

THE GOBESHONA CONFERENCE FOR RESEARCH ON CLIMATE CHANGE IN BANGLADESH 08-11 January 2017

SELECTED ABSTRACTS

Gobeshona steering committee members



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GOBESHONA is a knowledge platform initiated by the International Centre for Climate Change and Development (ICCCAD) which has a steering committee consisted of institutional members from academic, research, media, government, non-government and international organisations. GOBESHONA organizes annual conferences – the Third Annual GOBESHONA Conference for Research on Climate Change in Bangladesh will be held on 8-11 January 2017 at Independent University, Bangladesh (IUB).

The Steering committee members host different sessions of the conference along with the responsibility of selecting appropriate abstracts for that session. This publication is a compilation of selected abstracts from the response to the call for abstracts to present at GOBESHONA 3.

Compiled and designed by Mohammad Nazmul Chowdhury

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Available online from 24 January 2016.

International Centre for Climate Change and Development (ICCCAD)

At

Independent University, Bangladesh

Plot 16, Block B, Aftabuddin Ahmed Rd Bashundhara R/A

Web: <http://www.icccad.net> , <http://www.gobeshona.net>, <http://www.iub.edu.bd>

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Vertical Agriculture Options to Address Impacts of Climate Change in Coastal Regions of Bangladesh

Session: **Agriculture and Food Security** Type: **Action / Practice**

Keywords: **Vertical agriculture, Suspending horticulture, Scaling, Bangladesh, Climate resilient production**

Presenter: **Md. Emdad Hossain**
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Project Leader, WorldFish

Abstract:

The farmers of Southwest Bangladesh have been facing challenges created by climate change, namely, increasing salinity, water logging, flooding, and storm surges. The population in Bangladesh will increase to 250 million people by the year 2050 meaning that there will be less space for vegetable production per hectare impacting on food security. Vertical agriculture options can address the problems related to climate change as well as maximizing the space around households by suspending horticulture production. Not only do these structures have high production rates and use less land and water, but these options also allow households to take control of their own food security, nutrition, and consumption. Very little research has been conducted on this, and opportunities for scaling. Our study was focus on vertical tower for growing vegetables. The size and shape of the tower depends on the geographical locations, land space, availability of resources. The vertical tower allows for yearlong vegetable production in the homestead where vegetables can grow onto other structures such as the roof of a house, nets, or trees etc. The averages net profit per tower is BDT 2200 per cropping cycle. Three cycles can be planted in a year: summer, inter and winter.

Relation with climate-resilient Bangladesh:

Vertical agriculture options can address the problems related to climate change as well as maximizing the space around households. Allow households to take control of their own food security, nutrition, and consumption. A household can made profit from per tower averages BDT 2200 per cropping cycle.

International Experience:

Attended international Workshop and Conferences

Suitability of indigenous rice varieties to withstand drought condition in High Barind Tract of Bangladesh: An adaptive research

Session: **Agriculture and Food Security** Type: **On Going Research**

Keywords: **Adaptation to drought, Rice production, High Barind Tract**

Presenter: **Md. Kamruzzaman**
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Coordinator - Research, Climate Change Unit, Christian Commission for the Development of Bangladesh (CCDB)

Abstract:

Agriculture in the High Barind Tract is dependent on irrigation which is sourced from groundwater. The Bangladesh government has repeatedly been taking different initiatives including incentive packages to promote Aus rice cultivation among the farmers for the last couple of years. While weather in the High Barind Tract is highly unpredictable, in such condition indigenous Aus rice might be a good option for the farmers in HBT. Particularly in HBT groundwater is extracted for irrigation which already has negative consequences on the environment. Moving towards cultivating rain-fed Aus rice from irrigation-intensive Boro could be a great solution in this regard. This adaptive research has identified four indigenous rice varieties suitable for local context. These identified varieties can be recommended for the local farmers and also there should be attempts to ensure seeds.

Relation with climate-resilient Bangladesh

Drought is a severe problem in northwestern part of Bangladesh. In recent years extraction of groundwater for cultivation of Boro rice has created depletion of water table which in turn will create environmental disaster in near future. Conservation of water is crucial for sustainability of environment. This research focuses on the preparedness for drought resilience in northern Bangladesh.

