THE GOBESHONA CONFERENCE FOR RESEARCH ON CLIMATE CHANGE IN BANGLADESH

07-11 January 2015

DHAKA, BANGLADESH

CONFERENCE PROCEEDINGS

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Organized by:

ICCCAD
International Centre for Climate Change and Development
at
Independent University, Bangladesh
in partnership with BCAS and IIED

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This publication is based upon the outcomes of the conference and has been compiled from the notes taken by the session chairs and respective rapporteurs. The publication is a summary from the organizers' point of view, and does not necessarily express the views of each individual participant. Presentations made during the plenary sessions of the conference are available at http://gobeshona.net/archives/event/gobeshona-conference-research-climate-change-bangladesh#sthash.IZDDO2f6.dpbs

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ABBREVIATIONS

BARI	Bangladesh Agricultural Research Institute
BAU	Bangladesh Agricultural University, Mymensingh
BCCSAP	Bangladesh Climate Change Strategy and Action Plan
BFD	Bangladesh Forestry Department
BOEP	Bangladesh Overseas Employment Policy
BRRI	Bangladesh Rice Research Institute
BUET	Bangladesh University of Engineering and Technology
CBA	Community Based Adaptation
CDMP	Comprehensive Disaster Management Programme
COP	Conference of Parties
DFID	Department for International Development
DU	Dhaka University
DUET	Dhaka University of Engineering and Technology
FAO	Food and Agricultural Organization
IUB	Independent University, Bangladesh
IPCC	Inter-governmental Panel on Climate Change
ICCCAD	International Centre for Climate Change and Development
ICDDRB	International Centre for Diarrhoeal Disease Research, Bangladesh
LDC	Least Development Countries
MOEF	Ministry of Environment & Forests
NAPA	National Adaptation Programme of Action
NSU	North South University
RAJUK	Rajdhani Unnayan Kartripakkha
REDD+	Reducing Emissions from Deforestation and Forest Degradation
RMMRU	Refugee and Migratory Movements Research Unit
SUST	Shahjalal University of Science and Technology
VSO	Voluntary Service Overseas
ULAB CSD	University of Liberal Arts Bangladesh Center for Sustainable Development

1. BACKGROUND

'Gobeshona' was launched in June 2014 as a knowledge platform for people and institutes doing research on climate change in Bangladesh to share their findings, ideas and to address the quality of related research produced in Bangladesh. Gobeshona aims to make research on climate change more effective in informing policy and practice. The initiative was developed through a series of discussions, hosted by the International Centre for Climate Change and Development (ICCCAD) at the Independent University, Bangladesh (IUB) and organizations from across sectors who now form the Gobeshona Steering Committee. The Gobeshona Steering Committee guides and governs the initiative and remains committed to the production and effective use of quality research on climate change in Bangladesh. Members of the Steering Committee include: BRAC, IUB ICCCAD, IIED, Practical Action, World Fish, Waste Concern, Islamic Relief Bangladesh, BRAC University, WaterAid, Centre for Climate Justice, ULAB CSD, NSU, DUET, BCAS, Shahjalal University, VSO, RAJUK, Wageningen UR, Christian Aid, Khan Foundation, icddr,b, and Government of Bangladesh.

The initiative includes: the Gobeshona web portal - www.gobeshona.net, monthly seminar series which has had impressive contributions and participation from this valuable and thriving community and an annual conference.

The first Gobeshona Conference for Research on Climate Change in Bangladesh was held at the Independent University, Bangladesh, from 8-11 January 2015. The conference was preceded by the first Gobeshona Young Researcher Workshop, on 7 January 2015. The workshop reflects the first in a series of activities intended to engage young researchers, and enhance the quality of the research they are undertaking.

The conference brought together practitioners, researchers, government and media to connect, share and provide critical reflections and discussion around topical research issues. From 8-10 January, individual thematic sessions, hosted by institutes conducting research on climate change in Bangladesh, updated participants on the current state of knowledge on a diverse range of interrelated topics. The Government of Bangladesh hosted the final day of the conference on 11 January 2015. This provided different departments of the Ministry of Environment and Forests with the opportunity to present their latest research. Each host took responsibility for the co-ordination of their session, enabling ownership and deep engagement in the conference. The conference was graced by the presence of a number of nationally and internationally renowned special guests, who gave their insight throughout a series of keynote presentations. Alongside this, an impressive range of researchers, from students to early career professionals and senior researchers gave presentations on their latest research findings. The conference is to be an annual event with the next one being held from 8-11 January 2016 at the Independent University, Bangladesh.

The next conference will build upon the strengths of the first conference, engaging researchers alongside policy makers, implementing agencies and support organisations. It will also aim to evaluate research and address policy needs and gaps to find effective ways to move forward in tackling climate change. This publication provides a summary of the proceedings of the Gobeshona Conference for Research on Climate Change in Bangladesh, 2015. It also provides food for thought for future research objectives and areas of focus for next year's conference and beyond.

2. PROGRAMME SUMMARY

DAY 1 – THURSDAY, 08 JANUARY 2015 - RESEARCH ON CLIMATE CHANGE IN BANGLADESH			
9:30-10:30	**INAUGURAL SESSION**		
10:30-11:00	TEA BREAK	**REGISTRATION** FOR THE PARTICIPANTS OF GOBESHONA CONFERENCE 2015	
11:00-13:00	PLENARY SESSION: **THE STATUS OF RESEARCH** Hosted by **ICCCAD**		
13:00-14:00	LUNCH		
14:00-15:30	PARALLEL SESSION: **LIVELIHOODS** Hosted by **Christian Aid** and **Islamic Relief, Bangladesh**	PARALLEL SESSION: **SAFE DRINKING WATER** Hosted by **WaterAid**	PARALLEL SESSION: **HEALTH** Hosted by **IUB**
15:30-16:00	TEA BREAK		
16:00-17:30	PLENARY SESSION: **LOCAL ADAPTATION PLANNING** Hosted by **BCAS**		
19:00-21:00	RECEPTION AND DINNER: **LAUNCH OF BD2050: Bangladesh Energy and Emissions Pathways Calculator** Hosted by **Cardiff University, UK** at Hotel ASCOTT Palace		
DAY 2 – FRIDAY, 09 JANUARY 2015 - RESEARCH ON CLIMATE CHANGE IN BANGLADESH			
9:00 – 9:30	**REGISTRATION**		
9:30-11:00	PLENARY SESSION: **MIGRATION** Hosted by **Refugee and Migratory Movements Research Unit (RMMRU)**		
11:00-11:30	TEA BREAK		
11:30-12:45	PARALLEL SESSION: **GENDER** Hosted by **Khan Foundation**	PARALLEL SESSION: **RENEWABLE ENERGY** Hosted by **IUB**	PARALLEL SESSION: **NATURAL RESOURCE MANAGEMENT** Hosted by **SUST**
12:45-14:15	LUNCH		
14:15-15:30	PARALLEL SESSION: **URBAN POVERTY** Hosted by **University of Manchester**	PARALLEL SESSION**: INTEGRATED COASTAL ZONE MANAGEMENT** Hosted by **ULAB**	PARALLEL SESSION: **CLIMATE CHANGE MODELLING** Hosted by **BUET**
15:30-16:00	TEA BREAK		
16:00-17:30	PLENARY SESSION: **UNDERSTANDING PEOPLE** Hosted by **BBC Media Action**		
DAY 3 - SATURDAY, 10 JANUARY 2015 - RESEARCH ON CLIMATE CHANGE IN BANGLADESH			
9:00 – 9:30	**REGISTRATION**		
9:30-11:00	PLENARY SESSION: **POLITICAL ECONOMY AND CLIMATE FINANCE** Hosted by **International Institute for Environment and Development (IIED)**		
11:00-11:30	TEA BREAK		
11:30-13:00	PARALLEL SESSION: **DISASTER RISK REDUCTION** Hosted by **CDMP**	PARALLEL SESSION: **ADAPTATION TECHNOLOGIES** Hosted by **Practical Action Bangladesh**	PARALLEL SESSION: **WASTE AND CLIMATE CHANGE** Hosted by **Waste Concern**
13:00-14:00	LUNCH		
14:00-15:30	PARALLEL SESSION: **NATIONAL ADAPTATION PLANNING** Hosted by **IIED**	PARALLEL SESSION: **URBANISATION AND MITIGATION** Hosted by **RAJUK**	PARALLEL SESSION: **LOSS AND DAMAGE** Hosted by **ICCCAD**
15:30-16:00	TEA BREAK		
16:00-17:30	PLENARY SESSION: **RESEARCH INTO POLICY** Hosted by **United Nations Development Programme (UNDP)**		
19:00-21:00	**RECEPTION AND DINNER** by **International Institute for Environment and Development (IIED)** at Palm View Restaurant & Green Point Café, Army Golf Club		
DAY 4 – SUNDAY, 11 JANUARY 2015 - REFLECTIONS FROM THE GoB			
9:00 – 9:30	**REGISTRATION**		
9:30 – 16:00	Technical Sessions Hosted by the Government of Bangladesh		
16:00–18:00	**CLOSING CEREMONY**		

3. SESSION SUMMARIES

Day 1 - Thursday, January 8, 2015

3.1 INAUGURAL SESSION

Chair: Dr. Ainun Nishat, Professor Emeritus, BRAC University, Bangladesh

Welcome:

- **Dr. Saleemul Huq,** Director, International Centre for Climate Change and Development (ICCCAD)
- **Dr. Atiq Rahman**, Executive Director, Bangladesh Centre for Advanced Studies (BCAS)
- **Mr. Rashed Chowdhury**, Chairman, Board of Trustees, Independent University, Bangladesh (IUB)
- **Professor M. Omar Rahman**, Vice Chancellor, Independent University, Bangladesh (IUB)

Special Guests:

- **H.E. Mrs. Sophie Aubert**, Ambassador, Embassy of France, Dhaka, Bangladesh
- **Mr. Abdullah Al Islam Jakob**, Honorable Deputy Minister, Ministry of Environment and Forest(MoEF), Government of the People's Republic of Bangladesh

Chief Guest:

- **Mr. Anisul Islam Mahmud**, Honorable Minister, Ministry of Water Resources, Government of the People's Republic of Bangladesh

The panel at the inaugural ceremony

The conference was inaugurated by Dr. Saleemul Huq. Dr. Huq described the activities of Gobeshona, which aims to improve the quality, dissemination, and use of research on climate change in Bangladesh. Dr. Atiq Rahman proceeded to introduce the intellectual framework and rationale for climate change research in Bangladesh. Research centers around three key pillars: science, policy, and people – it should facilitate the formulation of science-based policies for helping the people of Bangladesh and more research is necessary as climate change is a complex threat. It dictates a variety of interacting impacts including sea level rise, saltwater intrusion, increased cyclonic storm magnitudes, storm surge, riverbank erosion, floods, droughts and rainfall changes. All of these threaten food, energy, water, health and livelihood security, especially for the poor. There are four main approaches to climate change research and policy action: mitigation, adaptation, technology transfer and finance, all at local, regional, national and multi-national levels. The government has supported climate change research in all these sectors.

Mr. Rashed Chowdhury highlighted that Bangladesh is particularly vulnerable to climate change due to its low topography and the risk of submergence due to sea level rise. Nevertheless, a lack of public awareness exists among the educated elite in Bangladesh about the adverse impacts of climate change. Prof. M. Omar Rahman stated that due to vulnerability to climate change, Bangladesh should take ownership of the issue alongside a proactive stance in generating new information about the problem. To develop, Bangladesh must take a more sophisticated and nuanced approach to generate knowledge at a level of quality comparable to international standards.

Ambassador Sophie Aubert brought the discussion to the international level. There will be four challenges to address in COP21 in Paris this year: 1) drafting a legally binding agreement for all countries; 2) securing national commitments to decarbonize economies; 3) ensuring finance and technology are at the disposal of Least Developed Countries (LDCs) for meeting their mitigation agreement; and 4) promoting the role of global civil societies to force their governments to take action. Although COP20 in Lima enabled a step in the right direction, too many points were left unresolved. Meanwhile, the urgency for action unceasingly increases.

Honorable Deputy Minister Abdullah Al Islam Jakob explained that early action and proactive thinking have characterized government responses to climate change. The Government of Bangladesh will continually need information from researchers and practitioners. Meanwhile, the future generation of researchers must be trained and there must be mutual learning among NGOs, government groups, scientists and local communities. This conference represents a marked step towards these goals.

Chief Guest Mr. Anisul Islam Mahmud, Minister Water Resources giving his keynote address

Honorable Minister Anisul Islam Mahmud described the urgent need for adaptation measures in Bangladesh due to its dependence on water for agriculture and its exposure to cyclones and tidal surges. Bangladesh has managed to develop despite the country's constant struggle with nature. Thus with hard work and planning, the people of Bangladesh can be a role model for other developing countries. However, Bangladesh cannot deal with climate change entirely on its own. Many developed countries are slow to mitigate their own emissions and have promised finance for adaptation and mitigation that has not been fulfilled.

To conclude the session, the session Chair Dr. Ainun Nishat argued that, although academics in Bangladesh may not have published a substantial number of papers in the international peer reviewed literature the country has the capacity to contribute. The state of climate change and its potential impacts is still in its infancy. Thus, the adaptation requirements of human communities are still evolving and optimal strategies are still in development. Bangladesh's Climate Change Strategy and Action Plan emphasizes food security. New research continuously generates useful information. However, this new knowledge has not yet reached the farmers and other end users.

Prof Omar Rahman, VC of IUB delivering his speech at the inaugural ceremony

Participants at the inaugural ceremony

3.2 Thematic Session 1: THE STATUS OF CLIMATE CHANGE RESEARCH

Host: International Centre for Climate Change and Development (ICCCAD)

Dr. Saleemul Huq, Director, ICCCAD giving his keynote address

Keynote: Dr. Saleemul Huq, Director, International Centre for Climate Change and Development (ICCCAD), Bangladesh *The Status of Climate Change Research in Bangladesh: 3 Theses*

Dr. Saleemul Huq introduced the conference as a forum to spur discussion, networking and collaboration amongst the participants. His presentation proceeded with the assertion of three central theses. First, tackling climate change involves a process of learning by doing, and Bangladesh needs to be more effective in the learning process, not just the doing process. Bangladeshi research is experiencing a "citation gap" whereby three quarters of the lead authors of publications on climate change in Bangladesh are foreigners or Bangladeshis living abroad. There is a need to improve the quality of research by Bangladeshis within Bangladesh, so they may be published in international journals. Second, to be effective in this learning process we need high quality research, which must be shared with decision makers and knowledge users. We need to understand how to communicate research effectively to a wider audience beyond the scientific community. Bangladesh must transition from awareness of the problem to awareness and knowledge of the solution. Third, Gobeshona can establish a national mechanism for learning in Bangladesh. The annual nature of the conference will adopt a continuous and reciprocal learning-by-doing process. Learning is key to adaptation and we need to capacitate people to deal with the challenges of climate change. The Gobeshona online portal offers information about papers on climate change in Bangladesh and Gobeshona is also engaging in young researcher mentorship. Through Gobeshona, Bangladesh can share climate change knowledge not only South-to-South but South-to-North, becoming an important and cutting edge resource for global researchers and actors. Dr. Huq concluded his presentation by illuminating the relevance of Gobeshona to the international level, explaining that the next Gobeshona conference in January 2016 will provide a chance to reflect on the outcomes of the 2015 Conference of the Parties, to be held in Paris in December.

Further clarification on Gobeshona, its services and its aims were made via an open question and answer session. Some organizations are interested to learn, but are funded for doing, rather than learning. Gobeshona aims to find ways for effective collaboration between the doers and the learners. By making literature accessible and creating connections between learners and doers, the planning process for practical implementation projects may be improved. Gobeshona will not be invested in creating data facilities for young researchers. Instead, it will act as a portal to direct people to where existing data is available. The Gobeshona conference is different to the Community Based Adaptation (CBA) conferences as it targets primarily researchers and knowledge generators in an attempt to improve research and its dissemination. Gobeshona aims to communicate to a wider audience than academia, and aims to find different vehicles of communication for different audiences. This is all advocacy purpose research. Gobeshona is attempting to improve the quality of Bangladeshi research through its mentoring programme for young researchers. In the future, there may be an interactive question & answer function for student engagement with the online portal. There may also be a Gobeshona award for high quality research.

3.3 Thematic Session 2: CLIMATE CHANGE AND LIVELIHOODS

Hosts: Christian Aid and Islamic Relief, Bangladesh

The panel discussing livelihoods

Chair: Mr. Shabel Firuz, Country Director, Islamic Relief, Bangladesh

Moderator: Mr.Shakeb Nabi, Country Director, Christian Aid, Bangladesh

Presenters:

- **Dr. Mahbuba Nasreen**, Director and Professor, Institute of Disaster Management and Vulnerability Studies, Dhaka University, Effectiveness of "Resilient Livelihood Framework" (RLF) of Christian Aid
- **Dr. Abu M. Ekramul Ahsan**, Former Executive Chairman, Bangladesh Agricultural Research Council (BARC), On Farm and Off Farm Resilient Livelihood – Experience from Islamic Relief Activities in Coastal Belt and Haor Area of Bangladesh
- **Dr. A.S.M. Golam Hafeez**, Associate Professor, Faculty of Agricultural Economics and Rural Sociology, Bangladesh Agricultural University, Climate Change and Wheat Production in Drought Prone Areas of Bangladesh – A Technical Efficiency Analysis

The session titled 'Climate Change and Livelihoods' was co-hosted by Christian Aid and Islamic Relief, Bangladesh. It was chaired by Mr. Shabel Firuz, Country Director of Islamic Relief, Bangladesh and moderated by Mr. Shakeb Nabi, Country Director of Christian Aid in Bangladesh. A total of 3 presentations were delivered at this session.

