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17 February 2010

Dr. Mihir Kanti Mazumder
Secretary
Ministry of Environment and Forests
Bangladesh Secretariat
Dhaka

Dear Mr. Secretary,

**Subject: Joint Mission for the Bangladesh Pilot Program for
Climate Resilience (PPCR)
Aide Memoire
(1 – 11 February 2010)**

We are pleased to attach the final Aide Memoire for the Joint Mission on the above subject, which incorporates comments made at the wrap-up meeting on 11 February 2010 under your chairmanship. We would appreciate receiving the Government's confirmation of the Aide Memoire by 22 February 2010. The Asian Development Bank and the World Bank Group will start preparation of the Pilot Program for Climate Resilience (PPCR) as soon as we receive your confirmation.

With best regards,

Sincerely yours,

Paul J. Heytens
Country Director
Asian Development Bank

Tahseen Sayed
Acting Country Director
The World Bank

Attachment

cc: Mr. M Musharraf Hossain Bhuiyan, Secretary, ERD
 Mr. C.Q.K. Mustaq Ahmed, Secretary, Ministry of Agriculture
 Mr. Md. Sharful Alam, Secretary, Ministry of Fisheries and Livestock
 Mr. Moklesur Rahman, Secretary (in-Charge), Ministry of Food and Disaster Management
 Mr. Monzur Hossain, Secretary, Local Government Division
 Mr. S. M. Wahid-uz-Zaman, Secretary, Ministry of Water Resources
 Mr. Sheikh Altaf Ali, Secretary, Ministry of Health and Family Welfare
 Mr. Kamrun Nesa Khanom, Secretary, Ministry of Social Welfare
 Mr. Md. Mejbahuddin Ahmed, Additional Secretary, ERD
 Mr. Joynal Abedin Talukder, Joint Secretary (Env), M/o Environment and Forests
 Mr. Saifuddin Ahmed, Joint Secretary, Ministry of Water Resources
 Mr. Mohammad Abdul Wazed, Joint Secretary, M/o Food and Disaster Management
 Ms. Zeuna Aziz, Joint Secretary, Local Government Division
 Joint Secretary, Ministry of Health and Family Welfare
 Joint Secretary, Ministry of Social Welfare
 Mr. Abul Kalam Md. Azad, Director General, Bangladesh Water Development Board
 Mr. Md. Sharafat Hossain Khan, Executive Engineer, BWDB
 Ms. Shamima Nargis, Deputy Secretary, ERD
 Mr. Shamsur Rahman Khan, Senior Assistant Chief, M/o Environment and Forests
 Ms. Shaila Sharmin Zaman, Senior Assistant Chief, ERD
 Mr. Md Helal Uddin, Senior Assistant Chief, Ministry of Agriculture
 Mr. Md. Zakir Hossain, Deputy Chief, Ministry of Fisheries and Livestock
 Mr. Jibon Krishna Biswas, Chief Scientific Officer, Bangladesh Rice Research Institute
 Mr. Dilder Ahmed, Director (Administration), Disaster Management Bureau
 Mr. Ahmadul Hassan, Director, Water Resources, CEGIS
 Ms. Maria Sarraf, Senior Environmental Economist, PPCR Co-Mission Leader, World Bank
 Mr. Arun Banerjee, Country Sector Coordinator (Energy & Infrastructure), World Bank
 Mr. Khwaja M. Minnatullah, Senior Environment & Water Resource Specialist, World Bank
 Ms. Sayeeda Salim Tauhid, Senior Monitoring & Evaluation Specialist, World Bank
 Mr. Sayeed Tanvir Hussain, PPCR Consultant, World Bank
 Mr. Jiangfeng Zhang, Senior Country Economist, PPCR Co-Mission Leader, ADB
 Mr. Zahir Uddin Ahmad, Head, Water Resources Management, ADB
 Mr. Arif M. Faisal, Environment Specialist, ADB
 Mr. Md. Karimul Haque Talukder, PPCR Consultant, ADB
 Mr. Tahir Qadri, International Consultant, ADB
 Mr. Aminul Islam, Assistant Country Director (Environment and Disaster Cluster), UNDP
 Mr. Islam M. Faisal, Environment & Livelihood Advisor, DFID
 Ms. Su-Lin Garbett-Shields, Adaptation Policy Adviser, DFID
 Mr. Brian Weller, Senior Environment Specialist, CIDA
 Ms. Sylvia Islam, Senior Development Advisor, CIDA
 Ms. Afifa Raihana, Project Officer, IFC
 Ms. Anika Ali, Operation Analyst, SEDF
 Mr. Mrinal Kanti Sircar, Program Manager, IFC

Bangladesh
Aide Mémoire of the Joint Multilateral Development Bank (MDB) Mission
for the
Pilot Program for Climate Resilience
1-11 February 2010

A. Introduction

1. The Pilot Program for Climate Resilience (PPCR) is part of the Strategic Climate Fund (SCF), a Multi-donor Trust Fund designed to pilot and demonstrate ways to mainstream climate vulnerability and resilience into national development policies and plans, consistent with poverty reduction and sustainable development goals. PPCR aims to achieve the following objectives:

- (i) Pilot and demonstrate approaches for integration of climate risk and resilience into development policies and planning;
- (ii) Strengthen capacities at the national levels to integrate climate resilience into development planning;
- (iii) Scale-up and leverage climate-resilient investments, capacity building and other ongoing initiatives;
- (iv) Enable learning-by-doing and sharing of lessons learning at the country, regional and global levels; and
- (v) For the PPCR pilot countries – Aim to strengthen cooperation and capacity at the regional level to integrate climate resilience into development planning and processes.

2. Following Bangladesh's nomination to participate in the PPCR, a joint mission (the Mission) led by the Government of Bangladesh's (GOB) Ministry of Environment and Forests (MoEF) with the participation of the Asian Development Bank (ADB), the World Bank, International Finance Corporation (IFC), United Nations Development Programme (UNDP), Department for International Development (DFID) and the Canadian International Development Agency (CIDA) was undertaken from 1-11 February 2010. The Mission composition is attached as Annex 1.

3. The Mission reviewed the Government's programs, plans, and strategies that take account of climate risks and provide a platform for joint work by the Government, the development partners, the private sector, and NGOs. The objective of this review was to support the formulation of a program and implementation arrangements for preparing a *Strategic Program for Climate Resilience* (SPCR). It is expected that the SPCR will identify the investment program of priority actions for integrating climate resilience into core development planning and climate sensitive sector strategies and actions, building as much as possible on existing work and development strategies, including the revised NAPA 2009 and the BCCSAP.

4. PPCR will be implemented in two Phases. PPCR Phase 1 is generally expected to last about 12-18 months and the budget is up to \$1.5 million. PPCR Phase 1 will result in the preparation of the SPCR, and a detailed investment program to be implemented under Phase 2. Funds available for the PPCR phase 2 is in the range of US\$50-60 million, about 50% as grants and the remaining 50% as concessional loans.

5. The specific objectives of the Mission were as follows:



- (i) strengthening the process of building country ownership and responsibility through wider participation and multi-stakeholder consultation to support government in the formulation of an agreed strategic approach and investment plan for integrating climate change adaptation into core national and local development plans and programs;
- (ii) stocktaking exercise on previous, ongoing and pipeline activities;
- (iii) identifying priority vulnerable sectors and possible preliminary actions and activities through desk review, consultation workshop, brainstorming session and field visits to the climate vulnerable hotspots;
- (iv) identifying priority sector-specific adaptation options and activities with focus on integrated project development and implementation in climate vulnerable zones;
- (v) a framework for Phase 1 planning and implementation including appropriate institutional set up and modalities to be followed by all stakeholders; and
- (vi) reaching agreement on the scope, cost, donor harmonization plan and implementation arrangement of PPCR phase 1, and identify the lead MDB/s for assisting the Government in administration of Phase 1.

6. The findings and recommendations of this aide memoire were discussed at a wrap-up meeting chaired by Secretary, MoEF on 11 February 2010. The findings and recommendations of the aide memoire are subject to confirmation of the management of the MDBs.

B. PPCR Participatory Process

7. Under the coordination and overall guidance of MoEF, several preparatory meetings were held ahead of the formal mission in January 2010) with the relevant PPCR focal points in the various ministries involved in climate change activities. A list of persons met during the Mission is provided in Annex 2. The Mission held meetings from 1-4 Feb 2010 with the following ministries to explore country specific sector priorities for adaptation to climate change and have a clear understanding of the GOB's requirements for climate resilience:

- Ministry of Environment and Forest (MoEF)
- Ministry of Water Resources (MoWR)
- Ministry of Agriculture (MoA)
- Ministry of Food and Disaster Management (MoFDM)
- Ministry of Local Government, Rural Development and Cooperatives (MLGRD&C)
- Ministry of Social Welfare (MSW)

8. A multi-stakeholder consultation workshop was held on 7-8 Feb 2010 with participation of representatives from concerned ministries, line agencies, NGOs, civil society organization (CSOs), Community Based Organization (CBOs), research/academic institutes, private sector, media and other development partners. Based on the priorities identified in the revised NAPA and BCCSAP, Government organized the workshop in four thematic groups that held separate sessions for discussions as indicated below:

- Session 1: Agriculture and Food Security (Chaired by the Ministry of Agriculture and Co-chaired by IFC)
- Session 2: Extreme Climate Events and Climate Induced Disasters (Chaired by Ministry of Disaster Management and Co-chaired by DFID)



- Session 3: Water Resource Management (Chaired by Ministry of Water Resources and Co-chaired by CIDA)
- Session 4: Public Health, Migration and Social Protection (Chaired by Ministry of Local Government and Co-chaired by UNDP)

9. A summary of sector impacts, vulnerability, and required priority actions identified by each thematic session is in Annex 3.

C. Major Findings

10. Based on the country context (Annex 4), the consultative process identified challenges and opportunities to mainstream climate change adaptation around the four thematic areas identified by Government for detailed study under Phase 1 and consideration for inclusion in the SPCR. These are summarized below:

1. Agriculture and Food Security

Impacts and vulnerabilities include:

- High temperature regimes, saline water intrusion, changing monsoon rainfall patterns, frequent and intense flash floods, and prolonged drought impacting crops, livestock, fisheries, and increased stress on hill agriculture impacting crop production and food security;
- Increased biotic stress on crops (pest, diseases, weed, etc.) and changing phenological patterns (early or late flowering, fruiting, etc of crops); and
- Soil degradation, desertification and salinity leading to reduced crop production.

The recommended priority actions include:

- Development and dissemination of climate resilient varieties of food grains and other crops; modification of cropping systems for water-logged and salinity affected coastal areas;
- Promotion of efficient irrigation practices and rainwater harvesting;
- Provision of storage facilities and promotion of crop diversification;
- Documentation of local indigenous knowledge and innovative practices (e.g. *Baira*, *Sorjan* system, etc.);
- Improved and expanded agricultural extension services; and
- Fodder reserves and shelter for livestock during extreme events.

2. Extreme Climate Events and Climate Induced Disasters

Impacts and vulnerabilities:

- Between 1991 and 2000, 93 major disasters recorded, resulting in nearly 200,000 deaths and causing \$ 5.9 billion in damage with severe losses in agriculture and infrastructure;
- Cyclonic storms and tidal surges in the Bay of Bengal have become more frequent and intense, causing rougher, adversely affecting million of coastal population;
- Sea level rise and salinity intrusion have increased adversely affecting the life and well being of coastal communities;



- Heat waves and cold waves observed in the country with greater frequency; and
- Untimely and heavy rainfall in short periods of time disrupt drainage systems and create flooding and water logging.

The recommended priority actions include:

- Multi-purpose Cyclone Shelter Centers where these are inadequate;
- Extension of cyclone preparedness program (CPP);
- Improved early warning and forecasting system;
- Construction of climate resilient Community Shelter home for cluster villages of landless families in the highly risk prone coastal areas;
- Climate resilient livelihood diversification to support to coastal communities; and
- Greenbelts/mangroves along the coast as defense against storm surge and cyclones.

3. Water Resource Management

Impacts and vulnerabilities include:

- Abundance of water in monsoons, scarcity in dry season, and increased salinity, adversely affecting water availability and quality;
- Increased frequency of intense rainfall events causing severe floods, landslides, riverbank erosion and mud flows; and
- Increase in water borne diseases.

The recommended priority actions include:

- Adaptation for water-logging through tidal river management(TRM);
- Climate proofing of coastal infrastructure (e, g. embankment, polders, dyke, etc.) including reconstruction, repair and maintenance;
- Impact assessment of sea level rise on inundation, drainage congestion, salinity intrusion, change of surge height and coastal morphology in the coastal zone;
- Upgrading the hydrological network and improvement of forecasting-system; and
- Modernization of irrigation schemes aimed at optimizing physical and economic efficiency.

4. Public Health, Migration and Social Protection

Impacts and vulnerabilities include:

- Increasing incidence of water-borne, air-borne and vector-borne diseases;
- Increased suffering of children, women, elderly due to heat waves and cold waves;
- Displacement of vulnerable people due to cyclone and storm surge sea level rise (SLR), river erosion, etc. resulting in loss of livelihood and increase in climate migrants; and
- Malnutrition and Psycho-sociological stress.

The recommended priority actions include:



- Climate proofed water supply and sanitation infrastructure, including the identification and installation of innovative water supply systems (e.g. low cost filter, increase surface water storage, desalinization, etc.) and sanitation;
- Small scale water resource management schemes for community level irrigation;
- Improved diseases/vector surveillance and monitoring;
- Monitoring of internal and external migration of adversely impacted population and providing safety net and support to them for rehabilitation; and
- Improved education facilities and skills training for migrants and possibly some financing of resettlement, rehabilitation and support for livelihood to enhance social welfare of affected persons.

11. **Cross sector issues include** institutional overlaps including capacity and policy constraints exacerbated by overlapping jurisdictions to deal with climate change impacts given the multi-sector nature of investments to address them. It was therefore recommended that a comprehensive assessment and evaluation of institutional and related policy issues, including the role of the private sector, be carried out and appropriate recommendations made for consideration of the Government.

12. A reality of climate change in the coastal region of Bangladesh is that women and children are affected disproportionately. They are more likely to be severely affected during extreme events and they must bear a large portion of the burden of survival in an environment affected by drought, flood, waterlogging and excessive salinity. The PPCR offers a key opportunity for the Government of Bangladesh to ensure that the needs of women and children are adequately integrated into pilot activities addressing food security, disaster risk reduction, water resources management and health and social welfare.

D. Design and Implementation of PPCR

13. Processing and implementation of various phases of PPCR are governed by the PPCR Guidelines as approved by the PPCR-SC. Accordingly, it was agreed that design and implementation of various priority activities under Phase 1 take account of the following:

1. Adopt an Integrated Cross-Sector Approach

14. As climate change impacts most of the important development sectors, an integrated cross-sector approach be adopted for design of adaptation activities in most climate vulnerable zones. The proposed program components and activities will be linked in such a fashion that their combined action reduces people's vulnerability to climate change and their disaster risk. The feasibility and modalities would be identified for packaging various activities that include construction of multi-purpose cyclone shelters, improvement of weather forecasting and dissemination, agricultural extension for dissemination and cultivation of climate resilient crop varieties, low cost water filters, small scale irrigation, repair and maintenance of existing coastal infrastructure, greenbelts along the coast, livelihood diversification, scaling up of indigenous coping mechanisms, skills building of displaced persons, etc. in an integrated fashion to reduce the communities vulnerability and enhance resilience. The objective would be package climate resilience options to build the resilience of the communities to extreme climate events and climate induced disasters, such as floods and cyclone, with the difference that these also



incorporate longer-term climate change scenarios and projected impacts into community-based planning. Broader participatory community development and livelihood diversification and scaling-up approaches will also be taken into account to address the adverse effects of climate change.

2. Focus Adaptation Investments and Activities in the most Vulnerable Coastal Zones

15. Based on available knowledge on local level climate impact assessment and vulnerability mapping, coastal areas are most vulnerable to climate change. Other vulnerable areas are drought affected *barind* tract, floodplain, *haor* and hilly areas. It was agreed that adaptation activities under the PPCR will be implemented in most vulnerable coastal areas and remote Islands where poverty is high and there are few facilities or government budget for adaptation to climate change. Some of the most vulnerable *upazilas* were identified in Khulna and Sathkhira districts and include: Koira, Paikgacha, Shyamnagar and remote islands is Nijhumdwp. A climate risk assessment (CRA) and participatory vulnerability analysis (PVA) will be required to prioritize most climate vulnerable areas in the coastal zone.

3. Ensure Effective Coordination Mechanism and Institutional Arrangements

16. Government is facing a coordination challenge, since climate change problems cut across various sectors, ministries and agencies. The major challenge in the implementation of these types of program is selection of an appropriate and capable ministry to take the lead role in effective coordination among all concerned ministries and line agencies. During the implementation of Phase 1 consultations will continue with the concerned ministries and line agencies to build a consensus on institutional arrangements and implementation modalities.