International Experience:

Climate Adaptation through Small Holder Climate Smart Agriculture: A Focus on Vulnerabilities & Empowerment

Session: **Agriculture and Food Security** Type: **Action / Practice**

Keywords: **Climate change adaptation, Local initiatives, Climate smart agriculture, NAP, Loss and Damage, Crop insurance, Salinisation, Vulnerable groups, Farmers, Women empowerment, Gender and climate change**

Presenter: **Vositha Wijenayake**
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Executive Director, SLYCAN Trust

Abstract:

This research related to work that has been conducted in the North East of Sri Lanka which was done with vulnerable groups to climate change, i.e farmers, women, youth and children. The research focused on how climate change impacts agriculture, and how the impacts could be lessened and adapted to through the use of organic agriculture. It further focuses on community lead initiatives which relate to community based governance mechanisms, and how adaptation practices can be sustainable, benefiting vulnerable communities directly. The research further focuses on how female lead initiatives could be set up in vulnerable communities, and how food security and agriculture impacted by climate change could be addressed through capacity building and economic diversification. The paper also tries to establish links on how national adaptation planning, and local adaptation planning could be linked up with the the practices of the research conducted, and how stakeholder engagement in the NAP process could link up to the grassroot actors such as farmers on whom this research was conducted.

Relation with climate-resilient Bangladesh

The research could be replicated in Bangladesh through creating links on policies at the national and local level, that could link up with the vulnerabilities that have been focused in the research. This could link up with farmer communities, women farmers, shifting to organic and climate smart agriculture, and how micro finance, and capacity building could help farmers reduce vulnerabilities to climate change and increase resilience through economic diversification.

International Experience:

UNFCCC, Adaptation Committee, LEG, NAPEXPO, UNFCCC Expert Meetings on Economic Diversification and NAPs

Gender and climate change: Power, place and space in climate change impact and adaptation

Session: **Climate Change and Gender** Type: **On Going Research**

Keywords: **Climate Change, Gender, Power, Space, Place, Bangladesh**

Presenter: **Mohammad Musfequs Salehin**
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Associate Professor, Bangladesh Agricultural University

Abstract:

Climate change is increasingly being recognised as a global crisis. The paper aims at exploring the complex nexus between gender and climate change to understand why does gender matter in climate change debates. Increasingly, literature on climate change and gender focus on the gender differentiated impacts, adaptation and mitigation of climate change. This paper goes beyond the binary understanding of man and women in regards to climate change to focus on the feminist political ecologist's perspective to understand the gendered dynamics of climate change in ways that integrate power relations, subjectivities, scales, places, spaces, and ecological changes. Based on the qualitative fieldwork in Bangladesh this paper argues that power dynamics and networks influence the distribution of resources leading to unequal capacity of women, aged male and younger children to adapt to climate change. This unequal capacity is further exacerbated and complicated through the nexus of religion, gender, class and culture. Moreover, gendered specific and embodied locations have influenced both impact and capacity to adapt to climate change both in rural and urban areas in Bangladesh. Finally, uncritical understanding of community participation lead to counter-productive post disaster and humanitarian outcomes for gendered population.

Relation with climate-resilient Bangladesh

My current research is on climate change and gender as well as on climate smart technology and governance issues.

International Experience:

Problematizing climate adaption: Querying intersectionality, power, and social justice

Session: **Climate Change and Gender** Type: **On Going Research**

Keywords: **Climate change; Adaptation; Bangladesh; Gender; Class; Power; Social Justice; Intersectionality**

Presenter: **Dr. Farhana Sultana**
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Professor, Syracuse University

Abstract:

Climate change adaptation has become critical to development in Bangladesh. The gendered and classed dynamics of climate adaptation raise questions of intersectional vulnerability, resilience, and adaptive capacity in the pursuits of climate adaptation and climate justice. The politics of climate adaptation is inherently about allocation of power, resources, decision-making, and knowledge production. Given the differential power relations in climate change adaptation, both existing and new inequities and inequalities must be investigated with due care to multiple understandings from a range of locations and voices. At the local scale, individuals and households vary in how they are impacted and in their capacities to adapt and have resilience, where the greater resilience of some can result in exclusions and exacerbations of sufferings for others. This research investigates the complex ground realities and the politics of adaptation that are often overlooked, ignored, glossed over, or poor understood. This presentation raises issues that need greater attention both conceptually and practically in order to strengthen climate adaptation strategies and policies.