Dr. Mahbuba Nasreen, Director and Professor of the Institute of Disaster Management and Vulnerability Studies at Dhaka University gave the first presentation, focusing on the 'Effectiveness of the Resilient Framework (RLF)' that was developed by Christian Aid). The study aimed to understand how the RLF contributes to resilient livelihoods in communities in areas like Sunamganj (Haor ecosystems), Gaibandha (riverine ecology) and Dacope (coastal and cyclone prone areas) in Bangladesh. It was based on five pillars: profitability, risk and resource management, adaptability, sustainability and health. The research revealed that because of climate change, traditional livelihood practices had to be altered in many areas. There have been shifts from agriculture to crab 'fattening', sheep and duck rearing, vegetable gardening and the production of vermicompost. Most of these activities were found to be profitable ventures. People are also reducing the risks of climate exposure through, for example, rainwater harvesting, planting flood and saline tolerant rice varieties, and creating food banks. These alternative livelihood strategies and adaptation techniques are fairly sustainable. Neighboring villages replicate successful models and have provided a 'voice' to the poor and landless.

Dr. Abu M. Ekramul Ahsan, Former Executive Chairman of the Bangladesh Agricultural Research Council (BARC), shared his research on Disaster Resilient Livelihoods, a study which was undertaken by Islamic Relief, Bangladesh under the supervision of Dr. Ahsan. The research was based on the Climate Adaptive Livelihood Options (CALO) framework and carried out in areas of three selected coastal districts, namely Patuakhali, Khulna and Satkhira, using both qualitative and quantitative approaches. It covered various livelihood aspects such as infrastructures, essential services delivery, pre and post-harvest technologies, market accessibility, profits and adaptability, health and other

social dimensions. The main objective of the study was to identify physical and climatic elements for consideration in the planning of appropriate and effective livelihood options. The study showed that the universities and local Union Parishads in the areas investigated were important institutions. Similarly, the activities of the Comprehensive Disaster Management Programme (CDMP) and the Department of Agricultural Extension of the Government were important in facilitating adaptation. The study revealed that disaster resilient infrastructure in coastal areas is important for reducing people's vulnerability and, as such, this type of infrastructure should be developed. Roadside plantation of indigenous varieties of trees by school children as well as pitcher irrigation under drought like conditions was noted as some successful initiatives.

Dr. S. M. Golam Hafeez, Associate Professor of the Faculty of Agricultural Economics and Rural Sociology, Bangladesh Agricultural University gave the final presentation, on climate change and wheat production. He explained that this study was important because of the vast impacts of climate change on agriculture and the fact wheat is the second most important crop in Bangladesh. Also, as the land area available for cropping and agriculture cannot be horizontally expanded anymore, it is important that cropping systems are efficient. The research was based on primary data, including interviews with farmers, from drought prone areas of Thakurgaon in north of Bangladesh. The years 2006 and 2007 were recognized as drought-free and drought-affected years, respectively. The major finding was that wheat efficiency had reduced by 17.4 per cent because of drought. Productivity and yield were considerably higher for the drought-free year, although costs were similar. Along with that, technical efficiency is higher for larger-scale farmers with more experience. There is scope for irrigation and the use of pesticides in drought-affected years, but costs will be higher.

The discussion session involved questions and answers from the floor to the presenters and the moderator. Migration from rural to urban areas because of the lack of livelihood opportunities was attributed to changes in climate patterns. Crab fattening is now a part of aquaculture in Bangladesh, especially as it is environmentally sustainable and adaptive to changing climate. It was highlighted that livelihood frameworks developed by various agencies can complement each other but that long-term research is needed to provide more concrete evidence showing links between climate and livelihoods.

3.4 Thematic Session 3: CLIMATE CHANGE IMPACT ON SAFE DRINKING WATER

Host: Water Aid

Chair: Dr. Khairul Islam, Country Representative, Water Aid Bangladesh

Presenters:

- **Ms. Umme Tania Sultan**, Program Officer - Climate Change, WaterAid Bangladesh, Drinking Water Consumption Practices Reflecting Vulnerability in South-west Coastal Area of Bangladesh
- **Anwar Zahid**, Deputy Director, Groundwater Hydrology, Bangladesh Water Development Board, Geochemical Modeling of Saltwater Intrusion at the Coastal Aquifers of the Bengal Basin, Bangladesh
- **Md. Reaz Uddin Khan**, Lecturer, Center for Climate Change and Environmental Research, BRAC University, Reversing Gender Role for Drinking Water Collection in the Coastal Areas of Bangladesh

Dr. Khairul Islam chairing the session on Climate Change Impact on Safe Drinking Water

- **Md. Ali Imam**, Research Investigator, Centre for Population and Urbanization and Climate Change (CPUCC), International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B), Scarcity to Solution- Perceived Reasons of Safe Water Scarcity and Coping Responses of Local People in a Coastal Village of Bangladesh

The chair opened the session, explaining the impact of climate change on the availability of safe drinking water in coastal regions of Bangladesh. Following this, Umme Tania Sultana, Program Officer for Climate Change at WaterAid Bangladesh, presented her study on how drinking water practices reflect vulnerability in the southwest coastal areas of Bangladesh. Coastal groundwater has high levels of salinity and arsenic. This research in Khluna district showed that people travelled large distances to find safe drinking water. Further, it highlighted the correlation between water crisis peaks and intestinal disease peaks. Daily water intake by different genders was also analysed, indicating that consumption of water was lower in the coastal regions that the tropical belt and females consumed less than males. This could be explained by different gender roles and physiologies but further evidence is needed to establish these facts.

Next, Anwar Zahid, Deputy Director of Ground Water Hydrology, Bangladesh Water Development Board, presented a study on the geochemical modelling of salt water intrusion in the coastal aquifers of the Bengal Basin. Coastal aquifers have been analysed for the sedimentology, lithology, mineralogy and chemistry of the water and sediments. High levels of salinity and arsenic levels were recorded in 19 districts of the coastal region. As 80 per cent of groundwater is used for irrigation, appropriate water management must ensure that water from the deeper aquifers is preserved for drinking water. At the household level, artificial recharge technologies have been used to conserve monsoon waters. These have been tested by researchers at the University of Dhaka and, as a successful adaptation technology, their use has been scaled up.

Md Reaz Khan, lecturer from BRAC University, explored how reversing gender roles in the collection and management of water might improve access to safe drinking water. Around 30 million people still lack access to safe water in Bangladesh. Conventionally in rural areas, women and children collect water for their families. Water censuses showed that 96 per cent of those surveyed do not have access to safe drinking water and 60 per cent travel over half a kilometer to collect water. Greater distances appear to be affecting gender roles. In addition, the time of day and religious beliefs have an effect. Questions were raised, which Dr. Khairul Islam responded to by pointing out that some natural hazard-affected areas undergoing rehabilitation are seeing lifestyle and livelihood changes impacting roles within families.

Lastly, Md. Ali Imam discussed the importance of local knowledge and local perception in finding solutions for communities along the coastal regions of Bangladesh. Perceived changes in the environment over the last few decades have linked the impact of climate change to the scarcity of water. Mr. Imam highlighted the importance of local perception and stated that local knowledge improves productivity of changes. While local perceptions are often correct, it was argued by Mr. Anwar Zahid that physiographic and scientific information is needed to ensure efficiency in adaptive mitigations. Dr. Khairul Islam closed the session by saying that citizens in rural areas ought to have the same standard of living as those in urban areas. This will require budgetary change since, currently, 70 per cent of the government's water and sanitation budget is allocated for urban areas.

3.5 Thematic Session 4: CLIMATE CHANGE AND HEALTH IN BANGLADESH

Host: Independent University, Bangladesh

Chair: Professor M. Omar Rahman, Vice Chancellor, Independent University, Bangladesh (IUB) and Dean of the School of Public Health, IUB

Discussant: Dr. Peter Kim Streatfield, Former Director, Centre for Population, Urbanisation and Climate Change and Head, Health and Demographic Surveillance Unit, International Centre for Diarrhoeal Disease, Bangladesh (ICDDR, B)

Dr. Peter Kim Streatfield discussing Climate Change and Health in Bangladesh

Presenters:

- **Muhammad Abdur Rahaman Rana**, Climate Change Impact & Response Professional, ADAMS, Khulna, Bangladesh & Director, Climate Change Adaptation, Mitigation Experiment & Training (CAMET) Park, Noakhali, Bangladesh, Impact of Salinity on Women's Reproductive Health in Saline Prone Rampal Upazila of Bagerhat, Bangladesh
- **Abu-Hena Mostofa Kamal,** MSS, Department of Sociology, Jagannath University, Bangladesh, Effectiveness of Institutional Response to Ensure Women's Sexual and Reproductive Health During Flood
- **Tahera Akter,** Senior Research Associate, Research and Evaluation Division, BRAC, Sleep Disturbances Among the Adults Living in Disaster Prone Areas in Bangladesh
- **Mofizur Rahman**, Research Investigator, Centre for Population, Urbanisation and Climate Change, International Centre for Diarrhoeal Disease, Bangladesh (ICDDR,B), Spatial Distribution of Salinity in Drinking Water and Associated Hypertension Prevalence in Coastal Bangladesh

The session opened with a short address from Professor Omar Rahman, who emphasised the importance of quality, evidence-based research on climate change and health. In his presentation, Mr. Rana hypothesised a correlation between salinity and health complications. Mr. Kamal explained that during floods, women have limited access to formal service providers and rely on community level healers and religious leaders. Ms. Akter stated that people living in disaster-prone areas are more likely to experience sleep disturbances, which also depend on age, gender and income. Mr. Rahman's research concluded a strong association between salinity and the prevalence of hypertension in coastal areas of Bangladesh. The prevalence rates recorded were lower than the rates found in the 2011 Bangladesh Demographic and Health Survey (BDHS).

Dr. Streatfield opened discussion with some constructive comments on the presentations. He raised concerns about comparing cross-sectional survey data with longitudinal time series data, about small sample sizes and the lack of control groups. He stated the need to consider the other variables that affect health, access to services and sleep deprivation, including social and cultural attitudes, lack of education, physical location of study participants, poverty and gender inequality. Similarly, Professor Rahman noted that although these were interesting and important topics, there were some problems in the methodology of the research. For example, he highlighted a lack of specificity, mixing and matching of longitudinal and cross sectional data, weak evidence bases and the confounding of

variables. Professor Rahman noted the trend in peer-reviewed journals towards research that uses longitudinal, multivariate and mixed method approaches, as opposed to cross-sectional and bivariate quantitative analyses. He emphasised the importance of linking conclusions to the data and questions asked. He also suggested use of theoretical frameworks to explain health outcomes, and control for other determinants, such as age and gender. Most importantly, the research should tell a story and argument throughout. These reflections were followed by comments from the audience. Dr. Joanne Jordan suggested that the term 'disaster' is highly heterogeneous and should be disaggregated when associated with health outcomes. Another participant asked whether quantitative research is more desirable than qualitative. Professor Rahman stated that the methodological choice depends on the types of questions asked and the levels of specificity required and that these two approaches are mutually beneficial in research on climate change and health.

3.6 Thematic Session 5: LOCAL ADAPTATION PLANNING

Host: Bangladesh Centre for Advanced studies

Chair: Dr. Atiq Rahman, Executive Director, Bangladesh Centre for Advanced Studies (BCAS)

Keynote: Mr. Mozaharul Alam, Regional Climate Change Coordinator, United Nations Environment Programme, Bangkok, Thailand. The Importance of Local Adaptation Planning.

Presenters:

- **Md. Shams Uddin**, Manager of Landscape Planning, USAID's Climate Resilient Ecosystems and Livelihoods (CREL) Project and and Shekhar Kanti Ray, PRA & Local Planning Specialist, CREL-BCAS, Learning and Challenges of Local Adaptation Planning in Forest Protected Areas of Bangladesh
- **Md. Gulam Kibria**, South Asian Water (SAWA) Fellow, Institute of Water and Flood Management (IWFM), Bangladesh University of Engineering and Technology (BUET), Local Adaptation Practices in Response to a Super Cyclone Aila in the Coastal Regions of Bangladesh

Panel:

- **Professor Mahbuba Nasreen**, Director, Institute of Disaster and Management and Vulnerability Studies, Dhaka University
- **Dr. Paramesh Nandy**, Project Manager, Coastal Afforestation Project, GEF-UNDP, Dhaka
- **Dr. Ashanuddin Ahmed**, Executive Director, Centre for Global Change (CGC), Dhaka

The keynote address from Mr. Mozaharul Alam identified the key issues inherent to local adaptation planning: identification of the local level and corresponding scale, the purpose and specific importance of the planning process and identification of decision makers and stakeholders. The local level can be defined as any level below national, thus it can indicate a very specific geographical area, administrative unit or ecosystem. While national level decision makers are important for adaptation planning, implementation occurs at subnational and local levels. Adaptation planning is complex since it requires consideration of societal goals, natural systems, and institutional and economic settings. Bangladesh's National Adaptation Plan of Action (NAPA) commits to planning at the national level and actions at the local level for vulnerable communities. There are four key benefits to a local level approach: 1) development levels, and consequently adaptive capacities, are best observed at local level; 2) climatic changes are best observed at the local level, for example hotter days, erratic rainfall, other indicators; 3) vulnerability and adaptive capacity are very context specific to community and ecosystem; 4) adaptation action is best observed at the local level, for example soil management,

water management, crop diversification. Maladaptive strategies must be avoided. A key challenge is to integrate local level planning into regional strategies and the complexity of the problem calls for dynamic solutions. Such solutions require political commitment and coordination as well as prioritization and funding.

Mr. Md. Shams Uddin and Mr. Shekhar Ray described the CREL multiagency effort funded by USAID and other partners. Its main objective is to increase resilience and livelihoods in protected areas and forest dependent communities in Cox's Bazar, Chittagong, the Sundarbans and Sylhet. Actions include incorporating climate change into forest protected area management and local level adaptation plans. Vulnerability assessments and adaptation strategies are implemented according to a participatory approach, with information shared among all stakeholders. However, challenges include lack of capacity, resources and coordination among agencies and institutions involved in local planning.

Mr. Md. Gulam Kibria reviewed the consequences and responses to cyclones Sidr and Aila in the coastal regions of Bangladesh. High population density and flat terrain make Bangladesh more vulnerable to cyclones. Aila generated storm surges that higher than the coastal embankments, impacting 2.3 million people in 12 coastal districts. The surge caused loss of livestock, crop damage, shrimp gher damage and waterlogging. Their research found that coastal communities are now shifting from shrimp farming to agricultural crops because shrimp farms required breaks in the polders to let in saline water, thereby increasing vulnerability. In the Rabi season farmers are planting non-rice crops, which are more saline tolerant and less labor intensive, thereby improving food security.

These discussions engendered a variety of responses from the discussant panel. Dr. Paramesh Nandy highlighted that plantation projects have transformed vulnerable coastal areas by requiring improved farmer institutions. Dr. Dwijen Mallick commented that actions occurring on the ground are not commensurate with the NAPA's ambition. Also, adaptation plans should integrate formal scientific knowledge with the local experiential knowledge of vulnerable communities. Professor Mahbuba Nasreen stressed the importance of both national and local planning as well as the integration of bottom-up and top-down approaches. Finally, Dr. Atiq Rahman concluded the session by highlighting the need for adaptation funds to go the poorest and most vulnerable. To respond to specific vulnerabilities defined by the community itself, local level participation and increased accountability and transparency in local government are vital.

3.7 Thematic Session 6: MIGRATION IN THE CONTEXT OF CLIMATE CHANGE: REGIONAL EXPERIENCES AND POLICY SHORTCOMINGS

Host: Refugee and Migratory Movements Research Unit (RMMRU)

Chair: Dr. Saleemul Huq, Director, International Centre for Climate Change and Development (ICCCAD)

Keynote: Dr. Tasneem Siddiqui, Chair, Refugee and Migratory Movements Research Unit (RMMRU), University of Dhaka, Adaptation to Climate Change: Migration, the Missing Link

Presenters:

- **Mr. A. K. M. Fazlur Rahman**, Manager-Research, SHIREE, Save the Children. Seasonal migration and how it affects households' trajectory out of extreme poverty? – Evidence from SHIREE Programme
- **Mr. Motasim Billah**, Research fellow, RMMRU, Climate Change and Migration in Chittagong Hill Tracts
- **Dr. Mohammad Jalal Uddin Sikder**, Assistant Professor, University of Liberal Arts (ULAB), Dhaka, and **Mr. Rashed Alam Bhuiya**, Lecturer, Department of Political Science, University of Dhaka, Adaptation Strategies of Poor Urban Migrants in the Context of Climate Change: A Case Study of Informal Settlements in Natore, Sirajganj and Rajshahi

Migration panel and participants

The session began with a keynote presentation from Dr. Tasneem Siddiqui, Chair of the Refugee and Migratory Movements Research Unit (RMMRU) at Dhaka University. She explained that it is difficult to distinguish the role of climate change in migration as there are other social, economic and political factors that drive migration, with economic factors being most prevalent. Most policies do not accommodate migration into their framework and fail to make use of the potential of migrants. The Government of Bangladesh is yet to develop any comprehensive policy to deal with internal migration. Instead of thinking about megacity development, the government and engineers need to think about district level urban growth - linking peri-urban growth with internal migration. Without urbanisation, growth and development do not happen. Decentralized development via district level cities should be encouraged by appropriate policy. Migration then needs to be combined with skills development opportunities in order to improve migrants' lives.

The second presentation was given by A.K.M. Fazlur Rahman, Manager of Research for SHIREE at Save The Children, Bangladesh. The objective of the study was to explore the factors impacting seasonal migration and the impact of seasonal migration on the extreme poor households in southwestern Bangladesh. Mr. Rahman's presentation gave the characteristics of seasonal migration in the southwest, the impact of seasonal migration on women and the factors that contribute to successful and unsuccessful migration. Seasonal migration is mostly considered as a temporary solution to reduced livelihood opportunities, but little evidence is found about the long-term positive impact of this phenomenon on extreme poor households.

Mr. Motasim Billah, Research Fellow at RMMRU presented on Climate Change and Migration in the Chittagong Hill Tracts (CHT). Changes in rainfall pattern and increased temperatures are causing altered livelihood patterns among people living in the CHT. Many are moving away from Jhum (slash and burn) cultivation, instead migrating to urban areas to work in the garment industry, in households and as laborers. The impact of climate change upon CHT is absent in policies such as NAPA, BCCSAP, CDMP, NPDM, BOEP and 6th Five Year Plan and these policy gaps need to be addressed in order to accommodate migration into the overall adaptation action plan.

Dr. Jalal Uddin Sikder and Mr. Rashed Alam Bhuiya presented on "Adaptation Strategies of Poor Urban Migrants in the Context of Climate Change: a case study of informal settlements in Natore, Sirajgang and Rajshahi". The presentation highlighted the migration trajectory of slum dwellers and their livelihood typologies. Policy recommendations highlighted the important role CSOs play in articulating and demanding for policy reforms.

The session chair Dr. Saleemul Huq, concluded by explaining that migration can be an example of transformational adaptation. Migration is often viewed as a problem, however it can contribute to a solution. We need to think about migration as a long-term strategy, along with urbanisation, and commit to enabling people to come from rural to urban areas, other than Dhaka.

3.8 Thematic Session 7: GENDER AND CLIMATE CHANGE

Host: Khan Foundation

Chair: Advocate Rokhsana Khondker, Executive Director, Khan Foundation, Solar Operated Pond Sand Filter in Accessing Pure Water: Accelerating Women Empowerment Towards Adaptation to Climate Change

Presenters:

- **Uzzal Karmaker**, Project Coordinator, Shushilan, Adaptation to Climate Change
- **Kazi Maruful Islam**, PhD, Associate Professor, University of Dhaka, Climate Change and Reproductive Health in Bangladesh: Coherence and Contradiction in National Policies
- **Abu-Hena Mostof Kamal**, MSS, Department of Sociology, Jagannath University, Dhaka, Bangladesh, Engendering Disaster: A Sociological Study on Aila Affected Area of a Coastal District of Bangladesh
- **Sajal Roy**, Lecturer, Women and Gender Studies, Begum Rokeya University, Rangpur, Mapping out Gender Relations of the Cyclone Survivors' of the Sundarbans Forest Society of Bangladesh

The Gender and Climate Change session featured presentations that explored the relationships between gender and issues ranging from climate policy to disaster risk reduction. Mr. Uzzal Karmaker began by presenting the findings of an assessment he conducted of Shushilan, a project supported by Oxfam, which is designed to supply fresh water in selected rural communities through the use of Solar Operated Pond Sand Filters (SOPSF). Mr. Karmaker found that the SOPSF project not only improved communities' access to fresh water, but also had the effect of empowering some women by reducing

the amount of time required for them to collect fresh water. With this additional free time, women were able to undertake income-generating activities, like duck rearing and tailoring, which increased their decision-making authority in their households.

Advocate Khondker and the Gender and Climate Change panel

Dr. Kazi Maruful Islam, an Associate Professor at Dhaka University, presented the findings of his research on the coherence of national policies dealing with climate change and reproductive health. His research sought to answer the questions: Have climate issues been considered in non-climate change policies? Have reproductive health issues been included in non-health policies? He argued that a high degree of coherence among relevant policies enhances the likelihood of their proper implementation, but found that the current policies on climate change and reproductive health lack a high degree of coherence. In his view, the incoherence between these policies has been caused by a lack of participation and coordination among national-level ministries and the instability of national policy frameworks. The way forward, according to Dr. Islam, should involve increasing: (a) awareness among national level political actors, (b) participation among stakeholders, (c) inter-ministerial coordination, and (d) the generation of evidence-based policy.

The final presentation, delivered by Abu-Hena Kamal, a Senior Research Assistant at the International Centre for Diarrhoeal Disease Bangladesh, examined the vulnerability of women living in Bangladesh's coastal region after cyclone Aila. Mr. Kamal noted that women are particularly vulnerable to the effects of natural disasters and suggested that vulnerability is related to women's education, income and the frequency with which they experience natural disasters. Mr. Kamal found the root causes of women's post-disaster vulnerability to be a lack of knowledge and resources, the politicization of resource distribution, inadequate relief management, and a lack of mobility. Mr. Kamal also noted that women lack access to key services in the wake of natural disasters and are exposed to risks, including sexual health risks and domestic violence.

Questions were raised about a number of issues, ranging from the management of pond sand filters to the methods used to conduct a policy analysis. One audience member noted that gender is an active category and that, while the presenters seemed to consider women primarily as victims, women play an active role in shaping their lives. Dr. Islam expressed his agreement with this point, which was reiterated by Ms. Khondker in her closing remarks. Ms. Khondker also noted the importance of coordination among national-level organizations and the need for practitioners to focus on gender issues in their work.

3.9 Thematic Session 8: RENEWABLE ENERGY SOURCES FOR CLIMATE CHANGE MITIGATION

Host: Indepdendent University, Bangladesh

Chair: Dr. Abdur Razzak, Associate Professor, Department of Electrical & Electronic
Engineering, Independent University, Bangladesh (IUB)

Dr. Razzak chairing session on Renewable Energy

Presenters:

- **Mr. Jawad Hasan,** Research Assistant, Independent University, Bangladesh (IUB), Design of a Small Wind Turbine Considering the Average Wind Speed in the Coastal Regions of Bangladesh
- **Mr. Mohammad Rejwan Uddin,** Research Assistant, Independent University, Bangladesh (IUB), Electrical Power Generation in a Fishing Boat by Using Ocean Wave and Design and Implementation of a Wind Power Cultivation System in the Coastal Area of Bangladesh
- **Mr. Khan Sharif Raihan**, CEO, GRENCON, Present Scenario of Solar Powered Irrigation Systems in Bangladesh
- **Mr. Shah Zulfiqar Haider,** Director (EE & C), Sustainable & Renewable Energy Development Authority, Power Division, Ministry of Power, Energy and Mineral Resources, GoB, Prospect of Sustainable Energy in Bangladesh

The session chair, Dr. Abdur Razzak, introduced the presenters and reiterated the role of renewable energy in improving the quality of our lives.

Following this, Mr. Hassan presented his design of the blade of a small wind turbine. The design is based upon the average wind speed in the coastal region of Bangladesh. Wind energy is clean, renewable, economical, compatible with other land uses, good for remote and rural communities and is gaining popularity worldwide. As such, small wind turbines can be a power solution for Bangladesh. The blade Mr. Hassan designed and tested causes minimum drag and maximum lift, making it more effective. The goal of his project is to replace traditional coal, HFO and HSD with renewable power sources to mitigate climate change. Mr. Hassan explained that the turbine he is working with is fully portable enabling transportation in the event of a cyclone warning and maintenance requirements are minimal.

Mr. Mohammad Rejwan Uddin, presented on electrical power generation using ocean waves. Just below sea surface the average wave-power level is typically five times denser than the wind energy transport 20 meters above the water, and 10-30 times denser than the average solar energy intensity. Ocean waves are a valuable energy resource, reducing the burden of energy on gas and providing the potential to reach off-grid areas. The project is aimed at fishermen who need energy to store the catch in a refrigerated unit on the boat. Mr. Uddin presented a wave energy calculation and gave a cost estimate of TK 244,650 per boat. Participants questioned the cost-effectiveness and generating power when the boat is standing still. Based on a five-year project with the current fuel price, this technology is cost effective. This is a new and unique project, not yet implemented anywhere in the world.

Mr. Khan Sharif Raihan presented on solar powered irrigation systems in Bangladesh. There are almost 1.61 million irrigation pumps in Bangladesh, of which 1.34 million are diesel-run. Diesel is expensive and difficult to deliver in remote areas so the government is looking for sustainable alternative sources for powering remote areas. Solar irrigation pumps in Bangladesh are a viable option as prices are

Q & A after the session

continuously reducing. A typical 4kw solar irrigation system has a 25-year lifespan, and can save 144 tons of coal and reduce CO_2 emission of 60 tons. If the technology is locally developed and managed, it will become more cost competitive. In addition, the government provides 40 per cent subsidies and soft loans for solar irrigation pumps. The government is planning to install 18,750 solar pumps by 2017, but only 350 solar pumps have been installed so far.

Mr. Shah Zulfiqar Haider presented, explaining that the economic cost of not providing electricity is much greater than the cost of providing electricity. If an energy system is efficient, it can be sustainable. Bangladesh's Vision 2021 is to ensure energy security with sustainability for all 160+ million people of Bangladesh. Renewable Energy Policy visions for the country include: 5 per cent of total power from renewable sources by 2015 and 10 per cent of total power from renewable sources by 2020. Mr. Haider explained that the biggest barrier to renewable energy is widespread education on how to handle the systems, because the engineers and service people are mainly based in Dhaka. Examples of energy efficiency and renewable energy highlighted in his presentation include improved cook stoves, solar home systems, PICO/PV. A participant asked for insight into Bangladesh's electricity trade with neighbouring countries to which Mr. Haider replied that Bangladesh has a successful track reord of electricity imports from neighboring countries.

Finally, Mr. Mohammad Rejwan Uddin gave his second presentation, which drew on the potential of harnessing wind power in Bangladesh with specific focus on vertical axis wind turbine (VAWT), its design, fabrication and calculations. VAWT is a feasible option for power generation for the coastal region in Bangladesh. The cost of generating power by wind is about half the cost of generating an equivalent power from solar energy. A VAWT can be located nearer the ground, making it easier to maintain the moving parts. Moreover, they have lower wind startup speeds than horizontal axis wind turbines and are quieter and much less prone to being destroyed during natural calamities.

3.10 Thematic Session 9: NATURAL RESOURCE MANAGEMENT AT THE CROSS-ROADS: FACING THE CHALLENGES OF CLIMATE CHANGE

Host: Shahjalal University of Science and Technology (SUST)

Chair: Dr. A. Z. M. Manzoor Rashid, Professor, Department of Forestry and Environmental Science, Shahjalal University of Science and Technology (SUST)

Presenters:

- **Dr. Mizanur Rahman**, Assistant Professor, Department of Forestry and Environmental Science, Shahjalal University of Science and Technology, Long-term Growth Decline in Toona Ciliata is likely Driven by Temperature and Cloud Cover and not by Rainfall: Evidence from a tropical moist forest of Bangladesh
- **Anika Nabila**, Student, North South University, Impact of Climate Change on Fisheries in Jessore Region, Bangladesh
- **Md. Shariful Islam,** Scientific Officer, Bangladesh Fisheries Research Institute (BFRI), Water Footprint of Dairy Milk & Meat in Bangladesh
- **Asif Raihan**, Student, Institute of Forestry and Environmental Sciences, University of Chittagong, Trade-offs Between REDD+ and Forest Dependency in Khagrachari Hill District, Bangladesh
- **Md. Emdad Hossain**, Project Leader, Climate Change Agriculture and Food Security, Habitat

Modification in Seasonally Flooded Rice-field Fisheries in Bangladesh

This session focused on various aspects of natural resource management—specifically fisheries, agriculture, and forestry—and their likelihood of being impacted by climate change. Collectively, these studies suggested that climate change, as well as mitigation and adaptation strategies to address it, will have multifaceted consequences for the natural resources of Bangladesh and the people who depend on them for their livelihoods.

Presentations on natural resource management

Mr. Md. Emdad Hossain presented his experimental work in enhancing the diversity and yield of rice field fisheries during monsoon floods. Cement tube wells installed in rice fields could provide stable ecological conditions throughout the monsoon period for fish aquaculture, protecting against rainfall volatility. This style of fish aquaculture would allow farmers to improve food security, income, and nutrition. Participants were concerned with whether sedimentation would limit the effectiveness of this technology, as well as the optimal standard size and number of rings per unit area. These are currently areas of further research.

Mr. Md. Shariful Islam, also studying fisheries, examined how temperature and photoperiod cause physiological changes in several commercially important fish species. The study revealed that increases in temperature cause changes in both coloration and reproductive cycles. Consequently, in Jessore, fishermen are trying to adapt to these changes by, for example, modifying breeding schedules, with the guidance from fisheries experts. Participants asked about river management projects and the effect of hydrological changes to fish morphology and reproduction. Mr. Islam explained that the focus on the study was on temperature and photoperiod, hence tidal river management was not considered. He also commented that river pollution from the industrial sector has caused riverine fisheries to decline, forcing fishermen to engage in migration and alternative livelihood strategies in response.

Mr. Rofiqul Islam, used tree ring analysis to show that cloud cover and temperature changes are likely resulting in the long-term growth decline in red cedar (Toona Ciliata) at Juri tropical moist forest reserve. The absence of younger trees also indicated the unviability of the population in Juri reserve.

In another presentation, Ms. Anika Nabila reviewed the issue of water scarcity in Bangladesh, in relationship to water usage in food production. She finds that dairy and meat production and consumption play an important role in the use of scarce freshwater resources. Audience members suggested avenues of further research, such as evaluations of efficiency of water usage via comparisons with beef and dairy production in other countries. Such a comparison could help Bangladesh develop methods of reducing water pollution and depletion from meat and milk production. Also, Bangladesh is preparing to introduce REDD+ pilot projects. To understand the complex tradeoffs between forest use and conservation by REDD+, Mr. Asif Raihan conducted a study in the Chittagong Hill Tracts. While forest dependent people could reduce forest materials extraction via alternative livelihood interventions and alternative cooking practices, they are less willing to forego the use of forests for medicines, fuelwood, water, vegetables, and cultural/religious purposes. This study revealed that religious rituals, in particular, could not be replaced with monetary compensation. Cash compensation could, however, be a feasible option to reduce forest dependency for livelihoods by arranging alternative livelihoods such as small-scale enterprises.

To conclude the session, the Chair, Dr. A. Z. M. Manzoor Rashid commented that Bangladesh needs community based approaches that integrate science and policy to enhance adaptation and livelihood resilience for the people dependent on natural resources. To implement effective adaptation and mitigation strategies to combat the effect of climate change on natural resource management, improved governance and accountability are also vital.

3.11 Thematic Session 10: URBAN POVERTY AND CLIMATE CHANGE

MANCHESTER 1824 The University of Manchester **Host: University of Manchester**

Chair: Dr. Joanne Jordan, Lecturer, University of Manchester, UK

Presenters:

- **Md Anjum Islam,** Student, Khulna University, Housing Condition of the Climate Migrants in Khulna City
- **Sally Cawood**, Co-Editor and PhD Researcher, Brooks World Poverty Institute, The University of Manchester, UK, The Lived Experience of Climate Change Impacts and Adaptation in Low-Income Settlements
- **Remeen Firoz**, Consultant, International Institute for Environment and Development (IIED), Internal Migration as a Radical Adaptation Strategy in Bangladesh
- **Bipasha Dutta**, Environmental Consultant, World Fish, Does Urban Governance in Bangladesh Consider Climate Induced Migration and its Aftermath?

In the first presentation, Mr. Islam argued that when climate migrants arrive in Rupsha, they find it difficult to access low-cost housing and financial support. Following this, Dr. Joanne Jordan suggested that clarification of 'climate migrant' is required, to differentiate between climate stresses, and take into account non-climatic drivers. Dr. Jordan also highlighted the importance of time scales of migration, i.e. whether migrants arrived before or after cyclone events.

Ms. Cawood reflected upon examples from the ClimUrb Project (2010-2013) and preliminary conclusions from upcoming book 'Urban Poverty and Climate Change: Life in the Slums of Africa, Asia and Latin America' (Roy, M. Hulme, D. Hordijk, M and Cawood, S (eds) (forthcoming, 2015)). Ms. Cawood outlined how the rising numbers of urban poor are vulnerable to climate change related hazards such as increased heat, water logging, flooding and fires, but deploy a range of adaptive strategies. The urban poor remain largely neglected in national climate change policies and programs.

In the third presentation, Ms. Firoz stated that what she observed was not necessarily climate migration, but rather forced, unplanned, permanent displacement. Ms. Firoz argued for a shift in mindset, to regard climate migrants not as a burden, but as engines to urban growth and development. She argued for a rights-based approach to equip climate migrants with choices. She directed participants to an IIED video-blog about the research (http://vimeo.com/113210378).

Finally, Ms. Dutta outlined formal and informal institutions and policy documents relative to Climate Induced Migrants (CIMs) and slum settlements. Ms. Dutta argued that, out of the policies analysed, none focused specifically on CIMs, and there was very low participation of this group in decision-making processes. She also argued for an inclusive formal policy framework to assist this group.

Two questions were posed to Ms. Firoz. Firstly, whether we should relocate people to less heavily populated cities, and secondly, whether we should consider people living outside Bangladesh as climate migrants. Ms. Firoz stated that we should consider migration outside of Dhaka. However, this was not

the focus of her study, and these international migrants are not necessarily the poorest and landless. Ms. Firoz argued that large cities always attract people. However, if given the choice, many people would not want to move. Ms. Dutta agreed that we should develop other urban areas, but that secondary towns and cities are currently underdeveloped, fuelling migration to larger cities. Ms. Cawood was asked what she meant by 'expert-led' planning in Khulna. Ms. Cawood stated that in the context of Parvin et. al.'s study, expert-led referred to city-wide planners and policy makers (e.g. in the Khulna City Corporation), whom did not take into account the adaptive capacity and strategies of the urban poor. Ms. Cawood called for recognition of the lived experiences of climate migrants and the urban poor living in low-income settlements across Bangladesh.

3.12 Thematic Session 11: INTEGRATED COASTAL ZONE MANAGEMENT

Host: Center for Sustainable Development, University of Liberal Arts, Bangladesh

Chair: Prof. Dr. Hamidul Huq, Director of Center for Sustainable Development (CSD), University of Liberal Arts Bangladesh (ULAB)

- **Jeffrey Chow,** PhD Candidate, Yale University, Local Benefits of Coastal Mangrove Plantations in Bangladesh
- **A.K.M. Ferdous**, Senior Specialist Agricultural Research & Development, International Rice Research Institute (IRRI), An Evaluation on Different Salt Tolerant Boro Rice Varieties in Gher Areas of Bangladesh
- **Amena Ruma**, Intern, Environment and Social Development Organization (ESDO), A Study on the Suitability of Polderization in Integrated Coastal Zone Management Program in Bangladesh
- **Dr. Catharien Terwisscha a van Scheltinga**, Bangladesh Delta Plan 2100 Formulation Team, Wageningen UR Project Office Dhaka, Climate Change Baseline Study for the Bangladesh Delta Plan

The session on Integrated Coastal Zone Management was introduced by the chair Dr. Hamidul Huq, Director of ULAB-CSD. He began by explaining that coastal zone areas are considered to be the most risk prone to the impacts of climate change, highlighting that 19 districts fall under this category, Khulna, Satkhira and Bagerhat being the most vulnerable. He spoke about the Coastal Zone Policy, adopted in 2005, which states that any initiative taken in coastal zones must abide by the framework of Integrated Coastal Zone Management (ICZM).

Jeffrey Chow, a PhD candidate at Yale University was the first presenter. His talk primarily focused on his research on the local benefits of mangrove plantations in Bangladesh. Since 1966, the Government of Bangladesh has been cultivating two main species of mangroves in Char areas along Chittagong and Barisal. Due to human encroachment and other natural hazards over the years, a third of this establishment currently remains. But the plantation process is ongoing by the Forest Department. Mangrove plantations bring in numerous benefits to local communities, primarily providing fuel resources. His research indicated that the benefit to cost ratio was much higher for pre-existing plantations than new plantations, due to higher current establishment costs. However, newer plantations have higher potentiality in areas where current use density is high. New plantations also bring indirect benefits such as performing various ecosystem services and contributing to climate change adaptation by land stabilization

A.K.M. Ferdous presented the results from his research on the evaluation of different salt tolerant varieties of Boro rice in Gher areas of Bangladesh, which are affected by salinity. He selected Keshabpur Upazila under Jessore district as his experiment site and experimented with 5 different

varieties of salt-tolerant rice. He concluded that concluded BINA Dhan 10 is the best variety for cultivation in Gher areas as it provides higher yields, enables a higher net return to farmers and is preferred by consumers due its non-sticky nature and better taste.

Amena Begum Ruma presented her study on the suitability of polderisation within the ICZM framework and the environmental, social and economic benefits associated with it. Her research was focused around three polder sites in the Chittagong district. From her assessment, she deduced that polders secure benefits for environment, economy and urbanisation by protecting Chittagong from cyclone impacts. She recommended cooperative action amongst NGOs, the government and local actors to develop Integrated Coastal Zone Management practices.

The final presentation of the session was given by Dr. Catharien Terwisscha van Scheltinga who is currently working on the Bangladesh Delta Plan 2100 (BDP 2100) project . BDP 2100 is a long-term plan which aims to map out a vision for the next 100 years. The plan aims to come up with scenarios to help prioritize investments in land and water management by creating an inventory of knowledge about climate change. BDP 2100 utilizes 12 meteorological indicators to predict the pattern and impact of climatic factors to provide knowledge for local people about future change. An Interactive Climate Map for Bangladesh has been developed, with the idea that visualising the data helps to demonstrate and impart knowledge to local people more effectively. It was recommended that quantifying climate change factors and various adaptive measures can improve research and action.

Discussion items indicated that the plan for Bangladesh should be subjective and long term, although preferably, may fail due to the lack of collaboration between government and civil society. Plans will need to emerge, evolve and adapt over time in response to manifold factors and monitoring the process will be beneficial. A mechanism to prioritize future investments is crucial.

3.13 Thematic Session 12: CLIMATE CHANGE MODELLING

Host: Bangladesh University of Engineering and Technology (BUET)

Chair: Prof Rezaur Rahman, Professor, Bangladesh University for Engineering and Technology (BUET)

Presenters:

- **Chowdhury Kamrul Hasan**, Senior Lecturer, Department of Environmental Science, Independent University, Bangladesh (IUB), A Study of the Impact of Climate Change and Wave Parameters on Coastal Sediment Dynamics
- **Fahmida Akter,** Research Assistant, Department of Civil Engineering, BUET, Evaluation of Spatial Interpolation for Finer Resolution of Rainfall Estimation: A Case Study of Rainfall Parameter Change in Bangladesh
- **Dr. Ainun Nishat,** Professor Emeritus, BRAC University, Changes in Seasonality and its Effect on Environmental Flow
- **Ali Mohammad Rezaie**, Research Associate, Institute of Water and Flood Management (IWFM), Bangladesh University of Engineering and Technology (BUET), Assessing Performance of Polders under Storm Surges in the Coastal Regions of Bangladesh for Current and Future Climate Scenarios Using the Delft 3D Model

Chowdhury Kamrul Hasan presented a proposal for his own PhD based on the climate change impact and wave parameters association with the coastal sediment dynamics of Bangladesh. He has found that a correlation can be drawn between the El Nino southern oscillation (ENSO) and the height and period of waves (wave climate) affecting the sediment erosion and accretion dynamics on the

Southern Bangladesh coast. He wants to build on these results to model the climate variability and its effect on coastal morphology. Dr. Ainun Nishat, Vice Chancellor of BRAC University, mentioned a limitation based on the modelling aspect of the project. Modelling only predicts the future but to understand the present it is helpful to collect data from the past.

Fahmida Akter presented her evaluation of spatial interpolation for finer resolution of rainfall estimation; the case study of rainfall as a parameter. The data for her research project was collected from the Bangladesh Meteorological Department database system covering the last 60 years from 1951 to 2010. ArcGIS has been used to geospatially interpolate the results using a range of methods; Inverse Distance weighting (IDW), simple kridging and local polynomial. Simple kridging proved to be the most effective method for estimating rainfall over the area of interest. The rainfall patterns have been inter-compared over 20 year intervals from the past 60 years to help deduce the seasonal rainfall trends. Future research will be centred on the evaluation of evapo-transpiration and temperature. Discussion highlighted potential areas for improvement in the analysis and presentation of the data collected via statistical tests and grid sizes, respectively.

Dr. Ainun Nishat presented the findings of an ongoing study on the changes in weather seasonality and its effects on environmental flow. Seasonality timings are moving out of sync, which is having a butterfly effect on associated factors; ecosystems relating to fish species, the increased frequency and duration of natural hazards, temperature and rainfall amounts. Most importantly, changing seasons are affecting fish, which are now spawning in the later stages of life. River discharge is also a calculated parameter and is highly related to that of fish species. Finally, it was stated that a change in temperature of 2°C can affect pollination patterns.

Ali Mohammad Rezaie assessed the performance of polders under storm surges in the coastal regions of Bangladesh for current and future climate scenarios using the Delft 3D model. Within this, past weather patterns have been used to predict future possibilities. His research indicated that the polder height in the coastal regions of Bangladesh would be inundated by tidal surges now and in the future. Dr. Nishat suggested that further background information on the knowledge on polders and tidal surges along the south coast of Bangladesh could strengthen the study. Polders and tidal surges are a widely discussed subject, gaining interest from organisations such as USAID, CGIS, IWM and World Bank. Ali Mohammad Rezaie clarified the assumptions and approach of the study, and his aims to strengthen it through further research.

The session Chair, Professor Rezaur Rahman, concluded the session thanking the presenters and encouraging their continued research over the coming year for presentation at the next conference.

3.14 Thematic Session 13: SEEING THINGS DIFFERENTLY: UNDERSTANDING AND COMMUNICATING WITH AFFECTED PEOPLE

BBC MEDIA ACTION
TRANSFORMING LIVES THROUGH MEDIA AROUND THE WORLD

Host: BBC Media Action

Chair: Dr. Saleemul Huq, Director, International Centre for Climate Change and Development (ICCCAD)

Keynote: Mr. Richard Lace, Head of Resilience, BBC Media Action Bangladesh, The Big Climate Quiz

Presenters:

- **M. Mahfujul Haque**, Professor, TRACKS Project Partner, Department of Aquaculture, Bangladesh Agricultural University, Analysis of Stakeholders Linked to Climate Change in Northeast Bangladesh: Introducing the TRACKS Project Approach
- **Aniqa Tasnim Hossain**, Research Officer, BBC Media Action, Taking Action on Environmental

Changes in Bangladesh: Changes to livelihoods and lifestyles

- **Farzana Rahman**, Shifting of Seasons: Perception of Local Community in Southern Bangladesh

Aniqa Tanim Hossain giving her presentattion

Dr. Saleemul Huq opened the session by noting that researchers often try to communicate their findings to policymakers, but that it is equally important for researchers to share their knowledge with the public. In the first presentation, Aniqa Tasmin Hossain provided an overview of the BBC Media Action television series "Amrai Pari," the aims of which are to: (1) improve the public's knowledge of existing climate shocks and (2) teach people how to employ replicable adaptation strategies. Ms. Hossain described some of the key findings of her evaluation of the series. She discovered that most people in Bangladesh have noticed changes in the environment. She also found that people are making changes to their lifestyles. The baseline study found that a key barrier to action is people's belief that they need support from outside actors – the government and NGOs – in order to act.

M. Mahufujul Haque's research was part of a larger inter-disciplinary research project currently being conducted by researchers from the University of Bergen in Norway. Mr. Haque presented the study's stakeholder analysis, which was conducted by reviewing the Bangladesh Climate Change Strategic Action Plan (BCCSAP), identifying all possible stakeholders, and categorizing the stakeholders into "influential" and "affected." Mr. Haque compiled a list of 200 stakeholders and developed a plan to interview those stakeholders in four study areas.

The third presentation was given by Farzana Rahman. It outlined the findings of a project that analyzed perceptions of climate change in southern Bangladesh. Ms. Rahman said that respondents in Shatkira reported experiencing longer summers and shorter winters. These changes have affected their cropping patterns and crop yield. Ms. Rahman noted that extreme heat, erratic rainfall, drought, cyclones, and salinity intrusion are all environmental stressors associated with climate change that decrease crop yield and threaten food security, livelihoods, and the national economy. Innovations such as resilient seeds, new cropping patterns, better forecasting and surface water conservation might help address some of the agricultural problems caused by environmental stress.

Richard Lace began his keynote speech with a quiz. He asked the audience, among other things, "How many people in Bangladesh have heard of climate change?" The answer was 62%, the largest percentage for any country in the region. Mr. Lace argued that listening to the voices of the people can help us move away from a discourse that treats people as victims and towards a discourse that identifies people's agency – one that no longer focuses exclusively on policy, but which also considers lived experiences. Mr. Lace stressed the importance of knowledge in shifting the narrative away from victimhood and towards agency. In a brief response, Dr. Huq reiterated Mr. Lace's call for a change in the narrative of Bangladesh. The speeches and presentations were followed by a discussion about knowledge, communication, and empowerment.

Dr. Huq concluded the session with a brief comment, in which he reiterated the point made throughout the conference that the aim of Gobeshona is to enhance the quality and usefulness of scientific knowledge.

3.15 Thematic Session 14: POLITICAL ECONOMY AND CLIMATE FINANCE

Host: International Institute for Environment and Development

Chair: Paul Steele, Chief Economist, International Institute for Environment and Development (IIED)

Presenters:

- **Neha Rai**, Senior Researcher, IIED, Understanding The Political Economy of Climate Financing
- **Md. Kamruzzaman**, Programme Coordinator - Climate Change, Islamic Relief Worldwide, Bangladesh, National Climate Finance: Performance of Bangladesh Climate Change Trust Fund
- **Dr. Joanne Jordan**, Lecturer in Climate Change and Development, University of Manchester, Is Microcredit an Effective Adaptation Strategy to Climate Stress? Evidence from Bangladesh
- **M. Zakir Hossain Khan**, Senior Program Manager, Climate Finance Governance, Transparency International Bangladesh, Climate Change Vulnerability and Poverty Nexus: Climate Finance in Bangladesh
- **A.K.M. Mamunur Rashid**, United Nations Development Programme, Bangladesh, Climate Change and Development: Can Climate Finance Transform Bangladesh's Development?

The session began with a brief overview of global climate finance, given by Neha Rai. Importance was placed on understanding the interests and incentives of different key actors in climate finance. Understanding these groups is essential to managing expectations and indicates the importance of beginning climate finance discussions early if interests are expected to diverge.

Md. Kamruzzaman then gave a presentation on the performance of the Bangladesh Climate Trust Fund. Since its establishment in 2010, he stated that this fund has been distributed to support projects in, for example, water management, food security, disaster management, infrastructure, research and mitigation/low carbon development. Potential challenges include a reduction in the flow of funds, lack of quality proposals and political influence/corruption. After the presentation, there was great discussion about the appropriate institutional arrangements for climate finance with recent developments including a growing role for the Ministry of Finance and the Planning Commission. Further emphasis was placed on the need to make these funds more easily accessible to local government authorities.

The next presentation was given by Dr. Joanne Jordan, questioning the effectiveness of microcredit being used as a climate adaptation strategy. Microcredit has become an increasingly popular method of development in recent years, yet Dr. Jordan emphasized the need to exercise caution with its application. The findings of her study indicated microcredit's tendency to exclude the poorest, pushing borrowers to turn to informal moneylenders in order to meet their loan repayments. This has also pushed people to sell their productive assets, contributing to the downward cycle of debt, and indicating serious limitations in the capacity for microcredit to support long-term adaptive capacity due to covariate risks arising due to climate impacts to a group of microfinance borrowers.

M. Zakir Hossain Khan then presented on Climate Change Vulnerability and Poverty. While the poverty rate in Bangladesh has been steadily decreasing, climate change is expected to push a large population back into poverty. It is important to allocate more funds to the vulnerable and poverty stricken coastal zone. Meanwhile, more funds need to be allocated to areas prone to cyclone and drought, which are currently under-funded. Key conclusions and discussions emphasized the need to support bottom

up adaptation plans and programs, with integrated development planning as well as the creation of a coordinated body to deal with vulnerability and climate finance.
Finally, A. K. M. Mamnur Rashid presented on the topic of climate change and transformative development. Emphasis was placed on the need to consider climate change within development approaches, as climate related events contribute to a significant amount of hidden GDP loss for Bangladesh. One key recommendation included shifting to a steady state economy, with a long-term macro-economic model to facilitate effective planning in the context of climate change. A key discussion point questioned the ability of Bangladesh to coordinate and implement such a long-term climate policy when underlying governance limitations continue to challenge the country. A further point addressed in the discussion was the need for the government to look at more than just growth to understand the economy and environmental losses.

A concluding statement from the chair, Mr. Paul Steele, emphasized the need to tackle challenges in facilitating the flow of climate finance to address the needs of poor women and men at the local level, who are at the forefront of climate change in Bangladesh.

Paul Steele at the IIED-ICCCAD dinner

3.16 Thematic Session 15: DISASTER RISK REDUCTION

Host: Comprehensive Disaster Management Programme (CDMP)

Chair and Keynote: Mohammad Abdul Quayyam, Director, Comprehensive Disaster Management Programme (CDMP), Trend and Impact Analysis of Internal Displacement due to the Impacts of Disaster and Climate Change

The session chair, Mohammad Adbul Quayyum, provided the keynote presentation based upon the findings of a study by CEGIS and CDMP. This study showed gender disaggregated data and destinations and receiving conditions for Bangladesh, using projections up to 2030. It was based on random sampling techniques deployed in 816 households in nine representative districts of Bangladesh and tools such as Focus Group Discussions, interviews and workshops on hazard prone Upazilas of the country.

The push factors were mainly natural disasters and accounted for displacement of people – floods (38 per cent), riverbank erosion (29 per cent), waterlogging and salinity were some of the major causes for temporary and permanent displacement of people. The loss of agricultural land due to slow and rapid onset events like salinity and floods was a major driving force behind rural to urban migration. Following super cyclones such as Sidr and Aila, salinity and waterlogging have intensified in coastal areas of the country, along with damages to infrastructure such as roads and embankments. In destination areas, such as Dhaka, the receiving conditions are not very different from the origin of the migrants. There is high population density, pressures on use and access to natural resources and amenities, high competition for work and disintegration of social bonds. However, because there is an unsettled debate globally about the definition of 'environmental migrants' – the study recommended better disaster management strategies in the areas of origin and proper management and resettlement of migrants in destination areas.

The discussion covered various topics such as alternative livelihoods and CDMP's example of distributing alternative crop seeds (watermelon) in saline and drought prone areas was cited. It was

discussed that an 'enabling situation' for migrants must be created, to give them 'choices' to move or not to move. Currently, people are forced to migrate, as they become landless and jobless after a disaster. The options for shifting the agricultural practices were also discussed.

3.17 Thematic Session 16: ADAPTATION TECHNOLOGIES

Host: Practical Action, Bangladesh

Chair: Ms. Veena Khaleque, Country Director, Practical Action Bangladesh

Keynote: Dr. Mostafa Ali Reza Hossain, Professor, Department of Fisheries Biology and Genetics, Bangladesh Agricultural University, Climate Change Adaptation of Fisheries Sector in Bangladesh

Presenters:

- **L. M. Sirajus Salekin**, Project Engineer, Practical Action, Bangladesh, Dilemmas of Scaling-up Effective Housing in Climate-vulnerable Coastal Areas of Bangladesh
- **Abu Wali Raghib Hassan**, Climate Change Specialist, Food and Agriculture Organization of the United Nations, Adaptation Technologies to Cope with Climate Change Impact in Drought and Saline Prone Areas of Bangladesh – Project Experience from GoB

Participants Engaged During Presentations

The first presentation was delivered by Dr. Mostafa A.R. Hossain. He first listed several ways that environmental stresses associated with climate change negatively impact fisheries. Erratic rainfall, drought, blockages in migratory routes for fish, habitat loss, increased production costs for fisheries, water scarcity and temperature increases have contributed to the reduction in fish stocks throughout the country. The decline in fish populations has had an adverse effect on people who depend on fishing for their livelihood. Several adaptation measures have been taken to deal with these challenges – including using irrigated water in fish ponds, switching to monocultural production of certain species, cultivating fish in rice fields – but Dr. Hossain argued that researchers need to raise awareness about the depletion of fish stocks, build capacity to deal with this problem, and effectively implement national policies governing fisheries. His three concluding messages were: (1) Climate change risk management is an important part of fisheries management; (2) Climate change is a threat to fisheries, and (3) We must adapt to climate change in order to preserve the country's fish stocks. Members of the audience raised questions about the relationship between climate change and fish populations, the introduction of exotic fish species, and the effectiveness of heat- and saline-tolerant fish varieties. There was an interesting discussion about attributing changes in fish populations to climate change.

The second presentation was delivered by L.M. Sirajus Salekin. It outlined some of the challenges Practical Action faced in designing and implementing a climate-resilient house in coastal Bangladesh. Mr. Salekin first enumerated the factors his team considered when designing their house. These factors included things like cost, material durability, and gender sensitivity. Designing sustainable

housing involves tradeoffs – such as the tradeoff between durability and construction cost – and more research is needed to discover workable solutions to these dilemmas. Audience members raised questions about the unit price of houses, the cost-benefit analysis approach and the design and effectiveness of this sort of housing. At 4 lakh taka, the houses are not affordable for most vulnerable people and currently cost too much to be constructed and distributed on a large scale. The key message was that effective and resilient housing should affordable.

The final presentation was delivered by Dr. Abu Wali Raghib Hassan. Dr. Hassan presented the results of research examining the consequences of extreme heat and salinity on agricultural production. The key problems in drought-prone areas include reductions in water-level, decreased soil health, and soil nutrient depletion, all of which reduce crop yield. In the coastal region, over half of all land is affected by high salinity levels. The Department of Agricultural Extension (DAE) has undertaken several initiatives in last few decades to address some of these challenges. The projects cover supplementary irrigation, disaster preparedness, disaster risk management and livelihood adaptation. Dr. Hassan outlined the review process for adaptation actions considered by the DAE and noted that the selection process for adaptation projects involved a bottom-up approach. He briefly outlined the advantages and disadvantages of several adaptation options and identified possible directions for future research. He concluded by recommending better forecasting, carbon sequestration and further research on soil.

3.18 Thematic Session 17: WASTE AND CLIMATE CHANGE

Host: Waste Concern

Chair: Dr. Ijaz Hossain, Professor of Chemical Engineering, Bangladesh University of Engineering and Technology (BUET)

Presenters:

- **Md. Abubokor Siddik**, Student, Institute of Forestry and Environmental Sciences, University of Chittagong, Impact of Existing Solid Waste Management System of the Chittagong City Corporation to Global Warming
- **Md. Kamrul Islam**, Senior Scientific Officer, Cotton Development Board, Effect of Organic and Inorganic Source of Nitrogen on Cotton Yield
- **Abdus Salam**, Professor, Department of Aquaculture, Bangladesh Agricultural University, Vegetable and Fish Integration through Aquaponics System for Climate Change Adaptation
- **Iftekhar Enayetullah and A. H. Md. Maqsood Sinha**, Co-founders, Waste Concern, Opportunity of Co-benefits of Climate Change Mitigation Actions from Waste: Experience of Waste Concern in Bangladesh

Maqsood Sinha, Director of Waste Concern, introduced the session thanking Gobeshona for this knowledge platform enabling the sharing of knowledge to take place. He explained that, in addressing waste, it is important to focus on the 3R's; reduce, reuse and recycle. For this to happen, the correct technology must be employed and the appropriate governmental organisations must take part and collaborate. Dr, Ijaz Hossain, the chair of the session, seconded the introduction. Presently every day in Dhaka there is 5000 tons of waste produced and the government only manages to collect 2,500 tons of this. The dust from this waste is causing localised microclimates to form over Dhaka. He reiterated that it is crucial to find a solution to this problem.

M. Abubokar Siddik discussed the impact of the existing solid waste management system of the Chittagong City Corporation (CCC) on global warming. In Chittagong 1357 tons of waste are produced per day and only about 1 per cent of that is recycled. The transport required for the recycling process

produces a net emission of 31,904.681 tons of carbon dioxide per month.
Dr. Md. Kamrul Islam gave the second presentation. The objectives of his research are to reduce the use of chemical fertiliser and hence improve soil health to increase cotton yield. Organic poultry manure is more environmentally friendly than chemical fertilisers, we can replace 30-40 per cent inorganic nitrogen applied as Urea by poultry manure without decreasing the cotton yield. Cotton plantations have potential to benefit from climate change due to the drought and saline tolerance of the crop. Research predicts that the growth of cotton crops could be expanded to 402,000 hectares over Bangladesh, covering drought prone areas to low lying saline valleys and floodplains.

The Panel Engaging with Participants during the Waste Session

Professor Adbus Slam discussed vegetable and fish interactions through aquaponic systems for climate change adaptation. Aquaponics provides a sustainable, environmentally friendly, organic, natural, disease free and easy to handle solution to the horticultural challenges presented by climate change. It involves the symbiosis interaction between plants and fish wherein the fish provide an organic fertiliser for the plants and the plants clean the water, filtering out the toxic minerals that are produced by the fish. This technique uses significantly less land and water than traditional farming practices and can be employed in both in urban and peri-urban areas. However, during the winter months, fish activity and, hence, plant yield are reduced. Moreover, it is an expensive technique that requires a constant electrical supply. Solar energy can provide a more viable alternative.

Maqsood Sinha and Iftekhar Enayetullah together presented their research on the opportunity for co-benefits of climate change mitigation actions from waste. Worldwide, waste is a problem that is increasing as the population grows. In developing countries, such as Bangladesh, 70 per cent of the waste produced is organic. With huge predicted rises in the population of Dhaka, the waste tonnage is expected to rise from 23, 600 tons per day at present, to 47,000 tons per day in future years. One ton of organic waste produces half a ton of greenhouse gases. Alongside this, waste enhances the spread of disease and pollutes soil and groundwater. Appropriate management of organic waste can reduce the damage caused. Organic waste can be recycled by, for example, composting and the creation of biogas and refuse-derived fuel. Recycling creates jobs and reduces landfill. A combined mitigation and adaptation approach can be employed to tackle waste in Bangladesh. Moreover, Bangladesh could replicate waste management schemes practiced in China and India, which are proven to be effective. Government support and project monitoring are critical elements for sustainability of waste projects.

The session Chair concluded commenting that waste and climate change are related matters. It is hoped that more research in the coming year will contribute to informative talks in next year's conference.

3.19 Thematic Session 18: NATIONAL ADAPTATION PLANNING

Host: International Institute for Environment and Development

Chair: Dr. Neha Rai, Senior Researcher, International Institute for Environment and Development (IIED)

Presentations

- **Mousumi Pervin**, Comprehensive Disaster Management Programme (CDMP) Mainstreaming Climate Change Adaptation (CCA) and Disaster Risk Reduction (DRR) in Bangladesh
- **Catharien Terwisscha van Scheltinga**, Director, Wageningen UR Project Office, Dhaka, Bangladesh Delta Plan 2100: Overview and First Steps
- **A.K.M. Mamunur Rashid**, United Nations Development Programme, Bangladesh, Whole of Government Approach (WGA): A way to achieve government mainstreaming

Ms. Pervin gave the first presentation, outlining isolated investment, convergence, dynamism of climate change, lack of sector-wide policies, separate funding mechanisms, lack of coordination between ministries and rule of business as central challenges to mainstreaming CCA and DRR. Ways forward include a new framework based on 'resilience' and harmonisation. Participant s queried how to promote coordination, consideration of the 'dark side' of resilience and whether CCA could be integrated with a Social Safety Net (SSN) program to reduce poverty. Ms. Pervin identified the Planning Commission as a key ministry in the coordination agenda and argued that resilience, as a shared concept in CCA and DRR, is a key way forward. As SSN targets people below the poverty line and CCA focuses on broader issues, she said it would be difficult to merge the two.

The panelists and Ms. van Scheltinga at the session

Dr. Terwisscha van Scheltinga introduced the Bangladesh Delta Plan (BDP) 2100. The BDP is a long-term (50-100 year) plan with a holistic vision of a 'multi-scenario' future. Dr. Terwisscha van Scheltinga posed some key questions, such as; does Bangladesh wish to have a long-term programme with decision-making, institutional settings and binding legal agreements? If so, how will they be funded? The BDP requires a change in mindset for scientists and policy makers, moving away from 'business as usual' to 'unusual business'. Participants asked about the BDP's political economy and it's integration with the government's 5-year plan. There are links to the 5-year plan, but further integration is required. The Dutch Government wants to follow up on its commitment to address the challenge of climate change in Bangladesh.

The final presentation from Mr. Rashid focused on a way to achieve climate mainstreaming through the Whole of Government Approach (WGA), a country-wide framework for multi-ministry and multi-stakeholder engagement. The WGA is based on the premise of 'good governance', with a pro-poor and participatory focus, transparent and accountable auditing, monitoring and evaluation, measuring and reporting. UNDP have been working with the Planning Commission since 2010 in designing the WGA. It must build local government capacity in order to reach the poorest.

Neha Rai concluded that more discussion is needed on the political economy of decision-making, knowledge management and coordination for the mainstreaming of climate change into National Development Planning.

3. 20 Thematic Session 19: URBANISATION AND CLIMATE CHANGE MITIGATION

Host: RAJUK

Chair: Mr. Kamrul Hasan Sohag, Deputy Director of Town Planning, RAJUK

Presenters:

- **Mr. Kamrul Hasan Sohag**, Deputy Director of Town Planning, RAJUK, Application of Renewable Energy in Climate Change Mitigation: Scope and Opportunities in Megacity Dhaka
- **Mr. Hafiz Iqbal**, Graduate Student, Independent University, Bangladesh, Transformation of Waste into Energy in the Pabna Municipality Area of Bangladesh: An Approach of First Order Decay Model
- **Khan Mortuza Bin Asad**, Urban Planner, Habitat Planning Associates Ltd, Role of Urban Greening and Roof Top Gardening in Climate Change Mitigation: Scope and Opportunities in Bangladesh
- **Kazi Samiul Hoque**, Capacity Building for Urban Disaster Preparedness and Climate Change Mitigation

Mr. Kamrul Sohag, chairing the session

Mr. Kamrul Hasan Sohag opened the session and gave a presentation on the scope for the application of renewable energy systems (RES) for climate change mitigation in Dhaka. The potential positive role of solar and biomass energy use was emphasised, along with the need to integrate this with construction plans. Dhaka has appropriate roof spaces for solar panels, and construction policies could encourage their use. Recommendations were made for effective city planning with regards to transport. Efficient mapping was identified as a crucial factor in facilitating density zoning, effective construction planning and scoping for solar sites. Key discussion points addressed the need for solar installations to be subsidised and questioned the future role of Dhaka's wetlands in green city planning.

Khan Mortuza Bin Asad explained that rooftop gardens have much potential including the cooling of buildings, the provision of a social space, an escape from the stressful urban lifestyle and organic food provisions for building residents. Policy could facilitate the use of public rooftops, while the use of private buildings depend on the willingness of the owner. Discussion picked up on this latter point, emphasising challenges related to willingness and coordination amongst building residents, access to water and related ethics and the need for experts to assess the structural capacity for each building to hold such extra weight on the rooftop.

Next, Hafiz Iqbal presented his research regarding the transformation of waste into energy in the Pabna municipality. Ineffective waste management threatens the spread of disease and accelerated ethane emissions. Meanwhile, the challenges to effective waste management include population growth, open dumping in commercial areas, lack of records, minimal waste collection, and a lack of consciousness amongst city dwellers to manage waste. Mr. Iqbal asserts that Pabna could benefit from a waste-to-energy (WTE) system. This requires an increase in awareness of waste disposal at the individual level, better organic and recyclable waste management and national coordination of waste management. The chair raised an important point about the potential employment opportunities that could be brought through effective waste management.

Finally, Kazi Samiul Hoque addressed the guests regarding capacity building for urban disaster preparedness and climate change mitigation. The presentation focused largely on mitigation,

emphasising the importance of understanding why climate related disasters occur, as a key to guiding policy. Policy recommendations for promoting urban adaptive capacity included the coordination of citizen groups and civil society, the introduction of an assigned budget, ongoing risk assessments, investment in training and workshops and protection of ecosystems and natural mitigation buffers. During the discussion, the need to focus on what tangible things can be done to reduce the impact of climate related disasters on city dwellers was emphasised. The chair concluded the session, highlighting that climate change research in an urban context is a recent endeavour and that the integrity of upcoming research will play a crucial role in guiding future policies.

3.21 Thematic Session 20: LOSS AND DAMAGE

Host: International Centre for Climate Change and Development (ICCCAD)

Chair: Dr. Ainun Nishat, Professor Emeritus, BRAC University, Bangladesh

Keynote: Md. Golam Rabbani, Fellow, Bangladesh Centre for Advanced Studies (BCAS), Loss and Damage in Climate Discourse: "Research" Influencing Policy and Advocacy at National and International Level

Presenters:

- **Dr. Abdullah Harun Chowdhury**, Professor, Environmental Science Discipline, Khulna University, Environmental Threats on the Angiospermic Plant Resources of the South-West Coastal Area of Bangladesh
- **Md. Shahin**, Lecturer, Patuakhali Science and Technology University, Climate Change Causes Change in Road Structures
- **Dwijen Mallick,** Fellow, Bangladesh Centre for Advanced Studies (BCAS), Loss and Damage in Coastal Bangladesh

Mr. Rabbani presented thematic research on Loss and Damage in Bangladesh, which has been recognized by the Intergovernmental Panel on Climate Change (IPCC). This research looked into non-economic loss and damage due to salinity issues in Bangladesh. It was found that in coastal areas there is a 75 per cent decrease in crop yields, but a 25 per cent increase in production of improved climate-resilient rice varieties. Both rapid and slow onset events lead to individual, societal and environmental loss and damage. Traditional cultures are slowly eroding because of changes in climate and practices, and biodiversity will be largely affected by salinity intrusion. Following a disaster, there is severe psychological trauma and absenteeism increases amongst youth and school children.

Md. Shahin explained that in the coastal belt, there has been extensive damage to roads and infrastructure due to cyclones, floods and storm surges. The study he presented investigated the maximum moisture content needed to maintain dry density in soil samples. Since Bangladesh is a lower riparian country, flood levels will be high and disasters such as cyclones will be recurrent due to climate change. Infrastructure needs to be adapted to ensure longevity.

Dr. Abdullah Harun Chowdhury presented the findings of research on angiospermic plant resources. The study was conducted in Khulna, Satkhira and Bagerhat Upazilas between 2010-13. Out of the 284 angiospermic species found about 18 were rare species and 36 were endangered. About 126 species of medicinal plants were also found in those locations, although changes in the microclimate and rainfall have seriously affected the foliage of trees. The trees are most abundant in the monsoon season. Conservation of indigenous species with deep roots and enhancement of community awareness were

identified as some key actions needed in the coastal region.

Dr. Huq and Dr. Nishat discussing Loss and Damage

The study presented by Mr. Dwijen Mallick captured various indications of agriculture, water, health, livelihoods and non-economic aspects from selected populations and sites. His research revealed that salinity, waterlogging and cyclones are the main causes of Loss and Damage, affecting the lives and livelihoods of coastal communities. The direct loss attributed to climate change was in the agricultural sector, where many households have shifted to shrimp cultivation to adjust to rising salinity levels. Non-economic losses are reflected by migration and decline in social capital. Approximately five crore taka is needed at the ecosystem level, for the rehabilitation of people in Sidr and Aila affected areas of coastal Bangladesh.

An interactive discussion session, moderated by the Chair, Dr. Ainun Nishat and Director of ICCCAD, Dr. Saleemul Huq, followed the discussions. The harmful effects of invasive species of trees were discussed and clarifications sought regarding the effect of the recent oil spill on the mangrove ecosystem in the south. The debate about a globally agreed definition of loss, damage and compensation continued in this session. It was agreed that 'loss and damage' came up from Polynesian countries (member of the SIDs) in the 1990s to reach some form of agreement about the consequences beyond adaptation and mitigation. The need to complete cutting-edge, scientific research and produce publications was stressed again.

3.22 Thematic Session 21: RESEARCH INTO POLICY

Host: United Nations Development Programme (UNDP)

Chair: Dr. Saleemul Huq, Director, International Centre for Climate Change and Development (ICCCAD)

Keynote: Dr. Aminul Islam, Senior Adviser, Sustainable Development, UNDP, Bangladesh

Panel:

- **Dr. Mashfiqus Salehin,** Institute of Water and Flood Management (IWFM), Bangladesh University of Engineering and Technology (BUET)
- **Dr. Neaz Khan**, Development Studies, Dhaka University
- **Mr. Shahidul Islam,** Uttaran (NGO)
- **Helen O'Connor,** Climate and Development Advisor, Department for International Development (DfID)

This session began with a keynote speech from Dr. Aminul Islam, who reiterated the importance of science based decision making to deal with the impacts of climate change, particularly on food security, water, sanitation and livelihood. Continuous policy analysis and research is needed to tackle the impacts of climate change as business as usual will not work anymore. One of the six pillars of the BCCSAP is on research and knowledge management, but there remains a fragmentation in policy initiatives, as policies are more likely supply driven. Research priorities should be aligned with policy

and programs so that the findings guide implementation. We need to better establish links between the research community and government and inform global policies using research findings from the ground.

Helen O'Connor from DfID Providing a Donor's Perspective

Mashfiqus Salehin presented on developing an integrated solutions approach based on two projects - ESPA Deltas and DECCMA. He explained the need to go beyond the problem domain. Both of these projects attempted to understand the relation between climate change, non climatic factors, environment and social economic factors. He presented a framework for combining quantitative physical/ecological models with demography, economics and poverty, coupling human and natural dynamics to explain the integrated solutions approach. These relationships are not linear. He ended his presentation with a scenario analysis and projections of possible futures.

Helen O'Connor gave her reflections on research into use through three lenses: (1) How can we use science to inform policy; (2) How can climate change policies help the poor; (3) How can DfID invest? There is much certainty about climate change now, but more multidisciplinary research is needed. Economists need to work with social scientists, with climate scientists and understand the implications on people through these various disciplines. We need frameworks that guide policy makers and help them prioritize. Communication with the end users is crucial. There is a need to understand the issues policy makers are grappling with and formulate messages in a way that policymakers will understand and read.

Dr. Mukhlesur Rahman addressed the need to translate science to grassroots reality. Reliable vulnerability assessments and indicators should be contextual and residual. There is a need to learn lessons and be aware of the outcomes of the many projects being implemented on the ground. Research on communications strategies and institutional policy relationships is necessary as is that on social, institutional, policy and communications.


Participats at the panel

Dr. Saleemul Huq closed the session by explaining that climate change is a science-based problem and the solutions will come out of science and research. Science into policy has been the approach at the global level and now needs to be replicated at the national level. We need to go about bringing the science and research to the policy makers in a manner that will reach them and help them understand the issues. Other stakeholders, including practitioners, farmers, traders, need to be reached with a completely different set of tools and delivery of key messages to them must be improved.

Participants were invited to share examples of research that was successfully taken up. Examples shared included homestead plinth raising, changing the terms in the policy to include fishermen, the BD2050 carbon calculator, the Warsaw International Mechanism on Loss and Damage and motivating communities to save energy through radio personalities.

3.23 Technical Session 1

Host: Government of Bangladesh

Chair: Professor Dr. Shahidur Rashid Bhuiyan, Pro Vice Chancellor, Sher-e-Bangla Agricultural University, Dhaka

Keynote: Mr. Z. Karim, Former Secretary, Ministry of Agriculture, Needs of Resilient Farming Practices and Reshaping Climate Change Adaptation in Agriculture of Bangladesh

Panel:

- **Professor Dr. Parimal Kanti Biswas**, Department of Agronomy, Sher-e-Bangla Agricultural University, Dhaka
- **Md. Masumur Rahman**, PhD Fellow, Deputy Secretary, Ministry of Environment and Forests

Mr. Masumur Rahman delivering his speech with the panel from GOB

The keynote presentation gave a brief overview of the agriculture sector in Bangladesh and its connection with food security in Bangladesh. Agriculture plays a very significant role in shaping the economy of Bangladesh with crop production as the main component, followed by fisheries. The five different major land types used for agriculture production, including highland, medium highland, medium lowland, lowland and very lowland - about 64 per cent of the total land area is comprised of highlands and medium highlands. The vulnerabilities faced by the agriculture sector due to climate change stem primarily from sea level rise, erratic precipitation patterns, increased temperature and salinity intrusion leading to altered season patterns, dwindling water resources and increased pest populations. Livestock will be affected due to the unavailability of quality feed and water as well as due to dominance of pests and diseases. The fisheries sector is under threat due to loss of habitat. The mangrove forests along Sundarbans play a crucial role in keeping storm surges at bay, while bringing in economic benefits. However, an increase in 45 cm of sea level is expected to submerge 75 per cent of the Sundarbans posing danger to the coastal areas.

Farming practices developed to combat these impacts include crop variety development and management practices such tillage, raised bed plinths, using aged seedlings, floating techniques, supplementary and low cost irrigation, rain water harvesting. A government initiative, 'Ektee Bari Ektee Khamar', aiming for poverty alleviation through family farming can help develop a model suitable for tackling climatic stress. For the fisheries sector, a number of techniques such as brackish water species cultivation, netting of ponds and shrimp-fish poly-culture are being implemented. To promote livestock production, local adaptive species of cattle and poultry can be reared.

The adaptation programs outlined in the NAPA and BCCSAP are too general and need to be diversified by taking specific locations, farmers' conditions as well as different commodities into context. Some strategies for climate-smart agriculture include capacity building for sound assessment of loss and

damage in the sector. Participatory adaptive actions need to be increased and farmers' need to have access to climate-smart technology and global resources for loss and damage rehabilitation. Overall awareness regarding strategies to combat climate change needs to be increased through schools and workshops, which will also facilitate mass information dissemination. Professor Karim concluded his presentation by stressing the need for government, non-government and private sector organisations to work together in developing programs to address the associated issues.

The question and answer session primarily focused on the role of agriculture in Bangladesh, including how climate change is beyond our control and collective adaptive actions need to be taken to minimize damage. Food security in Bangladesh is highly reliant on the development of the country's agriculture sector, which can be ensured with sustainable agricultural practices. An integrated framework in addressing all the components under the agriculture sector needs to be designed and this approach can be key to ensuring resources are effectively utilized. All relevant actors must be engaged to address the manifold implications of climate change to food security in Bangladesh.

3.24 Technical Session 2

Host: Government of Bangladesh

Chair: Md. Yunus Ali, Chief Conservator of Forests, BFD

Keynote: Mr. Asit Ranjan Paul, Assistant Chief, Conservator of Forests, BFD, Climate Change Impact; Lesson learn from Madhupur Initiative

Panel:

- **Md. Akbor Hossain**, Deputy Chief Conservator of Forests, BFD
- **Dr. Tapon Kumar Dey**, Conservator of Forests, BFD

Md. Yunus Ali opened the session. He gave a brief introduction and explained that with the aid of the government funding for forest management schemes, positive changes in forest can be seen.

Mr. Asit Ranjan Paul presented first. In Bangladesh there are five type of forest, ranging from the tropical forests in the hilly areas; Sylhet and the Chittagong Hill Tracts down to the mangrove forests of the Sundarbans. CGS helped prepare maps from 1967 to 2007 to show the aerial degradation of the forest areas in Madhupur. The forest is threatened by local needs, the brickfield industry, farmland encroachment and socio-economic issues. A new forest management programme designed to protect the forests has engaged and trained local people, providing incentives to ensure the forest is appropriately managed. The trainees work as a community and are motivated to protect Madhupur forest. Illegal felling of trees has reduced and the natural biodiversity of the forest floor has been rejuvenated. Incentives include grants and the provision of seedlings. In addition the programme has provided employment. The management programme has reduced the amount of chemical fertilisers used and initiatied household level compost collection. There has been a reduction in forest fires due to the management of the forests and a huge decline in offences since 2010. The forest cover over the area is gradually increasing. This is helping to the prevention of soil erosion and the loss of nutrients. A community conservation society has been established to encourage collaboration and knowledge sharing and to help implement management criterion to ensure sustainability of the forests. Such competent management schemes ensure ecosystem resilience and secure finances to fund reliable climate change mitigation practices for the present and sustainability for the future.

The questions addressed the sustainability of the forest program and the sustainability and management of biodiversity. Responses reiterated the effectiveness of the programme to date.

3.25 Technical Session 3

Host: Government of Bangladesh

Chair: Dr. Nurul Quadir, Joint Secretary, Ministry of Environment and Forests

Keynote: Dr. Anwar Zahid, Deputy Project Director, Water Development Board, Bangladesh, Establishment of Monitoring Network and Mathematical Model Study to Assess Saline Water Intrusion in Groundwater in the Coastal Area of Bangladesh

Panel:

- **Engr. Selim Bhuya,** Director General, Water Resources Planning Organization, WARPO, Ministry of Water Resources
- **Dr. Abu Wali Raghib Hasan Ahsan**, Climate Change Specialist, FAO Representation in Bangladesh

Dr. Anwar Zahid presented his talk on the establishment of a monitoring network and mathematical model to assess saline water intrusion in groundwater in the coastal areas of Bangladesh. This research and knowledge management project is funded by the Bangladesh Climate Change Trust (BCCT) of the government and is undertaken with the participation of local communities for assessing and monitoring the overall water resources of the coastal belt, highlighting the saline water encroachment in groundwater and anticipated impacts of climate change on coastal water resources. A long history of groundwater extraction and the ongoing use of tube wells is now causing water scarcity issues, affecting access to safe drinking water. There are also water quality problems, such as arsenic contamination in shallow groundwater and saline water encroachment in the coastal aquifers. Deep groundwater extraction can provide a source of safe drinking water however, as the recharge rate is very slow, extraction must be limited to drinking use. Understanding and monitoring the changes in hydrological cycles and conditions is very important in order to assess the sustainable use of groundwater and the impact of climate change. A well monitoring network has been established in response to this. It is managed by the local people and aims to detect groundwater salinity and surface water interaction with groundwater. Groundwater quality and distribution will be monitored in association with sea level rise and increased withdrawal due to irrigation and aquifer implementation. Mathematical models were simulated using the collected project data and a major report produced.

Professor Dr. M Qumrul Hassan explained that there is an excess of water in Bangladesh in the monsoon season, causing major flooding, while there is not enough water in the dry season to meet the demand for irrigation. Moreover the country is prone to natural hazards. Scientific research and monitoring of water resources aids understanding and the planning of effective steps for the future. Engr. Selim Bhuya reemphasized these points, reiterating the need for adequate study, investigation and monitoring of limited fresh groundwater resources for sustainable use. They emphasized the need for government support in continuing these types of research and knowledge management projects.

The chair summarized the session and explained that research and monitoring of coastal fresh water resources for sustainable long-term use is an utmost priority for the government. He thanked Gobeshona for bringing together this collection of research.

3.26 Technical Session 4

Host: Government of Bangladesh

Chair: Dr Sultan Ahmed, Joint Secretary, Director, Department of Environment and Forests, Ministry of Environment and Forests

Keynote: Dr. Paromesh Nandi, Project Manager, Community Based Adaptation (CBA) to Climate Change through Coastal Afforestation (CBACC-CF)- Lessons and Challenges

Panel:

- **Mr. Raton Kumar Mojumder**, DCCF, BFD
- **Mr. Fazle Rabbi Sadeque Ahmed**, PD, Community Climate Change Project, PKSF

Dr. Nandi presented an overview of the multi-stakeholder CBACC-CF project implemented in four coastal districts of Bangladesh (Barguna Sadar, Char Fasson, Anwara and Hatia). The project used an integrated FFF (Forests, Fish and Fruit) model to diversify the livelihoods of vulnerable coastal communities. Ditch-dyke structures were built to create fresh water systems, which would ensure short term and long-term benefits, adding an average of 1,000 USD to annual household income. In the forest areas, multi-cultural species (e.g. 10 commercial, saline tolerant mangrove species) were planted to increase vegetation density, and enhance resilience to cyclones and storm surges. Dr. Nandi showed participants a film of the 'transformational changes' in one project site, Char Kukri Mukri (CKM) in Bhola District. The CBACC-CF project created eight fresh water reservoirs on CKM to facilitate vegetable and fish cultivation. One beneficiary, a widow with five children, said she earned 10,880 BDT from selling vegetables and hoped to earn 50-60,000 BDT from selling fish. With this money, she and many other beneficiaries have become self-sufficient. Dr. Nandi concluded by stating that 9650 ha of coastal afforestation will absorb around 965,000 tons of carbon annually. The project improved resilience of 30,119 vulnerable households (4.7 lakh people) and increased the capacity of 1415 government, non-government and community-based organisations.

Panellist Mr. Mojumder observed that selection of stakeholders, comprehensive project management and support from the Ministry of Environment and Forests for land acquisition was central to project success. Mr. Mojumder explained that keeping grazing cattle and buffalo away from the afforested areas is now a key concern. The second panelist, Mr. Rabbi, noted that this project is important for mitigation and adaptation to climate change. However, he argued for greater policy support, linkage to other union areas and consideration of marketing, to ensure long-term ownership and profits for beneficiaries.

Dr. Sultan Ahmed opened the floor to questions. Dr. Nandi was first asked whether land grabbing is a problem and how the ditch/dyke structure can be protected from storm surges. In response, he stated that they did not implement the project on encroached land, only on clear government land. He acknowledged the storm surge threat but said they had raised the height of mounds surrounding the FFF areas. Next, Sally Cawood asked about the community engagement strategy, and how project staff worked with non-governmental and community-based organisations. Dr. Nandi explained that Participatory Rural Appraisal (PRA) was used to identify project beneficiaries. In addition, the creation of active farmer organisations aimed to reduce the relief culture that has developed throughout years of NGO assistance. Dr. Nandi explained that the project will be up scaled to other coastal sites. He concluded by highlighting the importance of that ownership, learning and policy impact.

3.27 Technical Session 5

Host: Government of Bangladesh

Chair: Mr. Nurul Karim, Additional Secretary (Environment), Ministry of Environment and Forests

Presentations:

- **Dr. Jiban Krishna Biswas,** Director General, Bangladesh Rice Research Institute, Climate Adversaries: Coping with Rice Agriculture

Panel:

- **Dr. Jotrish Chandra Biswas,** CSO, Bangladesh Rice Research Institute
- **Md. Masumur Rahman**, PhD Fellow, Deputy Secretary, Ministry of Environment and Forests

Dr. Jiban Biswas's presentation began with the expected temperature and rainfall changes in Bangladesh in the next 30 years. The changes brought about by climate change (i.e. heavy rainfall, flash flood, increased salinity and severe drought) would have a significant impact on rice crops, with yield expected to drop by half by 2070. Dr. Biswas discussed the work of the Bangladesh Rice Research Institute (BRRI) in researching and discovering new varieties of rice to adapt to these adverse conditions. BRRI has been working on transplanting genes from one type to another, to create saline, drought, cold and heat resistant varieties. Some 'hybrid' varieties have multiple tolerances. For example, the BRRI Dhan 55 is tolerant to cold, drought and some levels of salinity. BRRI is also working on nitrogen and zinc management, training and education to change cultural practices of farmers, insect management, cropping pattern practices for tidal wetlands (e.g. introducing sun flowers), water productivity, eco-friendly practices, water management and new technologies such as the BRRI Prilled Area Applicator.

Panelist Dr. Jotrish Biswas stated that now we know the climate is changing, we must focus on climate variability. He argued we need more data on emissions and salinity variation in order to adapt appropriate technologies. We also need to empower and train farmers to use these technologies. The second panelist, Mr. Rahman, argued that rice is a very important cereal crop for Bangladesh, and has been since 1971. There are eight million hectares of arable land and 160 million people. Whilst the population is increasing, crop yields are decreasing. This is a major challenge. Mr. Rahman argued that new rice varieties and public-private sector collaboration is central to combating food insecurity in the future.

Mr. Nurul Karim opened the floor for questions. Dr. Biswas was asked whether there are any rice varieties tolerant to both salinity and heat, about the supply chain and how outputs were reaching farmers. He explained that such varieties may be available 5-10 years in the future. Information on the existing varieties is available from the BRRI rice knowledge bank. He also said that BRRI has a good relationship with the Department of Agricultural Extension, as BRRI trains their field staff to use new varieties. The trained staff then communicate with farmers. Dr. Biswas clarified that they do not produce or distribute seeds but only conducts research and recommends them to their seed business clients. Another audience member asked about the upper limit of salinity that a species can tolerate. Dr. Biswas explained that there are limits, but that these also depend on factors such as frequency of irrigation and amount of exposure. He stated that we cannot produce rice at the expense of ecology, due to the importance of agronomy. BRRI are currently trying to introduce a mangrove gene but this is contentious if considered as a genetically modified (GM) crop. It was concluded and concurred by Dr. Nandi that we need to think about GM crops in the future if Bangladesh wants to reach its vision for 2021.

3.28 CLOSING CEREMONY

Chair: Dr. Atiq Rahman, Executive Director, Bangladesh Centre for Advanced Studies(BCAS)

Conclusion: Dr. Saleemul Huq, Director, International Centre for Climate Change and Development (ICCCAD)

Keynote: Dr. Jean-Pascal van Ypersele, Vice Chair of Intergovernmental Panel on Climate Change (IPCC)

Special Guest: Mr. Md. Nojibur Rahman, Secretary, Ministry of Environment and Forests (MoEF)

Chief Guest: Mr. Anwar Hossain Manju, Hon'ble Minister, Ministry of Environment and Forests (MoEF)

The closing panel (From left to right) - Dr. Jean-Pascal van Ypersele, Dr. Atiq Rahman, Mr. Anwar Hossain Manju, Prof Omar Rahman, Mr. Nojibur Rahman and Dr. Saleemul Huq

Vote Of Thanks: Professor M Omar Rahman, Vice Chancellor, Independent University, Bangladesh (IUB)

Dr. Saleemul Huq gave an overview of the Gobeshona Conference and provided a summary and highlights of the parallel sessions of the international event. A total of about 350 participants from Bangladesh and overseas had attended the conference, with good participation of researchers from regions outside Dhaka and from other countries. The recognized outcome of this first conference was that more rigorous and scientific research is needed, along with data sharing and the exchange of information. Gobeshona was created with that exact purpose in mind – to provide a common and open platform for sharing research.

Dr. Huq highlighted that some sessions, such as the 'Migration' and 'Urbanisation' had overlaps in the discussions. Migration was in fact an issue discussed in various sessions. Due to changes in climate and disasters, migration from vulnerable areas is likely to increase. Assisted migration especially for coastal communities can be a viable way forward. The 'National Level Planning' session recommended that climate change and adaptation activities be mainstreamed and incorporated into policy documents such as the Five Year Plans. The 'Climate Finance' session indicated that there be more transparency, acceptance and focus on the most vulnerable in terms of investments. Bangladesh has already invested more than 1 billion USD in combatting climate change and the tangible results of such investment need to be elucidated. The "Loss and Damage' session was cited as a good example of translating research into policy. Many Bangladeshi research organizations working on Loss and Damage have partnered with international agencies and shared evidence at the international level. Further, Dr. Huq talked about the launch of the 'Bangladesh Emissions Calculator', BD2050, as an open access model developed by Cardiff University in the UK. In his concluding remarks, Dr. Huq explained that this year's events and research will contribute to the next issue of the Journal of Bangladesh Studies. Participants were invited to next year's Gobeshona Conference, to be held from 8-11 January 2016.

Dr. Jean-Pascal van Ypersele, Vice Chair of the Intergovernmental Panel on Climate Change (IPCC), graced the closing ceremony, delivering a keynote speech and presentation. The IPCC assesses research by scientists around the world. Research initiatives need to be international and scientific communities need to reflect a diversity of perspectives. The three working groups of the IPCC: Climate Science, Vulnerability and Adaptation, and Mitigation, are supported by a large community of

researchers. These researchers provide scientific information and new data. They produced interim methodological reports that provide future scenarios and outcomes. The IPCC's Fifth Assessment Report (AR5), launched throughout 2013 and 2014 provide information on what is happening, what the risks are and what can be done. The AR5 reports have a more regional focus than previous IPCC reports. They provide new scenarios and highlight emerging issues such as ocean acidification and sea level rise. The main message of the AR5 is that human influence on climate systems is clear and greenhouse gas emissions will result in irreversible impacts.

Dr. van Ypersle delivering his keynote speech

Dr. van Ypersele explained that, although climate change threatens sustainable development, humanity has the means to limit the effects of climate change through adaptation and a more resilient future. However, despite the facts, political will is lacking. Anthropogenic activities, such as the changes in land use and burning of fossil fuels, over the past 150 years have dramatically altered the course of the climate. One of the scenario predictions for South Asia indicates that there will be 20-40 per cent more precipitation by the end of the century as well as enhanced monsoons, cyclones and variability in the climate. These changes will lead to food shortages, more poverty, movement of people, coastal flooding and heat and drought induced mortality and diseases. Adaptation has its limits and therefore mitigation is also very important to meet the 2-degree target that is acceptable. Dr. van Ypersele ended his keynote speech by saying that in the end, it is about the choice of humanity, to reduce their emissions and adapt their livelihoods and ecosystems.

Mr. Md. Nojibur Rahman was the Special Guest at the concluding session. He stated that it is a privilege to be a part of the Gobeshona platform. He discussed the Bangladesh Climate Change Strategy and Action Plan (BCCSAP), highlighting that one of the 6 pillars of the BCCSAP is Research and Knowledge Management. He said that the Government of Bangladesh was committed to combat climate change and has already allocated more than 10.2 billion USD to mobilize adaptation and mitigation activities. An open data system is now prevailing in the country and researchers can host their information in open websites. A study on migration and urbanization done by the Center for Urban Studies has indicated that, because of climate change and disasters, rural to urban migration, specifically to slums in cities, has increased manifold. Mr. Rahman highlighted that a gender imbalance remains in the research community. Further, he stressed that Loss and Damage issues need further investigation. The Secretary concluded by saying that focus of the Ministry of Environment and Forests is on knowledge, experience, wisdom and management.

Mr. Anwar Hossain Manju graced the occasion as the Chief Guest. He said that one of the positive outcomes of globalisation is enhanced connectivity, congratulating all the researchers for participating at the Gobeshona Conference. Bangladesh has been experiencing steady economic growth at 6-7 per cent per annum, which has led to a decline in poverty and vulnerability. Infrastructural development, such as bridges and roads have also added to development by providing more access to market opportunities. Finally, Mr. Manju explained that sustainable development is the path the country is following, where environmental concerns are addressed.

Professor M. Omar Rahman provided the vote of thanks and officially closed the conference. He thanked all the distinguished guests and participants, especially Dr. Jean-Pascal van Ypersele for providing inspiration to the young researchers of Bangladesh. He thanked the representatives of the Government of Bangladesh for their collaboration and invited everyone to join hands with the tripartite entity represented by the International Centre for Climate Change and Development (ICCCAD) – a collaboration between the Independent University, Bangladesh (IUB), the International Institute for Environment and Development (IIED) and the Bangladesh Centre for Advanced Studies (BCAS).

Clockwise from top-left: ICCCAD Visiting Researchers, lunch in the IUB courtyard, Dr. Ainun Nishat being interviwed by Channel i, Dr, van Yepersele with conference organizers, volunteers and organizers, French Ambassador Sophie Aubert with Dr. Atiq Rahman and Dr. Saleemul Huq, the Gobeshona team at the registration desk, Dr. Joanne Jordan and Dr. Fahim Nowroz.

4. PARTICIPANTS' FEEDBACK

"I believe, with ICCCAD's leadership, a new generation of Bangladeshi researchers will evolve over time. I would be very happy to be affiliated with ICCCAD as well as its mentorship program."' – Dr. Fahim Nawroz Tonmoy, Postdoctoral Researcher, Civil Engineering, The University of Sydney

"I enjoyed the conference and found it of high quality." – Paul Steele, Chief Economist, IIED

"I was extremely delighted to see very promising young Bangladeshi scientists being given the platform to share their knowledge and innovative ideas with many scientists from Bangladesh and beyond! I was genuinely impressed with many of the young presenters!" - Essam Yassin Mohammed, Researcher in Environmental Economics, IIED

"I am very happy to see all these people gathered, and the atmosphere was good...I hope that in future the part on climate change science will come out better, and on how we use that science for adaptation." – Catharien Terwisscha van Schettinga, Director, Wageningen UR Project Office, Dhaka

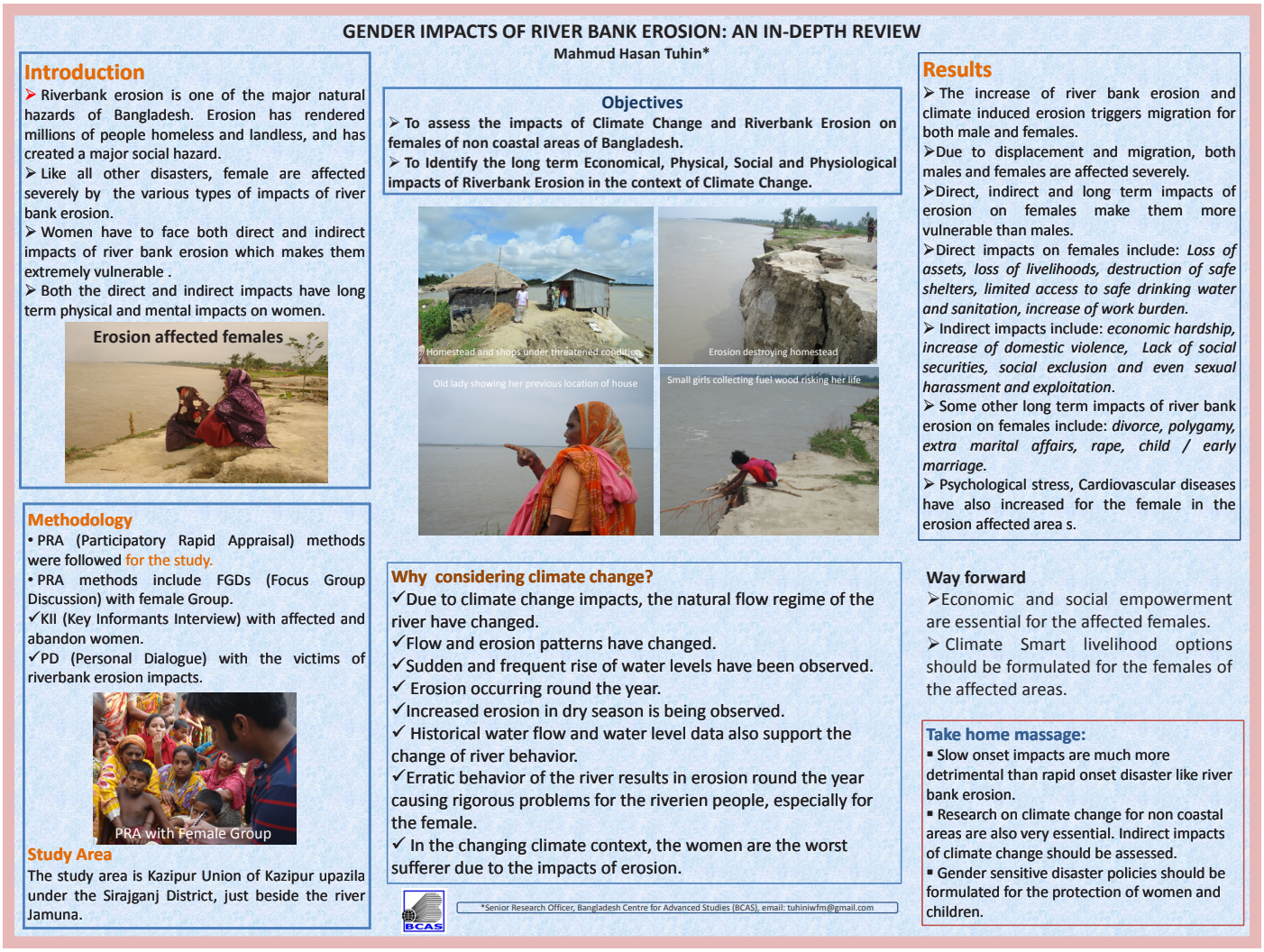
"Congratulations on a very successful conference." – Dr. Peter Kim Streatfield, icddr,b

"I believe the conference was a great success and lays a good foundation for future years. Besides the learning and sharing opportunity, we took from the conference many new connections and identified future collaboration opportunities." – Shabel Firuz, Country Director, Islamic Relief, Bangladesh

"The first annual Gobeshona Conference for Research on Climate Change in Bangladesh has been a great success. We hope to get more international scholars next year for the second conference" – Dr. Sallemul Huq, Director, ICCCAD

5. POSTERS

A selection of posters was produced by some of the participants for display during the conference. A few examples are given here.



Mahmud Hasan Tuhin - Gender Impacts Of River Bank Erosion: An In-Depth Review

BLUE CARBON-THE ROLE OF HEALTHY OCEAN IN BINDING CARBON FOR SUSTAINABLE ECOSYSTEM ALONG BAY OF BENGAL

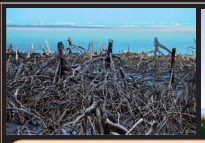
T. Rahaman[1]* S. Hossain[2] S.Khan[3]

1 ABSTRACT

Oceans play a significant role in the global carbon cycle. Not only do they represent the largest long-term sink for carbon but they also store and redistribute CO^2. Some 93% of the earth's CO^2 (40 Tt) is stored and cycled through the oceans. Out of all the biological carbon or green carbon captured in the world, over half 55% is captured by marine living organisms – not on land – hence it is called blue carbon. In Bangladesh we have a huge potential ocean which is surrounded by mangroves, estuaries, coral reefs, sea grass, and seaweeds. These are potential natural renewable resource for the inhabitants and the country and also important biodiversity hot pots and provide ecological foundation for the fishery resources of the Bay of Bengal. The rate of loss of these marine ecosystems is much higher than any other ecosystem on the planet – in some instances up to four times that of rainforests. If frequent action is not taken to sustain these vital ecosystems, most may be lost within few decades. In this contrast, the critical role of the oceans has been overlooked. The aim of this research work is to highlight the vital contribution of the oceans in reducing atmospheric CO^2 levels. Final outcome will come as actionable recommendations on management of blue carbon sinks & their restoration as well as the integrated ecosystem approaches for the better understanding of this Blue carbon effect along Bay of Bengal, Bangladesh.

2 INTRODUCTION

Recent studies suggest that mangroves and coastal wetlands annually sequester carbon at a rate two to four times greater than mature tropical forests and store three to five times more carbon per equivalent area than tropical forests. Although coastal habitats provide a great service in capturing carbon, their destruction poses a great risk. When these habitats are damaged or destroyed, not only is their carbon sequestration capacity lost, but stored carbon is released and contributes to increasing levels of greenhouse gases in the atmosphere. As a result, damaged or destroyed coastal habitats change from being net carbon sinks to net carbon emitters. Unfortunately, coastal habitats in Bangladesh along Bay of Bengal are being lost at a rapid rate, largely due to climate change effects, natural disasters &manmade disasters.



Coastal ecosystem services are worth an estimated US$25,000 billion annually. Blue Carbon Sinks store approximately 235-450 Gigatonnes of C every year, the equivalent of up to half of the emissions from the entire global transport sector 1,000 Gigatonnes of C every year and 3-7% of total anthropogenic emissions 7,200 Gigatonnes of C every year. Blue Carbon sinks, together with coral reefs, supply an estimated 50% of the world's fisheries, providing nutrition to close 3 billion people, as well as 50% of animal protein and minerals to 400 million people in developing nations.

3 Blue Carbon Storage -

3.1 Mangrove Resource

Mangrove forest of Bangladesh is divided into three zones, namely the Sunderban (largest continuous single productive forest of the world with an area of 577,040 ha), the Chakaria Sunderban in Cox's Bazar with an area of 8540 ha, and the planted coastal mangrove forests.

Threats

According to available data, the loss of mangrove wetland in Bangladesh during the last 25 years is about 50-70%.

Destruction of forest at Hiran point sunderban, Khulna,Bangladesh

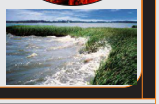
Oil spilling at Shela River Sundarban,Khulna,Bangladesh

3.2 Seaweeds

Human interventions have altered coastal habitats severely, causing extensive losses in seaweed habitats.

3.3 Salt marshes and Seagrass

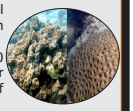
No inventories have been conducted so far on salt marsh and seagrass resources in the coastal area of Bangladesh. Only 5 salt marsh plants and five types of seagrass have been reported in the coastal and estuarine areas.



3.4 Coral reefs

St Martin's Island, also known as "Narikel Jinjira Island", is the only coral reef area in Bangladesh.

- Sea temperature increase in the last 40 years, raising acidification in the sea water and destroying approximately 22 species of corals available in this area.



4 COASTAL BLUE CARBON OPPORTUNITIES FOR CONSERVATION: TWO PATHWAYS

Blue pathway is not dependent on Carbon Market

Address National Policy Needs
- Identification of policies that could address coastal carbon
- Procedures for how to incorporate Carbon services into activities

Improve Ability to Incorporate Carbon services in programs and policies

Address Scientific Needs
- Better estimation of carbon storage, sequestration & emissions
- Arial extent of threatened habitants
- Better understanding on carbon release for disruptions in natural systems

GOAL
Enhanced Conservation of Coastal Habitats
- Mangroves
- Corals
- Sea grass & Seaweed

Address Market Policy Needs
- Protocols for GHG accounting
- Carbon Market Protocols

Additional Resources through Carbon Markets for Protection & Restoration

Ash pathway is dependent on Carbon Market

5 RECOMMENDATIONS

- The ultimate fate of this carbon is not known but should be determined. Further research is required, especially in these tropics for a sustainable coastal zone management in Bangladesh.
- Additional detailed studies on the economic feasibility and viability of including coastal wetland management projects in the carbon market are needed.
- At the national level, further work on ecosystem services valuation needs to be undertaken to quantify the value of ecosystem services provided by coastal wetlands, along with the cost of their loss.

GOBESHONA
Gobeshona Conference for Research on Climate Change in Bangladesh, 2015

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T. Rahaman, S. Hossain and S. Khan - Blue Carbon - The Role Of Healthy Ocean In Binding Carbon for Sustainable Ecosystem along Bay of Bengal

Assessing performance of polders under storm surges in the coastal regions of Bangladesh for current and future climate scenarios using the Delft 3D model

Ali Mohammad Rezaie [1], Mansur Ali Jisan[1], Anisul Haque[2], Munsur Rahman[2]
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[2]Professor, Institute of Water and Flood Management (IWFM), BUET, Dhaka-1000, Bangladesh. anisul@iwfm.buet.ac.bd

1. Introduction and Objective of the research:

Bangladesh is infamous for the negative impact that flooding has on the ability of Bangladesh to grow its economy. During the 1960s in response to tremendous floods and natural hazards the government decided to implement a program of coastal embankments (otherwise known as polders), protecting agricultural land from unpredictable and destructive coastal flooding.
Although the polders were not built to protect the storm surges, almost every year they play a significant role during the storm surge events which raised the issue of assessing the performance of the polders under such devastating events. Along with the increased rate of cyclone event due to climate change a rise in sea level in the northern Bay of Bengal of 0.1-0.3 m by 2050 and 0.3-0.6 m by 2100 is also expected from the latest projections of Intergovernmental Panel on Climate Change (IPCC) (key et al, 2014).
To this end, this study aims to evaluate the adequacy of the polder heights and how they would response to the impacts of storm surges in current and future climate scenarios.

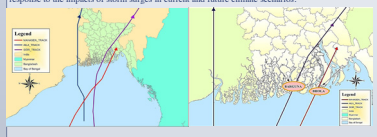

Figure: Cyclone Tracks for Mahasen (2013), Aila (2009), Sidr (2007) Track Source: BMD, IMD

2. Methodology & Application of the Model:

A Delft 3D hydrodynamic model coupled with the cyclone generating tool Delft Dashboard has been applied over the coastal region of Bangladesh to generate the inundation due to recent deleterious cyclones Sidr (2007), Aila (2009) and Mahasen (2013). The model domains are shown in the figure below. The upstream boundaries are specified as discharges at the Ganges, Brahmaputra and Upper Meghna. The downstream boundaries are specified at the Bay of Bengal.

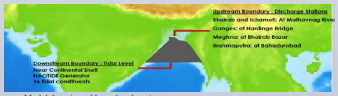

Figure : Model domain and boundary locations

The ocean bathymetry, river depth and land elevation data is collected respectively from open access data from General Bathymetric Chart of the Oceans (GEBCO), Bangladesh Water Development Board and measured cross sections taken under the ESPA-delta project and FINN Map provided by Center for Environmental and Geographic Information Services (CEGIS), Bangladesh.

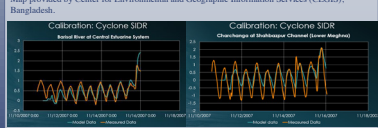

Figure : Model Calibration and Validation at two different locations using hourly tidal data measured by Bangladesh Inland Water Transport Authority (BIWTA)

2. Methodology & Application of the Model (Continued):

The strength (wind speed and pressure drop) of cyclone Sidr has been used generate the extreme inundation scenario for storm surges since it was way stronger than the other two in term of the strength parameters. To incorporate the climate scenarios the sea boundary conditions have been derived for a modeled period of 1971 to 2099 using the SRES A1B emissions scenario from the UK Met Office general circulation model HadCM3 while upstream freshwater conditions were taken for the Q0, Q8 and Q16 scenarios from a hydrological model of the river basins (Whitehead et al, 2014) . As information regarding future cyclonic strength (wind speed and pressure fields) are not available, future cyclones are generated using the strength of the present day cyclone (Sidr) but changing the upstream and downstream boundary conditions including incorporating the sea level rise effects.

3. Research Findings

From the assimilated scenario data it has been found that during the mid-century and the end century would have the most extreme hydrodynamic conditions. Analysis of 100 year data shows that year 2045, 2047 and 2088 would experience highest amount of upstream discharge. Out of these scenarios the model simulation is done for the most extreme hydrodynamic and hydrological conditions which were found for the year 2047 and 2088.

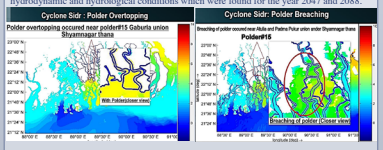

Figure : Sidr Present time inundation scenarios

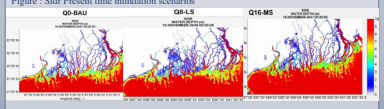

Figure : Mid Century Inundation Scenario for Sidr-like Cyclone

The model simulated outputs the maximum inundation height of 5.2m was found to occur near Shyamnagar in Satkhira district close to the Polder 15 during a storm possessing the strength of Sidr during the year 2088. In 2047, an inundation of 5m height is predicted to occur due to the Sidr like cyclones at the Assass union near Satkhira. Since the maximum, minimum and average polder heights in the study region are 5.75m, 4.5m and 4.79m respectively (BWDB).

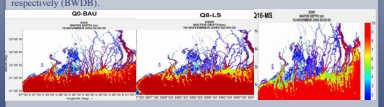

Figure : End Century Inundation Scenario for Sidr-like Cyclone

3. Research Findings (Continued)

Cyclone named Year	Maximum surge Height	Polder Height	Polder Increment	Remarks/ Specific Location
Sidr 2007	3.5m	4.5m	Not Required	Maximum inundation at Sarpara near polder : 39-40
Sidr 2047	3.9m	5.25m	Not Required	Maximum Inundation at Assas union, Shyamnagar Khansi near polder 7/2
Sidr 2047	5m	4.5-5.25	Maximum 0.5m	Maximum Inundation at Assas union below Shaikhkha near polder 15
Sidr 2088	5.2m	4.5m	Maximum 0.7m	Maximum inundation occurred near Polder# 15 near Shyamnagar Thana/Gabuta union-Satkhira district

Table : Polder height adequacy for current and future scenario storms

This study reflects the necessity of both strengthening and raising of the polders at certain locations to protect lives and livelihoods of around 35 million coastal people (BBS, 2003). In the end, this study recommends advancement in quantitative research on evaluating the polder performance for taking proactive measures to alleviate the storm generated damages in coastal regions of Bangladesh.

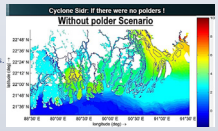

Figure : What if there were no polders

4. Acknowledgement

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Please feel free to mail us if you are interested to know about our work

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Ali Mohammad Rezaie, Mansur Ali Jisan, Anisul Haque and Munsur Rahman - Assessing performance of polders under storm surges in the coastal regions of Bangladesh for current and future climate scenarios using the Delft 3D model

6. IN THE MEDIA

Dhaka Tribune

Gobeshona raises the research bar

Tasnuva Amin Nova

January 1, 2015

In conversation with Dr Saleemul Huq about the status of climate change research in Bangladesh, the reasons behind it and the way forward

2014 broke the record for both the highest and lowest temperatures in decades. Climate change is here to stay, and we sit down with local expert Dr Saleemul Huq to find out what we're doing about it here in Bangladesh.

What is Gobeshona?

Gobeshona is an initiative to improve the level and quality of research in Bangladesh. There's quite a large research community both within and outside Bangladesh, working on different aspects of climate change. The objective is to make better use of the research, producing information and evidence as research outputs, thereby enabling decision makers at the national level and practitioners at the local level.

How did Gobeshona get started?

We had a series of preliminary brainstorming and planning meetings with the research community, identifying well over 100 organisations that claim to do some research on climate change including public universities, private universities, international and national research institutes, NGOs and the private sector. We invited them to join. Then with about 20 members we formed the consortium and named it Gobeshona.

Tell us about gobeshona.net.

It is a knowledge-sharing platform where we upload publications on climate change in Bangladesh. To get published on our site, the research must be on climate change in Bangladesh – any aspect of it. Through this web portal, researchers share information on their ongoing research.
After almost a year, we have over 650 publications on the site.
We are going to add a new element to the site, a Young Researcher Fellowship Programme, where we mentor young researchers on how to do good quality research. It launches next week on January 7.

What is the state of climate change research in Bangladesh?

Improving the quality of research is another of our objectives. Let me explain the situation with regard to quality. In the global scientific community, there is a very strictly followed guideline to measure quality research: Publishing in international peer-reviewed scientific journals. Within those journals there is a hierarchy, with some being more highly regarded than others. Nature and Science are the two most highly regarded science journals.

The Intergovernmental Panel on Climate Change (IPCC) looks at vulnerability reports and adaptation. My colleague Clare Stott did a study of a subset of IPCC cited papers with the word Bangladesh in it. There were about 150 papers, with over a 100 papers specifically on Bangladesh. Of the Bangladesh papers, she looked at the whether the first authors lived in here or abroad. She found that 75% of these climate researchers writing on Bangladesh actually lived outside the country. They are either international researchers like Joanne Jordan, or Bangladeshi academics belonging to foreign universities.

So the question is: Isn't there research going on inside Bangladesh?
The answer is yes. Lots of research is going on in Bangladesh, but it is of very poor quality. The quality bar is, as I said, publishing in international peer-reviewed journals. The IPCC only looks at papers that are published in international peer-reviewed journals. So if it is not there, it is not considered quality research. Bangladesh produces a lot of so-called research, but it is not of good quality, so that is another starting point for us.

Why do you think we produce poor quality research?
There are several reasons, one of which is that our education, as you are well aware, focuses on rote learning. We are taught to produce in exams through memorisation. We do it well, but it does not teach us to think for ourselves. As a result, Bangladeshi researchers are very good at collecting volumes of information. What they are very bad at is presenting that information in a critical, meaningful manner. If you see a Bangladeshi presentation, and I have seen many, they will tell you all kinds of information they have collected, but they have no ability to tell which information is important and which isn't. Critical analysis is a not part of their culture, unless they have a foreign degree.

How does that foreign degree impact a researcher's outlook?
At foreign universities they cannot get away without learning how to do effective research. Universities in Bangladesh are producing people with Master's or even PhD degrees who really do not know how to do good research. That is a gap that we need to address. Through the Young Researcher workshop, Gobeshona is trying to capture younger researchers who are beginning their careers. We will teach them how to distinguish between good and bad quality research and aim to publish in an international peer-reviewed journal.

Another reason is that to be a professor in Bangladesh, you don't need to have your papers published in an international peer-reviewed journal. Here, if you have an article published in a national newspaper, it counts as publication. There is no incentive to produce quality. In fact there is a disincentive. Why produce quality research when mediocre papers are treated the same as good quality ones?

Tell us about next week's Gobeshona Conference.
Gobeshona will be held as an annual event every second week of January. We want to become our national learning event.

There are at least a few dozen international research programmes around the world that work in Bangladesh. Researchers fly in, do their work, maybe have a seminar, then fly out. 90% of the time you will not even know they have come and gone. So what we're saying is: Come at one time of the year. Come to this one conference and present your work here then everybody will know about it, instead of doing isolated seminars. As this becomes a regular event, people can put it on their calendars. Holding it in January works out well because a lot of expat Bangladeshis academics come on holiday around this time, so we can get them to attend the conference.

In terms of the structure of the event, we have three different events happening in sequence: Young Researcher's Day on January 7, three days of conference sessions, and Government Day on January 11. The conference includes plenary and panel sessions, where we get 12-20 international participants

and about a 150 national participants. Researchers share what they do. Each theme is set by a host institution. For example, on January 10, UNDP will host a session titled “Research into policy” that will discuss the methods and scope of integrating science at the policy level.
Government Day is hosted by the government, who will present a number of papers on the projects they are working on.

What are your comments on tackling climate change in general?
Tackling climate change is inherently a learning-by-doing process. Bangladesh has actually done quite a lot. We’ve spent half a billion dollars already on several hundred programmes and projects around the country – government, non-government, academic. Our hypothesis is that now we need to learn from what we have done before we do something more, particularly learn from past mistakes. This is what we are trying to do collectively, because we are spending a lot of money to tackle climate change. That is what the conference is about. Learning from failure is a huge part of this process. Based on these reflections, we will be able to decide whether to do the same thing in the future or take a different approach.

Bangladesh is tackling climate change, and every year we aim to use the Gobeshona Conference as a collective national learning exercise with some key stakeholders such as the research community and research through other communities. We want to create a forum with the involvement of all those who are working with climate change

This is the first of what we hope will be a series of annual events, and that each one will be a milestone in moving up the learning curve. We hypothesise that tackling climate change successfully requires the involvement of a society and a country. Every year we will convene and see what we have learned, and then move on to the next phase.

- See more at: http://www.dhakatribune.com/weekend/2015/jan/01/gobeshona-raises-research-bar#sthash.Iqpu0lTF.dpuf

Dhaka Tribune

dhakatribune.com
http://www.dhakatribune.com/environment/2015/jan/10/'climate-change-causing-more-internal-migration-and-displacement'

'Climate change causing more internal migration and displacement'

Negative impacts of climate change on Bangladesh are causing rises in numbers of both internal migration in search of livelihood and internal displacement caused by natural disaster-prompted homestead loss, a study has found.

The study – titled "Adaptation to Climate Change: Migration, the Missing Link" - also found that the increasing trend of salinity intrusion, drought and riverbank erosion were playing major roles in increasing internal migration and displacement of people from their birthplaces.

Presenting the study yesterday at the ongoing Gobeshona Conference at the Independent University of Bangladesh campus, Tasneem Siddiqui, chair of Refugee and Migratory Movements Research Unit (RMMRU), said the government should formulate comprehensive policies to cope with migration-related problems for reducing peoples' vulnerability regarding climate change.

The government has addressed the migration issues in its different policies including Bangladesh National Adaptation Programme on Action (NAPA) and Bangladesh Climate Change Strategy and Action Plan (BCCSAP). These documents highlight the importance of short-term labour migration for economic development and stress on increasing the potential of this strand of migration, said Tasneem, who conducted the study.

Recommendations were also made in the study, urging the government to open market-oriented human resource development centres and to establish migration processing service providers' office close to areas affected by climate change.

It also suggested the government to focus on urban issues including planning for urban growth, connectivity between places, addressing protection gaps and mitigating social tensions.

The study was presented on day two of the four-day long Gobeshona Conference, organised by Gobeshona – a knowledge network for research on climate change in Bangladesh.

Addressing the event, Dr Saleemul Huq, director of the International Centre for Climate Change and Development (ICCCAD), said migration was obvious because of climate change, but we need to take adaptive measures to create opportunity for the people being displaced.

The study findings showed that in case of displacement, river erosion was the main reason for migration of entire families, while in case of livelihood migration from Chapainawabganj and Satkhira districts – mostly adult men were migrating in search of work.

The study was conducted among 1,500 migrant and non-migrant households in climate-affected areas including Chapainawabganj, Satkhira and Munshiganj.

According to the fifth assessment report of Inter-governmental Panel on Climate Change (IPCC), Bangladesh is identified as being at specific risk from climate change due to its exposure to sea-level rise and extreme events like salinity intrusion, drought, erratic rainfall and tidal surge which will hamper the country's food as well as livelihood security.

According to the Global Climate Models 2010 and the World Bank Studies 2011, around 16 to 26 million people would migrate from places of origin due to floods, storm surges, river bank erosion and sea level rise from 2011 to 2050 in Bangladesh.

Of them, two to five million people will migrate due to riverbank erosion, three to six million will migrate due to inland flooding, five to seven million will migrate due to coastal storm surges and six to eight million will migrate due to sea level rise.

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