E. Conclusions and Recommendations

17. The Mission's conclusions and recommendations are as follows:

- It was reaffirmed that MoEF will coordinate Phase 1, working in close collaboration with other relevant Ministries.
- It was agreed that ADB will administer the PPCR Phase 1 funds and the process leading thereto, with active collaboration with the WBG.
- PPCR activities should take place in 4 – 5 climate vulnerable hotspots in the coastal areas of the country. These hotspots should be identified as early as possible based on criteria broadly suggested during the consultative workshops.
- All design and implementation activities for inclusion in the SPCR should be determined using an integrated approach, as far as possible and practicable, to ensure adequate coverage of climate sensitive sectors like agriculture, fisheries, forestry, small scale water resource management, livelihood diversification, scaling of best adaptation practice, strengthening coping mechanism of vulnerable community, etc. in a coordinated fashion which will results in climate resilience.
- PPCR Phase 1 and SPCR should consider inclusion of sector-specific support for capacity building to mainstream climate change adaptation in line ministry/agency.
- The PPCR should pay adequate attention to institutional strengthening, capacity building and awareness of climate change to ensure effective implementation of



proposed investments for socio-economic development, sustainable development, including poverty reduction, long term inclusive economic growth, macro-economic performance and economic returns.

- In the design of various investment options, due consideration must be given to their social and environmental implications and appropriate measures put in place to ensure social acceptability and environmental sustainability.
- Workshop Proceedings and the *Aide Memoire* should be shared with the participants of the concerned ministries, line agencies and other development partners.

F. Follow up Actions and Time-line

18. The Mission and the Government agreed on the following follow-up actions and time line:

- By end of the wrap up meeting, the Aide Memoire was confirmed by MOEF in principle. The Aide Memoire will be finalized, signed by the MDBs and forwarded to MOEF by 17 February 2010, and MOEF will convey a formal confirmation by Monday, 22 February 2010. In absence of any communication by the said date, the Aide Memoire will be assumed to have been confirmed.
- Following confirmation of the Aide Memoire ADB and the World Bank will begin the preparation of the SPCR. Should there be a need for additional funding to prepare the SPCR, an appropriate Proposal for additional funding will be prepared and submitted to PPCR-SC for approval. The SPCR will be drafted in close consultation with other development partners and concerned ministries/agencies of the Government. Draft SPCR will be completed by 31 May 2010.
- Follow up Joint Mission to review and agree on the draft SPCR with the Government will be fielded by June 2010.
- Submission of the SPCR by the Government to PPCR-SC through MDB for approval and allocation of Project Preparation funds by June 2010.
- Preparation and approval of TAPP by the Government on the basis of approved SPCR to be completed by July 2010.

Zahir Uddin Ahmad

for
For the Asian Development Bank
Jiangfeng Zhang (Mission Leader)
Senior Country Economist
Bangladesh Resident Mission

Maria Sarraf

For the World Bank
Maria Sarraf (Mission Leader)
Senior Environment Economist
World Bank, Washington DC



World Bank

COMPOSITION OF MISSION

Government of Bangladesh

Ministry of Environment and Forests

1. Mr. Joynal Abedin Talukder, Joint Secretary (Env)
2. Mr. Shamsur Rahman Khan, Senior Assistant Chief

Economic Relations Division (ERD)

3. Ms. Shamima Nargis, Deputy Secretary
4. Ms. Shaila Sharmin Zaman, Senior Assistant Chief

Ministry of Agriculture

5. Mr. Md Helal Uddin, Senior Assistant Chief

Ministry of Fisheries and Livestock

6. Mr. Md. Zakir Hossain, Deputy Chief

Bangladesh Rice Research Institute

7. Mr. Jibon Krishna Biswas, Chief Scientific Officer

Ministry of Food and Disaster Management (MoFDM)

8. Mr. Mohammad Abdul Wazed, Joint Secretary

Disaster Management Bureau

9. Mr. Dilder Ahmed, Director (Administration)

Local Government Division

10. Ms. Zeuna Aziz, Joint Secretary

Bangladesh Water Development Board

11. Mr. Md. Sharafat Hossain Khan, Executive Engineer

Centre for Environment and Geographic Information Service (CEGIS)

12. Mr. Ahmadul Hassan, Director, Water Resources

Development Partners

World Bank

13. Ms. Maria Sarraf, Senior Environmental Economist, PPCR Co-Mission Leader
14. Mr. Arun Banerjee, Country Sector Coordinator(Energy & Infrastructure)
15. Mr. Khwaja M. Minnatullah, Senior Environment & Water Resource Specialist
16. Ms. Sayeeda Salim Tauhid, Senior Monitoring & Evaluation Specialist
17. Mr. Sayeed Tanvir Hussain, PPCR Consultant

Asian Development Bank

18. Mr. Jiangfeng Zhang, Senior Country Economist, PPCR Co-Mission Leader
19. Mr. Zahir Uddin Ahmad, Head, Water Resources Management
20. Mr. Arif M. Faisal, Environment Specialist
21. Mr. Md. Karimul Haque Talukder, PPCR Consultant
22. Mr. Tahir Qadri, International Consultant

United Nations Development Programme (UNDP)

23. Mr. Aminul Islam, Assistant Country Director (Environment and Disaster Cluster)

Department for International Development (DFID), UK

24. Mr. Islam M. Faisal, Environment & Livelihood Advisor
25. Ms. Su-Lin Garbett-Shields, Adaptation Policy Adviser

Canadian International Development Agency (CIDA)

26. Mr. Brian Weller, Senior Environment Specialist
27. Ms. Sylvia Islam, Senior Development Advisor

International Finance Corporation (IFC)

28. Ms. Afifa Raihana, Project Officer
29. Ms. Anika Ali, Operation Analyst, SEDF
30. Mr. Mrinal Kanti Sircar, Program Manager

Workshop Attendants for 7 and 8 February

List of person met during mission (1-4 Feb 2010)

A. Ministries and Line Agencies**Ministry of Environment and Forests**

1. Joynal Abedin Talukder, Joint Secretary
2. S.M. Manjurul Hannan Khan, Deputy Secretary
3. Dilruba Yeasmin, Deputy Chief
4. Shamsur Rahman Khan, Senior Assistant Chief

Economic Relations Division (ERD)

5. Mohammad Mejbahuddin, Additional Secretary
6. Ms. Shamima Nargis, Deputy Secretary
7. Shaila Sharmin Zaman, Senior Assistant Chief
8. Meer Ahmed Tariqul Omar, Senior Assistant Chief

Ministry of Agriculture

9. CQK Mustak Ahmed, Secretary
10. AZM Shafiqul Alam, Additional Secretary
11. Md Helal Uddin, Senior Assistant Chief
12. Jibon Krishna Biswas, Chief Scientific Officer, Bangladesh Rice Research Institute

Ministry of Food and Disaster Management (MoFDM)

13. Mohammad Abdul Wazed, Joint Secretary
14. Mohammad Tasharuf Hossain Farazi, Deputy Secretary
15. Monirul Islam, Senior Assistant Chief
16. Naima Bhuyan, Senior Assistant Chief
17. Dilder Ahmed, Director(Administration), Disaster Management Bureau

Planning Commission

18. Sheikh Shakil Uddin Ahmed, Senior Assistant Chief
19. Md. Mahbulul Alam Siddiqui, Assistant Chief
20. Nazia Afrin Chowdhury, Senior Assistant Chief

Local Government Division

21. Monzur Hossain, Secretary
22. Zeuna Aziz, Joint Secretary
23. Md. Ansar Ali Khan, Deputy Secretary
24. Md. Shariful Alam, Project Director

Local Government Engineering Division

25. Sayeed Ahmed Baset, Sr. Assistant Engineer(IWRM)
26. Anil Chandra Barman, Executive Engineer
27. Md. Mashiur Rahman
28. Md. Shahidul Haque

Ministry of Fisheries and Livestock

29. Md. Zakir Hossain, Deputy Chief

Bangladesh Water Development Board

30. Md. Sharafat Hossain Khan, Executive Engineer
31. AKM Shariful Islam, Executive Engineer
32. Sayeeda Nazneen, Executive Engineer
33. AKM Ibrahim, Executive Engineer

Department of Public Health and Engineering

34. Md. Wali Ullah, Assistant Chief Engineer
35. Alok Majumder, Senior Programme Officer

Centre for Environment and Geographic Information System (CEGIS)

36. Ahmadul Hassan, Director, Water Resources,

B. Development partners

37. Johan Willert, First Secretary, Urban Environment & Climate Change, Embassy of Sweden
38. Jorge Nieto Rey, First Secretary, EU, Delegation to Bangladesh
39. Tatsuhiku Sunouchi, Representative JICA
40. Zafar Iqbal, JICA
41. Charley Causeret, Ambassador, Embassy of France
42. Schnelle Hans, Head of Development Cooperation, Embassy of Germany
43. Arne Haug, Deputy Head, Norway Embassy
44. Johrin Ulhard, Embassy of Sweden

Workshop Attendants for 7 and 8 February

Dr. Hassan Mahmud, State Minister, MOEF
 Mr. Joyanal Abedin Talukder, Joint Secretary, MOEF
 Mr. Munjurul Hannan Khan, Deputy Secretary, MOEF
 Ms. Hasnun Nahar, Deputy Secretary, MOEF
 Mr. Mohammad Mejbahuddin, Add. Secretary, ERD
 Shailla Zaman, Sr Ass Chief, ERD
 Ms. Musrat Mehjabin, ERD
 Mr. Prashanta Chakrabarti, MoA
 Mr. Zakir Hossain, MOFL
 Mr. Dilder Ahmed, DMB
 Md. Sharafat Hossain Khan, WDB
 Begum Mahmuda Benu, LGD
 Fariduddin Ahmed, Arannaya Fn.
 Nasir Aziz, IUCN
 S.M. Khairul Ahsan, MOHFW
 MA Wazed, MOFD
 M. Aminul Islam, UNDP
 A.K.M. Shariful Islam, BWDB
 Afifa Raihan, IFC
 Dr. Md. Aziz Zinali Chowdhury
 Md. Shah Alam, BMD
 Dr. Iqbal kabir, MOHFW
 Tanzeha A. Huq, BRAC
 Dr. Md. Abdus salam,
 K.H. Talukdar, ADB
 Brian Weller, CIDA
 Dr. Ebadat Hasan, BLRI
 Su-Lin Garbett-Shiels, DFID
 Muhammad Shajahan, BADC
 James Radner, Toronto
 Zahirul H. Khan, IWM
 M. Hossain, CEGIS
 Dr. A.R. Mollah, NACOM
 Manjurul H. Khan, MOEF
 A K M Ibrahim DPHE
 A. K. M. Shariful Islam BWDB
 Aminul Islam BWDB
 Angie Harney, Tanvir Hussain WB
 Anis, Tutsuhito JICA
 Donel Rozario EU Delegation
 Dr. A. Q. M. Mahtab DU
 Dr. Ebadul Haque BRRI
 Dr. Hossain Shahriar ESDO
 Dr. M. Moznur Rahman BARI
 Dr. Md. Aziz Chowdhury BARC
 Shahjahan BADC
 M. Aminul Islam UNDP
 Mahmudul Alam Siddiqui GED
 Masood Siddique CNRS
 Md. Farhath Hossain Channel One
 Md. Mizanur Rahamn, MOFL
 Md. Shah Alam BMD
 Md. Shamsuddoha EQUITY BD
 Meherun Runi ATN Bangla
 MR. Kafuyaman JICA
 Nazma Mobarek Finance Div
 Saeeda Nazneen BWDB
 Shamsuddin Ahmed BMD

Dr. Mihir Kanti Mazumder, Secretary, MOEF
 Mr. Aparup Chowdhury, Joint Secretary, MOEF
 Mr. Shamshur Rahman Khan, Sr Assistant Chief, MOEF
 Mr. Mosharraf Hossain, Deputy Chief, MOEF
 Ms. Shamima Nargis, Deputy Secretary, ERD
 Mr. Mahmud R Khan, Dep Sec, ERD
 Subrata Sikder MoFL
 Dr. Md Shafiqul Islam, MoA
 Mr. Md. Abul Khair, DoF
 Dr. Fazole Sadeq Ahmed DoE
 Dr. Aktaruzzaman Hamidi, MoWR
 Alok majumder, WSSPI
 Aminur Rasel, Bdnews24.com
 Razaur Rahman, IWFm
 Aminul Islam, BWDB
 Md. Khalequzzaman, BMDA
 Sylvia Islam, CIDA
 Urmi Tarranum Finance Division
 Sayeed Ahmed, LGED
 Dr. S.M. Bokhtier, BSRI
 M. Akhter, CEGIS
 Dr. M. Moznur Rahman, BARI
 Dr. Md. Amzad Hossain, BSRI
 BINA Jin Hirosawa, JICA
 Sayedul Arifin, JICA
 Md. Khurshedullah, DRR
 Parimal Chandra Saha, MoWR
 Anika Ali, IFC
 Firoz Ahmed Bdnews24.com
 M.I. Sharif, BCAS
 Shamsuddin Ahmad, BMD
 Md Zakir Hossain, MOFL
 AKM Ibrahim, DPHE
 Shishir Morshed, Prothom Alo
 A. F. M. Farid ADB
 Abu M. Kamaluddin CDMP
 J. Nieto EU Delegation
 Anil Ch. Borman LGED
 Syed Tahir Qadri, Arif Faisal, ADB
 Karimul Hoque Taluikder ADB
 Dr. A. R. Mollah NACOM
 Dr. F. H. Ansarey ACI
 Dr. Iqbal Karim MoHFW
 Dr. Md. Abdus Salam BINA
 Dr. Md. Mizanur Rahman DLS
 Giasuddin Ahmed Chowdhury
 Mahbub Anam Lalteev Seed Ltd
 Maliha Fida Khan CEGIS
 Md. Altaf Hossain MoFL
 Md. Iftekharul Alam BADC
 Md. Musharraf Hossain, PI. Com
 Md. Shahin MoEF
 Md. Sirajul Islam BRRI
 Mr Ikeda JICA
 Muhammad Shahjahan BADC
 S. M. Khairul Ahsan MoHFW
 Sayeed Ahmed LGED
 Sharmain Azad Channel 1

Mr. Meer ATraiquel Omar, Sr Ass Chief, ERD
 Swapan Kumar Saha, Ministry of Agriculture
 Mr. Jiban Krishna Biswas, BRRI
 Mr. Md Ansar Ali Khan, LGD
 Mr. Md. Abdul Mutaleb
 Begum Ruksana Nasrin, Mol
 Prashanta Kumar Chokroborty, PI Com.
 AFM Rafiqul Hossain, GrpPubMgtCoLtd
 Hideki Kitayama, JICA
 Anisuzzaman, JICA
 Md. Olid-Bin-Asad, MoFDM
 Syed Tahir Qadri, ADB
 Rashada Akther, MoHFW
 Md. Mahabubul Siddique, GED
 Nazia Afrin Chowdhury, GED
 Md. Safaraz Wazed, CEGIS
 Nazma Mobarek, Finance Division
 A.M. Siddique, EU Delegation
 Md. Wali ullah, DPHE
 Md. Shariful Alam, LGD
 Saeeda Nazneen, BEDB
 Dr. Mohammad Islam, DAE
 Anilch Barman, LGED
 Ian Crossby IFC
 Dr. Mohammad Shahjahan, BARC
 Md. Wajjullah, CEGIS
 Naima Begam, MOFDM
 Urmi Tamanna, Finance Division
 Md. Abul Bashar, DLC
 A. Hossain CEGIS
 Zahirul H. Khan IWM
 Kabir Channel One
 Anindita Kamal ABC Radio
 Babar Kabir BRAC
 Khawaja M. Minnatullah, Arun Banerjee WB
 Dr. Dilruba Ahmed CEGIS
 Dr. G. C. Halder BRRI
 Dr. M. A. Taher Khanddkar BRDB
 Dr. Md. Amzad Hossain BSRI
 Dr. Md. Showkat Ali BADC
 Dr. Mohammad M A Wazed NOFDM
 Mahfuz Ulkiah CFSD/UYCN
 Maria Sarraf, Sayeeda S Tauhid WB
 Md. Ansar Ali Khan LGD
 Md. Khalequzzaman BMDA
 Md. Okid Bin Asad, MoF
 Md. Shahjahan Kabir BRRI
 Md. Wali Ullah DPHE
 Ulaseq Billah Prothom Alo
 Nazia Afrin Chowdhury GED
 S. M. Shah Newaz IWM
 Shahriar Islam USAID
 Sharmin Kamal Sayeed

Summary of Sector Impacts, Vulnerability and Required Priority Actions by Thematic Sessions¹

Proposed sectors	Sectoral impacts and vulnerability	Required priority actions
Agriculture and food security	<ul style="list-style-type: none"> - Higher temperature, saline water intrusion, and changing monsoon rainfall patterns, frequent flash flood are impacting on crop production - Salinity intrusion due to SLR would reduce the coverage of agricultural land that resulting decrease of crop production - Prolonged drought may increase input use like irrigation, fertilizers and other management inputs - Temperature increase would have severe impact on food-grain production, especially for wheat production - Increased biotic stress on crop(pest, diseases, weed, etc.) and changing of phenological pattern (early or late flowering, fruiting, etc of crops) - Production of wheat, HYV <i>Aus</i> and <i>Boro</i> might no longer be economically suitable under climate change - Soil degradation, desertification and salinization leads to less crop production 	<ul style="list-style-type: none"> - Development and dissemination of climate resilient rice and other crop varieties² and cropping systems for water-logging³ and salinity affected coastal areas; - Innovation and dissemination of drought tolerant rice and different crop varieties in ever increasing drought prone areas (<i>barind</i> tract); - Promote efficient irrigation practices and rainwater harvesting for southern belt; - Improved food security through storage mechanisms and crop diversification; - Documentation and scaling-up of local indigenous knowledge and innovative practice (e.g. <i>Baira</i>, <i>Sorjan</i> system, etc.). Improve knowledge and agricultural extension services; - Improved cropping pattern and agronomic manipulations such as shifting planting dates, using short duration crop cultivars, etc.; - Create fodder reserve and support shelter provision for livestock during extreme events; - Engage private sector and NGOs in order to speed up the delivery of the products/services;
Extreme Climate Events and Climate Induced Disasters	<ul style="list-style-type: none"> - Frequency and intensity of tropical cyclone and storm surge are increasing. - Between 1991 and 2000, 93 major disasters were recorded, resulting in nearly 200,000 deaths, causing \$ 5.9 billion in damage with severe 	<ul style="list-style-type: none"> - Construction of Multi-purpose Cyclone Shelter Centre⁴(MCSC) for the vulnerable people where there are too few or no shelter; - Extension of cyclone preparedness program (CPP) and improve broadcasting of

¹ Source: PPCR Consultation meeting 7-8 Feb, 2010

² Salinity tolerant rice varieties are: BR-40, 41,47, BINA-8 &9

³ submergence-resistant rice variety is BR-11

⁴ An improved multi-storied design of cyclone shelter where livestock, health facilities and other community service can be available and there will be separate space for special vulnerable groups e.g. pregnant women, disable, elderly and child

Proposed factors	Sectoral impacts and vulnerability	Required priority actions
	<p>losses in agriculture and infrastructure</p> <ul style="list-style-type: none"> - Due to changing monsoon rainfall pattern crop production is uncertain; - Bay of Bengal has become more intense and frequent, causing rougher seas that can make it difficult for fishermen and small craft to put to sea - Both heat wave and cold wave have observed in the country - Country observed untimely rainfall and also heavy rainfall in shorter period of time disrupting urban drainage system and creating flooding and water logging 	<p>early warning and forecasting;</p> <ul style="list-style-type: none"> - Introduction of a cell-broadcasting based early warning system for cyclone and tidal surge; - Construction of climate resilient community shelter home for cluster villages of landless families in the highly risk prone coastal areas; - Livelihood diversification in non-climate sensitive sectors to support to the coastal community; - Create greenbelt/mangrove long the coast to defense against storm surge and cyclone; - Integrated project with promoting micro-finance in the vulnerable coastal areas; involvement of private sectors in the coastal areas through promoting micro-enterprise development;
Water Resource Management	<ul style="list-style-type: none"> - Too much water in monsoon, too little water in dry season, untimely water and wrong water (saline water) are all experienced in the country; - Flood and water logging area is increasing - A SLR is exacerbating drainage congestion, siltation and water logging - Problems related to availability of fresh water for drinking and sanitation is becoming acute - Frequency of occurrence of more intense rainfall events in the country is increasing and causing severe floods, landslides, riverbank erosion and mud flows - Water borne diseases is also increasing 	<ul style="list-style-type: none"> - Adaptation for water-logging through tidal river management (TRM); - Climate proofing of coastal infrastructure (e. g. embankment, polders, dyke, etc.); - Reconstruction, repair and maintenance of existing coastal infrastructure; - Impact assessment of sea level rise on inundation, drainage congestion, salinity intrusion, change of surge height and coastal morphology in the coastal zone; - Upgrading the Hydrological Network and improvement of forecasting- system; - Modernisation of existing irrigation schemes and demand management aimed at optimising physical and economic efficiency in the use of water resources and recycled water in water-stressed area;
Public Health,	<ul style="list-style-type: none"> - Water-borne, air-borne and 	<ul style="list-style-type: none"> - Climate resilient water supply

Proposed sectors	Sectoral impacts and vulnerability	Required priority actions
Migration and Social Protection	<p>vector-borne diseases are increasing in changing climate. Outbreak of Cholera, Diarrhea and Dengue are also increasing</p> <ul style="list-style-type: none"> - Children, women, elderly and working class peoples are suffering more with heat wave and cold wave - Displacing vulnerable people due to cyclone and storm surge sea level rise (SLR), river erosion, etc. 'Climate refugee' is becoming a key emerging issue in the country - Peoples are losing their traditional livelihood options due to extreme climate events - Women, elderly, disabled and children are becoming more vulnerable in changing climate - Malnutrition and Psycho-sociological stress 	<p>and sanitation technologies;</p> <ul style="list-style-type: none"> - Identification and installation of appropriate and innovative water supply system (e.g. low cost filter, increase surface water storage, desalinization, etc.) and sanitation technologies in coastal area; - Small scale water resource management scheme; - Climate change responsive local planning; - Livelihood protection in ecologically fragile areas and protection of vulnerable socio-economic groups (including women); - Better and/or improved diseases/vector surveillance and monitoring; - Promoting Tele-medicine and E-health service; - Initiation of climate sensitive diseases surveillance program; - Monitoring of internal and external migration of adversely impacted population and providing safety net and support to them for rehabilitation; - Improving the education and workplace skills of migrants and possibly some financing of resettlement costs, proper rehabilitation and support the country to enhance the social welfare measure to the displaced person;
Multi-sectoral	<p>Various episode on climate change and variability</p>	<ul style="list-style-type: none"> - Mainstreaming climate change in national, local, sectoral and spatial development programs and development planning; - Institutional strengthening, building human resource capacity and increasing absorptive capacity of funds; - Public awareness campaign on climate change issues;

Country Context for Climate Change and Variability

The Bangladesh Resident Mission of the ADB prepared a Climate Change Implementation Plan¹ (CCIP) in 2009. The stock-taking exercise is based on the CCIP, revised NAPA, BCCSAP and consultations with various stakeholders. Two national consultants were also assigned, one each by ADB and the World Bank to summarize the discussions in various meetings and consultation sessions. These summaries are reproduced below:

- Bangladesh is frequently cited as one of the most vulnerable countries (MVC) due to climate variability and change. The vulnerability will be amplified further due to its vulnerable geographic location, flat and low-lying deltaic floodplain, dependence of traditional livelihood on climate sensitive sectors, cyclone prone and high level of poverty and dense population. Climate Change is now the pressing development concern of the country given the country's high vulnerability to its impacts. Climate change scenarios such as a sea level rise (SLR), increased air and sea surface temperatures, erratic and untimely rainfall, increased intensity of tropical cyclones and storm surges, floods, droughts, etc. have all been experienced in the recent past, which have significantly affected the country's development process, particularly progress toward achieving the Millennium Development Goals (MDGs). Efforts to reduce poverty will only be sustainable over the longer term if they incorporate climate change in development planning and programming.
- The key challenges in tackling climate change of the country are ensuring food and water security, managing disaster risk, protecting infrastructure, maintaining health and energy security, etc. and tackling forced migration and overall environmental degradation. These are further aggravated by population pressures, lack of adequate funds for appropriate adaptation, inadequate policy frameworks, and limited human and financial resources.
- Coastal zones are the most vulnerable to climate change due to sea level rise, salinity intrusion, increased frequency and intensity of cyclone and storm surge, increased coastal and riverbank erosion, etc. These are further aggravated by inadequate government support, vulnerable geographic location, population density and poverty.
- Bangladesh is at the forefront and is a global leader in climate change adaptation. The government has taken several creditable initiatives particularly for adaptation and has managed to draw international attention and cooperation to the impacts of climate change in Bangladesh. The Government of Bangladesh launched the NAPA in 2005, which identified 20 priority activities, including general awareness raising, capacity building, and implementation of projects in vulnerable regions with special focus on agriculture and water resources. More recently, the Government unveiled the BCCSAP with 44 programs under six thematic areas: (a) food security, social protection and health; (b) comprehensive disaster management; (c) infrastructure development; (d) research and knowledge management; (e) mitigation and low-carbon development; and (f) capacity building and institutional strengthening.
- The Ministry of Food and Disaster Management (MoFDM) drafted National Disaster Management Policy in January 2008. The MoFDM also drafted National Plan for Disaster Management (2008-2015) in May 2008 for addressing the disaster risk and climate change adaptation comprehensively. Over the last 35 years, the GoB has invested over US\$ 10 billion to make the country less vulnerable to natural disasters. In addition Government has developed state-of-the-art warning systems for flood, cyclones and storm surges, and it is expanding community-based disaster preparedness.
- Key priority adaptation actions proposed under the revised NAPA and BCCSAP include: improved weather forecasting and warning system, improved and restored livelihoods in climate vulnerable areas, develop climate resilient rice and crop varieties and disseminate them to farmers, community based disaster preparedness, strengthened and repaired

¹ ADB 2009. Bangladesh Climate Change Implementation Plan (Draft), Asian Development Bank, Bangladesh Resident Mission, Dhaka, 62 p.

coastal infrastructure and construct more multi-purpose cyclone shelter centre, improved water management systems to reduce water logging and saline intrusion on the coastal areas, extended green belt for coastal protection, improved field data and climate change modeling at a scale useful for sub-national planning, capacity building and institutional strengthening, etc.

- A small climate change unit has been setup within the MoEF with the aim of providing better technical information for more systematic planning in the face of climate change as well as awareness raising and disseminating information on climate change out across government more broadly. MoEF also established a 'Climate Change Cell (CCC)' in 2004 in the Department of Environment under the Comprehensive Disaster Management Programme (CDMP) with the objective of "Establishing an Integrated Approach to Climate Change Risk Management at National and Local Levels. The Government recently set up Climate Change Focal Points in various ministries for improved coordination.
- 'National Strategy for Accelerated Poverty Reduction II' (PSRP-II) has incorporated climate change adaptation issues with emphasis on agriculture and mainstream climate change in national development and planning process. The government has also formulated a Country Framework to mainstream Climate Risk Management and Adaptation in 2006.
- Bangladesh chaired the Least Developed Countries (LDC) group in the international climate change negotiations in the UNFCCC Conference of Parties (COP 14) in Poznan, Poland in December 2008 and remains a strong voice in this group, speaking on behalf of vulnerable countries.
- The magnitude of funding needs required for the climate change adaptation in the country has not accurately been estimated yet. However, the revised NAPA identified 15 priority activities which are roughly estimated to cost more than US\$ 70 million. Bangladesh Climate Change Strategy and Action Plan (BCCSAP) has roughly estimated the cost of about \$ 500 million (for years 1 and 2) to support program for immediate actions such as strengthening disaster management, climate proofing of infrastructure, ensuring food and water security, research and knowledge management, capacity building and public awareness programs, and urgent investment in cyclone shelters. However the total costs estimated in the BCCSAP for programs commencing in the first 5 years is estimated at \$5 billion. Recently the Government set up a 'Climate Change Trust Fund (CCTF) and allocated about \$100 million for tackling climate change. The creation of a Multi-Donor Trust Fund (MDTF) with support from donors is in progress. Up to date the proposed MDTF received a commitment of about \$100 million from UK, Denmark, Sweden and European Commission. It is important to note that over the last three decades, the Government has invested over \$10 billion (at constant 2007 prices) to make the country more climate resilient and less vulnerable to natural disasters.
- Some of the multilateral development banks e.g. ADB and WB, UNDP and other bilateral organizations e.g. DFID, DANIDA, EC, JICA, CIDA and Netherlands Government are supporting the country in addressing climate change adaptation and mitigation.
- As pointed during various stakeholder consultations, there is a need to set up stronger coordination mechanism amongst various Government ministries and line agencies involved in climate change adaptation and disaster risk management. Internal dialogue and strategic negotiation is going on with a view to finding a feasible solution.