Relation with climate-resilient Bangladesh

My research is focused on Bangladesh, and provides critical analysis from ongoing and past research that are important for making Bangladesh more climate-resilient and also more climate-just.

International Experience:

N/A

Untold Stories: Women's Resiliency and Climate Change Adaptation in Bangladesh

Session: **Climate Change and Gender** Type: **On Going Research**

Keywords: **Climate Change, Women, Resilience, Bangladesh, Gender Relations**

Presenter: **Mumita Tanjeela**
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Assistant Director, Department of Women Affairs

Abstract:

Bangladesh is considered one of the most climate change vulnerable countries in the world with a wide range of communities affected. Among these communities women are more vulnerable than men. Climate change increases Bangladeshi women's vulnerabilities by directly impacting on their food security, water consumption and livelihood. In this context, this study explores the gender dimension of the climate change response by examining climate adaptation programs. It reveals how gender has been incorporated or neglected in the programs. It argues that rather than simply being seen as victims, women's skills and knowledge contribute significantly to successful and sustainable climate change adaptation. This contribution has largely been overlooked in the studies conducted so far in Bangladesh.

The study's case study research uses the fundamental ideas of Feminist Political Ecology as its theoretical basis. Four adaptation practices from four different geographical areas were selected for an in-depth analysis of women's roles and contributions at diverse levels. It explores women's experiences from the personal and community level to provide a deeper insight into how women build resiliency at the household level, and how this resilience transcends to a macro scale. The research also identifies gaps between adaptation policies and practices, and the challenges of incorporating women as distinct actors and active agents in climate adaptation.

Relation with climate-resilient Bangladesh

My research provides a deeper insight on women's experiences from the personal and community level that, how women build resiliency at the household level, and how this resilience transcends to a macro scale that reinforces to build a climate resilient country.

International Experience:

Model Impact of Climate Change on the Groundwater Flow and Salinity Encroachment in the Coastal Areas of Bangladesh

Session : **Climate Change Modelling** Type: **Action / Practice**

Keywords: **Climate change, Salinity encroachment, Groundwater, Numerical model**

Presenter: **Anwar Zahid**
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Deputy Director / Part-time Teacher (DU), Directorate of Ground Water Hydrology,
Bangladesh Water Development Board and Department of Disaster Science and
Management, University of Dhaka

Abstract:

The coastal population of Bangladesh has already been suffering from the salinity encroachment both in groundwater and surface water regime. In addition, sea level rise is probably the most direct impact of climate change contributing to salinity intrusion in coastal freshwater resources. The availability of fresh and safe water in the coast is very limited mainly due to arsenic contamination and saline water intrusion in upper aquifers. Therefore, assessment of development stress and impact of climate change on fresh water resource is utmost important. The main purpose of the study is to assess the impact of climate change and development stresses on the availability of water resources in the coastal area. For that purpose integrated hydrological model describing the condition in the unsaturated and saturated zone of the subsurface together with rainfall, overland flow, evapotranspiration and the condition of flow in the river has been used. It has been seen from the simulation result of the model that under climate change condition during the month of March and April the salinity increase is highest for all river system within the study area and significant during period from December to June. The salinity movement from river to aquifer is not significant. However, there is a considerable interaction between river water and upper aquifer and high salinity in river water may increase salt water encroachment in adjacent shallow groundwater in the south-eastern coastal plain.

Relation with climate-resilient Bangladesh:

The main purpose of the study is to assess the impact of climate change and development stresses on the availability of fresh and safe water resources in the coastal area.

International Experience:

Presented papers and posters on climate change issues in Germany, UK, Netherlands, India, USA and COP Morocco (poster).

End-Century Multi-hazard Maps for Bangladesh Coast

Session: **Climate Change Modelling** Type: **On Going Research**

Keywords: **Climate change, Bangladesh coastal zone, Multi-hazard, Vulnerability**

Presenter: **Momtaz Jahan, Rubaiya Kabir, Anisul Haque, Md. Munsur Rahman**
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Student, Institute of Water and Flood Management, Bangladesh University of Engineering and Technology

Abstract:

The geographical location, land characteristics, low elevation from the sea, extremely complicated estuarine network, high population density, high levels of poverty, and overwhelming dependence on nature, its resources and services render Bangladesh coastal region as one of the most vulnerable zone to the impacts of climate change and sea level rise. The dominant hazards for Bangladesh coast are cyclonic storm surge, fluvio-tidal flood, salinity intrusion and river bank erosion. The present-day hazards of coastal inundation from storm surge & fluvio-tidal flooding, river erosion and salinity intrusion has already initiated large scale migration from this region. Due to climate change and sea level rise by the end of century, we still do not know how coastal hazards from storm surge & fluvio-tidal flooding, river erosion and salinity intrusion will affect this region. To understand the future threads due to climate change and sea level rise, future hazard conditions by the end of twenty-first century are assessed by constructing Multi-hazard map of future scenario. This gives an indication of future climate-driven hotspots for the region.

Relation with climate-resilient Bangladesh:

This research is based on future development of multi-hazard map under climate change scenario.

International Experience:

This research is a part of an on going research under Deltas, Vulnerability and Climate Change: Migration and Adaptation (DECCMA) project funded by Collaborative Adaptation Research Initiative in Africa and Asia (CARIAA)

Gain of land by siltation unlikely to be reversed by sea level rise

Session: **Climate Change Modelling** Type: **On Going Research**

Keywords: **River, Delta, Bangladesh, Coast, Land, Silt, Sea level rise**

Presenter: **Shahriar Khan**
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Professor, Independent University, Bangladesh

Abstract:

For most river deltas worldwide for decades, silt brought down by the river has been deposited to generate new land where river meets the sea. However, there is new concern that the rising sea levels caused by the ongoing global warming will cause the low-lying river deltas to become encroached and lost to the sea. The question arises whether the global warming is sufficient to reverse the land gain by siltation and cause land loss instead. The rate of silt carried by the river, and the rate of global warming are likely to remain unchanged in the coming decades. In this likely scenario, the rate of overall land gain should continue unchanged in the coming decades. This means that contrary to our fears, deltas like the Ganges delta will not lose but will continue to gain land for decades, in spite of rising sea levels.

Relation with climate-resilient Bangladesh:

The analysis of river deltas in this research is particularly applicable to Bangladesh. This means Bangladesh will not lose, but will gain land in the coming decades, in spite of sea level rise.

International Experience:

Presented two papers at International Conference on Anthropology, Adaptation, and Resilience in Climate Change Regime, 2016, Dhaka University

Measures to Address Loss and Damage Including Insurance for Coastal Fisher Folk of Bangladesh

Session: **Loss and Damage** Type: **On Going Research**

Keywords: **Loss and Damage, Fisher Folk. Insurance, Social Safety Net**

Presenter: **Md. Habib Torikul**
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Research Officer, Christian Commission for Development in Bangladesh (CCDB)

Abstract:

Coastal region of Bangladesh is a pathway for a number of weather related extremes. The marginal professional groups, especially the coastal fisher folks have been experiencing numerous loss and damage due to a number of climatic extremes. The intensity and magnitude of these extremes are following a rising track due to the aggravated impact of climate change. It is estimated that more than 3.5 million coastal peoples livelihood directly or indirectly depend on fishing and related activities, and their economic hardship is most likely to be aggravated by climate change. However, acknowledging the vulnerabilities of coastal fisher folks, the national fisheries policy of Bangladesh has incorporated the issue of micro-insurance as well as some adaptation and risk reduction measures are already being for protecting the life and livelihoods of the fishermen , but gaps and challenges remain. None of the approaches can offset loss and damage risk individually.

The objective of this report is to explore the range of loss and damage of coastal fisher folks in Bangladesh. In addition this paper aims to address possible options for addressing Loss and Damage (L&D) issue including insurance mechanisms for coastal fisher folk of Bangladesh. Primary data will be collected through survey and Focus Group Discussions (FGD) method. SPSS 16 and Arcgis will be used to analyze data. This research is expected to be completed by the end of December, 2016.

Relation with climate-resilient Bangladesh:

The coastal fishermen of the country have been experiencing various recurrent climatic extremes in one hand and on the other hand they didn't have any institutionalized mechanism to face these challenges. No single approach will be able to make them resilient against these challenges. This study will be carried out effective mechanisms for addressing loss and damage of the coastal fisher folks in the context of climate change.

International Experience:

Sustainable policy for the flood flow zone and effective development control mechanisms: Dhaka City

Session: **Loss and Damage** Type: **On Going Research**

Keywords: **Sustainable, Development, Management, Mechanism, Wetland, Acquisition, Policy**

Presenter: **Syed Nazmul Husain**
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Environment and Disaster management Expert, RAJUK

Abstract:

Dhaka is basically a three tier development control and growth management mechanism for Dhaka City and adjoining areas including wetland. Rajdhani Unnyan Kartripakkha (RAJUK) started to prepare it in 90s when Dhaka was expanding at a huge rate. Population was increasing and the pressure day by day. Sustainable development is the most buzzword topic now but the fact is that for the sustainable development need to protect the wetland which is under private property and day by day the wetland of the Dhaka city will be decreased which is the disaster risk and vulnerability. Dhaka was inundated again due to flow of about 65 to 200cm above the danger level of the surrounding rivers. In July 2004, the highest flow of the Buriganga, Balu, and Shitalakhkhya was 65, 195, 216 cm above the danger level respectively. This overflow of the rivers brought the most part of the Dhaka city under flood water of about 20 to 300 cm causing serious environmental damage. The government has no wetland acquisition policy in that case the wetland will fill up day by day by the Housing and Developer Company as a matter fact the flood flow zone going to be reduced and one day wetland will be vanished.

Relation with climate-resilient Bangladesh:

When we talking about climate resilient in that case we must need a Sustainable policy for the flood flow zone and effective development control mechanisms.

International Experience:

Non Economic Loss and Damage Caused by Tropical Storm ROANU

Session: **Loss and Damage** Type: **On Going Research**

Keywords: **Loss and Damage, Non Economic Loss and Damage (NELD), Coastal Zone of Bangladesh, Cyclone**

Presenter: **Md. Golam Mahabub Sarwar**
mgmsarwar@gmail.com
Environment Specialist, National Land Zoning Project

Abstract:

Bangladesh has been affected by several deadly disasters (e.g. cyclones, floods etc.) for past few decades, causing large scale Non-economic Loss and Damage (NELD). Unfortunately, NELD estimation for any particular disaster has been due for a long period of time. This study focuses on the NELD scenario of a recent Tropical Storm "Roanu."™ The study has followed the guidelines of the NELD framework developed by the United Nations Framework Convention on Climate Change (UNFCCC). NELD estimation for Roanu has been found as very high, compare to conventional concept of the extent of economic loss from a similar disaster. Total NELD caused by Roanu is as high as US\$ 508.83 million. About half of the NELD has been found in Ecosystems services sector. NELD in human mobility, cultural heritage, loss of biodiversity and health sectors have been calculated as US\$ 104.08 million, US\$ 94.04 million, US\$ 52.87 million, and US\$ 4.26 million, respectively.

Relation with climate-resilient Bangladesh:

Understanding Loss and Damage will help Bangladesh to address issues and concerns beyond adaptation.

International Experience:

I have presented in LOICZ, Netherlands; Third International Conference on Climate Change Adaptation (TICCA), Australia; International Water Diplomacy Workshop, MIT and Harvard; UNISDR and participated in International Maritime Organization (IMO) General Assembly.

Adaptation of rice cultivation under changing climate conditions in the coastal areas of Bangladesh by application of salt-tolerant biofertilizer

Session: **Adaptation Technologies** Type: **On Going Research**

Keywords: **Biofertilizer, Climate change, PGPR, Salinity, Bangladesh, Agriculture, Adaptation**

Presenter: **Muhammad Manjurul Karim**

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Professor, Department of Microbiology, University of Dhaka. Dhaka 1000

Abstract:

Salinity intrusion as a result of sea level rise in the coastal zone is one of the many effects of climate change inflicting Bangladesh, leading to reduction of normal crop production, and rice is no exception. To promote the adaptation strategy for coastal agriculture that can support the cultivation of *Oryza sativa* under salinity condition, we focused on isolating and identifying salt-tolerant, plant growth promoting rhizobacteria (PGPR). A total of 53 PGPR were isolated from the rice fields of coastal and non-saline areas of Bangladesh. Six of the most potential salt-tolerant isolates were chosen from a Venn diagram for further characterization of their PGP activities in vitro, and in pot experiments. Biochemical and molecular analyses, consisting of 16S rDNA gene sequencing followed by comparative genomics available in NCBI database revealed that the isolates belong to four species, of which *Bacillus aryabhatai* and *Ochrobactrum intermedium* exhibited highest PGP activities under salt stress (200 mM NaCl), viz. fixation of atmospheric nitrogen, production of Indole-3-acetic acid, and solubilization of phosphorus. Interestingly, the isolates' resistance to salt was correlated to their resistance to drugs and heavy metals, a feature which was found to be significantly lower in PGPR isolated from non-saline rice fields. Overall, their ability to withstand salt stress without compromising growth-promoting traits makes them potentially useful biofertilizer for future.

Relation with climate-resilient Bangladesh:

The traditional agricultural practice is feared to be vulnerable in coming days under changing climate conditions as the salinity level increases making the coastal agriculture at stake, so is the livelihood. Therefore, a preparedness program need to be ascertained that will ensure soil fertility brought forward by salt-tolerant biofertilizers.

International Experience:

Invited lecture in 3rd International Conference on Coastal Biotechnology (ICBC), Qingdao, China, Aug 19-21, 2015. Poster presentation at International Scientific Conference on Our Common Future for Climate Change (CFCC), UNESCO Headquarters, Paris, France, 7-10 July 2015.

Potential of Mobile Phone in Extension of Adaptive Agriculture for Community Resilience

Session: **Adaptation Technologies**

Type: **On Going Research**

Keywords: **ICT, Mobile Phone, Action Research**

Presenter: **Tapas Ranjan Chakraborty**
tchakraborty@oxfam.org.uk
ICT and Development Coordinator, Oxfam

Abstract:

Use of mobile phones for knowledge and information sharing in agriculture can help community coping climate change vulnerability. Growing interest on climate change adaptive and easy availability of mobile phones and network service created an opportunity for message sharing on sustainable agriculture. Oxfam and Monash University have been implementing Participatory Research and Ownership with Technology, Information and Changes in two fragile ecosystems. Potential of mobile phone in the information-ecology is being studied in this action research since July 2015. Development of the digital content requires a complex process because of regulation and technological limitation. Mobile phone set is a personal device; using a personal device for a community change has number of consciences on the process of discussion making and cumulative responses.

Relation with climate-resilient Bangladesh:

Integrating the scope from Vision 2021 and the current population dynamics (high % of youth) to make the coastal and charland community climate resilient

International Experience:

Have shared findings of the action research in different international conferences; From UNFCCC COP(s) learnt on Adaptation Technology by attending in sessions

Rooftop gardening in Dhaka: An adaptation measure of the commoners

Session: **Adaptation Technologies**

Type: **On Going Research**

Keywords: **Rooftop garden, Adaptation, Urban ecosystem, Dhaka.**

Presenter: **Naeema Jihan Zinia**

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Doctoral Researcher, Monash Sustainable Development Institute, Monash University

Abstract:

Rooftop garden (RG) is appreciated worldwide as a low cost adaptation measure influencing micro-climate regulation, storm water retention, air quality, aesthetics, recreation and social interactions. A recent survey on 500 households in Dhaka reveals that it is already in practice and has high social acceptance for implementation. About 85% of the respondents consider RG as the most implementable adaptation strategy with individual effort. The available RGs are mostly mixed in nature comprising seasonal fruits, vegetables and flower/ornamental plants. Common fruits grown in RGs are mango, papaya, lemon, pomegranate, guava and jamrul and commonly cultivated vegetables include leafy vegetables, green chili, tomato and gourd of different kinds. Respondents generally nurture the RGs and consume the produces by themselves. Preferences for RG has moderately strong association with household income and moderate association with ownership of holding and number of years living in the holding. