic growth and human development.

Bangladesh looks forward to a new international order, in which the developed and the developing countries would work together in keeping with the commitments made earlier. As we reflect on the attainments since Rio Summit of 1992 and chart our path for the next decades, we have a formidable challenge to create a just balance and harmony among the economic, social and environmental imperatives of development. Coherence among these pillars and unity among the humankind must inspire individual and collective actions as we assemble in Rio in June 2012.

Dr. Dipu Moni, MP

Dr. Hasan Mahmud, MP
Minister
Ministry of Environment & Forest
Government of the People's
Republic of Bangladesh

Message

This is indeed a great pleasure for me that the Ministry of Environment and Forests has taken the lead role in preparing "Bangladesh National report on Sustainable Development" which entails progress, remaining challenges, priories and future directions for sustainable development with the inputs from relevant ministries, divisions and stakeholders and technical assistance from UNDP-Bangladesh.

In the setting of upcoming Rio+20 conference, the preparation of this report can be termed as time worthy initiative. In the national preparatory process for Rio+20 conference, formulation of national report is one of the significant achievement and it demonstrates Bangladesh's strong commitment for the efforts it has been taking for the sustainable development of the country.

Sustainability has been deeply embedded within our society and is integrated in the life styles, livelihood and culture of the people of Bangladesh. Since the independence, the Government of Bangladesh has been taking continuous initiatives in terms of policies, programmes and strategies to promote sustainable development in the country. Bangladesh seriously recognizes the need for well balanced inter-linkages of economic, social and environmental aspects in order to confront the challenges we face for sustainable development.

Bangladesh is committed to achieve the MDGs within the given timeframe. The country has achieved remarkable progress in the areas of primary schooling, gender parity in primary and secondary level education, lowering the under-five mortality rate, reducing the incidence of communicable diseases and improving indicators on the environmental changes.

The government has incorporated environmental and social issues into economic policies, and has strengthened it's commitment to sustainable development and the implementation of Agenda 21 and related agreements through national policies and plans, national legislation and institutions, and the ratification and implementation of international environmental agreements.

We need firm commitments from the international community for enhanced cooperation to address the ongoing and persistent issues related to sustainable development in ways which will enhance opportunities for all, in particular for developing countries and be centered on human development and human dignity while using in a sustainable manner the natural system of our common home, our shared planet.

Dr. Hasan Mahmud, MP

Mesbah ul Alam
Secretary
Ministry of Environment & Forest
Government of the People's
Republic of Bangladesh

Message

Twenty years ago Brazil hosted the UN Conference on Environment and Development at the historic city of Rio de Janeiro. The city is chosen as the venue this time again to celebrate the 2nd decades anniversary of UNCSD and one decade anniversary of World Summit on Sustainable Development.

Marking the Rio+20 Bangladesh National Report has been prepared which inter-alia includes economic, environmental and social services including priorities, emerging issues and new directions for future in line with the objectives of the conference. The report adequately captures Bangladesh perspectives in its entirety in accordance with two thematic areas i.e., a green economy in the context of sustainable development and poverty eradication and the institutional framework for sustainable development.

I express my deep appreciation to the members of the drafting committee as well as steering committee and to many individuals who have contributed in different stages in finalizing this report within a limited time frame. I duly acknowledge the contribution of Dr Qazi Kholiquzzaman Ahmad who made laudable contribution to shaping this

report in its present form. I specially extend my appreciations to UNDP Bangladesh for lending its support to bringing out this national report for its wider dissemination within the country and beyond.

Mesbah ul Alam

Foreword

This National Report describes the achievements in respect of various dimensions of sustainable development in Bangladesh since the 1992 Rio Earth Summit and outlines the future directions and challenges in relation to carrying the process forward in future.

With a per capita GDP of US$848, Bangladesh is close to and moving fast towards achieving the status of a middle income country. Through vigorous pursuit of sustainable development, Bangladesh envisions to reach the status of an inclusive society of middle standard of living, not just a middle income country, within a decade.

Despite global financial meltdown and global recession starting in 2008, Bangladesh has been able to post a GDP growth rate of over 6% per annum over the past three years, in fact recording 6.7% in 2010-11. The projected growth rate for 2011-12 is close to 7%, despite the ongoing Euro Zone economic crisis.

At the same time, Bangladesh has performed very well on the social front, already achieving several MDG social targets. On this front, the country has done better than most of the other SAARC member countries including India. Women's educational and social status has generally improved significantly, although a lot of work is still needed to attain a fully satisfactory level, particularly in respect of the disadvantaged and downtrodden segments.

On environmental sustainability, Bangladesh has been using its own limited resources purposefully within the framework of Bangladesh Climate Change Strategy and Action Plan (BCCSAP) adopted in July 2009, Bangladesh Climate Change Trust Fund (BCCTF) financed from national budgetary allocations (US$300 million allocated over the past three years) and Bangladesh Climate Change Resilience Fund (BCCRF) financed through contributions of Development Partners (so far about US$170 million received) as well as other relevant policies, programmes and Acts. Bangladesh is also very active in the UNFCCC and other international fora dealing with environment and climate change. While highlighting its own perspectives, Bangladesh works with and speaks for LDCs and climate vulnerable countries. We also work with SIDS and Africa on common issues and play an active role within the framework of G77 and China. Bangladesh has participated actively, within the framework of G77 and China as agreed by all concerned, in the negotiations relating to the formulation of the Rio+20 Summit Declaration.

Bangladesh has been trying to promote an integrated approach, involving all the three pillars of sustainable development, as indicated above, with the human beings at the centre of the stage. Indeed, the ultimate goal is an inclusive society in which human dignity will be ensured for every citizen.

I wish to express our gratitude to Sheikh Hasina, Hon'ble Prime Minister of the People's Republic of Bangladesh (GoB) for her guidance and encouragement. We are thankful to Mr. Abul Maal Abdul Muhith, GoB Minister for Finance, Air Vice Marshal (Rtd.) A K Khandker, GoB Minister for Planning, Dr. Dipu Moni, GoB Minister for Foreign Affairs, and Dr. Hasan Mahmud, GoB Minister for Environment and Forests for their keen interest in relation to the preparation of this Report.

I wish to recognize all members of the Steering Committee chaired by Mr. Mesbah ul Alam, Secretary, MoEF and all members of the Drafting Committee for their support. In particular, I would like recognize Dr. Abu Saleh Mostafa Kamal, Deputy Secretary, MoEF and member of the Drafting Committee; Mr. S.M Ahsanul Aziz, Deputy Director, DoE and Member-Secretary of the Drafting Committee; and Mr Shamsuddoha, Member of the Drafting Committee for their commitment and hard work. National Consultant Shireen Kamal Sayeed deserves our thanks for the hard work she has put in.

Last but not the least, I wish to express our thankfulness to UNDP Dhaka, in particular Mr. Neal Walker, UN Resident Coordinator and UNDP Resident Representative in Bangladesh and Mr. Stefan Priesner, UNDP Country Director in Bangladesh for the strong support provided by UNDP to the process of preparation of this Report.

Qazi Kholiquzzaman Ahmad
Convener
Drafting Committee

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Abbreviations

ADP	Annual Development Plan
AIDS	Acquired Immunodeficiency Syndrome
BADC	Bangladesh Agricultural Development Corporation
Balu	Sand
BARI	Bangladesh Agriculture Research Institute
BCCSAP	Bangladesh Climate Change Strategy & Action Plan
BRRI	Bangladesh Rice Research Institute
BINA	Bangladesh Institute of Nuclear Agriculture
BOB	Bay of Bengal
BTRC	Bangladesh Telecommunication Regulatory Commission
CBO	Community Based Organization
CEDAW	Committee on Elimination of Discrimination Against Women
CFL	Compact Fluorescent Light
CHT	Chittagong Hill Tracts
CNG	Compressed Natural Gas
CSD	Commission on Sustainable Development
CSO	Civil Society Organization
CSR	Corporate Social Responsibility
ES&L	Energy Standards & Labeling
FAP	Flood Action Plan
FY	Fiscal Year
FYP	Five year Plan
GCRI	Global Climate Risk Index
GDP	Gross Domestic Product
GEF	Global Environment Facility
GIS	Geographic Information System
GHG	Green House Gas
GNI	Gross National Income
GoB	Government of Bangladesh
GOs	Government Organizations
HDI	Human Development Index
HIV	Human Immunideficiency Virus
HYV	High Yielding Variety
ICT	Information Communication Technology
IFF	Investment & Financial Flows
IMF	International Monetary Fund
IPR	Intellectual Property Rights
ITLOS	International Tribunal for Law of the Seas
IUCN	World Union for Nature Conservation
KW	Kilo Watt
LED	Light Emitting Diode
LDC	Least Developed Country
MDGs	Millennium Development Goals
MIC	Middle Income Country
MOEF	Ministry of Environment & Forests
MP	Member of Parliament
MT	Metric Tonne
MVCs	Most Vulnerable Countries

MW	Mega Watt
NAPA	National Adaptation Plan of Action
NARS	National Agriculture Research and Studies
NGOs	Non-government Organizations
NSAPR II	National Strategy for Accelerated Poverty Reduction -II
NSR	National Stocktaking Report
ODA	Official Development Assistance
ODS	Ozone Depleting Substance
PA	Protected Area
POPs	Persistent Organic Pollutant
RMG	Ready Made Garments
REB	Rural Electrification Board
R&D	Research & Development
RTI	Right to Information
SAARC	South Asian Association for Regional Cooperation
STP	Strategic Transport Plan
TRIPS	Trade Related Intellectual Property Rights
UNCED	United Nations Conference on Environment and Development
UNDP	United Nations Development Programme
Watsan	Water-Sanitation
WB	World Bank
WSSD	World Summit on Sustainable Development
WEF	World Economic Forum
WHO	World Health Organization

Terminology

Aus	Rainfed rice
Boro	Irrigated rice
Haor	A saucer shaped large water body formed between the levees of rivers
Kalajar	an infectious disease caused by an intracellular flagellate protozoan Leishmania donovani, common in rural parts of the tropical and subtropical countries of the world.
Khas	Fallow or unutilized government land
Monga	Lack of livelihood during lean season in poverty stricken areas
Mouza	A definite land area within which there is rural settlements. It is the lowest revenue collection unit.
Rickshaw	Three-wheeled tricycle carrier (usually manually pedalled)
T. Aman	Transplanted Aman rice
Union Parishad	Lowest administrative unit
Upazila	Sub-national level local government administrative unit

Executive Summary

As part of the preparation for participation in the forthcoming Rio+20 Summit, Bangladesh has prepared a National Rio+20 Report. As the first step in the process, a draft National Stocktaking Report was prepared to reflect the status of Bangladesh in relation to sustainable development, particularly her achievements during the past 20 years, and the future prospects. The draft Stocktaking Report has been validated through national consultations and synthesized into the Bangladesh National Report on Sustainable Development to be placed in the Rio+20 Summit in June 2012 in Rio de Janeiro, Brazil.

Sustainable development is conceived to be anchored on three pillars, which are to evolve concomitantly on sustainable factors, namely, economic, social and environmental; and to be centred on the human being, implying that the process of sustainable development is necessarily inclusive and should promote unity in cultural and other forms of diversity. But it is essential, in the context of establishing this unity, that diverse cultures, interests and wishes, particularly of the downtrodden and disadvantaged groups, are facilitated to flourish and find proper expressions in appropriate forms. Such a process conducted within a broad framework under provision of the Constitution of the country should help all groups, the majority and the minorities, to understand each other's points of view and needs and find common grounds to work together for an all-inclusive, equitable social progress. Sustainable development also invokes intra- and inter-generational equity, i.e. equity among and within nations at the present time and the management of natural and other resources such that while the present generation meets its needs, the future generations can meet theirs too.

Bangladesh seeks to promote sustainable inclusive development. So the cultural aspect of sustainable development is a very pertinent issue. Hence, this country focuses on the promotion of cultures of all ethnic and other minorities and their own languages where appropriate; on the promotion of the rights and prospects of women and children as the cross-cutting groups; and on the socio-economic development of various disadvantaged groups including street children, physically challenged people, and people living in backward areas. Vision 2021 adopted by the government is emphatic in this regard. National Education Policy 2010 provides for inclusive quality education, identifying the needs of each of the above mentioned groups along with those of the majority as well as the ways in which these identified needs will be met. It has proposed measures to integrate respect of languages and cultures of ethnic minorities for their promotion. However, Bangla is the country's lingua franca and state language.

The economy of Bangladesh is largely agro-based with just under 50% of the total labour force still employed in the sector and more than 70% of the population involved directly or indirectly in agricultural activities. In broad terms of sectoral contribution to GDP, the share of agriculture is now less than 20% as service sectors have thrived which now account for about 52%, while the remaining 28% is mostly accounted for by employment in the industrial sector.

The strength of the economy rests to a large extent in a vibrant rural economy including both agricultural and non-agricultural sectors; remittances from expatriate workers; and export of readymade garments, jute and jute goods, fish, tea and pharmaceuticals. Moreover, Bangladesh has managed the marco-economic front well enough to help keep the economy moving and not to be affected much by the recent crisis in the global economy. The country has been able to post an annual average GDP growth rate of over 6% since 2008, despite global financial meltdown and recession. However, the negative effects of the on-going global economic turmoil, particularly in the Euro zone may exert more adverse influence on Bangladesh economy than what was so far

been the case. The prices of essentials and fuel are on the rise or at high levels in the international market. The high prices of petroleum products have affected the generation of electricity where power generation had been a perpetual problem. It has put industrial production as well as other sectors at risk. Bangladesh has to be cautious of these developments and appropriate responses are to be made as far as possible to minimize the adverse impacts.

Head count poverty ratio has declined sharply from close to 60% in the early 1990s to 40% in 2005 and to 31.5% in 2010 and is well on track for achieving the MDG target of 29% by 2015. However, the number of poor people is still large, which is around 50 million. The hard core poor account for about 17.6% of the total population as of 2010, down from 25% in 2005. These people need assistance for sustenance. The Government implements a wide range of safety net programmes to assist these people. A large number of CBOs and NGOs have also been contributing, through various programmes, a supportive role to the governmental efforts in poverty reduction.

Mention should be made of commendable progress achieved in gender parity in the enrolment of students at primary and secondary levels (in fact, as of 2010, the ratios are in favour of girls at 1.02:1 and 1.14:1 at primary and secondary levels respectively); net primary level enrolment has reached 94.7% in 2010 (against MDG target of 100% by 2015); under-five mortality rate (per 1000 live-births) has declined to 50 as of 2009 (target: 48 by 2015); infant mortality rate has come (per 1000 live-births) down to 39 as of 2009 (target: 31 by 2015); immunization ratio of one year olds against measles, has risen up to 85.3% as of 2010 (target: 100% by 2015); maternal mortality ratio (per 1000 live-births) has come down to 194 as of 2010 (target: 143 by 2015); and the proportion of under-5 children with access to insecticide treated bed nets that is up to 90% as of 2010 (target: 90% by 2015).

However, malnutrition remains widespread despite the achievement of near self-sufficiency in foodgrain production in the recent years. Production of vegetables, poultry, fish, milk etc. has also increased significantly. The action to combat this phenomenon of malnutrition consists of awareness- building among the people at large regarding balanced diet, promotion of education for girls in rural areas and promotion of income generating activities for the poor, particularly the hardcore poor.

Bangladesh remains a Least Developed Country (LDC). But it has been striving very hard to move to Middle Income Country (MIC) status. In fact, it has made significant progress in terms of income growth (per capita income rising by 56% from US$438 in 2005 to US$685 in 2009/10) and has already achieved some of the key MDG targets and is well set to meet the remaining others by 2015. The country may achieve MIC status within the current decade if the GDP growth can be maintained at 7% or more on the average. The official development assistance (ODA) disbursement to Bangladesh has declined recently as percentage of its GDP, which, if it continues to be so, may act as a restraining factor with regard to both the MDG achievement and graduation to MIC.

Bangladesh has in fact achieved significant success in population management, with the population growth rate down to 1.32% according to Population Census 2011. But the problem of population growth continues. Rightly, the focus is now being enlarged also onto skills development among people at large so that they can effectively contribute to their own and national development and do not remain a burden on the society.

Regarding improvement of governance, the government also recognizes the need to carry forward further reforms, based on the achievements so far and as dictated by the prevailing realities, in

various areas such as public administration, judiciary, police, women issues, anti-corruption activities and democratic governance at all levels of society to enable the country to further improve its status as a modern, democratic society. But, these reforms are best introduced, over a period of time, in a sustainable manner and not hurriedly as this may do more harm than good. The government has also been taking measures and building institutions to counter corruption. There has been some improvement over the past few years in combating corruption in the country; but, more efforts are necessary to reach a satisfactory level, and the government is committed to achieving. A congenial political atmosphere is an important aspect of governance, which is recognized by all concerned, needs to be ensured and maintained for sustainable development.

Another challenge, again recognized in the government's plan and strategy documents, consists in actions in terms of, for example, investment in infrastructure, better inputs, and skills training, surely to be carried out in a planned manner, to further improve productivity and sustainability in various sectors such as agriculture, fisheries, livestock, water, energy, industries, trade, public works, rural development, health, education, environment, and forestry. Moreover, new challenges are also emerging both internally and also from outside such as global recession and price hike of essential food items and crude oil, which need to be kept under regular monitoring and timely appropriate actions should be put in place.

Another concern for Bangladesh relates to coping with the consequences of rapid, unplanned urbanization taking place now . This would require improvement and expansion of such infrastructural and other facilities as housing, schools, hospitals, clinics, other civic facilities, roads and highways, rail, water-ways, electricity, gas, coal, and renewable energy. Actions or policy planning exercises are afoot in respect of most of these issues. The challenge lies in addressing them within the framework of planning for sustainable cities.

With the maritime dispute with Myanmar resolved as a result of the verdict on 14 March 2012 of the International Tribunal on Law of the Sea (ITLOS), it has established Bangladesh's sovereign right over 200 nautical miles of exclusive economic zone and also outer continental shelf in the Bay of Bengal (a total area of 111,631 sq. km.) and opened up possibilities for peacefully exploiting immense resources (gas, oil, fish and others) that lie under our part of the sea. By 2014, a similar verdict is expected concerning the maritime dispute with India, relating to the western part of the sea. It is now essential to make all out efforts to extract the sea resources, which will boost up the country's economic prospects. The government has already put in motion the policy planning and other preparatory activities to that end.

Bangladesh is a disaster-prone country due to its hydrological and geo-morphological realities, its location at the bottom of three major river systems - the Ganges, the Brahmaputra, and the Meghna (GBM) - and being bound on the south by the Bay of Bengal. Given the evolving climate change, the country has begun to be visited by extreme climatic events more frequently. These climatic events cause adverse socio-economic consequences for the affected people and, therefore, are a major concern for national socio-economic progress. For example, mega cyclones Sidr in 2007 and Aila in 2009 have caused huge losses and damages affecting a large number of people and consumed significant budgetary resources in relief and rehabilitation, thereby constraining the country's development prospects by reducing resource availability for development activities.

Bangladesh has no responsibility at all to this climate change, but it is one of the most vulnerable countries, being at the forefront of threats from climate change effects in terms of increasing sea level rise, salinity ingress, storm surges, cyclones, floods, loss of habitat, destabilization of

agriculture, etc. Without international support for countering the effects of climate change, largely through adaptation actions, Bangladesh is not in a position to fight it alone. The country faces climate change not only as a development challenge, but also as a human rights and justice issue.

For Bangladesh and other severely climate vulnerable countries, the issue of seeking equitable justice in terms of financing and technological support from the developed countries is of highest priority. These countries individually and through the Climate Vulnerable Forum (CVF) have been raising voices on climate equity and justice issues in the international fora. Such voices are also echoed by Bangladesh in conjunction with least developed countries (LDCs), small island development states (SIDS) and similar African countries. Bangladesh reiterates that all financial support provided for climate change management activities must be new and additional to the Official Development Assistance (ODA). Therefore, the climate change management related funds extended to Bangladesh and other developing countries have to be over and above the normal ODA for each country.

Bangladesh is seeking to combat climate change impact with its own meagre resources to the feasible extent. But given resource limitations, it cannot do much on its own. Bangladesh in fact has adopted Bangladesh Climate Change Strategy and Action Plan (BCCSAP) in July 2009, being the first country in the world to do so, to provide overall policy and action guidance and outline action programmes. Bangladesh has also set up the Bangladesh Climate Change Trust Fund (BCCTF) in 2009, which has been receiving annual budgetary allocations for climate action.

Over the past three fiscal years (2009/10-2011/12), the government has allocated the equivalent of US$300 million (US$100 million every year), which is being utilized in implementing the projects, largely focused on adaptation but also on mitigation to an extent. Another Fund called Bangladesh Climate Change Resilience Fund (BCCRF) has been established in 2010 into which funds are being provided by development partners. Some amount has been received (about US$125 million), which is now being utilized. More contributions to this Fund are expected. But Bangladesh's own allocation and the kind of money so far received through BCCRF and other mechanisms are very small in relation to the large need for properly addressing the impact of the evolving climate change.

Bangladesh is committed to a low carbon development path, provided the process does not put additional burden on its already overstressed economy and financial capacity and is a win-win option for it with assured adequate international support. Already, dialogues are taking place at home with stakeholders for evolving a "green development" concept that promotes a "green economy" and provides "green jobs" in the future. But it has to be in the context of Bangladesh's priorities for accelerating economic growth, poverty reduction, social emancipation and sustainable development based on its three pillars. Any green development initiative has to be home–grown and country driven; and externally imposed conditions are not acceptable.

It is also to be noted that unless the developed countries lead the way with deep cuts in their greenhouse gas (GHG) emissions towards arresting the worsening climate change while time is not over, how long a country like Bangladesh can go on adapting? In fact, if drastic reductions (by 40-45% by 2020 and by 90-95% by 2050) in the overall GHG emissions are not made within this decade and beyond, the climate change phenomenon may become irreversible, spelling disastrous consequences for not only the most climate vulnerable countries at the present time, but in fact for the whole world. The world must heed the wake up call that has been ringing.

A country of rather small land size (147,570 sq. km.) with high population pressure (over 1,000 persons per sq. km.) and endemic poverty, Bangladesh faces severe stresses on its environment, ecology and biodiversity. Indeed, the rich biodiversity of Bangladesh is under threat from climate change. Deforestation, demolition of hills , river pollution, river erosion, loss of soil fertility, land degradation, urban congestion, sanitation problems in rural and urban areas, inadequate sewerage system in urban areas, pollution from solid and industrial wastes, and natural disasters such as floods and cyclones,- all contribute to environmental and ecological degradation and loss of biodiversity. This is compounded by drastically reduced water flows through transboundary rivers due to large-scale abstractions in upper riparians. Therefore, there needs to be a basinwide water resources sharing and management at the regional level.

At the policy level, the country has geared itself well with many policy instruments like the Perspective Plan, the Sixth Five Year Plan, National Water Management Plan, Draft National Energy Policy, Actionable Policy Briefs on Agriculture, Bangladesh Climate Change Strategy and Action Plan, National Plan for Disaster Management, National ICT Policy, Vision 2021, and so on. The future challenge remains to be implemented.

Least developed countries are now facing a scenario of declining actual ODA. This scenario needs to change and the developed countries should abide by their own commitment to sustainable and equitable development world-wide. To ensure global sustainability, the developed nations also have to remove the unfair dissemination in the global trading system. As an LDC, Bangladesh needs substantially increased ODA disbursements and duty free and quota free access of its exportables to developed economies.

To sum up, Bangladesh has achieved noteworthy successes in respect of all the three pillars of sustainable development, but much more needs to be done in relation to constructing a pathway for sustainable and accelerated development for the country. For this to be accomplished, Bangladesh needs to farther gear up its own act, which the government is committed to doing; but in order to accomplish the goal, given its resources and capability limitations, the country needs international support in terms of transfer of adequate finances and technologies, sustained and further capacity building and free access of its exports to developed market economies.

I. INTRODUCTION

This National Report is for Bangladesh's submission to the United Nations Conference on Sustainable Development (UNCSD), known as Rio+20 Summit in Rio de Janeiro, Brazil, June 2012. The "Rio +20 Summit" will take stock of the progress made by the member countries during the past 20 years and also agree on future directions for the countries to take in the context of emerging global issues critical for sustainable development.

As part of the preparation for participation in the Rio+20 Summit, Bangladesh has gone through a process of stocktaking which is reflected in the draft National Stocktaking Report, followed by review and validation of the report through various consultations at national, sub-national and grassroots level. The feedback received from these consultations and the findings of the draft Stocktaking Report have been synthesized into the National Report.

The entire process has been carried out involving some of the eminent experts in the fields of social, economic and environmental development of the country under the overall guidance from the top policy level in the country. Overall guidance for preparation of the report has been received from the Ministers for Finance; Planning; Foreign Affairs and Environment & Forest.

A National Steering Committee (Annex-2) constituted by the government including representatives of several ministries, with the Ministry of Environment and Forests (MoEF) as the lead ministry, has been responsible for overseeing of the activities related to the preparation of the draft Stocktaking Report; the review, consultations and validation; and preparation of the final National Report.

A National Drafting Committee (Annex-3) constituted by the Government under the MoEF, which is the focal ministry for CSD, helped the Government in the preparation of the draft National Stocktaking Report, its validation through country-wide consultations, and preparation of the Rio+20 National Report. The Committee was constituted of eminent economists and climate change and sustainable development experts of the country selected from the government, academia, civil society and think tanks.

As the first step in the process, a draft National Stocktaking Report was prepared to capture the status of Bangladesh in sustainable development, its achievements in the last 20 years and future trends. The draft National Stocktaking Report was prepared, under the guidance of the National Drafting Committee, by conducting a review of all the latest relevant national documents (list given in Annex-1) and incorporating relevant facts, figures, data and information from them as well as from reports and publications of other academic, non-government and international organizations.

For preparation of the draft Stocktaking Report, key national issues were discussed in the National Drafting Committee meetings, where GOB officials (from relevant ministries, departments, institutions and agencies), civil society (including academia, NGOs, CSOs, research organizations, etc.) were represented.

This was followed by the validation of the draft National Stocktaking Report at the grassroots and sub-national levels in four regional in-country consultations held in Chittagong, Barisal, Khulna and Rajshahi divisions.

An Experts' Group Consultation was held, attended by national experts with specialization in different fields, for the validation of the draft National Stocktaking Report and the draft National

Report for Rio +20. In addition, inputs were taken from an expert group consultation on “Green Development”, a new thematic area, for inclusion in the draft National Report.

A National Consultation was also held on the draft Reports in Dhaka for validation by participants from key government ministries and other national institutions, civil society, private sector and development partners. The final draft of the National Report on Sustainable Development (Rio+20) was cleared by the Drafting Committee and then endorsed by the National Steering Committee in May 2012.

II. BACKGROUND TO RIO+20

Following the United Nations Conference on Environment and Development (UNCED) in 1992, popularly called the Rio Earth Summit, the governments that participated in that meets committed themselves to pursuing human development while ensuring a sustainable environment. Such development was premised within the bounds of UNCED agreements of equity within and between nations, prosperity for all strata of society and efficient and equitable management of natural and biological resources and life support systems.

In 2000, the United Nations General Assembly at its Millennium Session endorsed the decision to undertake a 10-year review of progress in the implementation of the UNCED outcomes of 1992. This review took place at the World Summit on Sustainable Development (WSSD) in Johannesburg, South Africa in September 2002. The Johannesburg Summit was launched by the UN with the aim of ensuring that the outcome of the Summit is not only limited to a review of the progress in the last 10 years, but also "leads to new visions, commitments, partnerships and plans for practical implementation to make sustainable development real at all levels".

A significant feature of the WSSD preparations at that time was that the main issues for discussions in the summit emerged from participatory national and regional assessments and discussions, with participation of representatives from all segments of society in all the regions of the world. The Rio+20 Summit is, a sequence to the same process on wider consultations at the national and regional levels, addressing the key issues identified. Therefore, Bangladesh is following the same approach of wider consultations within the country to prepare for the Rio+20 Summit.

Rio+20 Summit differs from Rio+10 Summit in relation to achieving sustainable development, albeit the focus is still on the overarching aim of poverty alleviation, but with emphasis on the goal of building green economies around the world it would contribute to a global green economy with sustainable cities as future green growth centres. From the point of view of least developing countries (LDCs) this process is largely dependent on technology and financing from the developed world, enabling them to leap-frog into technologically modern economies, while ensuring that planned economic growth and poverty reduction in these countries are not adversely affected. Other developing countries will also surely require international assistance if they are to move forward in terms of greening their economies and accomplishing sustainability of development.

Also, given the current state of development, LDCs like Bangladesh will be careful about committing to any global Green Economy agenda that has the slightest chance of turning into a bane for development through the imposition of tariffs and other barriers to trade and pursuit of other economic activities. LDCs are already stymied in their growth by intellectual property rights which make technologies, medicines and other patented products of developed countries beyond the reach of the common people in the developing countries, in particular in the LDCs.

III. BANGLADESH : COUNTRY PROFILE

Bangladesh is the lowest riparian of three major river systems of the Himalayan Range – the Ganges, the Brahmaputra, and the Meghna (GBM), which drain a huge volume of water generated in the GBM region and pass through Bangladesh on to the Bay of Bengal. About 92% of the run-off Bangladesh has to deal with, enters the country from upstreams annually outside of the country. Bangladesh occupies only 7% of the GBM catchment area with a network of rivers criss-crossing the country. It is one of the most densely populated countries of the world with a population of 155 million in a land mass of 147,750 sq. kms. Bangla is the state language and citizens are known as Bangladeshi.

The country is surrounded by India in the West, North and Northeast and by Myanmar on the Southeast with the Bay of Bengal in the South providing a gateway to the oceans of the world. Bangladesh was once a part of the Indian sub-continent and gained independence from the British colonial rule as East Pakistan in 1947 only to be politically dominated, socially alienated and economically exploited by West Pakistan. After 23 years of political struggle and a War of Liberation under the leadership of Bangabandhu Sheikh Mujibur Rahman, Bangladesh emerged as an independent nation in 1971.

Bangladesh is endowed with a unique natural resource base. About 80% of the country consists of floodplains and wetlands with over 300 rivers in the riverine network that sustains rare wildlife, flora and fauna and distinctive but diverse ecological systems across the country. These systems range from the unique mangrove forests of the Sundarbans in the Southwest (a world heritage) to coastal and marine ecosystems in the deep South; deep natural water basins called “haors’ and “baors” in the Northeast which remain inundated for half of the year and has a unique but changing ecology; arid area in the upper mid-section to hill tracts in the Southeast and flat sandy or marshy riverine deltas in the middle down to South. The country has 29 agro-ecological zones that have micro-climates of their own.

More than 700 kms of coastline in the South has a population of over 35 million who are most vulnerable to cyclones, tidal surges and salinity ingress. Floods are a regular phenomena as part of Bangladesh’s normal hydrological cycle and usually affects 22-30% of the country. But they turn disastrous when the waters overspill to inundate wider areas. The changing climate over the past 3-4 decades has increased both the intensity and frequency of floods, cyclones and droughts together with the changing and shifting pattern of rainfall.

In spite of the global financial crisis, Bangladesh has managed the marco-economic front well enough to maintain its economic growth at an average of 6% per year since 2008 and also not to be much affected by the global financial meltdown and global recession of 2007-2008. The economy is still agro-based, with just under 50% of total labour force employed in the sector and more than 70% of the population involved directly or indirectly in agricultural activities. Following the parliamentary elections held in December 2008, Bangladesh embarked on the road to democracy again after two years of an army backed caretaker government. By then, the country was already facing the negative effects of the global economic recession and rising prices of foodgrains and other consumer essentials and fuel. However, that has been managed fairly well. But the current Euro zone crisis looks alarming and may adversely impact on Bangladesh’s economic prospects. Bangladesh is watchful of the developments for appropriate responses to be made as far as possible.

Head count poverty ratio has declined significantly from close to 60% in the early 1990's to 40% in 2005 and to 31.5% in 2010. However, the number of poor people is still large, which is around 50 million. The hard core poor are about 17.6% of the total population as of 2010, down from 25% in 2005. These people need assistance for survival. The government is implementing social safety net programmes on a wide scale in support of these people. Bangladesh remains a Least Developed Country (LDC), but it has been striving consistently over the years to improve as a Middle Income Country (MIC) status. If the growth trend can be maintained and accelerated to an extent, that goal may very well be achieved within the current decade.

The World Bank's Country Assistance Strategy, 2011-2014, recognizes that Bangladesh has "a surprisingly good track record for growth and development," which "has been accompanied by significant poverty reduction and profound social transformation".

IV. SUSTAINABLE DEVELOPMENT : BANGLADESH CONTEXT

Article 18 A : Protection & Improvement of Environment and Biodiversity; in the Constitution of the People's Republic of Bangladesh states that, "The state shall endeavour to protect and improve the environment and to preserve and safe- guard the natural resources, biodiversity, wetlands, forest and wildlife for the present and future citizens". The pursuit of sustainable development is, therefore, a Constitutional obligation in Bangladesh.

Rapid economic growth coupled with a rising population is putting a high toll on the environment, ecology and natural resources in Bangladesh. In order to ensure the best possible opportunities for a productive and healthy life for the people while maintaining the balance in nature and ensuring sustainability for future generations, the country has to have "human-centred" sustainable development.

This vision has been the central focus of all sustainable development activities in Bangladesh. All development plans and programmes conform to it. The Government had developed the National Strategy for Accelerated Poverty Reduction (NSAPR) for carrying out the 5th FYP. The NSAPR-II has now been aligned to implement the 6th FYP.

The 6th Five Year Plan (FYP) "recognizes that Bangladesh is still a low income country with poverty, inequality and deprivation. An estimated 60 million people are below the poverty line with a significant proportion living in households which are female headed, in remote areas, and consisting of socially excluded and other vulnerable people".

Overall poverty has declined from 59.6% in 1991-92 to 31.5% in 2010. Poverty has declined at an annual rate of 2.46% during 1992-2010 as against the MDG target of 2.12%. In addition, the progress made so far in many fronts indicate that the country is well set to halve poverty by 2015, i.e. achieve a poverty ratio of just under 30%.

High population, extreme poverty, scarce land and natural resources on the one hand and the problems associated with growing crops, livestock, fisheries and forests sustainably on the other, makes achievement of GDP targets rather difficult and challenging. Added to these are the complexities and adverse impacts of upstream water withdrawal and climate change on the ecology, biodiversity and environment.

In recognition of the long term development challenge, the government has set development targets in its "Vision 2021" which are aimed at achieving a transformation in the socio-economic and environmental areas that will help Bangladesh to graduate to a middle income country by 2021. To that end, a perspective plan to 2021 and a medium term plan, i.e. the 6th FYP has been formulated and in due course, the 7th FYP will be formulated.

The 6th FYP focuses on creating policies, strategies and institutions directed toward public investment in specific core areas together and guide the public sector to achieve its potential for the transformative changes in the country.

Emphasis will be put on increasing productive labour, creating more labour- intensive industries and promoting small enterprises in order to increase jobs. Increasing exports, regional connectivity and import of energy from neighbouring countries is also an important means of enhancing economic growth in the Plan. Raising productivity in all areas including agriculture, manufacturing and service will be given special focus.

Raising land productivity and agricultural diversification is a top priority in view of rising population and scarcity of land. Access to essential services like water, energy, fertilizer, institutional financing, etc., will be the drivers for poverty reduction in the Plan.

Sound land management is a key to poverty reduction in Bangladesh as most of the poor are landless and close to 1% agricultural land is being lost every year to other uses including settlements for a growing population. Therefore, the 6th FYP envisages implementation of Land Use Policy for the possible use of land resources, based on a land use planning being prepared on the basis of aerial mapping and zoning, improved land administration, and resolution of land disputes through coordinated and modernized land services to people.

The 6th FYP also lays importance on providing social protection to the poor and vulnerable groups like women, children, underprivileged, disabled, elderly, tribal and indigenous people through a set of programmes with priority in distribution of benefits and ensuring gender and social inclusion. Girls' education, female reproductive healthcare, population control service delivery and social mobilization will get special attention as they are drivers in the context of impacting on population growth. Quality of education, especially of women, will be enhanced as Bangladesh is a "youth majority" population and skilled and semi-skilled work forces will be created and encouraged to seek jobs abroad.

Under the 6th FYP, improving administration and emphasis on anti-corruption measures will be a part of the good governance strategy. Better and speedier service will be provided to people through e-governance. Capacities of core public institutions will be enhanced for improving services to the people and ensuring transparency and accountability. The 6th FYP's strategy for capacity building is centred on strengthening the civil service, devolution of power to local governments, strengthening public-private partnership and reforming planning and budgetary processes.

Human capital development through better training and skill development will be a priority for reducing income inequality. Impetus will be brought to the growth and social transformation through introduction of information communication technology (ICT) in all spheres of society. The key role in this context is being played by the Prime Minister's initiative, known as "Digital Bangladesh" which aims to make Bangladesh encounter the digital divide by 2021. As part of modernization of Bangladesh and capacity building of its populace under the Digital Bangladesh agenda, the government has undertaken a new project to bring the vast rural areas under a network of high speed internet connections by December 2013.

A more rational and balanced growth of rural areas and urban centres is emphasized in order to address to the issues to remove regional disparities, uneven regional growth and concentration of wealth and income. Reforms will be made on property tax, based on income level, to augment the governments' revenue earnings and other steps will be taken to check the spiralling cost of property and make housing affordable for the poor.

The stress on land and water has to be reduced for ensuring sustainable environment as a degraded environment adversely affects the well-being of the people. Therefore, the Plan commits to an "environmentally sustainable development process" through conservation of natural resources, reduction of air and water pollution and recouping of encroached rivers, water bodies, forest areas and khas lands.

The government needs to ensure coordination amongst the various sectors for ensuring overall sustainability in future through an integrated approach. However, it cannot be achieved fully

without adequate support from the international community for climate adaptation in addition to ODA. It is also necessary to promote regional cooperation in finding solutions to regional water crisis.

The key priorities for Bangladesh for sustainable development are agriculture and food security, water, energy, climate change and disaster risk reduction and disaster management. Among the other major issues that Bangladesh needs to plan for and initiate activities on a priority basis during the 6th FYP are increasing creation of jobs including green jobs, sustainable cities, urban transport and infrastructure, and harnessing the resources of the Bay of Bengal.

Under the 6th FYP, Bangladesh will explore in collaboration with the international community and develop initiatives for adaptation to the impacts of intensifying climate change caused through shifting and changing rainfall, sea level rise and salinity ingress, more frequent and more devastating floods and cyclones, and increased river erosion. It is the responsibility of the developed countries, the responsible parties for climate change, to provide adequate finances and transfer of technologies so that Bangladesh can manage climate change impacts as best as possible.

V. INSTITUTIONAL FRAMEWORK FOR ADDRESSING SUSTAINABLE DEVELOPMENT

The highest development policy making and programme/project approving institution is National Economic Council (NEC), which is headed by the Prime Minister. After the NEC is the Executive Committee of National Economic Council (ECNEC), headed by the Finance Minister this Council reviews the plans and programmes sent by various ministries and endorses them. Thus all projects/programmes under the Annual Development Plan (ADP) have to be cleared by NEC /ECNEC.

Thus policies and actions for 'sustainable development' come under the purview of NEC /ECNEC for endorsement and approval. No project or programme is approved unless environmental and other sustainability issues are properly evaluated. The government's strong commitment to sustainable development is reflected in its plan and other policy documents, which guides the decision taken by the NEC /ECNEC.

Even before the Rio Earth Summit of 1992, Bangladesh realized its varied problems and poverty, which are crucially linked to environment; due emphasis is given to environment as a separate sector. It was formed by the Ministry of Environment and Forests (MoEF) in 1989 for addressing one of the three pillars of sustainable development.

From 1989 onwards, overall responsibility for the environment sector lies with the Ministry of Environment and Forests (MoEF). The MoEF works with other ministries to ensure that environmental concerns, including climate change issues, are given due priority in their development programmes/projects. The Ministry plays an active role in environmental and climate change related advice and guidance in relation to the implementation of action plans across various sectors. MoEF is also responsible for environmental impacts assessment (EIA) of all relevant projects implemented by the government.

The implementation organs of MoEF are Department of Environment (DOE) and the Forest Department (FD). DOE has wide ranging responsibilities from enforcement of environmental laws and codes in addition to EIA in respect of public and private sector projects.

The FD plays a vital role in the protection of biodiversity and conservation of forests. Its responsibilities include monitoring of Ecologically Critical Area (ECA), wildlife crime control, issuance of licence for trade in wildlife, management of World Heritage Site - the Sundarbans, management of reserved forests and also other forest ranges where it issues permits for community based social forestry.

Since 1992, Bangladesh has amply demonstrated its political commitment to sustainable development by building institutions and capacities that support environmental sustainability in the country in 23 other sectors which are linked to environment in the country, for which MoEF acts as the focal point. Major institutions involved in the development of plans and policies in the public sector in this context and their implementation, overseeing are the Planning Commission under the Ministry of Planning, Economic Relations Division (ERD) under the Ministry of Finance, and Ministries of Agriculture, Fisheries & Livestock, Water Resources, Local Government & Rural Development, Energy & Mineral Resources, Health & Family Welfare, Education, Public Works, Information & Communication Technology, Science & Technology, Overseas Welfare & Employment, Labour & Manpower, Women & Child Affairs, Industries, Commerce, Food & Disaster Management, etc.

The above mentioned ministries have their own policy and program frameworks which provide a basis for addressing fundamental issues of sustainable development in their respective areas of concern with due regard to the three pillars (economic, social and environmental) of sustainable development. Each of the ministries has a Planning Cell within it which works closely with the Planning Cell of the MoEF with due emphasis on environment and climate change sensitivity in the formulation of respective sectoral policies and plans. The Ministry of Foreign Affairs undertakes responsibility in global negotiations.

At the Divisional level, the Divisional Environment Committee chaired by the Deputy Commissioner with representation from all other government bodies is mandated to deal with environmental and sustainability issues. The Upazila and Union Parishad level planning at the grassroots is in place. Over the years, the Government has created linkages from the top (highest policy level) to the bottom (grassroots) with the above mentioned sustainable development actors in-between. The challenge for the future is to strengthen the institutional framework for better delivery in achieving sustainable growth.

All the line ministries mentioned above are responsible for implementation of public projects. They get the work done through their line agencies and departments. Over the years, many institutions have been created under these ministries to carry out their mandates related to sustainable development. Many of these institutions are performing vital functions regarding implementation of projects/programmes, policy studies and analysis, research and development, enforcement of legislation, monitoring and evaluation, etc in each of the sectors.

These institutions could better perform their work if their capacities were built adequately. More often than not these institutions are underfunded due to shortage of revenue budget. Skill development is a constant need in view of changing scenarios in the development arena. However, there is not much scope for skill development or human resource development in these organizations due to resource constraint.

More funding is required for carrying out policy studies and analysis, research and development and outcome evaluation in key areas for feedback into policy and project development. With critical issues arising out of complexities of globalization, climate change, regional dimensions, etc., and the need to have cross-cutting analysis and integrated approaches, it is all the more essential for building national capacities.

At the grassroots level, the local government institutions like the Union Parishads and Ward Councils also need capacity development for local level planning and implementation of sustainable development initiatives. Advocacy and awareness raising on key issues related to sustainable development are essential as well.

The government will launch the Local Governance Support Project- II with US $ 545 million to cover all the 4,504 Union Parishads (UPs) to benefit around 130 million people. The project aims at strengthening the UPs to make them more accountable and responsive to people. It will build the capacity of the UPs for an efficient and transparent inter-governmental fiscal transfer system.

VI. PROGRESS DURING PAST 20 YEARS (1992-2012) AND FUTURE DIRECTIONS

The progress made during the Rio+10 period (1992-2002) has been encapsulated in the National Report of Bangladesh for the World Summit on Sustainable Development in 2002 "Stepping into the Third Millennium". Based on that and the stocktaking done of the last 10-year period (2002-2012), this National Report notes below the progress made and some of the key achievements of the country during the past 20 years in the area of sustainable development encompassing economic, social and environmental dimensions.

1. National Capacity Development and Institutional Strengthening

1.1 Policies, Plans and Institutions

1.1.1 Background and progress and achievements during the last 20 years

On the policy and institutional capacity building front, Bangladesh has been able to make key policy interventions and take legal measures which contributed to keep the growth rate acceptably fair (about 5.4% annually on average since mid-1990s) during this period, accelerating to an annual average of over 6% during the past few years. The major contributing sectors to this growth include agriculture, readymade garments and expatriate workers' remittances.

Salient among the policy instruments launched during the Rio+10 period include : Bangladesh Fifth Five Year Plan; Agriculture Sector Review-I, 1995; Flood Action Plan, 1990; Environment Policy, 1992; Forest Policy, 1994; National Environment Management Action Plan (NEMAP), 1994-1995; Environment Conservation Act (ECA), 1995; National Energy Policy, 1996; Forestry Master Plan, 1996; Environment Conservation Rules (ECR), 1997; National Fisheries Development Policy, 1998; National Water Policy, 1999; National Water Management Plan (draft) 2001; Playfield, Open Space, Park and Natural Water Reservoir Conservation Act, 2000; National CDM Board, 2002; Environmental Courts 2001.

The above policies, plans and initiatives undertaken and institutions responsible to oversee their implementation have contributed to Bangladesh's capacity building for promoting economic, social and environmental sustainability during the decade following the WSSD. However, more efforts are required to construct a desirable sustainable development pathway for the country. More frequent and devastating natural events have been a constraint in the past and may be more so in the future given that climate change is intensifying.

In keeping with its national and international commitments, the GoB prepared and launched since 2001 or is currently in the process of launching various policy instruments and institutions that have already started or are going to pay dividends for sustainability, both in the short and long terms. These include, amongst others:

AREA	POLICY INSTRUMENT
Governance (including poverty eradication through Sustainable Development)	Fifth Five Year Plan, 1997-2002 Anti- Corruption Act, 2004 Anti Corruption Commission Act, 2004 (Amended 2011) Unlocking the Potential: National Strategy for Accelerated Poverty Reduction, 2005 Code of Criminal Procedure (Amendment) Ordinance, 2007 National Strategy for Accelerated Poverty Reduction (NSAPR) -II, 2009-2011 Right to Information Act, 2009 National ICT Policy, 2009 National Sustainable Development Strategy, 2009 GoB Perspective Plan, 2010-2021 Public Administration Reform Road Map, 2010-2014 Sixth Five Year Plan, 2011-2015 Civil Service Act (draft), 2011 GoB Medium Term Budget Framework Citizens' Charter for different ministries and departments
Economic	Seed policy, 1993 The National Energy Policy 1995 Policy New Agricultural Extension Policy (NAEP), 1996 Seed Rules, 1997 National Fishery Policy, 1998 National Water Policy, 1999 National Agriculture Policy (NAP), 1999 Department of Agricultural Extension (DAE)-Strategic Plan, 99-02 Agricultural Extension Manual, 1999 National Land Use Policy 2001 National Land Use Policy 2001 National Jute Policy, 2002 Dhaka Building Construction Rules, 2004 Coastal Zone Policy (CZP) 2005 Agriculture Sector Review- II, 2005 Actionable Policy Briefs on Agriculture, 2005 National Energy Policy (draft), 2006 National Coal Policy (draft), 2007 National Livestock Development Policy, 2007 National Food Policy Plan of Action , 2008-2015 National Water Management Plan (2004, revised) Building Construction Rules, 2008 Renewable Energy Policy, 2008 National Sustainable Development Strategy, 2009 Jalmohal Management Policy, 2009 Amendments to Jalmohal Policy, 2009 Land Acquisition Law for Padma Bridge, 2009 Energy Conservation Act, 2010 The Gas Act, 2010

	Bangladesh Economic Zones Act, 2010 Revised Renewable Energy Policy 2011 Dhaka Elevated Expressway Project (Land Acquisition) Law, 2011 Industrial Policy, 2011 Draft Bangladesh Economic Zones Regulations, 2011 Sustainable & Renewable Energy Development Authority (SREDA) Act (draft), 2012. Land Zoning Act (Draft), 2012 National Water Act (draft), 2012 Brick Production Act (draft), 2012 Haor Master Plan, 2012-2032 Coastal Development Strategy Detailed Area Plan
Social	Child & Mother Health Institute Law, 2002 Safe Blood Transfusion Law 2002 National Sanitation Strategy, 2005 The Smoking and Using of Tobacco Products (Control) Act, 2005 The Drugs (Control) (Amendment) Act, Ordinance, 2006 National Policy for Women's Advancement 2008 Comprehensive Early Childhood Care and Development (ECCD) Policy Framework- Final Draft, 2009 National Education Policy, 2010 Bio- Medical Technology Guidelines, 2010 Bangladesh Medical and Dental Council Act, 2010 International Mother Language Act 2010 Domestic/Family Violence (Prevention and Protection) Act, 2010 Vested Properties Release Act 2011 National Child Policy, 2011 National Women Development Policy, 2011 National Health Policy, 2011 Vested Properties Release Act 2012 (revised)
Environmental	National Environment Management Action Plan (NEMAP), 1995 National Land Use Policy, 2002 National Biodiversity Strategy & Action Plan (NBSAP), 2004 Social Forestry Rule, 2004 (amended in 2010 & 2011) Coastal Zone Policy 2005 Integrated Coastal Zone Management Plan, 2005 National Adaptation Plan of Action (NAPA), 2005 (updated 2009) National Capacity Self Assessment (NCSA) Report, 2006 Deer Rearing Rule, 2008 Biomedical Waste Management Rules, 2008 Bangladesh Climate Change Strategy & Action Plan (BCCSAP), 2009 Bangladesh Climate Change Trust Fund Act, 2010 Revised National Conservation Act, 2010 Environment Courts (in all district) Act, 2010 Draft National Solid Waste Management Rules, 2010

	National 3-R Strategy, 2010 (3R : Reduce, Reuse and Recycle) National Plan for Disaster Management 2010-2015 Ship Breaking and Hazardous Waste Management Rules, 2010 Balu Mohal and Soil Management Rules 2011 Bangladesh Climate Change Resilience Fund, 2011 Forest Transit Rule, 2011 Draft National River Conservation Act, 2011 Bangladesh Wildlife Conservation and Security Act , 2012 Draft Tree Conservation Act, 2012 Disaster Management Act, 2012 Forest (Amendment) Act, 2012 Bangladesh REDD+ Readiness Roadmap , 2012 (under preparation)

The above policy instruments for specific policy areas are not necessarily restricted to only their respective areas. Many of them overlap with other areas. For example, the renewable energy policy and brick policy are a part of the government's strategic interventions in the energy and industrial sectors, with implications relating to greening the economy. Similarly, all policies related to natural disaster management under environment are also relevant to the social area since they are people-centred. Again, sanitation under social area is also related to environment.

The above policies, plans and instruments are contributing or will do so in near future to social, economic and environmental advancement. For example, in the area of biodiversity conservation and protection, enactment of Deer Rearing Rule 2008, Compensation for Wildlife Affected People Rule 2011, and Compensation for Wildlife Affected Forest Staff Rule 2011 will play a positive role in protecting endangered wildlife like deers, tigers and elephants as they will provide an incentive to people to play a role in ensuring necessary protection.

Likewise, in the area of disaster management, many policy instruments have been developed such as Local Disaster Risk Reduction Plan, Standing Order on Disaster (revised 2010), Coordination Plan of the Ministry of Food & Disaster Management (MoFDM), Disaster Impact Risk Assessment and Risk Screening Tool and Local Disaster Risk Reduction Fund, which are aimed at strengthening institutional capacities at all levels for disaster and climate risk reduction.

For example, a huge amount of hydrological and hydraulic data is collected, processed, analyzed and disseminated by institutions like the Bangladesh Water Development Board (BWDB), Flood Forecasting & Warning Centre (FFWC), Water Resources Planning Organization (WARPO), River Research Institute, Bangladesh Haor & Water Development Board (BHWDB), Institute for Water Modelling (IWM) and Centre for Environment and Geographic Information Services (CEGIS). These institutions help the Ministry of Water Resources in policy planning, development and implementation. Bangladesh Unnayan Parishad (BUP) and several other independent think tanks provide analyses with recommended ways forward is relation to climate change and water management and socio-economic development.

As part of institutional strengthening, a Climate Change Cell has been created in the Department of Environment (DoE) for providing feedback and technical support to the Ministry of Environment and Forests (MoEF) on climate issues and a Climate Change Unit has been set up in the MoEF for supporting all CC related issues in coordination with other relevant ministries, agencies and departments as well as the civil society and climate experts.

To promote ICT in the country, the Government has set up several institutions as part of its forward-looking Digital Bangladesh agenda. Similarly, many institutions have been created in various sectors for increasing the capacity of the government to deliver services to the public for their well-being.

The above are only some examples of policies and institutional development in the country in some key areas. In addition to policies, various institutions have already been set up by the government for national capacity building to address various issues of development.

1.1.2 Challenges and future directions

The above mentioned policies, plans and legislations are, if implemented effectively, expected to help the country in leap-frogging the technological, environmental and socio-economic bottlenecks and bringing about shifts required for accelerating growth, sustainable environment and social well being.

The 6th Five Year Plan (FYP) covering the period 2011-15 has a set of 16 core targets for enhancing economic growth, poverty reduction, employment generation, human capital development, gender balance and environmental protection.

Vision 2021 of the current Government envisages a development scenario where citizens will have higher living standards, better education and social justice. As a strategy for poverty reduction, Vision 2021 also promises employment for at least one member from each family.

In the area of institutional development, the government is setting up new institutions that will help realize the new vision of the government in the coming years. For example, it is in the process of establishing the Sustainable and Renewable Energy Development Authority (SREDA) as the national nodal authority for coordinating all national efforts in taking forward its sustainable energy agenda for energy efficiency and conservation and renewable energy promotion in the country.

Similarly, other institutions also are being created for meeting the current and future challenges. However, lack of resources prevents the Government from building adequate capacities for these institutions to become fully functional in a pro-active manner.

1.2 Governance

1.2.1 Background and progress and achievements in the last 20 years

During the last couple of decades, various aspects of “good governance” have been introduced into national strategies and plans in various ways for promoting equity and enhancing the quality of life of the people and putting due importance to their expectations from the state. Although there are governance deficits by global standards, Bangladesh has made gradual but definitive progress in recent years to rise from the bottom of global ranking to become within the bottom 25 countries according to the Corruption Perception Index. Since corruption inflicts high costs on growth and discourages investment, the government is committed to building accountability and transparency mechanisms to check it.

It has undertaken various steps to counter corruption through strengthening of institutions and capacity building. The Anti-Corruption Commission (ACC), set up in 2004, continues to investigate and file corruption cases against individuals and institutions. But, there is a complaint that it is still not totally free from executive influence. The government is committed to enabling the ACC to perform its responsibilities independently without interference.

The Judiciary was separated from the Executive branch of the Government through the Code of Criminal Procedure (Amendment) Ordinance, 2007. At the local level, alternative dispute resolution mechanisms have been initiated, village courts were made active, and legal aid and training are being provided.

To protect human rights of the citizens, Bangladesh Human Rights Commission was established in 2008, which is actively trying to fulfil its mandate, but it needs financial and technical support to function effectively.

The government is implementing a National Plan of Action for e-Governance to improve public sector service delivery. Introduction of ICT in various GoB ministries, departments and agencies is bringing in transparency in many areas. The response time to public demands for documents and services in many sectors has been fixed in terms of number of days, thus eliminating rent-seeking from service providers. The Right to Information Act 2009 has created an enabling environment for the people to assert their claim on public information.

As part of Police Reform initiatives, the government has set up 35 Model Thanas (police stations) in the country in the first phase in 2011-2012, which have help-desks for people seeking information or assistance. Two Women Investigation Centres have been set up which are providing special assistance to women in recording cases on violence against women. Their work is being supplemented by two Victim Support Centres in the country.

Currently, the police stations are being enabled to respond to public services on-line as part of the Digital Bangladesh agenda. People can now register "general diary (GD)" online without reporting to the police station. . The online service is available in relation to such matters as reporting loss or theft of certificates, ID cards, documents or security checks on guards, domestic workers, caretakers or problems with tenants. Police reforms need to be continued to make it more people-friendly and efficient enforcers of law and order, protecting the good people and punishing the violators of law.

The banking sector has been functioning fairly well. However, the stock market went through some free falls, which have some destabilizing effects on the financial market and the lives of the people who invest, particularly the small investors, in the stock market as well. This has severely eroded the confidence of the investors in the stock market. The government has lately carried out some reforms in the banking sector and stock exchange in order to bring stability. It remains to be seen how effective the reforms are over medium and long run. The recent opening of nine new banks is based on the argument that the expanding economy will be better served with the addition of the new banks. It remains to be seen how things shape up.

Public Administration reform is another contentions area. There are two sides to the prevailing situation. It is perceived that the bureaucracy remains entrenched and does not respond to changing needs of an expanding and more equitable economy. On the other hand, it is contended that the civil administration is politicised given that promotion and transfers are not always merit-based. It is also perceived that they are tainted by rent seeking. More need to be done in this area of reform, and the government is committed to doing so.

1.2.2 Challenges and future directions

Further reforms are needed to which the government is committed, in respect of the functioning of the Anti-Corruption Commission, Public Administration, Police and the financial sector. The aim of these reforms is to further enable these institutions to perform their responsibilities more purposefully and efficiently. The tasks involved are challenging, but the government is committing to fulfilling them.

For example, the Anti-Corruption Commission is functioning as an overseeing body with limited resources. It will require capacity strengthening for investigation and improvement in other areas. The Justice sector reform needs to continue further to improve access to justice of the poor and the disadvantaged.

As part of the Public Administration reform process, the Citizens' Charter initiative was started in 2007 to improve the services to the people, ensure transparency, responsiveness and accountability in public service. However, it is in the formative stage and will take some more years to gain grounds in Bangladesh.

The on-going Police Reform initiative aims to transform the police into a modern, people-friendly, responsive, accountable and transparent force with adequate capacity building in crime control, investigation and management.

The government continues to carry out fiscal and financial sector reforms with a view to supporting sustainable development.

1.3 Strengthening Democracy

1.3.1 Background and progress and achievements in the last 20 years

Bangladesh is one of the first countries in the region to enrol over 81 million voters in the country's first-ever digital electoral roll with photographs to get rid of vote rigging. It helped eliminate nearly three million fake voters from the voter list. The gigantic task was conducted by the Bangladesh Army during the last caretaker government (2007-2008) to assist the Election Commission. National ID Cards were issued to the people which are proven to be useful as photo-voter IDs and also for getting services from more than 18 sectors including banking, licence renewal, land registration, etc.

The Election Commission was separated from the Prime Minister's Office through the Election Commission Secretariat Act 2009. The latest Elections to the 300 seat Parliament was held in December 2008, which returned the current Awami League led 14-party Grand Alliance government to power with a staggering 263 seats. Another 50 women MPs, proportionately from different parties on the basis of the number of their elected MPs, have been included against reserved seats for women, chosen by the MPs elected through the general elections. Local and international observers certified that the elections were free and fair. This was a real achievement for democracy in Bangladesh. The Election Commission has been made by and large independent.

The country was under martial law or pseudo-martial law for 15 years since 1975, until the truly democratic elections were held in 1991. Again, an army backed caretaker government ran the

country for two years in 2007-08. The democratic journey of the country has not been smooth. It is up to the political parties to come to common terms on ways forward so that democracy takes firm root and flourishes in the country. That will benefit all concerned.

Some reforms have been brought forth over the years to strengthen the Parliament. To make Parliament more effective, Parliamentary Standing Committees were constituted on various sectors, composed of MPs from both the treasury and opposition benches. In the current Parliament, chairs of the committees have been drawn from the opposition and from various parties in the grand alliance other than the main ruling party, the Bangladesh Awami League. Also, the chairpersons of these committees are not the concerned ministers, but Members of Parliament (MPs) from different parties. This arrangement is very innovative in this country. These committees function appreciatively well, with the participation of the main opposition party (The Bangladesh Nationalist Party—BNP) MPs.

The committees review the progress and make policy recommendations on sectoral matters that are under their respective jurisdictions. The capacity of the current MPs have been enhanced by exposing them to parliamentary practices in other countries, arranging orientation workshops for them on such issues like extreme poverty eradication and climate change, setting up a library, a database and installing ICT facilities. Parliamentary Democracy is relatively new in Bangladesh and may take some time to come of age.

Local government elections were held for the first time in 18 years, bringing new interest at the local level in matters of decision making. More reforms will be carried out to make local government at the upazila level functional with capacities built for effective local governance including planning and financial management.

1.3.2 Challenges and future directions

In relating to governance, challenges include the issue of national government at the time of parliamentary elections, the role of the election commission, and the nature and effectiveness of local governance. Resolution of these challenges, particularly the first one, will lead to positive outcomes for both democracy and development in the country.

Efforts are continuing to make the local government effective through peoples' participation, capacity building for local level planning and implementation of projects, and improvement of service delivery to the local level in the areas of health, education, etc. The government is committed to strengthening local governance by making the local government institutions autonomous in respect of administration and devolved responsibilities. These reforms are expected to be carried out in due course of time.

The presentgovernment's election pledgeisto "bring services to the doorsteps of the people". The Local Government Support Project (LGSP) has demonstrated that, with improved accountability, planning and adequate resources deployed for local level activities, the efficiency and responsiveness of local service delivery can improve significantly. The future actions will relate to transfer of fund management to local level, institutionalizing accountability mechanisms, enhancing financial management skills and building effective capacities for monitoring and evaluation.

1.4 ICT for the People and the Role of Media

1.4.1 Background and progress and achievements in the last 20 years

Information Communication Technology (ICT) has brought about a social transformation in Bangladesh from the grassroots to the centre level. ICT in the rural areas started with the apprehension that it would be too expensive for the poor who might not therefore gain access to this technology. However, innovative marketing and adaptability of Bangladesh's poor to new technology has allayed that fear.

Cell phones are also used as a medium of information dissemination and advocacy by the government on various national issues like vaccination, literacy, right to information, etc. The Bangladesh Telecommunication Regulatory Commission (BTRC), established in the mid-2000s, has been instrumental in bringing discipline into the sector and protecting the interests of the users against the telecommunication giants.

Introduction of cell phone and its widespread expansion into rural areas has changed the lives of the poor people by opening the door to instant communication, information gathering and doing away with isolation. The middlemen have been eliminated. The farmer can now directly get first hand information on market prices from miles away . Happy mothers, wives and children can talk to their menfolk working elsewhere, in the cities or in distant lands. Cell phone banking is also now available.

Over the last decade, cyber cafes have sprung up even in rural areas of the country with ICT support services for the people. As part of its campaign for "Digital Bangladesh", the government is providing computers in schools throughout the country in phases in a bid to modernize education and equip the children as citizens of a future world of technology.

Record keeping and filing of documents in government offices are gradually being digitized and websites are being created for database and documents. This is helping to increase transparency, accountability and access to information. The government has promulgated the Right to Information Act in 2009, which has strengthened the hands of the people in seeking information from government ministries and agencies as well as from all other (private and non-government) relevant sources, which was a next to impossible thing in the past, given the administrative red tape and corrupt practices and the prevailing idea of protecting one's own turf. Use of ICT is currently being promoted in 500 village councils under the Local Government Project.

The total number of mobile and Public Switched Telephone Network (PSTN) subscribers was only 1.75 million in 2002. It is close to 80 million in 2012. As a result, the teledensity of the country has exceeded 50% from 1.25%. Cellular subscribers per 100 population was nil in 1990 in the country.

Publications of results of Secondary School Certificate (SSC) and Higher Secondary School Certificate (HSC) via website, SMS, e-mail of educational institutions were started in 2009 so that students do not now have to wait for the results to reach their schools. Texts books are distributed free of costs to all primary and secondary students in the country. The government has started uploading textbooks in the website from early 2012.

Public media are playing the watchdog role in addition to information dissemination, promoting various national causes and taking to people analyses on various national issues by experts. The

media have in fact been exposing corruption and major violators of laws, leading to filings of charges against them in the Courts of Law. The reports more or less are on various issues related to economic, social and environmental development from inside and outside the country. With climate change coming to the fore of development issues and regional issues like water availability gaining on importance, the role of the media, both print and electronic, can play a more useful role in the context of sustainable development.

1.4.2 Challenges and future directions

The government is going to provide high speed internet connections through fibre optic cables to the vast rural areas across all 64 districts by December 2013, which will link 1006 unions (lowest administrative tier) to the internet. These strategically located unions will relay the network to adjacent unions and villages, thereby fast-tracking Bangladesh into the "global village" of internet world.

These e-centres will facilitate opening of bank accounts by villagers, enable them to receive remittances from relatives working anywhere in the world, facilitate students to receive examination results, provide market information to farmers and other services like digital photo shops. Another project will modernize all 8,500 post offices by introducing electronic services by 2015. Modernization of Bangladesh through ICT will continue in other sectors as well.

It is expected that modernization will create paperless offices in the near future and reduce the cost of doing business. It will also bring about transparency in administration and record keeping. Already many GoB offices have started e-tendering to facilitate fair participation and outcome. This process will be extended. .

Digitization of land records and certification system will drastically reduce the false litigations related to land ownership and high public and private costs associated with those.

The electronic media can be used effectively for advocacy and awareness raising on key national, regional and global and issues of national importance as well as about sustainable development to employ a people- centred integrated approach.

These are challenging undertakings, but can certainly be accomplished, as indicated by the successes achieved so far in the areas of ICT and media interventions.

2. Economic

The government's policy is to follow an inclusive economic growth, as it promotes sustainable development. Key economic issues related to food security and sustainable agriculture, water security, energy security, sustainable cities, transportation and infrastructure are presented under the chapter "Priorities, Emerging Issues and New Directions Beyond 2012". Other economic issues are presented below.

2.1 Status of growth

2.1.1 Background and progress and achievements in the last 20 years

The country has posted an average annual GDP growth rate of about 4.8% in the 1990s which improved to over 5% on average during 2000-2008 and to over 6% during the past few years. In spite of frequent natural disasters, particularly the mega cyclones Sidr and Aila in 2007 and 2009 respectively, which have wrought losses and damages to the tune of billions of dollars, the country has shown a tremendous resilience and, through focused policy interventions, particularly in agriculture and other sectors, and in rural and industrial sectors, the GDP growth could be maintained at as high a rate as over 6% in recent years, in fact attaining 6.7% in FY 2011.

For many years, readymade garments (RMG) exports have been accounting for nearly two-thirds of total annual export earnings. The remittances substantially contribute to the enhancement of the foreign exchange reserve and also support imports as well as economic activities in rural areas. In the recent years, Bangladesh has been receiving annually US$ 12 billion or more in remittances from expatriate Bangladeshi workers. The foreign currency reserve of the country is over US$ 10 billion as of first quarter of 2012.

Head count poverty ratio declined from close to 60% in the early 1990s to 40 % by 2005 and 31.5% by 2010. Some of the achievements of key sectors that contributed to the economic growth and supported poverty reduction are outlined below.

In order to fulfil its mandate for poverty alleviation, the government has had to provide subsidy to agriculture, energy, infrastructure, and education and to support the export industries in the wake of global recession. Large amounts of subsidies boosted by high oil prices in the international market over the past two/three years have contributed to double digit inflation. The government is under pressure from the IMF to reduce subsidy. But doing that steeply will have adverse implications for food and energy security of the country, and retard its growth. But since high levels of subsidy are not sustainable, the government is gradually raising the prices of electricity and other fuel items, for example, towards streamlining the pricing of these items while bringing down subsidies. At the same time, the government is taking other measures to reduce the burden of adjustments on the people and keep the economy moving in a desirable manner.

On the trade and investment side, the government has been taking steps towards a more liberalized environment and improved facilities. It has set up export processing zones in response to challenges of economic liberalization. However, public-private partnership (PPP) activities are yet to make an impression. The corporate sector does not give much attention to corporate social and environmental responsibility yet.

The RMG sector, ceramics, and pharmaceuticals have expanded as export sectors. The growth in the pharmaceutical sector has been facilitated by a sound National Drug Policy and is now expanding further based on high quality exports. Leather products, jute and jute goods, and tea continue to be export earners. To these have been added shrimp and other fishes, as well as vegetables and spices in limited amounts. Recently, ship-building has turned out to be a highly potential export sector.

Despite significant expansion of electricity generation capacity over the past two/three years, shortage of energy (electricity, gas), in relation to demand, remain a major constraint on industrial expansion in the country. Primary energy is largely supplied by natural gas for electricity, fertilizers, boilers, and other purposes. Electricity comes largely from the electricity grid for

industry, commercial enterprises and households; and primary energy for transport comes from CNG and liquid fuels. Liquid fuel is imported and the sector is heavily subsidized to keep the electricity consumption affordable for the people. The government has undertaken projects or is in the process of doing so to expand electricity supply and it is expected that a reasonably satisfactory level will be reached within the next year or so. Exploration for gas on land has been accelerated and some gas resources have been found very recently. Off-shore gas and oil exploration activities are being planned as well for the near future.

Average tariff rate imposed by developed countries on agricultural, textile and clothing from Bangladesh was 12% in 2005 and 15.3% in 2009. The Total debt service as a percentage of export of goods and services was 5.7% in 2010. The international community needs to facilitate Bangladesh's exports by allowing duty free imports of all items from Bangladesh, a least developed country, so that its foreign exchange earnings and debt servicing ratio can improve.

The government is engaged in discussion with the international community to secure duty free, quota free and fairer access to the markets of all advanced economies for its high quality pharmaceuticals, the ready- made garments' (RMG) and other relevant exportables. While ODA has increased for MDGs to some extent, its sharp fall in agriculture, power and transport sectors is hurting the economy and overall development of the country, particularly hurting energy, communication and infrastructure sectors.

Trade liberalization by EU, Japan and Canada helped Bangladesh's exports grow sharply by (1991-2009) raising the share of exports in GDP to 17.41% from 5.54% during the period.

Relaxation of rules in Trade Related Intellectual Property (TRIP) Rights in Public Health under the Doha Declaration has given Bangladesh an advantage until 1 July 2013 to comply with intellectual property rules and until 1 January 2016 to adopt compulsory patent regime for pharmaceutical products.

In view of the shrinking ODA as well as potential strategies, government is seeking to expand public-private partnership (PPP) and secure increasing foreign direct investment (FDI) for larger development projects. It has relaxed the rules for FDI. In recent years, FDI has grown as a proportion of GDP to 5.4% in 2009 from 1.5% in 1990 resulting in a 10-fold increase in FDI stock. The telecommunication sector has received the largest share of FDI at 43%. Other sectors receiving FDI include energy, banking, textile and apparels.

2.1.2 Challenges and future directions

In spite of some of the above successes, the economic growth rate experienced set back due to disasters like the mega cyclones Sidr and Aila in 2007 and 2009 as a result of the effects of global climate change. The combined effect of the two cyclones drove the GDP down by more than 1%.

There has been a depreciation of the Taka against the US Dollar, which inflated the cost of imported goods. The economy has been facing a double-digit inflation for a year. Yet and despite a global financial meltdown and recession, the Bangladesh economy performed well in the last fiscal year, registering a 6.7% growth in GDP and 41% growth in its exports, compared to the recession in most of the developed world. The GDP growth is attributed to growth in agriculture, industries and service sectors and accumulation of capital and increase in effective labour (total factor productivity-TFP growth). The future challenge is to sustain the increasing trend in growth in the face of domestic and external shocks.

The government has taken some measures to bring down the inflation. It has followed a contractionary monetary policy and has sought to curb some non-essential imports and increased taxes on luxury goods like cars and others. This together with bumper harvest of crops has helped in checking the inflation. In May 2012, the trend seems to be reversing as inflation has come down to a single digit. The challenge will be maintain the lower trend.

Unplanned rapid urbanization has given rise to many problems. Rural-urban migration continues at a high rate due to limited job and economic opportunities in rural areas, giving rise to huge urban slums and creating pressure on the urban infrastructures, utilities, services and civic amenities. The population of the four metropolitan cities of Dhaka, Chittagong, Rajshahi and Khulna has been burgeoning.

While opportunities in urban areas should be exploited, special emphasis needs to be placed throughout the country, based on opportunities in various areas. Along with the emphasis on agriculture and other sectors of the rural economy, industrialization is being given due importance in the public policy regime. While high-tech sectors have important roles to play and should be supported, the government's policy stance of promoting small and medium enterprises fits well with the economic realities in this still largely agricultural and rural country. This approach can help accelerate both economic growth and poverty reduction.

For the above to happen, uninterrupted power supply is necessary. Currently, shortage of power supply is a constraining factor in respect of expansion of productive capacity and utilization of existing capacity. The government is giving highest priority to this sector and, given the projects already undertaken for power generation and those that are planned to be undertaken, the situation is expected to improve substantially over the next one year or two.

2.2 Industrialization

2.2.1 Background and progress and achievements in the last 20 years

Industrialization had picked up over the last 2 decades in the RMG sector, ceramics, pharmaceuticals, cosmetics, electrical wires and fittings, furniture, bathroom and floor tiles, toilet accessories, shoes and handbags, paper, etc. Many of these are also exported as mentioned above. The growth in the pharmaceutical sector was benefited by a sound National Drug Policy and the sector is now benefiting from high quality exports. Tea has long been an export earner too. Jute has seen a revival in the last decade. The decade also saw addition of spices, fish and fresh vegetables to the export list. The list is growing each year and speaks of the hard work and entrepreneurship of the people. But still the export sector is very narrowly based with the RMG and 4-5 other items accounting for 80% or more of the annual export earnings.

The country has 7 (one of them owned by foreign investors) fertilizer factories; all of them are gas based. They are unable to meet the total domestic demand of nearly 2.5 million metric tonnes (MT). The country imports roughly 3.5-4 million MT every year to meet the needs. Currently, shortage of gas is preventing the country from setting up of more fertilizer factories, and it is hardpressed to provide gas for the CNG needs in the transport sector and to meet increased demand for domestic use.

The dairy sector is now growing at the initiative of the private sector although the pioneering initiative had been taken by the government by setting up Milk Vita, which remains a major

operational plant in this sector. Processing fruits, vegetables and juices has potential, but progress remains limited.

Some industries meet local needs to produce shoes, table cloths, kitchenwares, decoration items, chairs, tables etc. Handloom is very popular in Bangladesh, particularly for producing sarees for women; and the industry employs a significant number of poor people in the villages. With more institutional support, the handloom sector could become an export earner. The leather industry exports products after meeting the domestic need.

A new area that has come to the fore and has drawn international attention is that of ship building. A private sector company, Western Marines Shipyard Ltd., is building heavy ocean going vessels and exporting them to Denmark and other countries.

The country also has developed a ship breaking industry in the last decade which is, on the one hand providing much needed iron and steel (mostly imported) in the country, and on the other hand causing pollution of land and sea and is a threat to human health, biodiversity and ecology. The future challenge will be in containing the damage to humans and environment and making the industry sustainable since it is supplying a raw material that is not available in the country.

There are roughly 250-300 steel re-rolling mills of various capacities in the country. Of them, Bangladesh Steel Rerolling Mills (BSRM) is the largest with a capacity of generating 600,000-700,000 tons of steel per year. Since Bangladesh does not have the raw materials, all these mills recycle scrap steel from the local market mainly and from ship breaking industry too. Since the industry uses only scrap, it is helping to recycle the material and is environment- friendly in that sense.

2.2.2 Challenges and future directions

In the context of environmental sustainability, the industrial sector has a major role to play, especially through efficient effluent treatment. Though this is mandatory by law, compliance remains largely disregarded. Untreated chemical wastes, which often contain heavy metals, are discharged into rivers, canals, wetlands and even agricultural lands, severely degrading them and causing health risks to people. This remains a challenge which the government intends to address seriously. The planned relocation of high risk industries like tanneries and cloth dying plants from the city of Dhaka to areas where the impact will be minimized is a step in right direction.

Shortage of energy supplies is hampering the industrial expansion in the country. Since power is not available in much of the rural areas and is subject to load shedding where available, setting up of industries is discouraged. Also, industries in and around the urban centres of Dhaka, Chittagong, Khulna and Rajshahi face power shortages. The government has initiated plans for increasing power generation in phases. On-shore exploration for gas is being intensifies; and off-shore exploration is planned. Very recently, some oil reserve has been found in two places, the estimated reserve, if extracted, is enough to meet the total national demand for two years. But, when that will be on stream is still not clear.

In order to increase the economic growth in the country, poverty eradication and development efforts should concentrate on the long neglected areas in addition to the four cities mentioned above. Rapid industrialization in these areas will provide jobs to people of these areas, improve the lives and livelihoods of the people and curb rural-urban migration. For this to happen, infrastructural support including uninterrupted electricity supply incentives are necessary, which is a challenging proposition but one that has to be addressed seriously.

Towards increasing economic growth and to scale up poverty reduction through rapid industrialization and creation of employment, the government has planned to establish one Economic Zone (EZ) in each of the 7 divisions in the near term (next 5 year). It plans to establish 20 such zones across the country by 2021.

These zones will be established, under public-private partnership, to remove discrimination of local industries with regard to the tax holiday, energy, infrastructures and other incentives currently enjoyed by the existing 8 Export Processing Zones (EPZs). Besides exporting their products, the industries in these EZs will be able to sell their products in the local market as well, which is not allowed for the EPZs. The government hopes that the new EZs will become important drivers of economic growth by generating 1.5 million new jobs and producing 85% of the country's exports in future. Currently, the EPZs employ around 295,000 people and their exports account for US $ 2.8 billion accounting for an FDI of US $ 222 million (2010-2011).

2.3 Rural Infrastructure

2.3.1 Background and progress and achievements in the last 20 years

In the last 20 years, the accessibility to rural growth centres has improved tremendously in the country. Over US$ 1 billion has been spent on improving the road and other means of connections to rural growth centres as well as on developing the growth centres themselves as rural hubs for markets, offices, rural health clinics, etc. This involved building of small bridges, culverts and laying drainage pipes where necessary along the rural roads. Over 6,000 rural roads now connect all upazilas to national highways. This was done under a series of projects called Rural Development Projects (1 to 30) implemented by the Local Government Engineering Department (LGED) over the years with support from the development partners.

A key achievement in the above project has been the empowerment of rural women by providing them with shops in the rural growth centres. Every market developed in the growth centres now has a women's corner, where shops are owned and run by rural destitute women. This has brought in a kind of social transformation as these women now have more economic power and are enjoying the respect of the menfolk. Availability of medical emergency services for pregnant women has vastly improved through the establishment of the rural health clinics. The patients do not have to travel long distances to get medical attention for delivery, given that the facilities are spread widely in the rural areas.

Other positive impacts of the growth centre development include increase in economic activities like poultry development and crop diversification by farmers as they can now access to up-to-date information on market demand and grow crops and livestock accordingly. They are also getting rid of middlemen in marketing their products and are getting much better prices as a result. Rural communication sector has also grown with various kinds of indigenous vehicles being developed by the people and run by them. This has also created non-farm jobs and activities.

The government is building more schools in all areas in phases as education is a priority for the people. It is also investing in establishing local government institutions including at the lowest administrative tier, the Union Parishad.

To mitigate the sufferings of people out of frequent cyclones, the government is expanding the number of cyclone shelters in the coastal zones of the country. It needs to fortify and raise the height of coastal embankments to protect people from storm surges and inundation due to

extreme weather calamities like mega cyclones as a result of climate change, but the cost is too high for the government to bear alone. This is expected to be built from adaptation funding support of the international community.

2.4.2 Challenges and future directions

Experience shows that good infrastructural development is not, often, followed-up by proper maintenance. Increased growth of traffic requires further improvement and regular maintenance of the roads and highways and rural arteries. It is necessary that adequate allocations are provided in the Annual Development Programme (ADP) for the purpose of the maintenance work, which should be completed before the onset of the monsoon in the year it is done.

Development of infrastructures and their proper maintenance in a planned way, in keeping with overall rural development plan, is extremely important in order to support and help enhance the increasingly visible activism and enthusiasm for economic and social uplift in rural sectors and, hence, sustainable development in the country.

3. Social

The government puts special emphasis on all major social sectors as part of its commitment to meeting the Vision 2021 goals as well as the Millennium Development Goals (MDGs). The social sectors related to population, health and their development dynamics, education and gender development are discussed in details in sections 3.1 to 3.6 below. Youth development is discussed under “Creation of Jobs” in section 8. Other areas are discussed briefly under 3.1.

3.1 General

3.1.1 Background and progress and achievements in the last 20 years

As the readymade garment (RMG) sector has flourished, more and more women have come for work in the RMG factories and they now account for a large majority of the workforce in the industry. Although they are rather poorly paid, the fact that they earn money has given them an improved status in the family and society. This has helped a new social phenomenon to emerge, opening the way for gainful employment of women who would otherwise have been house-bound and dependent on the male bread winners. Women’s full contribution to the national economy is not accounted for since the value of the household chores as well as agricultural work that they routinely carry out, though very significant, is not incorporated in the national income.

In Bangladesh, a large number of CBOs and NGOs play a supporting role in the context of poverty reduction. Many of these organizations work in deterring violence against women and environmental pollution, and highlighting the problems of land and river encroachment, promoting human rights; and raising awareness relating to climate change, biodiversity protection and other environmental issues.

Participation of indigenous people in development activities needs further enhancement. National Education Policy 2010 recognizes that their culture and languages should be facilitated to flourish and identifies ways forward in this regard. Bangla is the lingua franca and the state language of Bangladesh and is, therefore, compulsory for all to learn.

Some of the landless, who lost their land to river erosion, were resettled in Adorsho Gram (model villages) built by the government. Various safety net programmes continue to support the poorest of the poor in order to ensure that no one goes hungry.

The long running Food-for-Work and rural work programmes which were aimed at providing employment for a number of weeks to the hard-core poor during the agricultural lean seasons. The typical activities undertaken include earth works like dredging canals, repairing roads, building embankments etc. In addition, Rural Maintenance Programme (RMP) looks after rural infrastructures and is targeted mainly to poor women. A majority of the women headed households have benefitted from the RMP over the last 10 years or so.

Source: UNDP Bangladesh

Human Development Index

Year	**HDI Rank**	**Life Expectancy at birth**	Human Development Index
1992	**146 (out of 173 countries)**	**52.2**	**0.309**
2002	**138 (out of 177 countries)**	**61.1**	**0.509**
2011	**146 (out of 187 countries)**	**68.9**	**0.500**

According to UNDP's Human Development Report 2011, Bangladesh ranks 146 amongst a total of 187 countries listed in the Report. The per capita Gross National Income (GNI) of Bangladesh is US $ 1,529 (constant 2005 PPP). Compared with other countries in the region, Bangladesh is above Nepal, but below India, Bhutan and Pakistan in global ranking and GNI.

3.1.2 Challenges and future directions

Social transformation is a continuous process. The positive trends seen in Bangladesh over the last 20 years is expected to continue in future. As more and more women join the workforce there will be more social recognition of their contribution to national development. The current and future plans of the government including the Sixth Five Year Plan (2011-2016) and Annual Development Programmes put emphasis on women development.

The government is committed to improving the living conditions of the ethnic and other minorities and ensuring their rights. Although the process is still slow, it is expected that positive result will be achieved in the coming years.

Internal migration of people is already a major factor due to loss of livelihood in certain rural areas, particularly due to climate change related increasingly frequent extreme climatic events

and loss of homesteads and land due to river erosion. Their problems can be addressed through identification of most vulnerable locations, creation of alternative livelihoods there and strengthening the social safety net. The BCCSAP and the elaborate social safety net programmes of the government seek to respond to these problems faced by the people. But, as noted elsewhere, adequate financial and technology transfer from the international community is essential to meet these challenges successfully.

The government has been making larger allocations in the Annual Development Programme (ADP) over last 2/3 years for "social safety net" programmes addressing the poor, disadvantaged women, elderly and disadvantaged groups like the physically handicapped, beggars and others. These programmes are very helpful towards reducing hardships and hunger.

Absolute poverty has declined in the country to 31.5% and the MDG target of 29% by 2015 is sure to be met. The hardcore poor have also declined significantly and are now 17.5%. The government is very focused on poverty reduction and the goal is to eradicate the menace.

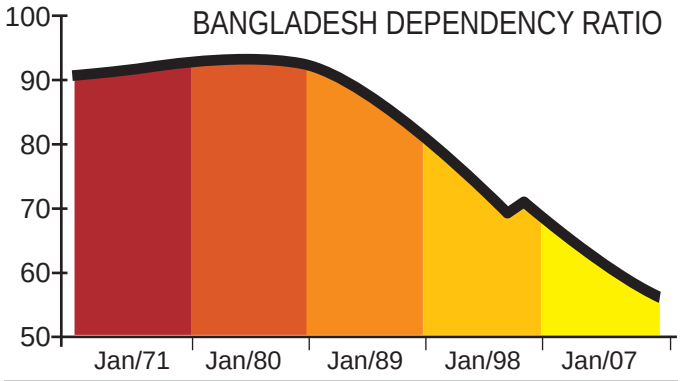
3.2 Health, Population and Development

3.2.1 Background and progress and achievements in the last 20 years

Life expectancy at birth has increased in Bangladesh from 46.2 in mid-70s to 68 years currently, which is due to improvement in nutrition and availability of vaccines against diseases and affordable medicines.

The total fertility rate (TFR) has fallen from 7 live births in the mid-70s to 2.3 births per woman in 2011 as the contraceptive prevalence rate increased from about 8% in the early 1970s to 40 % in early 1990s to 60% by 2011.

The reduction in birth rate is also attributed to education of girls and more women joining the work force. The population growth rate which was of 1.42 % in 2001 is down to 1.3% according to 2011 Population Census, which is a worthy achievement. The male-female ratio is also quite stable at 105:100.



Source: William Westgate, The Daily Star, 24 April, 2012

Since the 1970s, Bangladesh has experienced negative demographic forces. The dependency ratio indicates whether a country is struggling to generate growth in income and output with a high dependency ratio or is poised for economic boom with a low dependency ratio. The dependency ratio, or the ratio of population below working age (18 years) and population above working age (about 65 years) in Bangladesh was very high with almost one dependent for every worker until recent years. This caused a drag on the economy. Recently the trend has started to reverse and hence it is expected that the future will have positive demographic forces at play.

The population born during 1970s - 90s is now entering the most productive working age. The country is expected to benefit from this 'demographic dividend' through increase in productivity and outputs if they receive skills training and are facilitated to find employment.

On the health side, infant and child mortality rates sharply have fallen dramatically and may exceed the MDG expectations. The infant mortality rate has declined from 87 per 1000 live births in 1994 to 39 in 2009. The under-5 child mortality rate has dropped to 50 per 1000 live births in 2009 from 146 in 1991, which is a significant achievement. Large scale child immunization contributed to reduced mortality and diseases. Successful programmes to control diarrhoeal diseases and Vitamin-A supplementation have contributed to significant reduction in infant and child mortality. Another contributing factor in this regard is the breastfeeding of babies of less than 6 months old, which has increased from 43% in 2007 to 64% in 2011.

Overall mortality among women at reproductive age has consistently declined in last one decade. The maternal mortality has decreased from 322 per 100,000 live births in 2001 to 194 in 2010. Skilled birth attendants are assisting one out of four births in rural areas. Their number has increased from 21% in 2007 to 32% in 2011. More needs to be done to meet the MDG target of 143 deaths per 100,000 live births by 2015.

The incidence of HIV/AIDS is very low at less than 0.1%. Polio has been virtually eliminated. Leprosy is almost eliminated. Trends show a positive decline in the number of malaria cases and consequent deaths. Major interventions providing effective treatment to 90% of malaria victims and preventive medication provide to 80-100% households in high risk areas have yielded results. Intensive information, education and mass communication campaigns for prevention and control of malaria was carried out by the government toward this end. Immunization ratio of one year olds against measles is up to 85.3% as of 2010, and the target is to take it to 100% by 2015. Tuberculosis is on the decline due to the door to door direct preventive and treatment interventions of the health service. Multi-drug resistant TB prevalence remains very low. The proportion of children under-5 sleeping under insecticide treated bed nets has risen to 90% as of 2010 (MDG target: 90% by 2015).

3.2.2 Challenges and future directions

The current population of Bangladesh exceeds 150 million, with almost 50% of them below the age of 35 years constituting a large young work force. Importantly, Bangladesh has been able to keep the population growth rate in check with targeted interventions in the population and health sector. The population growth rate is as noted earlier, down to 1.32% per annum, but the large and growing population remains a major concern. Bangladesh therefore needs to continue meeting the challenges of improving the environment that encourages further reduction in population growth, which will necessarily focus on those segments of population which still records higher growth rates. There is a slow progress in improving nutrition. Malnutrition affects two-fifths of children. Access to Vitamin A supplement has fallen from 84% in 2007 to 60% in 2011

More than one-quarter of all under-5 deaths are due to diarrhoeal diseases and acute respiratory infections. However, it has been found that the mother's level of education is inversely related to infant mortality rate. Mothers having secondary or higher level of education have less number of infant mortality compared to uneducated or less educated mothers. Their knowledge of health, hygiene and nutrition plays an important role in reducing child mortality. Educated mothers also tend to have less number of children. Therefore, the future focus will remain on education of females.

and this needs special attention in future. Bangladesh has some progress with regard to decreasing child malnutrition. The disadvantaged groups at the wrong end due to wide disparities in regions and income classes need to be particularly addressed. More follow-up needed.

Bangladesh is now slightly behind expected progress with regard to decreasing maternal mortality rates, but some extra efforts can meet the MDGs target by 2015.

Behavioural factors of Most at Risk Population (MARPs) to HIV need to be monitored and addressed in order to avert any future epidemic.

The government is aiming to achieve universal access of all persons with TB to high quality care in future. Bangladesh enjoys a favourable position for achieving this goal by 2015. However, in the area of infectious diseases like HIV and malaria, the government needs to build adequate responsive services and technical capacities, which calls for increased government funding in the health sector.

Health experts around the world warn that with rise in temperature, due to global warming, the vector-borne diseases will increase. Therefore, climate change poses a big health risk for the population. Although it is too early to predict the nature and extent of increase in infectious diseases, experts believe that malaria, kalajar, influenza, various skin diseases, and other new or emerging diseases may affect the health of the population, bringing immense sufferings and increasing the economic burden of health cost. More emphasis on research and research- based adaptation programming and action should be in place.

3.3 Education

3.3.1 Background and progress and achievements in the last 20 years

The country has made significant progress in the areas of increasing literacy rates both for girls and boys and greater enrolment of girls in primary schools and secondary schools. The literacy rate for 7 years and above was 44.3%, the female literacy rate was 28.5% and male was 50.4% and adult literacy was 35.3%.

Gender parity has been achieved in primary and secondary levels of education in the country making it a significant achievement for Bangladesh. As of 2010, the ratios are in favour of girls at 1.02:1 and 1.14:1 at primary and secondary levels respectively. Free education for girls is now extended to intermediate level (12^{th} grade).

Primary level enrolment has reached 94.7% in 2010 against MDG target of 100% by 2015. The school drop out rate has also significantly decreased. It is expected that by 2015 all primary age children will be enrolled in schools. School feeding (i.e. mid-day meal) programme has been introduced in selected parts of the country to check school drop-out rate and increase child nutrition. The programme will be expanded throughout the country, but contribution by individuals, private and voluntary organizations and others concerned in addition to governmental efforts are necessary for successfully implementing the programme nation-wide.

3.3.2 Challenges and future directions

Future challenges remain in relation to increasing the quality of education; proper training of

teachers at the primary, secondary and higher secondary levels; making school environment attractive; and raising completion rates.

The number of schools, colleges and universities is also inadequate to meet the demand of the growing number of students. In the urban areas, this has led to the establishment of a lot of private schools, colleges and universities. However, the increasing rural demand for educational facilities calls for serious attention to be given to expand educational opportunities in rural areas.

Bangladesh still has to overcome the challenge of increasing women's tertiary level education from the current 39% against 61% for boys.

3.4 Gender Development

3.4.1 Background and progress and achievements in the last 20 years

Over the years there has been noteworthy improvement in the status of women in Bangladesh. But, a long way remains to be traversed to reach gender equality. Preference for male child still persists, particularly in poor and lower income families, which account for the majority of the total population. A reason for this preference is the perception that male children are future bread winners, while girls would require money as dowry for marriage. Therefore, in such families, compared to boys, girls often end up with less education, worse healthcare and nutrition and also hold less or no economic resources like land and money. But, this mindset is changing slowly and awareness about the value of education for all and human rights for all is increasing as a result of campaign by the government and also, by CBOs and NGOs.

A major breakthrough has been achieved in the area of education and employment for girls due to affirmative actions by the government and employment opportunities in the RMG industries that employ mostly women. Although the wage rates at entry in the RMG sector is much lower compared to rural wages, the women who work in the sector have found a niche for themselves as earners and, hence, they can increasingly articulate their needs better and also participate in family decisions.

There exists wage discrimination for the same work done by men and women, with women being paid significantly less. Also, there is a bias against women in respect of employment in many sector/sub-sectors, where stereotyping needs to be broken. Participation of women in decision-making in public sphere is still at a low level.

A recent World Bank study reveals that a mother's marginal control over resources increases the chances of a baby's survival by 20% in the country. The Bank's World Development Report 2012: Gender Equality and Development mentions that in Bangladesh, a woman earns only 12 cent for every dollar that a man earns, one of the lowest wages earned by women compared to other countries of the world. On the positive side, the report mentions that women's life expectancy has increased to 68.9 years in 2009 from 46.7 years in 1960.

Women are subject to socio-cultural vulnerabilities such as early or child marriages, dowry related violence, psychological or physical violence, trafficking, acid throwing, stalking and sexual harassment at times resulting in deaths. Deaths or maiming due to violence related to dowry and intolerance at homes occurs noticeably, which are sought to be curbed by legal and

awareness- building activities. Acid throwing on girls and women is another phenomenon of relatively recent origin, but stringent laws have been enacted to curb it. There is massive under-reporting of the crimes by the victims in view of threats, social taboo, non-cooperation from law enforcement bodies and political immunity enjoyed at local level by the perpetrators. Advocacy and awareness raising both by the government and media and sentencing of the culprits by courts are slowly reversing the trend of under-reporting.

Bangladesh has developed one of the most stringent legal coverage for stopping crimes against women through the application of laws. Violence against women is a non-bailable offence. The courts do not hesitate to mete out punishments for such crimes when brought to book. NGOs providing legal aid have helped in many exemplary court verdicts. NGOs are also providing support to acid and trafficking victims by providing them shelter and medical care. One Stop Crisis Centres and Victim Support Centres opened by police is also helpful. Legal actions, advocacy and awareness raising have brought down the number of deaths caused by violence at home and outside in 2011 from those reported in the past years, which is a positive development.

A large proportion of women still lack voice in the household decision making. Since individual families are more in control of gender norms and are responsible for the gender gaps, equity-based changes in gender relations can come through education, awareness and social movement. Female headed households—which are on the rise due to divorce, death of husbands, abandonment by husbands or husbands working abroad—face the brunt of social discrimination.

Traditionally, women have played a vital role in the rural economies with their involvement in post-harvest activities as well as in food production from tilling to sowing to harvesting. About 80% of post- harvest work is done by women. Much of this work and indeed all the household chores that they routinely carry out remain unrecognized, unpaid for and invisible.

In general, women's full contribution to the national economy is not accounted for since the value of the household chores as well as agricultural work that they routinely carry out, though very significant, is not incorporated in the national income.

Poverty is significantly related to gender inequality. It has been observed that families graduating out of poverty are more open to changes and appreciation of women's development than those in the poverty circle. In households, where women earn wages and control resources, the standard of living and gender equity rise. Increased access of women to micro-finances and trading, and consequently income earning activities, has been helpful in improving their status and reducing domestic violence.

For women's all round development, the government has adopted the Women Development Policy 2011 for inclusive growth and participation in all spheres of national life. The Policy envisages women as equal partners of development and creates opportunities for them in various areas.

At primary and secondary level enrolment in educational institutions, girls now account for larger proportions at 1.02% and 1.14% respectively. Girls are also doing better or no worse in public examinations at these levels compared to boys. However, at the tertiary level, the proportion of girls is only 39%, which is largely due to social reasons such as marrying off of girls at that age. Also, girls lag behind in science education. More social engineering and awareness building efforts should be undertaken to overcome the constraints.

Access of women to health care services has increased, but not adequately yet. However, it has contributed to increased life expectancy of women in general. Obviously, more needs to be done for women's empowerment to achieve their health and reproductive rights, including determining the number, spacing and timing of child-births and freedom from child marriage and enforced marriage.

The government has very recently increased the paid maternity leave for working women from 4 months to 6 months in order to encourage breast feeding of new born babies and reduce infant mortality rate. The number of mothers breastfeeding their babies have risen as a result and infant mortality and incidence of diseases has declined. For women's all round development, the government has adopted the Women Development Policy 2011.

Since 2005, the BBS has been developing poverty maps of Bangladesh with special focus on gender disparity and pockets of extreme poverty. These maps will serve as powerful tools for monitoring extreme poverty and gender related concerns and should be helpful towards strengthening the actions to address them.

There has been a steady improvement in the social and political empowerment of women in the country. A social transformation is underway in Bangladesh with more women joining the work force. The number of women Parliamentarians has risen to 19%. There is more participation of women in the decision making process at home than in the past. There has been a steady improvement in the social and political empowerment of women in the country. Like any social transformation process, it will take more time until a real change is achieved. The government is committed to achieving the objectives of CEDAW for sustainable development of women.

3.4.2 Challenges and future directions

The women's movement in the country is quite vibrantnow and draws respect from the government and people in general. The government is yet to act on their demand for full ratification of UN Committee on Elimination of Discrimination Against Women (CEDAW).

However, the government has put full emphasis on the inclusion of women in all spheres of social life as a strategy for raising women's status, accelerating growth and ensuring the long term sustainability of the country's development. The recently adopted Women Development Policy 2011 is a forward looking step in this respect and, if implemented properly, will contribute to effective nation-building with improved social status and increased participation of women. Given this policy and the National Education Policy 2010 implemented properly and sustained reduction of poverty, it is expected that the resulting social changes will lead to dynamic changes in the country in favour of gender equality through the dismantling of taboos and unequal social practices.
The Government is committed to ensuring better health care and enhancing social welfare of women. It is further committed not only to enrol but also retain more girls in schools in future, reduce tax burden on women and encourage the banks to provide more loans to women for entrepreneurship development.

The government expects to reduce poverty from 40% to 25% by 2015. As more women come out of the poverty trap and get education and enter the job market, it is expected that the social taboos and norms will undergo a dynamic change in Bangladesh and reverse the trend of gender disparity for good as all indications are there now.

3.5 Participation for sustainability

3.5.1 Background and progress and achievements in the last 20 years

Bangladesh's strides in development, in spite of daunting challenges, is largely due to human endeavour and entrepreneurship of its poor people within the framework of an enabling environment created by the government. A large number of CBOs and NGOs have also been making useful supportive contributions. In many cases, the quality of partnership between the government and civil society is exemplary.

The partnership developed between the Ministry of Environment and Forests (MoEF) and civil society including CBOs, and NGOs has stood the test of time and become a very proactive collaboration in the recent years towards promoting sustainable development in the country, focused on environmental and climate change management.

This MoEF has involved the civil society in the process of formulating national policies, strategies and action plans on environment and climate change through a consultative approach. Grassroots opinions have been and continue to be sought. In other sectors too, the government consults the civil society as well as the private sector in matters of formulation of policies and plans, as appropriate.

In fact, the government often seeks the views of the civil society including CBOs, NGOs, academia, media and the private sector, and takes cognizance of useful opinions on key national issues related to economy, trade, infrastructure, share market, energy, environment, ICT, and so on. These groups have also been playing a useful role through their critical review of government policies and actions, suggesting alternative approaches as and when found necessary. The media are performing a very important role of watchdog in addition to information dissemination.

The private sector in Bangladesh is now, by and large, aware of the challenges of doing business in a sustainable way in view of environmental degradation and global climate change. As a result of environmental and climate change-related awareness raised in the national and international media, some of the private sector operators now recognize their responsibility towards sustainable growth and some of the industrial and business houses have come forward to make some contribution to environmental and social sustainability, as part of their corporate social responsibility (CSR). But, a lot more is needed to be done by the sector as a whole to reach a satisfactory level. In fact, industrial pollution remains a major environmental hazard in the country.

The government recognized that participation of more women in sustainable development activities contributes to economic development since women comprise almost half the population. Therefore, the access and participation of women in the labour market has to be increased. The government is trying to put special focus on bringing about wage equality. With more women becoming second earners, the standard of living of families and children's health and education shows marked improvement.

Rural women play an important role as micro- environmental managers and know best about sustainable use of natural resources than their male counterparts. Therefore women's role in environmental conservation cannot be ignored. Similarly women, with their invaluable indigenous knowledge can play a very important role through their participation in climate adaptation initiatives and hence government has focused on involving women at the grassroots in

the consultative processes related to climate change in order to gain from their knowledge base and provide them more decision making opportunities.

3.5.2 Challenges and future directions

Further strengthening of the process of engagement of the government with the civil society including CBOs, NGOs, and with local level institutions for mobilization of opinions from the grassroots is essential to promote sustainable development. It is obviously a challenging task, but has great potential in relation to the unleashing of social forces towards sustainable development.

Industrial pollution; illegal grabbing of land, wetland and even rivers; illegal felling of trees; and demolition of hills are among the major environmental problems of the country. These cannot be addressed effectively by the government alone. It remains a challenge as to how all the wrong doers can be taken to task. This can be best done through a people's process working with the governmental action. The government and civil society, media, and other actors need to focus more on removing the social menaces such as those listed above towards contributing to sustainable development in Bangladesh.

In responding to climate change, all segments of society need to play their respective roles from their respective positions. This is too huge a task for the government to handle on its own. A good basis for socially cooperative action regarding climate change management already exists in Bangladesh. This cooperation needs to be further strengthened in future, to overcome various challenges that may exist now or may arise in future.

Technologies should be made available to women to enhance their role and participation in sustainable development and their knowledge and capacities should be built for using such technologies. More women should be encouraged to go for education in science and technology and entrepreneurship development.

4. Environmental

4.1 Sustainable Environment and Ecology

The world's most densely populated country (except for few tiny city states), Bangladesh has been experiencing degradation of the natural environment for decades in terms of deforestation, river erosion soil quality depletion, water and air pollution, poor solid waste disposal, pollution from chemical fertilizer and pesticides, biodiversity loss and urban congestion. On top of all these, more recently climate change impacts consequent upon more frequent and devastating extreme climatic events and vagaries of nature caused by global warming are playing havoc both to natural and human systems.

The government and the civil society and other actors in Bangladesh are becoming increasingly aware of the looming environmental rise due to the growing intense climate change and an even otherwise degradation of environment, particularly since the 1992 Rio Earth Summit. Environment being one of the three pillars of sustainable development along with social and economic pillars, must achieve appropriate attention in relation to environmental protection and response to the climate change.

4.1.1 Background and progress and achievements in the last 20 years

The Rio Earth Summit of 1992 brought home to countries around the world that sustainable development (SD) is the way for the future, and the pursuit of SD is not possible on the part of the government alone. All stakeholders must play their respective roles from their respective positions to generate a momentum, an integrated forward move and to achieve collective benefit of all concerned.

The Ministry of Environment & Forests (MoEF) of Bangladesh, therefore, sought to involve the civil society, CBOs and NGOs. A major work undertaken with active participation of these actors, which in turn generated public opinions through an elaborate consultation process at the grassroots, has been the formulation of the National Environment Management Action Plan (NEMAP) in 2005.

The areas on which peoples' views were mobilized include: natural hazards/disasters, industrial pollution, water resource management, energy, forests and biodiversity, land resources, fisheries and livestock, agriculture, housing and urban, health and sanitation, education and awareness and transport and communication.

A segment of NEMAP, centred on green initiatives, was launched in 1998 by MoEF through the implementation of a US $ 26 million 'umbrella' programme called the "Sustainable Environment Management Programme (SEMP)" which lasted until 2006. The SEMP was unique in the sense that it was the largest single initiative under the environment sector, the first initiative launched under "programme approach", aimed at a larger national objective in the area of environment with the participation of a host of government departments, agencies and ministries, NGOs, CSOs and international bodies like IUCN. They implemented 26 individual projects addressing various aspects of NEMAP under 5 thematic areas as follow:

- Environmental Policy & Legislation
- Participatory Eco-system Management
- Community Based Environmental Sanitation
- Advocacy & Awareness Campaigns
- Training & Education

SEMP additionally developed an environment plan for the Chittagong Hill Tracts (CHT) called NEMAP-CHT and, as a follow-up to it, developed a medicinal plants in Khagracharri and malaria eradication model for Rangamati. The SEMP interventions in CHT also opened the door for more support for the CHT region through a donor consortium.

Another segment of NEMAP, launched by MoEF was the US$10 million Bangladesh Environment Management Project (BEMP) which dealt with capacity building of the government for sustainable environmental management. Brown issues like improving the air quality was addressed through the Air Quality Management Project (AQMP).

The government has developed and implemented various policy and strategy instruments to protect and improve various aspects of environment. There is now awareness among the people at large that environmental protection is necessary for their own and national benefit. But the grabbing of land, water bodies, even of segments of rivers and industrial pollution remain major challenges. In this context, the international community has a major role to play by providing finances and transfer of technologies to Bangladesh and supporting its capacity enhancement.

4.1.2 Challenges and future directions

In view of the poverty-environment nexus, a key premise of environmental sustainability is that reversing the trend of degradation and increasing conservation cannot be achieved in a satisfactory manner unless poverty is also reduced at the same time. Therefore, all emphasis is being put by the government on accelerating economic development while addressing environmental issues. National efforts in that direction need to be strengthened to ensure sustainable use and management of natural resources.

> The Bangladesh National Report for WSSD 2002 notes that "In a country like ours with a huge population and scanty and depleting resource base, it is not easy to strike a balance between economic growth and conservation needs".

The people's livelihood and therefore the national economy are dependent on the country's natural resources as is the case in all other countries. The challenge is as to how to continue to use natural resources in a productive way, while containing the degradation and conserving the quality of the environment and sustaining the natural resource base. This is a very challenging proportion.

But it is crucial for sustainable development in the country that the challenge is addressed resolutely by the government and all other actors working together towards successful outcomes.

4.2 Forests and Biodiversity

4.2.1 Background and progress and achievements in the last 20 years

Though small in size, Bangladesh can boast of a unique stock of floral and faunal biodiversity. According to IUCN, the country has 895 varieties of vertebrates of which 13 species are extinct and 201 are under threat; 702 marine and migratory vertebrates of which 18 species are under threat; 265 fresh water fish and 24 prawn inland species of which 54 are threatened and 12 are critically endangered; 475 marine fish and 38 salt water shrimp species of which 4 are under threat. The IUCN Red Book lists the species under threat and those which are critically endangered.

Bangladesh had over 12,000 varieties of rice. The number has dwindled over the last 50 years to about 5,000. The International Rice Research Institute has recovered 28 species of lost Bangladeshi rice from germplasms. There are over 5,000 plus terrestrial trees and plants and 400-500 aquatic plants. The Bangladesh Agriculture Research Council (BARC) reported in 2001 that 106 species of vascular plants were threatened species, in addition to severe depletion of other agricultural species.

Local birds account for 400 plus species and 201 species are migratory. The birds, specially the migratory ones, are subject to poaching and indiscriminate hunting though there are laws to prevent such action. Poverty is the main reason for violation of this law and lack of awareness also contributes to it and it is compounded by lack of resources to prevent the enforcement of the laws in this regard.

Forests in Bangladesh are home to many species of indigenous tress, plants, insects, birds and animals, some of them are rare. Almost 80% of terrestrial biodiversity finds refuge in forests. Thus the forests also provide a much needed habitat for endangered biodiversity as mentioned above. However, in Bangladesh, the forest products are unfortunately being overexploited to the

point of making the forests unsustainable. The country's forest cover has come down from more than 90% of about100 years ago to less than 7% in 2000s as per satellite imagery, due to illegal logging. This has contributed to massive loss of biodiversity, making some species extinct and putting many species on the endangered list. Since then, through concerted efforts of the Forest Department, the area under tree cover has increased close to the MDG target of 20%, but the density is much less than the target of 10% and above.

Alien tree species like eucalyptus and acacia which were introduced in the past have been very damaging to the local ecology and other species of trees, birds and animals. These trees were introduced as part of social forestry projects in view of their quick growth. But they draw a lot of water from the ground and other trees cannot compete with them. Mono cultivation of large swathes of land with such trees has led to the extinction of many indigenous trees, plants, birds, insects and tree-based or tree dependent animals.

Bangladesh already has a reserved forest widely known as in place in the Sundarbans World Heritage sites. About 60% of this largest mangrove forest in the world, with its unique biodiversity including the Royal Bengal Tiger, is in Bangladesh while 40% is in the Indian territory. Although it is a unique single ecosystem, it has been administered as they fit by the respective countries since the partition of India in 1947.

The Ecologically Critical Areas (ECAs) Act was enacted by the government to protect endangered biodiversity and forest cover. The country now has 12 ECAs, 17 national parks and 17 wild life sanctuaries. The protected areas are 1.8-2% of the total land of Bangladesh. Due to lack of resources, it has not been possible on the part of the government to enhance these areas and sanctuaries or manage them better. The national target for protected areas is set for 5% by 2015; but upto 2011, only 2.15% of terrestrial and marine areas could be increased.

Introduction of alien predator fish species in the country by the private sector has destroyed local fish species to a large extent. Lack of policies regarding import of such fishes and lack of monitoring and inadequate manpower are the contributing factors. In addition to these, there is the lack of awareness of the people, particularly the importers and customs agents.

The matter is exaggerated by the use of current nets for fishing although it has been banned by the government. Fishing trawlers regularly use current nets even though many are seized and the owners are fined by the government.

The Sustainable Environment Management Programme (SEMP), Coastal and Wetland Biodiversity Project (CWBMP) and Nishorgo Project of the government have helped bring in innovative approaches of community management of coastal and wetland ECAs and their biodiversity including fishes, birds, animals and indigenous trees as well as established forest sanctuaries for wildlife. These projects created incentives for communities for the protection of biodiversity and alternative sources of income for them. It has also helped the communities to seek protection from tidal surges and floods by building barriers with indigenous water resistant trees. Effects of shrimp cultivation and the resulting land degradation have been reduced to an extent to enhance sustainability in the coastal regions. To provide protection against tidal surges during cyclones, mangrove plantation was undertaken on 160,000 hectares of newly accreted coastal land in the recent years. The Coastal Green Belt project continues to implement the coastal afforestation initiative of the government.

4.2.2 Challenges and future directions

Bangladesh's environmental and ecological balance is under severe threat due to population pressures, over-exploitation of natural resources, deforestation, degradation, habitat loss,

pollution, indiscriminate killing, hunting and poaching of wild animals. Tigers were once found in greater number in Bangladesh, but today the largest remaining population of tigers is in the Sundarbans only. Other endangered species including elephants, hippopotamus, dolphins, turtles, crocodiles, lizards and other rare birds and animals are facing the threat of extinction due to poaching and transboundary illegal trade off animal and body parts. The rhinoceros is all but extinct. Poaching has increased during the last decade although the government has been trying to stop it with inadequate resources and manpower.

It is recognized that like water and air, the forest acts as a sustaining source of life by regulating the water in the air and helping to create rains and fresh water catchments. In the context of climate change, it is the most important function is to act as a carbon sink. To counter the effects of global warming, creating forests is a very good option as they temper climate change by reducing the temperature, absorbing carbon dioxide, capturing water and causing precipitation. However, in a small country like Bangladesh with high population density and majority of the population living on less than PPP US $ 2 a day, protecting and regenerating forests will not work unless strong incentives and alternative livelihoods are provided to communities to protect them.

The programmes under the UN's Reducing Emissions from Deforestation & Degradation (REDD) convention may provide such incentives or funding has to be arranged under the Adaptation Fund for future programmes for conservation of forests.

Sundarbans, the largest mangrove forest in the world and a world heritage, also happens to be one of the largest carbon-sinks in the world. Experts predict that 15% of this unique bio-reserve will be lost to sea level rise in the next few decades. This will endanger the already fragile ecosystem under stress from over-exploitation by humans, reduced water flow from the Ganges due to upstream Farakka Dam in India and top-dying of Sundari tress which are crucial for the survival of the forest. Urgent attention needs to be given to the threats faced by the Sundarbans, as outlined in the BCCSAP, for which external funding would be required.

Regional cooperation between Bangladesh and India is a must for the protection and conservation of the Sundarbans and taking joint initiatives to save it from the adverse effects of climate change. In this regard, a Memorandum of Understanding (MoU) for Conservation of the Sundarbans and a Protocol on Conservation of Royal Bengal Tiger of the Sundarbans has been signed between the two countries recently as part of regional cooperation.

Bangladesh is mostly a flat land with hills in the Chittagong Hill Tracts in the Southeast, Moinamoti in the Comilla, Barind and Garo Tracts in the upper reaches and hills in Sylhet. These places have extremely rich pools of biodiversity and also are identified as "biodiversity hotspots" in terms of threats to biodiversity. Therefore the hill areas and hill forests need to be protected to ensure ecological and biodiversity security. This challenge needs to be addressed more resolutely in future, and the government is aware of this urgency.

Laws have been enacted by Bangladesh to protect the biodiversity and penalties made heavier. Enforcing the law is difficult in the absence of necessary manpower and institutional capacity. Also lack of awareness and education and extreme poverty make enforcement more difficult. The Government is taking steps to improve the situation by creating a marine reserve of 698 sq. km. in the Bay of Bengal, and several eco-parks and protected zones and sanctuaries in the country to conserve biodiversity in the near term.

People's perspective

Many local varieties of flora and fauna have disappeared in the last 20 years. Dolphins which were visible in Padma river in the past are no longer seen. Vultures have all but disappeared due to chemical poisoning through eating dead cows treated with the medicine Clofenec. Crows are on the decline feeding on poisonous wastes. Indigenous species of many trees and plants are not available in many areas now. The local people are fully aware that biodiversity of the country is under threat. Therefore, they think an updating of inventory on existing and endangered flora and fauna is a critical need in order to monitor their status in the next 20 years and afterwards.

Poaching and cross-border trafficking of live wild animals and body parts is rampant with international gangs operating in illegal trade. To tackle this problem a regional approach is required. Therefore, Bangladesh has joined a regional project with India, Nepal and Bhutan which will help the participating governments to build or enhance capacities and institutions, and share knowledge and expertise to jointly tackle illegal wildlife trade and improve management of endangered wildlife and their habitat by addressing select regional conservation threats. Under the new Strengthening Regional Cooperation on Wildlife Conservation project, comprehensive Protected Area (PA) management plans will be developed and implemented with improved and effective patrolling for wildlife crime control through a regional approach side by side with the strengthening of national capacities for wildlife conservation and protection.

What is critically required for the protection of wildlife and endangered species and forests is not only laws, which there are many, but adequate manpower to monitor and capacity building of the relevant departments in this regard, larger community participation and co-management, and advocacy and awareness raising through school curriculum and the media.

The demand for protected sanctuaries for rare species to breed and multiply and live in safe heavens has been a long standing phenomena in the country. The 13 ECAs were established in the last decade but hardly have the manpower to monitor the conservation of biodiversity in all the ECAs is too inadequate. Some targeted interventions in some areas like Lawacharra forest, some haor and coastal areas are yielding results, but much more is needed. There needs to be a coordinated approach for biodiversity conservation in the all the ECAs. The government is responding with its limited resources, but the challenge is enormous.

The government has recently (January 2012) declared 3 zones of major canals in the Sundarbans as dolphin sanctuaries. These safe havens for the endangered species cover a total area of 32 kms. Under the law, fishing in these 3 areas is prohibited and carries a sentence of 6 months to 5 years along with a fine. But fishing and cargo trawlers are regularly plying through them discharging wastes and oil which are polluting the sanctuaries. Plying of large vessels carrying oil and other cargo through these sanctuaries, which currently pollute the waters and pose a danger to the dolphins should be banned. For that, an alternate route has to establish for the vessels.

Any place declared as a sanctuary need to be closed off and protected with limited entry of people, including eco-tourism. The eco-parks and reserves are new creations and would need more time and resources to build to full potential as tourist attractions. Community involvement needs to be ensured in such activities, and the government has been promoting community participation through various initiatives including awareness raising and co-management arrangements.

While tree resources in the reserved forests have increased in the last 15 years, cyclones Sidr and Aila have devastated a large part of that and set back the progress made. Future challenges lie in genetic fingerprinting of forest and other species and establishing IPR over them and conducting environmental valuation. Growing of climate- resilient trees would need to be persuaded too. Therefore, substantive support from the international community would be required for research and development and technology transfer in the forest and biodiversity sector in future.

4.3 Sustainable Land

4.3.1 Background and progress and achievements in the last 20 years

A formidable challenge before the country relates to the housing, food security, access to clean water and energy and other services for a population of 150 million living in a country of 147, 570 square km. Unplanned land use in setting-up of development projects, private industrial and service activities, human settlements, grabbing of wetlands and other common resources by unscrupulous persons, and unplanned rapid urbanization is a major problem facing the country.

The country is also losing on an average close to 1% of agricultural land per annum to other uses. More agricultural land will be lost in future due to increased salinity ingress and river erosion as a consequence of climate change. This is a serious concern relating to food security in future. Therefore, Bangladesh has to follow the path of sustainable land management in order to cope with the demands of its large population.

The courts of the country have a logjam of cases, some pending for many years. More than 80% of these cases are related to land disputes. Violence and deaths occur as a result of land disputes. People make false claim on others' properties with fake documents obtained with the help of corrupt functionaries of the land offices. Therefore, land administration needs to be modernized and made fullproof. In order to resolve these issues, digitization of land records has started. In fact, an ICT based land record system was piloted in mid-2000s, but there has not been much progress since and the vested interest groups oppose it. The government has in the past few years initiated the use of the National ID Card for registration of land together with photograph. Obviously this issue remains a major challenge and should be addressed resolutely.

Over half of the coastal area is affected by salinity intrusion due to rise sea level. Increased salinity in a wide expanse of land as a result of storm surges, mega-cyclones like Sidr and Aila, has rendered land infertile even after 2-3 years.

Significant amount of land has been lost to river erosion that has rendered a large number of people destitute. They migrate to urban centres in search of livelihoods and find refuge in slums and are forced by circumstances to live a wretched life. There is some accretion of land in the coastal areas as riverine islands (charlands) due to sluggish flow of rivers in lean seasons. Many

families who lost their land to river bank erosion tend to move on these almost inhabitable places and live a danger-prone life.

Demolition of hills is a key retardant in the growth of sustainable land and environment in Bangladesh. Development of infrastructure, housing and brickfields in hilly areas cause immense damage. Loss of hills and wood extraction has already taken a severe toll on the biodiversity of the country.

Environmental laws exist for the protection of hills, but since land management is under the ambit of the Land Ministry and there are deficits in coordination between two ministries, the implementation of laws becomes difficult. Increased coordination is highly desirable and shared act to bring about the much needed coordination.

4.3.2 Challenges and future directions

Bangladesh needs to rethink its priorities relating to sustainable use of land as it approaches 2050 when the population is expected to be more than 300 million from the present 150 million. The Sustainable Land Management Programme of the government should address the poverty issues of the deprived people with reference to their access to land along with other measures.

The government owns substantive areas of land called Khas land, which can be distributed among the poor for productive use as part of the poverty reduction strategy. Also access to Common Property Resources (CPR) like wetlands and water bodies will help the poor to subsist. The poor are known to protect the biodiversity in these areas since they need to survive on them and therefore make optimum use of the resources. Current leasing practice of water bodies and wetlands to the rich and powerful by local administrations, municipalities and the Ministry of Land must be stopped through legislation. This class of people are responsible for the over-exploitation of natural resources and degradation of land, rivers, wetland and other water bodies.

The char settlers comprise the poorest of the poor in these remote and depressed areas. They remain mostly out of reach of the government's health, education, agricultural and other services due to their remote settlements and inaccessibility. Over the years, they have made these lands grow crops, but new lands are not fertile and the people have to rely on fishing and other means of livelihood. Often they are displaced by rich and powerful grabbers of the land. These hard core poor need to be ensured of livelihood through allotment of land. The Government has to ensure access of these poor to common property resources and bring them under the provision of necessary services to ensure their basic needs.

Land use in the country must follow the National Land Use Policy and Land Use Zoning. The country needs to build institutions and capacities for managing land zoning and land use planning. Currently land use is highly unsustainable since various land use policies and methods are being used by different ministries involved with natural resource management of various kind and by the city corporations too. There should be coordinated efforts of between the various agencies/ministries to follow a comprehensive land use policy and system as defined in the National Land Use Policy.

Modernization of the land record system will reduce/remove corrupt practices and bring down the financial burden on the people who would otherwise be affected by false cases. The government has to make more policy interventions to protect the rights of the land owners. It has to develop

mouza maps and detailed description of properties in digital formats and issue fullproof certificates of ownership to land owners to bring down the corrupt practices related to land.

The only answer to doing away with illegal land grabbing and lengthy litigation process is a modernized land administration system which will have full-proof digitized land record systems in place that will protect the land rights of the citizens.

Unplanned and unauthorized demolition of hills is causing ecological destruction, loss of biodiversity and loss of tress and forests. It also causes localized disasters like landslides. This has to be brought under control through sustainable land use policies and laws and their strict enforcement. This will also require a centralized coordination among various agencies and ministries relevant to land administration and land use.

In the coastal areas, conflicts between agriculture and brackish water shrimp gher (enclosure) farming needs to be resolved through sustainable programmes involving local community in probable arbitrations.

Due to withdrawal of Ganges water in upper riparian India, large swathes of land in the Ganges basin in Bangladesh has become desertified where it used to be lush green before. The land has become unfit for agriculture and the river flow has narrowed down with large shoals and islets cropping up. Bangladesh has to seek a solution to this massive land degradation through water-sharing with India.

Desertification is also a problem in the North of the country. The Barind Multi-purpose Development Authority (BMDA) has been more or less successfully addressing the problem of desertification in the Barind Tract and has in the process developed a model for land restoration and water conservation leading to greening of the area, agricultural growth and return of biodiversity. Desertification in Protected areas has to be addressed as well. The government has prepared the National Plan to Combat Desertification under UNCCD. The BMDA Model could be replicated in other arid parts of the country provided resources are made available.

Recovery of degraded wetlands and water bodies are much needed. In this respect, the practice of leasing of land to the rich has to be reconsidered in favour of keeping them as common property resources for the poor. Construction of fresh water reservoirs is also necessary. River dredging and using the silts for land reclamation could be one option for retarding land degradation. All these would require a lot of investment.

4.4 Chemicals and Waste Management

4.4.1 Background and progress and achievements in the last 20 years

One major source of Green House Gas (GHG) emissions is methane from bio-waste. Hence biomass, a potential source of gas generating from global warming, is being composted to produce organic fertilizer. Biogas, which is a by-product of the process, is used in rural areas to cook food and run small and cottage industries like bakeries and workshops. These initiatives have taken off in Bangladesh and are increasingly becoming popular through the interventions of GOs and NGOs.

In keeping with the Basel and Stockholm Conventions, the government has taken steps to eliminate the “dirty dozen” chemicals known as Persistent Organic Pollutants (POPs) through an

action plan and its follow-up. However, gains made over the last decade in eliminating the POPs from most industries have been offset by the growing ship breaking industry in Bangladesh.

Industries are causing 60% of the river pollution through wilful discharge of effluent, even by those few having effluent treatment plants. The cities discharge 82% human excreta directly into the rivers without treating them. The situation is so bad that some rivers like the Buriganga in Dhaka are almost biologically dead, with no oxygen in the water and hence fail to support any aquatic life. In fact the water is filthy, smelly and black.

About 200 ship breaking yards are in operation in the coastal zone as the demand for steel rises in the country and the developed countries sell the obsolete ships at throw away prices to avoid contamination from scrapping them in their lands. This industry, which had been operating without any care was recently brought under some compliance through development of a Ship Breaking Policy and safety rules and regulations. However, these are yet to be enforced in the country.

4.4.2 Challenges and future directions

The industrial sector has to become sustainable by setting up effluent treatment plants. Though the law does mandate it, there is flagrant violation of law in this sector. Untreated chemical wastes, many containing heavy metals, are discharged into rivers, canals, wetlands and even agricultural lands severely degrading them and causing health risks to people. Strict enforcement and monitoring are required for sustainable development. Relocation of high risk industries like tanneries and cloth dying plants has to be expedited.

Bangladesh lacks many basic raw materials and among them steel is a primary one. The construction industry in the past had to depend entirely on imported steel. With the ship breaking industry started by a few entrepreneurs a decade ago, the country's demand for steel could be met to some extent from this industry. The industry is growing day by day and is polluting the coastal areas and sea. There is not much care about worker's safety. Therefore, government has to ensure the import of non-toxic ships (decontaminated at source) for dismantling in Bangladesh. It also has to ensure workers' safety and health together with environmental clean up and protection if the ship breaking industry is to continue in future.

The POPs inventory in the country has to be continued in order to know about their use by various industries and for taking effective steps to eliminate them. Awareness raising among major stakeholders including import agents and customs agents has to continue.

Elimination of POPs was a success initially, but with newer varieties of POPs cropping up and loopholes in the system of import and international monitoring, further support is required for eliminating POPs in future, taking into considerations the emerging threats and gaps. In this respect, international monitoring of transboundary illegal trade of POPs is also required with a globally coordinated mechanism.

4.5 Meeting International Obligations

4.5.1 Background and progress and achievements in the last 20 years

Bangladesh has remained at the forefront of meeting its international obligations, even while being at a disadvantage as a recipient of development support. It is one of the most vulnerable

countries to climate change. As part of its commitment, it has prepared the following instruments, with support from GEF, which forms the basis for meeting its international commitments:

- National Biodiversity Strategy & Action Plan (NBSAP)
- Initial National Communication (INC) on Climate Change
- Second National Communication (SNC) Climate Change
- National Capacity Self Assessment (NCSA)
- National Adaptation Programme of Action (NAPA) 2005; Revised NAPA 2009
- National Biodiversity Strategy & Action Plan (NBSAP)
- National Plan for Combating Desertification,

So far, GEF has provided Bangladesh with about US $ 30 million to formulate the above reports and instruments and also to implement some projects. The projects implemented with GEF support are on Rural Electrification, Coastal & Wetland Biodiversity Management, and Persistent Organic Pollutants (POPs). The country is currently implementing Energy Efficient Brick Manufacturing (Green Brick), Coastal Afforestation and Fuel Cell projects of GEF.

Under the Montreal Protocol technical support, Bangladesh had made significant progress in phasing out Ozone Depleting Substances (ODS) which also contribute to global warming, like Chlorofluorocarbons (CFCs) from the industrial and pharmaceutical sectors and is now in the process of phasing out Hydrochlorofluorocarbons (HCFCs.) CFCs and HCFCs were used as refrigerants in fridges and air-conditioners and as propellants in aerosol and asthma sprays. They are considered as wonder chemicals for food and vaccine preservation until it is discovered that they are responsible for global warming and breakdown of the Earth's protective ozone layer shield in the upper atmosphere and thus exposing people to cancer and many threats to biodiversity extinction.

Bangladesh was earlier consuming 1100 Metric Tonnes of CFCs. It embarked on a series of 16 initiatives since 1994 for complete phase-out of ODS from the country. As of 1st January 2010, Bangladesh has achieved 100% phase-out of CFCs from the refrigeration and air conditioning service sectors.

Bangladesh has also achieved 100% phase-out by 1st January 2010 of Carbontetrachloride which was used as a cleaning solvent in the ready-made garments industries. Therefore, ODS is nearly phased out from the country and Bangladesh is expected to meet the MDG target on time.

4.5.2 Challenges and future directions

A very small amount of 25 MTs of CFCs continue to be used in the production of medicine spays inhalers, and essential use by asthma patients and will be phased out completely by 31 December 2012.

The Department of Environment (DoE) has prepared a HCFC Phase-out Management Plan which it is going to implement soon for 100% phase-out. HCFC is used as insulation foam in domestic refrigerators.

The most recent policy of GOB on ODS mentions that the HCFC phase-out will ensure that the alternative of HCFC will be zero ozone depleting, having zero or negligible GWP (Global Warming Potential) and must be energy efficient. This is a major voluntary policy intervention for phasing out of ODS in Bangladesh

Bangladesh has gone to the extent of analyzing its Investment & Financial Flows (I&FF) in 3 major sectors that will be affected by climate change – agriculture, water and energy – and come up with a costing for adaptation/mitigation measures that would be additional/incremental to the ADP allocations. It is expected that the incremental costs will be provided by the international community to offset the impact of climate change. However, these economic gains should not only be for technology transfer, but they must address also the human impact as outlined in the I&FF studies.

Bangladesh would need more support from international funds like GEF to address the adverse impacts of climate change.

VII. PRIORITIES, EMERGING ISSUES AND NEW DIRECTIONS BEYOND 2012

The Rio+20 has set out to focus on 7 critical issues of sustainable development which are common in global context: creation of jobs (including green jobs), energy, sustainable cities, food security and sustainable agriculture, water, oceans and disaster readiness.

However, for Bangladesh, there are a few other critical issues for sustainable development. The key priorities for Bangladesh according to its current and future (next 20 years) policies, plans and development programmes are: food security and sustainable agriculture, water security, energy security, climate change, disaster management, transportation and infrastructure. All of these are critical needs of the people or issues affecting their lives and livelihood and have to be addressed in order to achieve sustainable growth.

Among the emerging needs of the nation are: creation of jobs including green jobs, developing sustainable cities, and managing sea/ocean resources. All the current and emerging priorities are linked to the 3 pillars of sustainable development: economic, social and environmental. The key priorities and emerging issues can be put down in the following way.

1. Food Security and Sustainable Agriculture

1.1 Background and progress and achievements in the last 20 years

Agriculture including crop cultivation, livestock and poultry rearing and fishery, despite its relative decline in terms of contribution to GDP, remains the mainstay of the economy of Bangladesh. Forestry is also a part of agriculture but is addressed separately due to its major interface with other environmental issues including climate change. Agriculture provides employment to just under one-half of the local labour force, supplies raw materials to some of the major agro-processing industries and earns foreign exchange from its exports.

Agriculture also remains the main buyer of some of the major domestically manufactured industrial products such as fertilizer and agricultural tools and machinery while farm families buy a substantial proportion of other domestically manufactured consumer goods. This has been possible due to both growth and structural change in agriculture. On the other hand, agriculture is at the cross-roads as water scarcity, land degradation, salinity ingress and possible climate change impacts are threatening its sustainability.

Agriculture is dominated by crop cultivation, particularly rice, which is the main staple food in Bangladesh. Only recently had there been some move towards other food crops, while the previously major non-food crop jute has declined in terms of area under crop cultivation and production. Rice (Aus, Aman and Boro), cultivated in three seasons a year had been basically rain-dependent till the mid 1990s. But there has been, over the years, a gradual switch towards fertilizer-intensive high-yielding varieties of rice in place of low-yielding ones. Now, with Aus reduced to a tiny proportion, rice has virtually become a two season crop, one (Aman) dependent on rain requiring supplementary irrigation, while the other (Boro) is irrigated and contributes about 60% to total domestic rice output.

Such a shift towards high-yielding and irrigated rice has two major implications; first: the cost of production has gone up and the use of energy has also gone up in the form of nitrogenous

fertilizer (mainly urea produced from domestic natural gas) as well as in terms electricity and diesel which are used for pumping irrigation water.

Major achievements have been registered by Bangladesh in various agricultural sub-sectors. Despite a large and growing population, national self-sufficiency has now been achieved in foodgrain production. Rice production has been intensified through HYV and other technology infusion. Production of vegetables, fruits and spices has also registered notable expansion. Crop diversification was introduced in the country with the addition of maize and wheat as major crops. The horticulture and nutrition development initiative established horticulture nurseries around the country and set-up 12 training and research centres. Recently flowers are being produced widely as a cash crop. Integrated Pest Management (IPM) was introduced throughout the country through the establishment of "Farmers Field Schools (FFS)" in all upzilas to reduce harvest and post-harvest losses and better manage crop diversification and production. GIS-based agricultural planning has been introduced in the country based on specific agro-ecological zones.

Another significant achievement in the agriculture sector is the improvement in research and development capabilities, which has led to the development of various HYVs of rice and other crops. The country has recently developed and released rice varieties which include those of shorter duration maturity (escaping seasonal drought and thus obviating the need for supplementary irrigation, and saving energy), tolerant up to two weeks of flood water submergence, and tolerant to moderate salinity. The agriculture extension service which diffuses the new technology to farmers and advises them is the largest public sector service provider in the country with its delivery agents in practically every village of the country.

Most farms are tiny by any standard, 88% of them operating on no more than a hectare or so. Yet, the credit for the achievement of self-sufficiency in foodgrain goes to the hard work of these marginal and small farmers of the country, who are very open to adopting newer technologies and building resilience to the vulnerabilities of climatic events such as floods, cyclones, droughts, etc, by adapting quickly to new farming options.

Starting from the aftermath of 1998 deluge, the farmers have demonstrated their resilience by planting early crops as a departure from tradition in order to recover from the losses of the floods. However, more often than not, the hard work of the farmers does not get rewarded sufficiently due to the limitations of the marketing system. The farmers often, particularly when production is high, do not receive fair prices and, at times, prices are such that even costs cannot be recovered. Procurement of rice (at better than market prices) and open market operations (selling of rice at fair prices) are used by the government, at appropriate times, to stabilize the rice market.

Bangladesh's is one of the largest fresh water fishery sectors of the world. Yet, continuous and increasing volume of fishing has caused depletion in the national stock and loss of indigenous varieties of fish. Over the years, fish has become dearer in cost and sometimes unaffordable to the poor. Shrinking wetlands, drying and siltation of rivers, and flood embankments inhibiting the flow of water between rivers and wetlands have also contributed to the decline in stock as well as diversity. Yet, this decline has encouraged large scale adoption of pond-based fish culture, but the natural decline that has happened so far is yet to be recouped.

Large scale fish stocking projects have been taken up i.e., Third Fisheries Project. But these do not help the common people much; access to the facility and hence distribution of benefits have been skewed in favour of the rich. The main problem has been a leasing system of the wetlands that favours people who have money and thereby more opportunities. The fishery sub-sector is an

area where innovative governance can both increase production of fish and help the poor to benefit.

The livestock sub-sector is highly promising but has shown little dynamism since late 1990s, although the dairy and poultry looked like taking off at one time. There is scope for small scale dairy in various parts of the country. However, it is likely that large mechanised dairy processing plants may come on stream as major agri-business houses are now showing interest. On the other hand, the poultry industry, which had a vigorous growth only a few years ago, is now reeling under the threats and effects of avian influenza and other diseases. In any case, rising income, rapid urbanization and changing tastes are likely to continue to push up the demand for poultry, dairy and other livestock products, with major implications for further restructuring of agriculture.

1.2 Challenges and future directions

The world saw a very large spike in the prices of staples during 2007 and 2008. Moreover, a global financial crisis ensued in 2008 followed by global economic recession. Right now, the Euro zone is passing through a severe economic crisis. Bangladesh successfully withstood the global financial and economic crisis that started in 2008. Agriculture in Bangladesh has been receiving particular attention and support in the wake of global food crisis and high prices of rice in 2008. The country's rice production has increased significantly. A crisis has successfully been tuned into an opportunity. However, the ongoing Euro zone financial and economic crisis is threatening to cause negative impacts on the economy of Bangladesh. If that happens, the agriculture sector may also be adversely affected since reduction in public support to agriculture may be a possible compulsion.

Agricultural growth needs to pick up further from its present rate of around 3.5% or so simply to keep feeding an increasing population. But as agricultural land is declining by close to 1 % a year, owing to shifting of agricultural land to other uses and climate change-induced increased salinity ingress and river erosion, the challenges the sector faces in reality can curb its performance. Moreover, the production of rice is characterised by sharp fluctuations between years as well as within the year due to various natural hazards such as floods, cyclones, drought and salinity ingress. The present apparently satisfactory situation relating to foodgrain production is thus on a razor's edge and finely balanced.

The key challenges to agricultural growth in the country include (on the supply side) water resource and land area constraints, soil degradation and climate change, coupled with (on the demand side) a rapidly growing, increasingly urbanized and more affluent population with changing tastes. Addressing these challenges will require new thinking on how domestic food security goals can be met while sustaining an increasingly fragile environment and a large population dependent on agriculture for their livelihoods. These problems are exacerbated due to the low holding capacity of the large majority of farmers who, by and large, till by themselves only very small areas of land.

Other problems relate to agriculture marketing, post-harvest losses, effective extension services, and access to adequate finance and credit. A new development in the agriculture sector in recent years is that the proportion and also the absolute number of male farmers and farm workers have fallen while those of female farmers and farm workers have risen. The proportion of women in the total number of employed agricultural workers has increased from 20 percent to more than a third of the total since 1998/99. This development may have policy implications relating to the organization of agricultural production and the nature of support to the sector.

Soil degradation is commonplace in Bangladesh, whether man-made (for example, through unbalanced use of fertilizers) or due to natural factors (salinity ingress in coastal areas, or landslides on the hilly terrains). Estimates by BARC (2000) indicate that soil related problems may be a major constraint on agricultural growth. Organic matter depletion is observed in 7.5 million hectares of land. Declining soil fertility, soil erosion, and salinization affect respectively 5.6–8.7 million hectares, 5.3 hectares, and 3.05 million hectares of land. It is estimated that Bangladesh soil loses annually some two million metric tons of nutrients. Unless compensated through balanced application of nutrients every year, the fertility of land is expected to decline and so will its productivity. As per one estimate, about one percent of crop GDP will be lost every year. Sustainable land management is therefore a major challenge for now and also in the future.

Post-harvest losses constitute a major problem. According to various estimates, these losses range from around 8 to 15% for rice and about a quarter for non-rice crops. Such huge losses need to be diminished through organisational means and simple technology to no more than 2-3%, which will significantly raise availability of food immediately.

Climate change is going to create major problems for Bangladesh agriculture. The impacts of climate change are already being felt in the country. The agriculture is already being impacted and likely to face more problems as climate change intensifies through changing and shifting pattern of rainfall intensive flooding, drought, salinity ingress and land degradation. Rice output is expected to fall substantially in the absence of effective adaptive measures, although recent modelling indicates little impact on fish production.

On the whole, climate change will create major problems for agriculture and food security as well as for urban habitation, coastal and riverine flood protection, and overall livelihood and health. These call for large scale investments in technological innovation or adaptation in water management, infrastructure development, cropping system and varietal improvement and development, modelling of climate change and its impact (natural as well as socio-economic) and will affect human and institutional capacity building.

Bangladesh recognizes that food security will be difficult to achieve unless the people and the economy are safeguarded from the effects of climate change. A GoB-UNDP study in 2009-2010 on Investment and Financial Flow (I&FF) required for adaptation in the agriculture sector (crops, fisheries, livestock and forestry), has estimated that the country will need over and above (or incremental to) the ADP allocation for the sector, a total of US $ 69.67 billion up to 2030, with 2011 values as the baseline. Of this amount, 30% will be for investment in infrastructure, 17% for market development, 15% for irrigation and water management and the rest for other purposes, and all these are related to adaptation.

Indeed, development and diversification of agriculture, covering its various sub-sectors, is required to broaden livelihood opportunities and ensure food security and better nutrition of the people.

The government is aware of the problems and has recently prepared a comprehensive Country Investment Plan for Food Security with attention to all the three components of food security, viz., availability, access and nutrition with resource requirements of about US$ 7.8 billion over a period of 5 years. With reference to this estimate, the present resource gap is over US$5 billion.

On climate change, Bangladesh has prepared several planning documents, the latest being the Bangladesh Climate Change Strategy and Action Plan (BCCSAP), which contains a section related to agriculture. The BCCSAP is now reflected broadly in the country's Sixth Five Year Plan (2011 - 16). Agriculture ministry is a beneficiary of the disbursements from the GoB's Bangladesh Climate Change Trust Fund (BCCTF), which is being used mainly for adaptation programmes.

The government has set up a major research fund for innovative research in agriculture. The present amount stands at about US$ 70 million.

On the whole, agriculture in Bangladesh has made tremendous strides, but is likely to face many natural and man-made challenges in the coming years and greening agriculture will necessitate major institutional efforts as well as huge resources. Given that Bangladesh's own resources are very limited, the country needs adequate international support for sustainable improvement in the agricultural sector (crop, fishery and livestock).

2 Water Security

2.1 Water resources

2.1.1 Background and progress and achievements during the last 20 years

Bangladesh is a great delta formed by the alluvial deposits of the three major Rivers: the Ganges, the Brahmaputra and the Meghna. There are about 310 rivers in Bangladesh of which 57 are trans-boundary rivers. Out of the 57 trans-boundary rivers, 54 are common with India and 3 with Myanmar. In fact most of the rivers of Bangladesh are tributaries and distributaries of three major rivers (GBM). The life and livelihood of the millions of people of Bangladesh have been revolving around waters of these rivers over the ages. The Ganges, the Brahmaputra and the Meghna river systems drain a total catchment area of about 1.72 million sq km through Bangladesh into the Bay of Bengal. Out of this large catchment area, only 7% lies in Bangladesh. Unfortunately, the country faces the problem of either too much or too little water respectively in monsoon and dry seasons. In the dry season water problems are compounded by low flows slowly coming down the trans-boundary rivers due to large scale obstructions up-stream outside the country, particularly in India. These critical water shortages play havoc to agriculture, ecology and lives of the people. A further blow is dealt by the adverse effects of the intensifying of climate change.

Being a low lying country with two-thirds of it having an elevation ranging from 2 to 5 metres above the mean sea level, Bangladesh is highly susceptible to storm surges in addition to river and rain water flooding. The GBM region receives over 80% of its run-off during the five rainy months. Some 93% of the total annual runoff that Bangladesh drains to the Bay of Bengal enters the country from the up-streams so that Bangladesh has very little control over the behaviour of these water flows. Between 22-30% of the country becomes flooded every year, which is considered normal. Major floods used to strike with longer-return periods. But in recent years, as climate change intensifies, more frequently and devastatingly such floods are occurring. In case of severe floods, up to two-thirds of the country beome inundated. The last 25 years have seen six devastating floods (1987, 1988, 1998, 2004 and two in 2007). The hilly regions in the east have an altogether different hydrological system as these become victims to flash floods.

Floods bring with them river erosion and loss of land and homesteads of the poor people who live on or by the river banks. Hundreds of hectares of agricultural land get lost due to river erosion every year. The displaced people migrate to the cities in search of livelihood but are forced by circumstances to live in the slums and create problems for urban congestion and strain on urban services.

In the dry season, water scarcity severely constrains agricultural and other economic activities. River waters, when available, are pumped for irrigation and ground water is extracted for the purpose where or when river water is not available. The latter is more often the case.

The water sector development projects has mainly been focused on flood control and drainage; irrigation; riverbank erosion control, delta development and land reclamation. The projects involved construction of infrastructure facilities like barrages, cross-dams, regulators, sluice gates, canals, embankments and sea-dykes along the coast and on rivers. The Dhaka City Protection work undertaken to protect the city from flood. Protection embankment in this regard has been partially completed.

Over the last 12 years, the Government of Bangladesh has spent a total of US $ 1,310 million as investment for development of flood control, irrigation and drainage. A comprehensive water sector assessment was done under the Flood Action Plan (FAP) in the late 1980s and early 1990s. But these studies have, by and large, remained unutilized in policy making or action on the ground, although some experimental projects had been undertaken and the Dhaka city protection embankment, which had been initiated earlier, was incorporated within the relevant component of FAP.

The National Water Policy 1999 is a forward-looking document that has taken into consideration all the important aspects for improving the water resource management and protection of environment comprising of water rights, water pricing guidelines, decentralized water management and the role of women in water management. Although climate change does not feature in it, the more recent policy documents indicate the major implications of climate change for the water sector.

A National Water Management Plan, drafted during 1999-200, was finally adopted by the government in 2004, which addresses the overall water resource management issues, specifying 83 programs under 8 clusters to be implemented around the country. But it has largely remained neglected, although some major projects identified have been taken up for implementation one way or another. The challenge remains in implementing both the policy and the plan, particularly under adverse conditions of changing climate.

In the wake of climate change and sea level rise, a major issue now relates to how the flood control and irrigation polders and coastal embankments, which were built in earlier decades, are to be repaired, rehabilitated, renovated, or even reconstructed to successfully withstand storm surges. Broadly speaking, these need to be strengthened and their heights raised appropriately. But this is a very expensive undertaking. One tentative estimate puts the figure at US$ 10 billion, which the government cannot afford. It’s in fact the responsibility of the developed countries to provide funds and technology to enable Bangladesh to undertake this adaptive task.

The Indo-Bangla Joint Rivers Commission deals with sharing and management of trans-boundary river waters, which is a very politically sensitive issue as it involves negotiations with India. Bangladesh shares 54 common rivers with India. Large scale withdrawal of water by India, the upper riparian, has been causing many of the trans-boundary rivers to carry very low flows or dry

up with attendant land degradation, drought, ecological degradation, loss of habitat and agricultural decline in lower riparian Bangladesh.

2.1.2 Challenges and future directions

The geographic location and geo-morphological conditions of Bangladesh have made the country one of the most vulnerable ones to climate change, particularly to sea level rise. Bangladesh is situated at the interface of two different environments, with the Bay of Bengal to the south and the Himalayas to the north. This peculiar geography of Bangladesh causes not only life-suffering monsoons but also catastrophic ravages of natural disasters, to which now added climate change. As a result, disasters - floods, torrential rains, erosion, and severe cyclonic storms and tidal surges – have claimed lives, caused severe damages to infrastructure and other economic assets with adverse effects on livelihoods. Climate change is expected to exacerbate the intensity and frequency of these natural hazards. Current global climate models predict upward trends in mean temperatures, warmer winters, precipitation during monsoon months and drier months, and frequency and intensity of tropical cyclones. For a country like Bangladesh, effects of climate change could reverse any progress in tackling extreme poverty, plunging the most vulnerable in the communities –women, children and the disabled into deeper poverty.

Climate change is already affecting water cycle in the country in terms of both spatial and seasonal adverse implications. Too much of water in rainy season and too little in the dry season as well as changing and shifting patterns of rainfall are hampering the agricultural production, navigability and sustainability of the ecology and biodiversity. Recurrent floods and tidal surges affect the GDP growth negatively, and massive investments are required to rehabilitate the damages caused to water infrastructures across the country.

In the coastal zone, rising sea level and salinity intrusion, already up to about 100 km inland, is a serious threat to the lives and livelihood of the people of the affected areas. While agriculture is severely affected, increasing scarcity of drinking water is also a major problem. Survival of the Sundarbans, the world's largest mangrove forest and its rare and unique biodiversity including the Royal Bengal Tiger, is under threat from salinity intrusion. A Coastal Zone Policy (2005) and a Integrated Coastal Zone Management Strategy (2006) have been adopted. The challenge remains in their proper implementation.

By the end of the century, sea level rise is projected to be between 0.5-1.5 metres. Available estimates show that if the sea level rises by 1.0 meter, about 17% of land in the coastal zone of Bangladesh will be permanently inundated displacing 30 million people or more. Such a scenario may be a reality by 2050. The rehabilitation of these large numbers of people will be a huge problem.

Although rivers are the lifeline of people of Bangladesh, many of them are practically being choked off due to rampant abuse by people, encroachers and upcoming industries. Thousands of rich and powerful people are encroaching on not only the river banks but also on rivers. The government has so far identified about 8,000 grabbers who have taken over 1000 acres of areas in the river banks, which is only the tip of the iceberg. Thousands of brick kilns, sand traders and other informal industries and unauthorized developers doing land-filling are responsible for river encroachment and pollution.

During the last few decades the dry season flows of some trans-boundary rivers declined sharply due to obstruction in the upper stream region and climate change. Construction of Farakka Barrage on the Ganges and Teesta Barrage in Gazaldoba in India may be cited as examples. The

acute shortage of dry season flows has caused adverse impacts on all forms of development activities as well as serious degradation effect on environment and bio-diversity risking extinction of many fauna and flora populations and Sundarbans Mangrove forests. Out of the 54 common rivers with India, coming down to Bangladesh, currently there is a water sharing treaty with India in respect of only the Ganges. A draft treaty for the sharing of the Teesta river was prepared in 2011 but it is yet to be signed. For several other rivers—Muhuri, Khoai, Dharala, Dudhkumar, Gomoti, Feni—negotiations still remain at a low key.

Rivers and wetlands are protected by laws in Bangladesh, but their enforcement is a problem in the absence of adequate capacities of the enforcement agencies. Therefore, Bangladesh needs capacity building and institutional strengthening for the enforcement of laws and rules in order to protect rivers and wetlands in future. The river banks in many cases are encroached upon by land and water-body grabbers, which the government has been trying to reclaim. But it remains a challenge.

It is essential to strictly enforce pollution control over rivers and wetlands. The appropriate laws are there, but their enforcement needs to be ensured so that the industries discharging wastes and effluents, install as required by law, effluent treatment plants (ETPs) properly. Number of sewerage treatment plants has to be increased to meet the demand of rapid urbanization and also to ensure that untreated excreta does not flow into the rivers. More is needed to be done to stop dumping of solid wastes into rivers through legal, legislative and awareness raising measures.

The government has a plan to implement a total of 33 projects in the water sector in the 20 years by 2030. Many of those are adaptation related investments. The climate change Investment and Financial Flows (I&FF) study of the water sector has determined that the incremental cost for adaptation will be a total of US $ 13.68 billion over the next two decades for the 33 programmes under the sector's plan of action which is worth US $ 38.5 billion in total.

To ensure protection from floods, which affect not only food security but also peoples' health and livelihoods, capital dredging of the major rivers is a must. But the country is unable to undertake extensive river dredging due to shortage of funds. The development partners have not been forthcoming in this regard, though it is a top priority for the country. The government has launched a two-year long study on "Capital Dredging and Sustainable River Management in Bangladesh", which will define the projects to be undertaken in future (ranging from 5-15 years) for river dredging in order to bring back navigability of the important rivers, to control floods and to ensure availability of water for irrigation.

Permanent water-logging has been created in many places due to siltation of rivers, which needs sustainable solution. Silted lakes, rivers and canals should be dredged. These water bodies should also be freed from the conventional leasing agreements so that they can be utilized by the people as common natural resources.

In view of scarcity of fresh water, large lakes like Vutiar Beel in Khulna and Vobodaho Beel in Jessore and other beels around the country should be kept free from degradation and pollution. With proper and effective management these could serve as very useful surface water sources.

In view of the current and future water scarcity in the region and for the sake of maintaining regional stability, the GBM regional countries should take up, on a cooperative basis, basin-wide water management of transboundary rivers for mutual benefit. This will help control ecological disasters and destruction of ecosystems of the rivers, haors and other bodies; enhance availability of irrigation water, improve flood management; and enable the countries to undertake

hydropower generation, expand inland navigation, and facilitate undertaking of other water-based cooperative activities for mutual benefit.

Coastal protection has to be reinforced through rehabilitation and raising of old polders where feasible and building of new polders where necessary with the height of the polders raised by several metres to meet the threat from sea level rise. Coastal greenbelts need to be strengthened through afforestation and reforestation to act as a shield to tidal surges. Construction, repair and maintenance of cyclone shelters and flood embankments are priority needs along with cyclone and flood forecasting and early warning systems. More research and analyses are required for understanding the cyclonic patterns and to improve predictive capabilities.

All these issues are being addressed at one level or another. But, they remain a challenge to be more effectively put into action without any delay.

Dhaka City embankment protection has to be completed to save Dhaka from any repetition of the 1987-88 and 1998 mega floods which immobilized the capital including its airports, thereby cutting off the country from the rest of the world for a number of days. The work is continuing, though slowly.

2.2 Water Supply and Sanitation

2.2.1 Background and progress and achievements in the last 20 years

Urban congestion as a result of exodus from rural areas to major urban centres, in particular in Dhaka, has overstressed the volume of old water supply and affected the sanitation systems in the cities. Municipal waste disposal is a constant challenge as the population keeps increasing and immediate measures should b taken to dispose waste.

During the last decade, a section of the private sector has taken up programmes for door to door waste collection and disposal from centralized points. Advocacy and awareness raising on the value of waste as a recyclable resource and successful piloting by private sector bodies/NGOs have succeeded to motivate people to a large scale in the activities of non-formal waste picking and recycling industry in the country. The activities in this informal sector follow the 3R (reduce, recycle and reuse) principles of solid waste management. However, it is not enough to address the problem in its entirety.

The Government struggles to provide safe drinking water. Supplies from deep tubewells are considered safe while water treated from the river is not. People in urban areas take boiled water to avoid diarrhoeal diseases thus adding to energy consumption. In the rural areas, people take water from tubewells.

Unsafe water, inadequate sanitation and insufficient hygiene are the key factors contributing to poor health in a majority of the population in Bangladesh. Massive campaigns at grassroots level by the government and NGOs have yielded some positive results though a lot needs to be done. The country has more or less been able to switch to safe drinking water by drawing water from underground sources. Percentage of population using safe drinking water in 2009 was 86% and users of improved sanitation stood at 89% out of a target of 100% under the MDGs. The country is on track to meet the two targets for water and sanitation by 2015.

Providing safe drinking water remains a big challenge with arsenic contamination of ground water and salinity intrusion in coastal areas due to sea level rise as a result of climate change. The latter may get worse in future to fund solutions only in desalination plants.

Arsenic contamination of ground water in the sub-soil strata, between 100-300 feet below ground level, has affected people in 63 out of 64 districts since the mid-90s. Watsan programme across the country made people shift from drinking polluted surface water to ground water. While Watsan was successful in reducing deaths due to diarrhoea, it exposed a fairly large segment of population to unpredictable arsenic poisoning through drinking water.

The search for arsenic-free drinking water down to 400 feet below the surface may lead to fall in ground water level. The extraction of water for irrigation. This compounds the environmental threats since there has been land subsidence in many areas can also cause harm due to heavy extraction of ground water.

Diseases incur a cost to the society in terms of mortality, morbidity and social burden, and to the economy in terms of health costs and fall in production. Studies conducted in Nepal have confirmed that the incidences of malaria have risen due to rise in temperatures caused by climate change. Studies in Bangladesh by Bangladesh Centre for Advanced Studies (BCAS) and National Institute of Preventive & Social Medicine (NIPSOM) in 2011 confirm that incidences of diarrhoea multiplied as the variation of temperature increased due to climate change. Increased flooding and drainage congestion also gives rise to diarrhoeal diseases, dengue and typhoid while kala zar finds prevalence in water logged areas.

With decrease in food production due to climate change, the nutrition factor in countries like Bangladesh is at high risk according to WHO.

2.2.2 Challenges and future directions

Clogging of the city drainage system with wastes leads to water-logging coupled by scanty rainfall. It is exacerbated during the monsoon rains causing floods in the city. Limited storm drains have been put in place by the municipality authorities in some areas, but it does not cover the whole city. Age old sewerage lines in the cities need to be overhauled to cope with the pressure of the huge urban population. Collection of municipal waste does not take place regularly in many areas giving rise to urban pollution. Haphazard disposal of medical wastes pose serious health risks for urban population with hospitals and medical clinics being located in residential areas.

According to the British medical journal ‘The Lancet’, upto 77 million Bangladeshis are suffering from arsenic poisoning. This can cause cancer unless treated at the initial stage and these people should be provided with arsenic free drinking water. Mineral water bottles are now available for sale across the country, but not affordable for the poor. Quality of bottled water has often been questioned. Piped water supply in urban areas is unfit for drinking and has to be boiled, making it fuel consuming.

The water supply in Dhaka, the largest city, is severely stressed due to high population growth and expansion of infrastructures. In many parts of the city, the water supplied is unfit for human use. The government is increasing the water treatment capacity in urban areas and has started building a few water treatment plants. It however, cannot provide water to rural households which

are dispersed and they do not have access to piped water systems. Therefore, the incidences of diarrhoeal diseases, typhoid, cholera and hepatitis are more prevalent in rural areas.

WHO has warned that climate change is likely to increase incidences of diseases such as malaria, diarrhoea, dengue, kalajar, typhiod (common to Bangladesh) and heat strokes and also increase malnutrition around the world.

Ground water levels are under stress due to massive extraction of water for household purposes and irrigation across the country. The government plan includes investment for additional water supply, especially in the peak of summer when temperatures rise higher due to climate change causing scarcity of water particularly in drought and salinity-prone areas. It will also monitor water quality for ensuring health security as per future plan.

Bangladesh may not be able to meet the MDG Goal 7, Target 3: "Halve, by 2015, the proportion of population without sustainable access to safe drinking water and basic sanitation". Currently about 62% households lack access to sanitation.

Future plans of the government include development and implementation of surveillance systems for risks existing and new disease and to ensure that health systems are geared up to meet future demands. It will also implement drinking water and sanitation programmes in areas at risk from climate change such as coastal areas, flood and drought-prone areas. It plans to conduct adaptive research on vector borne diseases and invest in preventive and curative measures.

The government has started a Revitalization of Community Health Care Initiatives under which 11,000 community clinics built a decade ago will be revitalized to provide healthcare services to the poor. The government is also considering setting up a Healthcare Assistance Trust Fund in the near future.

Rainwater harvesting has been initiated through small scale efforts by NGOs in the country. There is a need to put special emphasis on this through a larger national programme to maximize it at the household level in both rural and urban areas in order to meet the ever-increasing future needs for fresh water in next 20-50 years. The technology could be provided under the climate Adaptation Fund.

A big challenge is the intrusion of salinity in new areas of habitation due to sea level rise which is already affecting about 30 million people in the coastal areas and the number will increase as the sea keeps on rising. In the long run, Bangladesh will require desalinization plants to meet the demands of huge population. These plants are very costly and therefore Bangladesh expects support from the international community to meet the costs as part of counter measures in the context of adverse effects of climate change.

3. Energy Security

3.1 Background and progress and achievements in the last 20 years

Energy is a key to development and a fundamental issue in relation to poverty reduction and achievement of MDGs in Bangladesh. It is a low energy consuming country with per capita annual consumption of 220 KW hours. The country is struggling to meet the current demand of

5500 MW. The demand for energy outstrips the availability. Energy demand will continue to rise in response to expanding economic activity and exploding population. The increasingly high population density in the urban areas and rapid industrialization is also driving up the demand for energy. Indeed, energy security is essential for Bangladesh's sustainable development.

A comprehensive energy policy was adopted in mid-1990s, but an updated version has been in the process for a number of years. Gas is the major primary energy source of Bangladesh. But, the reserve is limited. Gas exploration was, however, neglected in the past. In recent years, gas exploration on land has been intensified and some gas and oil reserves (sufficient for the country's need for two years) have been found, and such exploration continues. Exploration of off-shore gas and oil is being planned. And now that maritime dispute with Myanmar has been resolved on the western side and the dispute with India is likely to be resolved in 2014. It seems that more opportunities are at disposal. Currently, however, the country is faced with shortage of gas, it is necessary to restrains gas supplies for electricity generation and other sectors depending on gas.

In the past 2/3 years, over 3,000MW new electricity generation capacity has been installed, particularly through rental and quick rental plants. But due to high cost of oil, this new capacity cannot be properly utilized. Also, some old plants tend to break down often. The government has prepared a plan to ensure increased electricity supply to match the need with 2/3 years. This remains a daunting and challenging task and coordinated efforts at conservation of energy may produce very helpful results. In the meantime, through various steps, system loss has been reduced substantially to 15%.

Currently coal is being mined in the country by Petrobangla only in the Boropukuria coal mine. Given that a coal policy is yet to be adopted, coal extraction cannot be undertaken in other sites mines. In the absence of sufficient gas supply, use of coal for electricity is a must. Pending coal extraction from domestic mines, the government has planned to set up imported coal-based electricity generation plants. It is, however, the intention of the government to finalize the national coal policy soon.

The electricity transmission system through 230 KV lines has recently been doubled from that of in 2005, while 132 KV lines have been increased by 20%. The total urban distribution grid of 266,460 km supplied electricity of 11.7 million urban consumers up to 2010. With the setting up of 70 Palli Biddyut Samities (PBS) or rural power societies by the Rural Electrification Board (REB) over the years, approximately one-third of the population living in rural areas have been brought under electrification so far. The PBSs are owned by the consumers in groups of 5-6 upzilas, who buy power from the REB. REB buys power from PDB and acts as the regulator for the PBSs. REB is also setting up a cooperative power plant of 210MW and has plans for more in future. The REB maintains its own transmission system through the PBSs. By 2010, about 62% of total villages (86,038 according to the census of 1991) have been connected to REB grid.

Piloting of renewable energies (solar, wind, biogas) started in the country about a decade and half ago through Local Government Engineering Department (LGED). From early 2000s, Grameen Shakti (a sister concern of Grameen Bank) started to spread of solar and biogas energies in rural and off-grid areas of the country. The country currently produces 75MW of electricity from renewable energies.

The government established the Infrastructure Development Company Limited (IDCOL) in 2003, which has now become the largest provider of Solar Home Systems (SHS) and biogas stoves in the country. IDCOL has so far installed a total of 1.4 million SHSs which save 100,000 tonnes of

fuel a year and provide livelihood to 70,000 people. The SHS has generated a US $ 200 million market in Bangladesh through an innovative financing mechanism by making it easier for the poor to pay back the credit in instalments over 3 years with interest. About 500 biogas plants are being set up by IDCOL every month.

In 2011, the government made it mandatory for developers to install solar power to meet 3% of the total electricity requirement of any new building before getting electricity connection. This will not only reduce the load on conventional power but also force developers to plan for green buildings.

Although the country saw some progress in the area of solar and biogas energies, hardly any progress has been made in respect of wind energy. The few wind turbines that were set up as pilots have not been sustainable. Absence of wind mapping in the country remains a constraint.

3.2 Challenges and future directions

An additional 3,000 km of electricity transmission system is projected by 2015 under the Outline Perspective Plan of the energy sector. Another 60,000 km will be added to the urban grid system by 2015. REB plans to increase distribution lines in rural areas by 26,900 km annually until 2015 and has projected adding further 29,900 km annually from 2015 to 2023.

About 82% of the country's total electricity generation is gas-based. With not much exploration for gas executed in the past and the current gas reserves diminishing significantly, this dependency on a single fuel to produce electricity is threatening the energy security of the country. Electricity plants have to vie for gas with the fertilizer factories. Reducing supply of gas to these factories can hamper food production and hence adversely affect food security. The government has taken up plans for more gas exploration, both on-shore and off-shore. Under the Gas Sector Master Plan, expansion of gas pipe lines is projected at 808 km for the period 2010-2023.

The Power Development Board (PDB) has no choice in summer, when the demand for electricity peaks, but to reduce the supply to households to strike a balance with the supply to industries to divert some supplies to agriculture from urban areas as a measure to attain food security. There is acute shortage of power in the hot season due to higher consumption in the urban areas for the use of air-conditioners.

Irrigation usually consumes around 1,600 MW of power per day. The country currently faces a power shortage of 1000 MW per day. Therefore, there takes place load-shedding across the urban areas in summer. Moreover, the diesel-based irrigation pumps require a huge amount of imported diesel which is subsidized by the government for the agriculture sector.

The energy requirement in the transport sector will reach 85000 TJ (Terajoules) by 2030, it is projected. With most of the liquid fuel being imported, the sector has been hit badly by increase of oil prices in the international market. Massive amount of subsidies provided by the government for oil imports implies pressures on the budgetary resources.

The subsidy for the entire power generation sector has become unsustainable for the macro-economics of the country and IMF continues to put pressure on the government to cut subsidies on oil import. The government has started phase-wise withdrawal of subsidies by increasing the price of electricity. This creates problem for the common people since it immediately impacts on the cost of living as the transport fares and consequently prices of essentials and other things rise

in the market. Such adverse impacts have the potential to ignite social discontent and, therefore, the government has to treat carefully on this issue.

Bangladesh has joined a regional programme with 5 other countries to develop energy standards and labelling (ES&L). Under this programme, the capacity of the Bangladesh Institute of Standards & Testing (BSTI) will be enhanced for assisting the government, manufacturers of 5 electrical equipment (CFL, AC, fan, refrigerator and electric motor), distributors, retailers and consumers to ensure effective standardization and labelling of these products, remove barriers to ES&L policies, and reduce emission of green house gases.

The government is trying to make the demand side management (DSM) efficient through energy efficiency and conservation measures. In doing so, it is facing the challenges of changing consumption patterns of the consumers, which they find very difficult to adjust to. DSM also involves making efficient appliances and equipment, which can save power. It is estimated that nearly 400MW power can be saved by changing fluorescent bulbs to CFLs and another 400MW by making electric fans efficient. Also, nearly 30% load reduction is possible by increasing energy efficiency of fridge and air-conditioners.

"*Electricity for all by 2020*" is the Government's pronounced vision. As noted earlier, the rental and quick rental power plants have been installed to meet the immediate demand for electricity. These will be phased out as new generation larger power plants are installed in the next 5-10 years. The government is trying to diversify from its single source gas-based power generation to utilize its coal deposits and also to explore other sources of energy like the nuclear in the future.

Energy security is a fundamental need for development of Bangladesh for eliminating poverty, ensuring the quality of life of its people and enhancing economic growth.

The country has a coal reserve of 3.2 billion tonnes which can be utilized to offset the high price of oil in the international market. To do this the government needs to finalize and approve the draft National Coal Policy. In the absence of a policy for coal extraction in its 5 new coal mines is not possible in this moment. Adoption of the coal policy will help expand coal mining to Phulbari field by 2014 and Khalashpur by 2017 in order to replace imports of coal by domestic production. These two fields are expected to provide 33 Mt of coal annually.

In addition to coal, renewable energies and other sources are also being emphasized. The government is investing substantially in renewable energy, particularly solar power and biogas for rural households and enterprises. The current electricity generation from SHSs in the country amount to 65 MW. The target is to install 2.5 million SHSs by 2014 through IDCOL.

With the view to promoting sustainable energy in the country, the government has also taken steps to establish a Sustainable & Renewable Energy Development Authority (SREDA) as part of its policy and institutional capacity building efforts. The SREDA will assist the government in policy framing and will promote energy efficiency, energy conservation and renewable energy onto the forefront of Bangladesh's energy agenda.

Bangladesh plans to generate 5% of its electricity from renewable energy sources by 2015 and 10% by 2020. SREDA is expected to assist the government in promoting renewable energy. The government needs to focus on off-grid areas (60% of rural areas) for power generation through renewable to address poverty elimination and achievement of all the MDGs.

Falling prices of Photo-voltaic (PV) modules may usher in PV based microgrids for rural off-grid areas. It may also replace SHSs in future and can provide power for irrigation. Currently irrigation has become too expensive for the farmers due to rising cost of diesel, which has to be subsidized by the government. Experts believe Bangladesh can save US$ 750 million in the consumption of diesel in the agriculture sector alone by switching to renewable energy-based irrigation.

The government has made an agreement for wind mapping in 5 coastal areas over the next one year with support from an Indian company to eventually set up a wind turbine based 15 MW power plant. The success of the pilot project will determine future expansion of wind energy in the country.

Traditional brick kiln Source: The Daily Star

Energy efficient "green" brick kiln Source: UNDP

Regional power sharing will be a key factor in solving Bangladesh's acute power crisis. To meet the acute shortage of power, Bangladesh has signed an agreement with India to purchase 250 MW from states-owned corporation one of their and is in the process of purchasing another 250MW from private Indian power companies. India has also agreed in principle to Bangladesh's participation in the projects for supply of power to northern part of the country from the north-eastern states of India. Bangladesh is also exploring import of power from Nepal and Bhutan and setting up of a tri or quadrilateral sub-regional cooperation structure for the power sector with win-win incentives for all the countries.

A recent study made under the MoEF on Investment & Financial Flows (IFF) in the energy sector for addressing climate change shows that Bangladesh will require an investment of US $ 26.6 billion, in the coming years up to 2030, to cut carbon emissions in such sector as coal production, generation of electricity from coal and gas, installation and upgrading of transmission and distribution systems, transport, brick kilns and industries that use boilers and motors.

The IFF study predicts that the demand for domestic coal will rise as the government aims to generate electricity from coal since gas supplies are not adequate to meet electricity demand from gas-based electricity and increased use of coal by the brick kilns. However, in order to reduce emissions from coal-based fixed chimney brick kiln, the study recommends use of Hybrid Hoffman Kiln (HKK) which cuts emissions down by 50%. With increase in the use of coal, the carbon emissions may increase by up to 32% by 2030 from the current level of 17 %. On the

other hand, emissions will drop from current level of 62% to 53% by 2030 in case of natural gas as its use is likely to expand.

Natural gas has the lowest carbon dioxide intensity of any fossil fuels as it is combusted fully. Conversion of simple gas cycle turbine plants to combined cycle in electricity production will also reduce carbon emissions. Therefore, the current miniscule emissions from the energy sector of Bangladesh will remain about the same in future years as well.

The World Economic Forum (WEF) in its last meeting in Davos emphasized that the world must adopt energy production facilities that are based on renewable resources. The country can fast track the development of its energy sector while ensuring a low carbon path provided adequate resources and appropriate technologies are made available to it from international climate funding sources. The country has taken many steps in the right direction for ensuring sustainable energy security in the country. But as the new and improved technologies are very expensive, the government alone cannot ensure sufficient energy supplies to the people, unless international support is forthcoming under climate mitigation initiatives.

4 Climate Change and Climate Resilient Development

4.1 Background and progress and achievements in the last 20 years

Bangladesh's contribution to global carbon emissions is negligible at per capita/annum emission of 0.3 tonnes compared to the global average of 1.6-2.0 tonnes for the developing countries, and about 20 tonnes in USA. The historic responsibility for global warming through carbon emissions and the resulting change in climate lies with the industrialized nations. Herself not a contributor to global warming, but Bangladesh is one of the most vulnerable countries (MVC) in the world to climate change. Is, it is a victim of climate change caused by the developed nations.

According to the MoEF, the country currently loses 1.5% of its GDP due to increased frequency and intensity of natural disasters as a result of climate change.

The Global Climate Risk Index (GCRI) 2010, covering the period 1990 – 2008, assesses Bangladesh as the most vulnerable country to extreme climate events and it further estimates that, on an average, 8,241 people died each year in Bangladesh while the cost of damage was US $ 1,189 million per year and loss of GDP was 1.81% during the period.

A British firm called Maplecroft, specializing in risk analysis, finds in its Climate Change Vulnerability Index (CCVI) Report 2011 that Bangladesh is among the 30 most vulnerable countries to climate change, out of 193 nations.

The country faces more frequent and devastating floods, cyclones, unpredictable and intensive rainfall, drought during rainy season, change in seasons, and unusual behaviour of plant harvest. Bangladesh even without the impact of climate change is a natural disaster-prone country, but the major events took place with long interregnum. But, such events, of one type or another, are occurring almost routinely as climate change is intensifying.

Bangladesh has been playing a proactive role in addressing both impacts and risks of major natural disasters. For example, elaborate coastal embankments were built since the 1960s as protection against storm surges and salinity ingress. Many cyclone shelters have been built since

the 1990s and thousands of volunteers mobilized to warn people of an impending cyclone and assist them to evacuate.

But, the intensifying climate change induces more frequent and devastating natural disasters which are beyond the capacity of people. And the government is not able to respond in any meaningful manner without substantial international support.

However, Bangladesh remains highly proactive in facing the adversities of climate change. It is one of the first countries to develop a Nationally Appropriate Plan of Action (NAPA) in 2005 for addressing climate change through a consultative process among GO, NGOs, civil society, academia, professional bodies, private sector, research organizations, think tanks and development partners. The NAPA was updated in 2009. And, as the first country in the world, Bangladesh has adopted a Bangladesh Climate Change Strategy and Action Plan (BCCSAP) in July 2009. It is built around six broad thematic areas or pillars: (i) food security, social protection and health, (ii) comprehensive disaster management, (iii) infrastructures, (iv) research and knowledge management, (v) mitigation and low carbon development, and (vi) capacity building and institutional strengthening. The BCCSAP includes 44 listed programmes of action.

The objective of BCCSAP is to increase the country's resilience to climate change, reduce or eliminate the risks that climate change pose to national development, and expedite development of the country following a low-carbon path. It postulates that climate resilient development would be pursued through an integrated approach to socio-economic development and management of climate change issues.

Bangladesh in its submission to the Bali Action Plan made it explicit that development and poverty reduction are the priorities for the country and it opposes any action that may jeopardise the attainment of secure access to food, water, energy and livelihoods.

Although Bangladesh has not received expected support from the international community, the country has thus been taking actions to the extent possible with its own limited resources to address the problems of climate change. The country has demonstrated exemplary commitment to managing climate change impacts and is also committed to following a low carbon development path provided its economic growth and poverty reduction goals and prospects are not compromised and adequate financial and technological support is available from the international community. In the international arena, Bangladesh actively participates in global climate change negotiations and is a leading voice also on behalf of LDCs and other climate vulnerable countries.

The government has already invested US $ 10 billion over the last 3 decades to make the country's climate resilient and less vulnerable to disasters. Recently the government has created a US $ 300 million Bangladesh Climate Change Trust Fund (BCCTF) with its own resources and is going ahead with adaptation activities by GOs and NGOs. Another Fund, namely Bangladesh Climate Change Resilience Fund (BCCRF) has been established by the government with contributions from development partners. So far US$125 million has been received in BCCRF, and another US$113 million has been pledged. Managed by a committee headed by the Minister of Environment and Forest, Government of the People's Republic of Bangladesh, the fiduciary responsibility is performed by the World Bank. Projects have started to be implemented with allocations from this Fund.

However, both funds are too little to address the massive cost of adaptation infrastructures needed for protection against sea level rise, floods and storm surges.

4.2 Challenges and future directions

For an LDC like Bangladesh with limited natural resources and a large population, the balancing act to be performed in the face of climate change is very difficult.

Available estimates suggest that a 1.0 metre sea-level rise will inundate 15-20% of Bangladesh in the coastal region. The existing coastal embankments can not stop the sea water intrusion into rivers and increased salinity further inland, rendering the affected land unfit for agriculture or for any other economic use. Also, livelihoods, water security, health security and even human security will be severely threatened. The impacts may cause the displacement of up to 30 million people by the mid-20th century. The rehabilitation of such a large number of people will be a gigantic task. Given the extreme scarcity of land and limited adaptive capacity, social tensions may arise in the country. The challenge is: how best to minimize the human displacement and find ways of rehabilitating those displaced. Obviously, international support will be needed in terms of acceptance of out migration of climate change induced displaced people from Bangladesh and transfer of resources and technologies to enable Bangladesh to undertake appropriate adaptive and rehabilitative activities.

Even the Dhaka city, parts of which are only few metres from the mean sea level, will face the scourge of sea level rise. During the 1987-88 devastating floods, the entire city of Dhaka was under water. Since then, the government has constructed embankments and concrete reinforced walls and pumping stations in various points to protect Dhaka. These would need to be strengthened as part of adaptation measures against flooding of the city.

An ADB Report on Climate Change and Migration in Asia and the Pacific mentions that no international cooperation mechanism has been set up to manage the likely migration flows consequent upon displacement due to climate change and suggests an integrated global approach to the problem. The report describes how dislocation of people is being caused by flooding and storm surges, suggesting that coastal areas and the mega cities of the region face serious risks. The Report emphasizes that such climate induced migration need to be properly managed, creating new opportunities for these people in less vulnerable environments. The Cancun Agreement also recognizes that climate change induced displaced people should be relocated within the particular country, regionally and internationally. This convergence should be built upon for an agreement to be reached. Bangladesh has no land for large scale internal relocation and will strongly argue for relocation of its displaced people in land rich developed countries, which are responsible for the predicament that Bangladesh and many other countries face.

Women are found to be more vulnerable to the impacts of climate change than men, particularly because they are more involved with natural resource management. Therefore, capacity building of women for climate resilience has to have priority in any community-based adaptation activity.

Limited experimentation is ongoing in Bangladesh to help people avert or minimize, through insurance programmes (life, health, livestock, crop), climate change induced risks relating to losses and damages. This is indeed a very difficult proposition, given that the risks are likely to be both extensive and intensive and insurance providers for the millions and millions of very climate vulnerable people in Bangladesh are hard to come by. The government may lead the way in this context, provided funding from external sources are available to top up whatever meagre funds it can mobilize internally.

Bangladesh has pioneered cyclone response mechanisms in terms of cyclone shelters and volunteers to assist people to evacuate to the shelters when a cyclone is impending and help them with accessing

immediate relief services. Also, community-based disaster risk aversion and impact management approaches and activities have been developed. But, being at the forefront of climate change impact, Bangladesh faces a massive burden of adaptation, given that its adaptive capacity is very limited. The challenge is enormous and finance and technology transfer and further capacity building are essential for it to undertake adaptive activities effectively.

Climate resilient development would require 'climate proofing" of the development initiatives by building capacities from the grassroots to the national levels to deal with adverse effects of climate change through necessary and innovative adaptive measures. At the grassroots level, these may include low cost indigenous responses to climate-proof the surroundings, environment and natural resources at that level. At the national level, it would involve political commitment and building national capacity for adaptation to climate change in all relevant sectors of the country: agriculture, fishery, forestry, livestock, water resources, water supply and sanitation, health, industry, infrastructure, communication, housing and settlement, education, social welfare, disaster management, etc. The cost is huge and cannot be borne by the country alone.

As part of low carbon development, both the private sector and the government are investing substantially providing solar home systems, biogas stoves and are now undertaking solar mini-grids and wind energy as pilot projects. However, financing of these expensive technologies still remain a major challenge.

For both adaptation and mitigation, the BCCSAP mandates a technology needs assessment as an integral part of investment activities. Since many of the technologies are not only expensive, but are, in many cases, also protected by Intellectual Property Rights (IPR) of industrialized countries, the acquisition of technologies by countries like Bangladesh will need to be supported through global and bilateral financing mechanisms, ensuring adequacy, additionally (to normal ODA) and direct access for the recipient countries including Bangladesh.

5. Disaster Management and Climate Risk Reduction

5.1 Background and progress and achievements in the last 20 years

In the pre-Liberation period of the 1960s and 1970s, severe cyclonic storms devastated the country as, except for some coastal embankments mostly built in the 1960s, adequate structural and non-structural measures were not in place to protect the people, infrastructure and the economy from the effects of cyclones. As a consequence of major cyclones, enormous losses and hundreds of thousands of deaths occurred. In the 1980s, the country started building cyclone shelters for the vulnerable coastal people and the death toll began to decline.

Beginning in 1998, Bangladesh developed and subsequently launched a national Comprehensive Disaster Management Programme (CDMP) for disaster planning, coordination, preparedness and response. The programme has brought in a paradigm shift in Bangladesh's disaster management culture by moving away from the earlier response mechanism of primarily relief and rehabilitation to disaster planning, preparedness, early warning dissemination, emergency response and rehabilitation by building capacities at all levels – national, sub-national and grassroots.

A large number of cyclone shelters were built and a large contingent of volunteers was trained to help the people in harm's way evacuate as a cyclone approaches and also help them find access to immediate relief. As a result, Bangladesh became a world leader in cyclone response preparedness and action. Hence, while 348,000 and 138,000 people died as consequence of the

devastating cyclones of 1970 and 1991 respectively, only 3,800 died as a consequence of the mega cyclones Sidr (2007) and Aila (2009). Bangladesh has an elaborate Standing Order on Disaster (SOD), which outlines committee formations at all levels from central to village and codifies what to do in the event of a natural disaster. People also rise to the occasion by making whatever contribution they can in saving themselves and their property as well as helping others. Over the past decade, integration of disaster risk reduction with disaster risk management has been institutionalized.

The disaster management mechanism involves the local level people, volunteer youths, local elected government, local administration, civil defence, fire service, army, navy, air force, coast guards, metereological and satellite information systems, various government organizations, departments and ministries, and NGOs and civil society. The system is now able to evacuate millions of coastal people within a couple days, thus reducing the death toll to a small number.

Floods are a normal annual hydrological phenomenon in Bangladesh, given that the country is a huge deltaic floodplain. Floods usually inundate 22-30% of the country. They turn into disasters when larger areas are affected. The country has seen six major floods (1987, 1988, 1998, 2004, two in 2007) during the last 25 years.

Mega cyclone Sidr devastated the coast of Bangladesh in 2007 and affected 33 districts. It was followed by another mega cyclone Aila in 2009 which affected 26 districts. Although people were evacuated, their homesteads were totally wiped out and many of them remain destitute till today due to lack of resources to rehabilitate such a large number of people. Sidr and Aila have also destroyed the ecology of vast areas of the coastal zone through salinity intrusion and rendered the affected land unfit for cultivation. There were huge losses of crops, livestocks and fisheries as the cyclones lashed through the areas. The saline intrusion has also severely affected agricultural prospect in the areas, the main livelihood of the affected people. Major damages were sustained by the coastal protection infrastructure and embankments. International support has been lukewarm in relation to the actual needs of the people affected and need for ecological restoration of the areas.

The country has also been experiencing moderate to severe droughts, particularly in its north-western region, in recent years which have affected crop yields to some extent in certain areas.

Some salient institutions and capacity building instruments created under CDMP-I include, among others: Climate Change Cell in the Department of Environment, National Risk Reduction Action Plan, Corporate Plan of Ministry of Food & Disaster Management, Strategic Risk Reduction Plans, Local Disaster Risk Reduction Plans, Standing Order on Disasters, Disaster Impact Risk Assessment, incorporating Risk Screening Tool in planning process and enhancement of community coping mechanisms. The country has launched CDMP-II in 2011, which has integrated climate risk management (CRM) in the disaster risk reduction (DRR) process.

Community led initiatives-Protecting village from wave erosion, Sunamganj. Source: CDMP II

The Cyclone Recovery & Restoration Project of the government launched in 2007 has so far improved 456 cyclone shelters, built 230 new ones and is going to build another 2700 new

multipurpose cyclone shelters in the next 10 years in the coastal belt. The newly built cyclone shelters also double as government/non-government primary schools under the Primary Education Development Project and also as community centres for training and recreation. These shelters have been or are being provided with solar lightning, rain-water harvesting, separate rooms for pregnant women, bathrooms, doors and windows, first aid boxes and 2-4 tubewells, which were absent in previous cyclone shelters. All shelters are 3-storied with one floor for keeping animals when a cyclone strikes and have provisions for vertical extension in their foundation.

Cyclone Shelter, Noakhali, Bangladesh Source: www. deconcrete.org

A project has recently been initiated with funding from BCCRF to contribute to build more cyclone shelters.

5.2 Challenges and future directions

The government has embarked on Phase-II of the Comprehensive Disaster Management Programme (CDMP-II) from 2011. The latest policy instruments developed by the government will go a long way in strengthening the institutional capacity for disaster management in the country in future. The first phase of CDMP concentrated more on building national level capacity while creating local level institutions and institutionalizing the risk reduction approaches. A focus of CDMP-II is on strengthening local Disaster Management Committees at Upazila, Union, and lower levels fully functional. Their capacities will be built for resource management and planning. Resource allocation will be ensured to these local and grassroots level committees for disaster planning, preparedness and implementation of recovery activities. Modern ICT based technologies will be used for disaster management. For example, early warning will be forecast through mobile networks of the country.

Currently there are Disaster Management Committees at the community/ward level in the country. In order to empower the people in managing disasters, Disaster Management Committees could be established in every school and college to better equip the youth of the communities to respond to natural disasters including through dissemination of information and assistance in evacuation.

The CDMP-II will also help farmers gain access to crop varieties resistant to climate change impacts. Thus, CDMP-II would seek to respond to predicted climate change impacts with tangible local level actions that support adaptation in line with the Hyogo Framework of Actions. The risk reduction approaches and models will be disseminated to all key relevant ministries and their line agencies. Thus risks will be reduced further through national capacity building and recovery activities will be linked to comprehensive disaster risk management.

Future challenges would also include building appropriate (e.g. major cyclonic impact resistant) housing in the vulnerable coastal areas, land reclamation, preventing coastal and river erosion and trauma counselling for disaster victims.

Bangladesh cannot go adapting without being overwhelmed by climate change impacts unless the developed countries and high emitting developing countries bring down the global level of carbon emissions to level consistent with a global temperature rise of 2^{o}C or less.

The implications of climate change induced faster Himalayan glacial melt for Bangladesh include possible untimely increased water flows in near future and low flows later, both adversely affecting natural and human systems. The level of impacts would depend on the speed and pattern of the glacier melt.

A catastrophic scenario may arise when global temperature continues to rise steeply and or back to back with the sea level rising sharply on one hand and the Himalayan glaciers are gone. River water flows, ecology and biodiversity, agriculture and other human systems will be on the other squeezed from both sides, rendering large parts of the country uninhabitable. This possible future scenario poses a catastrophic threat. Commensurate adaptive response therefore is called for by Bangladesh for which adequate international support will be needed. The avoidance of such a scenario may be possible through a drastic reduction of greenhouse emissions by the developed countries as well as by other countries according to common but differentiated responsibility and respective capabilities.

Case Study: ***Economics of Adaptation to Climate Change in Bangladesh***

A study on the Economics of Adaptation to Climate Change in Bangladesh was conducted by the World Bank together with UK, Netherlands and Switzerland in 2009-2010. The report mentions that Bangladesh is one of the most vulnerable countries to climate change as two-thirds of the land is less than 5 metres above sea level and it is prone to flooding in monsoon when 80% of the annual precipitation occurs. On an average, every 3 years a severe cyclone makes landfall and accompanying storm surges can be in excess of 10 metres.

The study mentions that investments in the past 50 years have increased the resilience of Bangladesh to climate induced hazards, particularly in the disaster management and agriculture sectors. Despite the resilience, climate related disasters continue to bring large economic losses, which reduce economic growth and slows the progress in poverty reduction.

It is acknowledged that the "scope of study is more limited that the BCCSAP, so the reported costs represent a lower bound on the total adaptation costs in Bangladesh". The study looked at the hazards identified under the BCCSAP such as tropical cyclones/storm surges, inland flooding, direct and economy-wide impacts of climate change on agriculture and food security, and assessed the impacts and costs for transferring existing coping mechanisms (the study did not go into an analysis of various options available) to overcome or adapt to these impacts. It also provides a local perspective on adaptation as seen by the poor and vulnerable people.

The study concludes by putting emphasis on sequencing of adaptation action as a necessity in the face of uncertainties, addressing current climate related risks, research and knowledge building for improving future actions, sound development policies for an adaptation agenda, adjustment of design standards for resilient infrastructures, development of climate resilient cultivars and cropping, and strengthening regional cooperation for management of Ganges-Brahamaputra-Meghna Basin amongst other things.

Source: Economics of Adaptation to Climate Change in Bangladesh, The World Bank

6. Sustainable Cities and Low Carbon Development

6.1 Background and progress and achievements in the last 20 years

Bangladesh has the highest population density in the world at over 1000 persons per sq. km. except for the few city states such as Singapore and Hong Kong. Currently about 75% of the total population of the country lives in rural areas and 25% in urban areas in Bangladesh. The last decade has seen a major rural-to-urban migration. According to UNFPA, it is expected that about 40% of the country's total population will reside in urban areas by 2030.

With people from other districts moving to the major cities such as Dhaka and Chittagong in search of good jobs, better living standards and education for children and large numbers of people being displaced due to economic reasons and now increasingly by natural disasters also moving to Dhaka and other city slums, urban infrastructures (both physical and social) and environment (both natural and social) are under severe stress.

The annual population growth rate in Dhaka in 2011 was 4%. Dhaka currently has a population of 15 million or more. It is already the 8th largest city in the world with sprawling slums and dense suburban areas. By 2020, it may become the 3rd largest city in the world according to some projections.

Chittagong, the second largest city of the country, is also expanding fast. Other cities like Khulna, Rajshahi and Sylhet are also increasing in terms of size and population. In view of that, the government has over the last 20 years declared a number of municipalities in various cities in order to provide municipal services to the people. Each of the municipal cities is run by an elected Mayor.

The Dhaka City Master Plan prepared more than a couple of decades ago had the vision of developing the city and its suburban areas into a Greater Dhaka with well demarcated areas for housing, industries, commercial and other areas. This would provide Dhaka City with a better planned space utilization and growth. Unfortunately the Plan was never followed in letter or spirit, leading to a chaotic growth of the City.

Part of Karail Boasti, Dhaka Source: Icddr,b

The residential areas demarcated earlier by the government have in the last 20 years turned into a mix of residential, commercial and industrial areas with shops and offices and other establishments spread in them. Many schools, private universities and hospitals and health clinics have sprung up in residential buildings. This has created logjams of traffic, human insecurity, lack of sanitation and overall deterioration of healthy and environment friendly residential areas for the people in urban set-ups.

Public parks and open spaces are vanishing fast to encroachers and developers. Therefore, the

children are deprived of places or playgrounds for physical activities or enjoy open air outings. In order to protect the parks and open spaces, the government has recently enacted a law that prohibits filling up of or encroachment on such places.

A large number of urban poor lives in abject poverty in the slums, which are often flood-prone and water-logged areas, in the fringes of the cities. According to a recent survey conducted by the Centre for Urban Studies, 90% of slum dwellers live with three or more persons in one-room shanties. Nearly 60% of the slums in Dhaka have poor or no drainage and is prone to frequent flooding, making the people living there easy prey for water-borne diseases like diarrhoea, typhoid and scabies.

The survey also found that one-third of Dhaka's population live in buildings whose structures are too weak to withstand a major earthquake. Again it is the opinion of many earthquake experts of the country that about 60 - 80% of the buildings in the Dhaka city will fall if there is an earthquake of an intensity of 8 on the Richter scale. This is because most of the buildings constructed in the past did not follow the Building Code and oversight of the constructions was poor. New policies and measures as well as legal steps have improved the situation for current and future buildings.

A key necessity for a healthy and sustainable urban environment is clean air, permissible noise pollution and safe drinking water. Traffic congestions in the capital and smoke from the brick kilns in its periphery are causing severe air pollution in Dhaka. Thousands of unfit and faulty vehicles and older than 20 years fuel-inefficient vehicles, especially those running on diesel are a major source of the air pollution.

According to the MoEF, vehicles in the city move, on average, only at about 14 km/h due to traffic jams. It causes the vehicles to burn more fuel, contributing to increased air pollution. The fuel inefficiency in effect puts a dent in the national budget due to high import cost. Rise of respiratory diseases is on the rise according to health experts.

The Clean Air and Sustainable Environment (CASE) project of the Department of Environment (DoE) has found that the density of particulate matter is 250 micrograms per cubic metre in Dhaka, which is 5 times the acceptable limit of 50 set by the national Ambient Air Quality Standard of Bangladesh. The CASE has also found that reducing the air pollution by just 20% would save at least 1200-3500 lives and up to 80-230 million cases of respiratory diseases can be averted each year, as a result.

Among the urban centres, Dhaka has the highest noise pollution level at more than double the permissible limit. According to WHO, the noise level should not exceed 55 decibels during the day time. But according to the DoE, sounds exceeding tolerable limits in Dhaka are found to be excessively high and exceeding the limits substantially, on an average. The Coalition Against Pollution (an alliance of 12 organizations) in a survey conducted in 2012 in Dhaka found noise levels to be between 120-130 decibels at day time.

The culture of rampant honking of all kinds of transport horn including banned hydraulic horns could not be curbed through legislation or media advocacy. Added to this is the noise of construction of buildings and other infrastructures, including at night against the law. The enforcement of noise curbing laws remains deficient, given inadequately manned traffic management system as well as the enforcement authority. Lack of adequate resources for ensuring compliance and awareness raising is hindering the efforts being made to curb noise pollution. Despite resource limitation, the government is trying to improve compliance.

Dhaka also suffers from acute shortage of water. Many areas in the vast city hardly have adequate piped water supply. Overall, water supply is significantly short of requirement per person and sometimes available water is also contaminated. People in low-lying areas of the city, mostly the poor, have to line up for water supply from government utility trucks. Projects are planned or in the works to address this issue.

Expansion of Dhaka into one of the mega cities of the world by 2030 and more industrialization in and around it will usher in a massive need for electricity. The government has already initiated actions for augmenting the energy supply and developing plans for energy sustainability through energy conservation, energy efficiency and renewable energies following the path of low carbon development as well as other alternative sources of energy like coal and nuclear power.

6.2 Challenges and future directions

A major challenge facing the country now is rapid unplanned urbanization and the need for tackling the urban congestion and physical and social infrastructural stresses that come with it. The main urban centre, the capital city Dhaka, does not have adequate facilities in place to meet the demands of an ever growing population. These include water, sanitation and sewerage, health, education, housing for the poor, and other services. Large investments are required to provide these facilities as well as to adequately develop energy, road, railway and other sectors. The total costs of the required investments are not yet determined.

The country is working to plan for and undertake activities for sustainable cities for the future. Sustainable cities would take into account zoning for residential, commercial, health, education, industrial and various infrastructural purposes. There should be adequate roads and highways within cities and out of cities to connect the cities with one another and with the rest of the country and also to join the Asian regional network and beyond. Different transport types have to be established for meeting the needs of millions of city dwellers.

Plans are underway for expanding the transportation systems to cater to mass movement of people. These include: inter-intra-city trains and trains around suburbs, which would be expanded and services made attractive to people; sky trains and sub-ways in the city which would facilitate movement of a large number of people frequently; and more and more city buses which would remain an alternative to people who are far from the rail stations and find the bus service convenient. Dhaka circular waterbus through the rivers surrounding the capital would to be made effectively operational and attractive to people. The government initiatives in these regards for the next 20 years have been elaborated in section 7 below.

A major need is for municipal waste management - ideally through land-fill gas recovery for generation of electricity and composting of the waste - and for the city sewerage systems to be overhauled and modernized. The cities would need to be free from pollution and, therefore, effective solid waste management is a critical need. Air quality has to be improved and sound pollution brought down to permissible levels. Ensuring safe drinking water and water supply in the cities will be a daunting task, given the current water shortages. The electricity requirements will keep increasing as the economy expands and the population increases to challenge the state's capacity to raise conventional electricity generation capacities in a matching fashion. Therefore, renewable energies are duly emphasized, but these are very costly. Renewable energy of various types can also be developed as part of carbon mitigation, for which international support may be forthcoming.

Available estimates indicate that 50% of the country will be urbanized within the next 20-30 years. With the unstoppable rural to urban migration and attendant stress on the urban infrastructures and environment, urban population pressure, high consumption of energy in future, increased demand for service delivery, Bangladesh has to urgently find ways of putting in place such urban management mechanisms as can meet the demands of the future.

More than half of Bangladesh's population will likely live in the cities by 2050. Not only that people will tend to move to the major cities like Dhaka, Chittagong, Rajshahi and Khulna, but smaller towns will be growing into cities sooner rather than later. The urban centres of Bangladesh need proper zoning for effective development of physical and social infrastructures and proper positioning of services to meet the needs of the influx of people.

Any future urban development also has to take into consideration proper land-use planning. In this context the Land Use Policy of 2002 needs to be revisited. To make the city liveable, the most important factor is to ensure the environmental sustainability along with planned growth of housing and infrastructures. The utilization of land has to be based on zoning; and adherence to it must be ensured through legislation and enforcement. Growth of markets, commercial and residential areas, educational institutions, hospitals and clinics, parks, free spaces, playgrounds, etc should be included in the zoning exercises.

The Dhaka City Master Plan has been overtaken by the unplanned growth of the City in the last 20-30 years. Therefore the government has developed a Detailed Area Plan (DAP) for Dhaka, which provides for restrictions on unplanned growth, protection of the water bodies in and around the city, and mandates clearance of such housing and other development activities by the Rajdhani Unnayan Kotripokkho (RAJUK) and the capital development authority, and requires Environmental Impact Assessment (EIA) by the DoE. It is a major challenge to ensure compliance of the DAP by the large scale developers in the private sector.

The broader perspective in planning for a sustainable city should include a focus on strategies and initiatives that would make it (i) liveable, (ii) be a service provider to large populations in a systematic fashion, (iii) housing provider for the poor/working class, and (iv) a low carbon path follower. For this, the right policies need to be drawn up along with strategies for implementing them in a planned and phased manner. The government is planning some efforts in that direction through the Municipal Services Project which will build infrastructures and support managerial and financial capacity building in 100 municipalities in future. However, it is challenging task to be accomplished.

Creation and preservation of green spaces is essential for reducing carbon emissions. Lakes and water bodies are required to be in place, as they moderate temperatures in the cities. Urban agriculture on the roof tops can go a long way in providing food security while cooling the buildings. Culture of fish in basement tanks in buildings can also augment the food security.

It is important to construct low-cost housing for the poor people who now live in the slums. Such housing could be eco-friendly, models of which are available locally. Only housing will not solve the problem, the poor have to be provided with access to schools, adequate healthcare and job opportunities to bring about their integration as city dwellers. Policies are in place but the task is gigantic. In the const of climate change management in the cities, particularly in relation to the impacts on the slum dwellers, international support would be needed.

The increasingly high population density in the urban areas and rapid industrialization are rapidly driving up the demand for energy. The country is currently producing over 4500 MW of power as

against a demand of 5500 MW. However, the demand is going to increase substantially in the coming years as a result of new growth centres coming up and development of more infrastructures and urban transport. Bangladesh is committed to ensure energy security in the country, following a low carbon path as far as possible. Here again, international financial and technological support would be needed.

The government is seeking to take measures including setting up of water purifying plants in adequate numbers and other measures to improve water supply in Dhaka and other cities. With demand increasing and water table depleting due to continued use of ground water, it is a major challenge to ensure water security for the cities.

7. Transportation and Infrastructure

7.1 Background and progress and achievements in the last 20 years

During the last three decades, US$ 40 billion has been spent by the government in the transport sector since it is considered a priority area for the development of the country and poverty reduction. The road sector received the lion's share (90%) of this investment. As a result, roads and motorized vehicles have seen a very high growth in the country. Since the 1990s, Bangladesh has made significant progress in the transport sector by reducing the commuting time from one end of the country to another two hours in place of days.

About US$ 10 billion has been spent in developing on elaborate network of roads and highways across the country. All the major road connections have been more or less completed and connections to the port in the South established. Work is on-going for establishing linkage with the Asian Highway.

However, increase in population, internal migration and urbanization have led to tremendous increase in the movement of people internally that the transport sector is still hard pressed to cope with.

Passenger growth is reported to have increased from 11.75 billion in 1973 to 131.75 billion in 2007, growing as fast as at an annual average of 7.45%. Similarly, freight transport has grown from 1.44 billion in 1973 to 21.87 billion in 2007. Projections indicate that passenger traffic will reach 220 billion and freight transport 39 billion by 2030.

The private sector was quick to take advantage of the opportunity to expand bus transport facilities in urban areas and also in long distance sectors; but still, there are gaps. Moreover, road travel is often risky, given poor maintenance of the roads. The railway has been neglected and inland navigation has also not been developed. Scope of development of both these sectors is huge and these are also cheaper means of transportation. The import of fuel is subsidized by the government causing a big dent in the revenue budget and it is under pressure from the IMF and the World Bank to withdraw subsidies on fuel, which, if done, would lead to increased transportation costs. It is worth noting has that increases in fares have in the past led to rising social discontent; and higher fares hit the poor people hard.

In the last decade, the Bangabandhu Bridge was constructed on the Jamuna to connect the North of the Country with the South. This bridge has led to vastly increased movement of people and

goods and has caused rural growth centers to come up on both sides of the bridge. The bridge is considered a salient achievement in the area of communication development across the country.

7.2 Challenges and future directions

Infrastructure development, in a planned manner, in keeping with the overall urban development plan, is extremely important for the country in order to ensure sustainable cities in the future; and, in order to implement the projects and programmes effectively, institutional and human capacity enhancement is essential.

Bangladesh has to leap forward in providing the infrastructures required a result of the ongoing rapid growth of urbanization. Currently, the Dhaka City roads are clogged with traffic jams and at certain times it takes 1-2 hours to travel distances of 10-15 kms. Road development for the cities is the responsibility of the respective city corporations. While the main avenues are generally maintained well, the interior roads in the cities tend to be neglected, not infrequently due to resource constraints but also at times due to inefficient use of the available funds.

A Dhaka Circular Waterway project was launched but remains dormant. If fully implemented, it will bring down the transport cost of goods substantially, make movement of people and goods easier around the city and ease the traffic jams.

To reduce road congestions in Dhaka City, the government plans to build infrastructures like elevated light rail, underground rail and rapid bus transit keeping mass movement of people in mind. It will also expand the roads and highways grid and build elevated expressways to increase connectivity and overcome traffic jams.

Plans are already underway to construct sky trains to meet the needs of millions of commuters in Dhaka, the capital. In this regard, a commuter Metro Train service is planned to be built, running from the North to the South of the city. This will encourage many poor families to move to the suburban areas around the capital, where house rent is cheaper, and commute to work in Dhaka.

Although a sizeable portion of GHG emissions comes from the transport sector, it is very difficult to quantify it. Climate Change Investment & Financial Flows (I&FF) study on the energy sector suggests some measures for the future, which have potential mitigation effects. These include providing mass rapid movement facilities, improvement of vehicle efficiency, sound traffic management systems, switching railway from diesel to electricity, shifting passengers from road to railway, improving engine efficiency in water transport, shifting passengers and freight from road to water, and removal of old fuel inefficient vehicles.

Neglect of proper maintenance of inter-city and other roads around the country in the past has rendered road journey arduous and risky. Recently the government has started construction of over-bridges, flyovers, roads and 4-lane highways on an expeditious basis to address the current communication problems.

Inland water transport is one of the most neglected sectors in the country despite the fact that Bangladesh is basically a riverine country with an elaborate network of rivers all over the country. During monsoon, have 22-30% of the country is usually inundated. There are 8 major inland ports, which have suffered from chronic negligence in the past. Major issues affecting the

water transport sector are reduction in river flows, siltation, lack of dredging (both capital and development) and lack of funds. Surprisingly no donor agency has come forward to support dredging of the rivers, although it is a critical element in the water resource management in Bangladesh. Recently, the government has started dredging a few rivers with its own limited funds. The Bangladesh Inland Water Transport Authority (BIWTA) is in charge of the river port operations. It is the opinion of some experts that BIWTA may better function as a regulatory body and hand over the operation of the ports to the private sector for increased efficiency. But the pros and cons need to be properly evaluated for policy guidance in this regard.

The strategic location of the Chittagong Port in the Bay of Bengal makes it a natural regional hub for sea going vessels. But operation of the Port is not yet as efficient as it could be and often faces problems arising from labour union activities. As a result, at times, sea traffic logjams develop, slowing down movement of goods. Stockpiling of goods cause huge economic losses in terms of thefts, damages, and demurrages to be paid. The operationalization of the New Mooring Container Terminal by the private sector remains in abeyance due to opposition from labour unions. This needs to be resolved soon.

The Bangladesh Railway has been running at a loss as little attention has been given to its development in the past. A massive overhauling of the railway sector is needed to make it viable. It is important that this be done since it is more accessible to the poor, given the comparatively lower fares. Aware of this and committed to people-centred development, the present government has created a separate Ministry for Railways.

The first priority is to increase the rail infrastructure and the number of engines and compartments. For more efficient functioning, double gauge lines need to be set up. The container traffic capacity has to be increased to meet the demand. Improvement of intercity train services will require operational, institutional, technical and financial backups. Only increasing the number of train services by one or two will not solve the problem. The government has allocated a substantial sum of money in FY 2012-13 for improving the railway system in the country. The government has also recently signed a deal with India for a credit of US$ 1 billion on very easy terms, mostly for modernizing the railways. The hiccups are expected to be over soon for the project activities to start in earnest.

It is recognized that Bangladesh cannot remain outside the regional development initiatives. Although it was rather late in joining the Asian Highway, but the country is part of it now. It is expected that the Highway will link Bangladesh with neighbours in the North (Nepal, Bhutan) in the Northeast (Myanmar, Thailand, China) and in the West (India) and beyond and place it in the regional hub.

Providing transit to India for reaching its North-eastern states through Bangladesh territory is currently under negotiations, albeit keeping in perspective the attendant political sensitivities on both sides. The issue is under discussion and no concrete agreements have so far been reached. The tariff, fees and other costs have to be determined. Bangladesh has to analyze the gains it will make from the facility provided to India; its implications for the economy, environment and social aspects; issues related to transboundary water-sharing; and other issues such as exchange of enclaves and trade deficit; and also weigh the pros and cons of these and other matters for achieving a win-win outcome before committing itself to giving transit facilities to India.

The government is working to start constructing the much awaited Padma Bridge, which will connect the North and East with the Southwest of the country, the latter being rather depressed in

economic terms. This is a challenging undertaking, not the least because its high cost. But, the government committed to constructing this bridge.

8. Creation of Jobs Including Green Jobs for Poverty Eradication

8.1 Gainful Employment for Sustainable Development

8.1.1 Background and progress and achievements in last 20 years

Increasing economic growth over the last decade (2000-2010) has added nearly 1.2 million new jobs every year. Readymade garments (RMG) sector has been a major employer of women, although they are rather poorly paid at entry level. The quality of jobs has also increased in certain sectors, particularly in the rural sectors, as indicated by the rise in real wages of agricultural and other workers and declining poverty of the self-employed.

But the new job creation in the rural sectors remains short of the number of people joining the labour force annually so that there is high rural unemployment, particularly underemployment. This is one reason of rural-urban migration, in addition to natural disasters-related reasons. The government focuses on the strengthening of the rural economy, which has already started paying dividends in terms of both increased employment and production and increased wage rates in rural areas.

Bangladesh's current demographic reality consists of a high proportion of people in the working age group. Also, more women are now entering the job market than before. Therefore, creation of jobs is of high priority and the government considers it as such.

Agriculture still accounts for just under half the total labour force of the country including both farmers themselves and other farm workers. Many of them take to non-farm jobs in agricultural lean seasons for additional income. Indeed, rural non-farm and urban informal sectors account for a large number of workers who are often self-employed; but the number of wage earners is increasing in these sectors, given that these operations are increasing in size and using improved or new technologies.

On the one hand, youth employment has risen to more than 47% (19 million) between 2001-2010, with significant improvement in the quality of their jobs. On the other hand, the number of jobless rose to 2.6 million in 2010 from 2.1 million in 2007. It indicates that enough employment is not being created within the country.

However, in addition to the above employment figures, Bangladesh has nearly 7.5 million people working abroad. Many unskilled workers are serving abroad under harsh conditions in many countries of the Middle East, South East Asia, Europe, North America and elsewhere. The country's economy gets a boost from over US$ 1 billion that they send home per month.

Several skill development projects are underway for the youths, run by the government. To train the migrant workers, the government has formed a Skill Development Fund with Tk. 140 crore of "seed" money, out of the income of which Tk. 14 crore will be spent annually. In 2011, about 30,779 skilled, semi-skilled or technical hands were sent abroad with jobs ensured. The government has established 38 technical training centres across the country to train aspirant

migrant workers, which offer 45 different training courses, charging nominal fees. Of them, 13 centres train women on housekeeping, languages, culture and personal security related issues.

8.2.2 Challenges and future directions

The number of unemployed, with educated youths making up a significant proportion, in the country is large. Almost 40% of the country's total population belongs to the teen-age group who should be provided with jobs in the near term. They are a priority for the government in relation to its job creation policies and programmes. Scope of increased employment in public sectors is limited. The government is trying to create jobs for them internally as well as in other countries. That is, creation of both local and foreign job opportunities is a high priority for the government. But, this is a challenging task and various hurdles will need to be overcome.

Again, a large segment of the youth with school education is not inclined to take up agricultural jobs. Therefore, jobs for this group has to be created in the non-farm sector such as labour intensive industries including processing of food and other agricultural produces, textiles, garments, etc. Another challenge for the government is to provide appropriate jobs to the large number of people who are handicapped. In this regard, the government has initiated programmes under its social development initiatives to train and employ the handicapped and disadvantaged.

The rural-urban migration will increase in the wake of intensifying climate change and for other reasons, creating stress on the urban environment and infrastructure, obstructing progress towards sustainable cities, unless better job opportunities are created for the rural poor in their own areas. Rapid industrialization in different areas of the country other than cities will not only generate positive impact in relation to job creation, but will also contribute to acceleration of growth. For this to happen, there has to be uninterrupted power supply to rural areas, but at present shortage of power remains a major challenge. The government has taken some initiatives to address the issue, which have been discussed in the Energy Security section.

Bangladesh continues to provide cheap labour to the countries of the Middle East and some countries in the South East Asia, Europe, North America and elsewhere. However, the unskilled labour markets in those countries are contracting, following the global economic crisis. But skilled labour is in demand in most of those countries and elsewhere, which is likely to increase in future. Bangladesh is taking steps to increase its capacity to train workers, keeping in view the skills that are in demand in the markets of those countries. Obviously, more investments are necessary to expand the capacity to an appropriate level for providing diversified quality training courses.

8.2 Green Development, Green Economy and Green Jobs

8.2.1 Background and progress and achievements during last 20 years

Green development underscores a development which ensures ecological and environmental as well as social and economic sustainability. In the case of Bangladesh, greening the economy would entail undertaking actions towards a low-carbon and socio-economically equitable and inclusive development. Job creation within this framework would surely mean creation of green jobs. This is all the more necessary in view of the fact that the country has a young population with under-35 year olds constituting half of the total population. Tapping the energy of these young people would require that they be provided with gainful jobs, which should also contribute to green or sustainable development.

The current concerns related to water, food and energy in the world, which are inter-related, will be more so in the coming decades as natural resources will be scarcer and demand for them higher with increasing population and expanding economic and social activity as well as the impact of climate change and other social and economic factors, geopolitical and national security considerations, and fight for control over natural resources gain momentum in the world.

In order to offset the risks threatening global prosperity and political and economic stability, the World Economic Forum (WEF) has highlighted that the response to the resource constraints should be made through action towards global green growth. The WEF has emphasized that increasing demand for food, water, energy and other products are met by green production processes and businesses. The WEF contends that this will entail scaling up of green industries, creation more green jobs, and driving down the cost of technologies through more competition.

However, scaling up green industries and green businesses is a huge undertaking since the green technologies are either extremely expensive or not readily available. They are often patented and protected by Intellectual Property Rights (IPR) as well. High tariff and other trade barriers can make green technologies unaffordable to poorer countries.

It remains to be seen if such scaling up of green industries for a green economy is going to be adopted by emerging large economies. It certainly cannot be a solution for LDCs like Bangladesh striving to gain middle income status, but with poverty still afflicting about one-third of the population.

> Bangladesh in not opposed to the idea of creating more green jobs through sustainable economic development, without being under compulsion to conform to any international "green standard" or prescribed norms for a global "green economy" that may become detrimental to its over-arching goal of poverty eradication and socio-economic progress.

Any "standardization" of sustainable development in the name of "green economy" will not be equally applicable for advanced economies and struggling economies of LDCs like Bangladesh. It is more so when the country is also one of the most vulnerable ones to climate change and thus it cannot jeopardize its desirable economic growth and poverty reduction prospects by subscribing to any global standard for green economy if that's what it implies. There is also concern as to whether global 'green economy' standards will be used as trade and aid conditionality, adversely impacting on the poorer countries. Clarity of these and similar other issues remains to be found. Bangladesh, is, however, committed to pursuing low-carbon green development, provided necessary financial and technological support is available from the international community.

That is, Bangladesh is committed to the pursuit of sustainable development on the basis of its three pillars flourishing, with equity and inclusion informing the process. Obviously, the country will determine the pace and pattern of greening its economy on the basis of the internal and external realities it faces.

8.2.2 Challenges and future directions

Historically, seeking of short-term economic benefits has tended to preponderate to the neglect of long term environmental sustainability. Again, the benefits are often captured by a few rich and

powerful and are not equitably distributed in society. As a result, poverty and environmental degradation tend to perpetuate.
Provided appropriate technologies are available, green jobs can be created in such sectors as rice, fruits, spices, flowers, high value vegetables, fishery, livestock rearing, community protected forestry, and other natural resource management activities. Growing more fruits, spices and flowers and high value crops like vegetables can create green jobs. Aqua culture, both in urban and rural areas, can also bring green self-employment for many people if they are imbibed with necessary knowledge and skills. Creation of water reservoirs to meet water shortages and fresh water fisheries can be another green economic activity. Community based social forestry schemes and biodiversity protection will also fall under green jobs.

Off farm activities like food processing, packaging, distribution, transportation and marketing has further scope for green jobs. Waste collection, sorting, recycling and reuse can also create green jobs. Compost making from bio-waste has the potential for not only green jobs for women but also production of organic fertilizer for crops and plants as some piloting has shown. Small scale rural enterprise development, which use natural resources optimally, while reducing energy use or reducing carbon emissions, can also be considered as green enterprises.

Development of industries for food processing will not only reduce wastage of perishable crops, but will also add value to the food and open up prospects for exports. Cultivation of more jute, tea and spices will open up prospects for green jobs in the agriculture sector. Fish processing has enormous prospects both in domestic and external markets.

Access to common property resources, wetlands and khas lands to the poor either through open access or through allowing limited exploitation may also generate green jobs. Co-management of natural resources like social forestry and co-management of protected areas aimed at biodiversity conservation can also generate green jobs. Eco-tourism has a lot of prospects too if it can be developed properly, based on successful sustainable models from countries in the Asia-Pacific region, if available.

Encouraging more tea plantations and growing of spice and fruits in the hill tracts can bring much better economic prospects for the hill people while containing environmental degradation. Increase in inland navigation can create green jobs and contribute to a green economy. Likewise, there are many other ways in which green development can be promoted by helping the people find green jobs within their natural environment, with sustainable use of the natural resources and efficient use of energy.

Industrial development has to be diversified with a mix of right policy directions and incentives to the private sector to develop green industries, based on processing of natural resources using green technologies. However, these technology intensive initiatives are very expensive and, thus, beyond the means of common people. These technologies can only be made available to them through creative financing mechanisms or under grant funds. International financial and technological support would be crucially important in this context. At the same time, care should be taken to ensure that productivity in these activities, overall economic growth and poverty reduction strategies are not adversely affected.

Poverty has a particular dimension in the wetlands of the country, called haors and baors which remain under water for half the year and dry for the other half. In the dry season, these areas together constitute a large area for crop production in the country, in which people actually grow crops. However, with the onset of the wet season, the whole area is flooded and employment

opportunities dry out for up to 6 months. The challenge is to create alternative employment opportunities for these people during that period.

Besides agriculture and natural resource management, there is also scope for creating green jobs through renewable energy initiatives. Small workshops can proliferate in rural areas for repair and maintenance of solar lights and electrical products using solar energy. Rural transportation can benefit from pollution-free solar rickshaws which have the potential to create green jobs for many people. Solar water pumps can aid irrigation and create jobs. Generation of power from rice husks can also contribute to job creation. Setting-up of biogas plants also help create various types jobs, e.g. in bakeries, small enterprises and tea-stalls. Besides, green jobs can also be created in the service sectors like water supply, sanitation, health, family welfare, low emission transportation, etc.

It should be noted that Bangladesh, as a Non-Annex least developed country is exempt from carrying out mitigation activities. Its GHG emission is in any case negligible compared to the total global emission. However, as part of its commitment to managing climate change, Bangladesh is committed to reducing emissions, wherever possible, through its own efforts and, importantly, with international financial and technological support.

However, the overall policy planning relating to greening the economy has to be conducted in the context of prevailing domestic and external realities faced by the country and the its goals of accelerated economic growth and poverty reduction while ensuring social equity and inclusiveness.

9 Ocean/Sea Resource Management

9.1 Background and progress and achievements in last 20 years

International laws allow a country to stake its claim to 200 nautical miles of sea involving continental shelf as its exclusive economic zone as also beyond that limit through the outer continental shelf. In case of Bangladesh, that was disputed by India and Myanmar until recently, given the disadvantageous position of Bangladesh arising from concavity of its costal shoreline. The principle of equidistance is usually applied under the Laws of the Seas. But concavity of the shoreline is a special natural phenomenon, and the resulting boundary is not equitable for the particularly country.

Bangladesh insisted on the principle of equity in negotiations with the two countries, but the negotiations fell through. Bangladesh then took the matter to International Arbitration and sought delimitation of its exclusive economic zone and the continental shelf up to 200 NM and beyond in the Bay of Bengal from its 421 Km coastline, claiming that the principle of equity was the appropriate legal provision for this country given the peculiarity of its shoreline.

It is a matter of great pride for Bangladesh that, International Tribunal for the Laws of the Seas (ITLOS) has ruled in its favour, applying the principle of equity vis a vis Myanmar's claim for the principle of equidistance to be applied, on 14 March 2012, providing the country with sovereign rights over 200 nautical miles as exclusive zone economic zone in the Bay of Bengal and beyond through the outer continental shelf. This has become an important precedent and it is expected that the dispute with India will also be resolved with a verdict to be delivered in 2014, similarly favourable to Bangladesh.

9.2 Challenges and future directions

With the favourable decision obtained from the ITLOS the maritime territory of Bangladesh is now clearly defined and its territorial, political and economic rights over 200 NM and beyond are established. It has opened up economic opportunities for Bangladesh for uninterrupted exploitation and use of sea resources within its maritime boundary. Bangladesh can now go for gas and oil exploration in the Bay with a view to augmenting energy security of the country in future. It can also expand opportunities for marine fishing and extraction of mineral and other resources. Of course, for the delimitation of the western boundary, Bangladesh has to wait until 2014. The country would need investment and technology support for sea resource extraction.

Bangladesh needs to build a comprehensive maritime security arrangement for protecting the maritime expanse from external threats. The government has already started planning for building capacity for the purpose.

A study conducted on 8 Bay of Bengal (BoB) countries including Bangladesh, India, Maldives, Myanmar, Sri Lanka, Thailand, and others identified sewerage as the number one polluting factor. A regional cooperation needs to be developed for ensuring that untreated sewerage does not contaminate the adjacent seas and oceans.

Bangladesh may lose St. Martin's Island, its only coral island in the Bay, to sea level rise and may also lose about 15-20% of its land in the coastal areas by 2050. Therefore, Bangladesh needs ocean monitoring systems in place to observe the sea level rise that can provide early warning. Such a system could be developed through regional partnership with BoB countries, provided the necessary technologies are made available by the developed countries.

Studies need to be conducted on the El Nino and La Nina effects on the Bay of Bengal and its relationship with extreme climatic events in Bangladesh and neighbouring countries. Modernization of the weather information and early warning service is required. Mapping of the ocean resources would also need science and technological capacity enhancement including space research and remote sensing and GIS technologies. For these to happen, external support is needed in the form of technology transfer and research and development capacity enhancement.

VIII. CONCLUSION

The Executive Summary at the beginning of this Report provides the highlights of the successes achieved since the 1992 Rio Earth Summit as well as the major future directions and challenges.

Bangladesh has achieved significant progress in respect of all three pillars of sustainable development, especially the social front. However, with the climate change intensifying and the country being at the forefront of climate change impacts, there are formidable challenges to contend with in future. Bangladesh is fully committed to pursuing sustainable development, seeking to establish and maintain economic vibrancy, social equity and inclusiveness, human dignity for all, and a healthy environment and a sound natural resource base. However, given its resource limitations, the country needs finance and technology transfer as well as capacity enhancement support, consistent with the properly defined tasks that it will take to move steadfastly towards the goal of sustainable development.

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Annex- 2: National Steering Committee

Government of the People's Republic of Bangladesh
Ministry of Environment and Forests
Environment Branch-2.

No.MoEF/Env.-2/20/2011/44 Date : 19/01/2012

Notification

Formation of National Steering Committee for UNCSD 2012.

Ministry of Environment and Forests has hereby declared the formation of a National Steering Committee for Bangladesh regarding United Nations Conference on Sustainable Development to be held in 2012 in Brazil comprising following members. This notification replaces the previous office order bearing memo no. MoEF/Env.2/20/201 /422, dated -31-10-201.

Structure of the Committee:

1.	Secretary, Ministry of Environment and Forest	- Convener
2.	Representative, General Economic Division, Ministry of Planning	- Member
3.	Representative, Economic Relations Division, Ministry of Finance	- Member
4.	Representative, Ministry of Water Resources	- Member
5.	Representative,Ministry of Agriculture	- Member
6.	Representative, Ministry of Foreign Affairs	- Member
7.	Representative, Energy Division, Ministry of Energy & Mineral Resources	- Member
8.	Director General, Department of Environment	- Member
9.	Coordinator, Climate Change Unit	- Member
10.	Joint Secretary(Development), Ministry of Environment and Forests	- Member
11.	Joint Secretary(Environment), Ministry of Environment and Forests	- Member
12.	Chief Conservator of Forests, Department of Forest	- Member
13.	Director General, Bangladesh Institute of Development Studies(BIDS)	- Member
14.	Dr.Qazi Kholikuzzaman Ahmad, Chairman, PKSF	- Member
15.	Dr. Ainun Nishat, VC, BRAC University	- Member
16.	Country Representative, IUCN Bangladesh	- Member
17.	Executive Director, Bangladesh Centre for Advanced Studies (BCAS)	- Member
18.	Representative of Vice Chancellor, BUET	- Member
19.	Prof. Dr. Abdul Manan, Ex. VC, Chittagong University	- Member
20.	Mr. S.M. Munjurul Hannan Khan, Deputy Secretary, MoEF, Dhaka	- Member
21.	Mr. Mansurul Alam, Director(Admn.), Department of Environment	- Member
22.	Country Director, United Nations Development Programme(UNDP), Dhaka	- Member
23.	Country Director, World Bank, Dhaka.	- Member
24.	Country Director, Asian Development Bank, Dhaka.	- Member
25.	Ms. Farah Kabir, Action Aid Bangladesh	- Member
26	Representative, Bangladesh Paribesh Andolon(BAPA)	- Member
27	Representative, FBCCI	- Member
28.	Representative, Bangladesh Economic Association	- Member
29.	Dr. Abu Saleh Mostafa Kamal, Deputy Secretary, MoEF, Dhaka	-Member-Secretary

Terms of References :

(a) The Committee will provide strategic guidance regarding Bangladesh's participation in the United Nations Conference on Sustainable Development to be held in 2012 in Brazil.

(b) The Committee will supervise the Country Report Drafting Committee and Peer Review Group for UNCSD.

19.01.12
(Dr. Abu Saleh Mostafa Kamal)
Deputy Secretary
Phone # 88-02-9551512

Deputy Controller
Bangladesh Government Press
Tejgaon, Dhaka.
(You are requested to publish the notification in the next issue of Bangladesh Gazette)

Distribution(Not according to seniority):

1. Secretary, Ministry of Planning, Sher-e-Bangla Nagar, Dhaka.
2. Secretary, Economic Relations Division, Ministry of Finance, Sher-e-Bangla Nagar, Dhaka.
3. Secretary, Ministry of Water Resources, Bangladesh Secretariat, Dhaka
4. Secretary, Ministry of Agriculture, Bangladesh Secretariat, Dhaka
5. Secretary, Ministry of Foreign Affairs, Segunbagicha, Dhaka.
6. Secretary, Energy Division, Ministry of Energy & Mineral Resources, Bangladesh Secretariat, Dhaka.

With a request to send the nomination of one suitable representative for the committee.

(Contd...P/2)

7. Director General, Department of Environment, Agargaon, Dhaka.
8. Coordinator, Climate Change Unit, 56/1, Purana Paltan, Dhaka.
9. Joint Secretary(Development), Ministry of Environment and Forests, Dhaka
10. Joint Secretary(Environment), Ministry of Environment and Forests, Dhaka
11. Chief Conservator of Forests, Department of Forest, Dhaka.
12. Director General, Bangladesh Institute of Development Studies(BIDS), Agargaon, Dhaka.
13. Dr. Qazi Kholikuzzaman Ahmad, Chairman, PKSF, Agargaon, Dhaka.
14. Dr. Ainun Nishat, VC, BRAC University, Mohakhali, Dhaka.
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Copy for kind information :

1. PS to Minister, Ministry of Environment and Forests, Dhaka.
2. PS to Secretary, Ministry of Environment and Forests, Dhaka.

Annex-3: National Drafting Committee

Government of the People's Republic of Bangladesh
Ministry of Environment and Forests
Environment Branch-2.

No.MoEF/Env.-2/20/2011/45 Date : 19/1/2012

Notification

Formation of Country Report Drafting Committee for UNCSD 2012.

Ministry of Environment and Forests has hereby declared the formation of a Drafting Committee to prepare the Country Report for Bangladesh regarding United Nations Conference on Sustainable Development to be held in 2012 in Brazil comprising following members. This notification replaces the previous office order bearing memo no. MoEF/Env.2/20/2011/421, dated -31-10-201.

Structure of the Committee:

Sl.No.	Name and Designation	Position
1.	Dr. Qazi Kholikuzzaman Ahmad, Chairman, PKSF	Convener
2.	Mr. Monowar Islam, Director General, Department of Environment	Member
3.	Mr. Aparup Chowdhury, Joint Secretary(Environment)	Member
4.	Dr. Ainun Nishat, VC, BRAC University	Member
5.	Dr. M. Asaduzzaman, Director General, BIDS, E/17, Agargaon, Dhaka	Member
6.	Dr. Rezaul Karim, Environment Specialist	Member
7.	Dr. Ansarul Karim, Environment Expert and Managing Director, ECOMAC	Member
8.	Dr. Atiq A. Rahman, Executive Director, BCAS	Member
9.	Dr. Mizan R. Khan, Prof. North South University	Member
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19.	Mr. Abu Nayeem Md. Maruf Khan, Senior Assistant Secretary, MoEF	Member
20.	Mr. Shamsuddoha, Environment Expert	Member
21.	Representative, Ministry of Foreign Affairs	Member
22.	Mr. S.M. Ahsanul Aziz, Deputy Director, Department of Environment	Member-Secretary.

Terms of reference:

The committee will prepare the country report for Bangladesh regarding UNCSD 2012 (Rio+20) within the time frame specified by the Ministry.

19.01.12
(Dr. Abu Saleh Mostafa Kamal)
Deputy Secretary
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1. PS to Minister, Ministry of Environment and Forests, Dhaka.
3. PS to Secretary, Ministry of Environment and Forests, Dhaka.

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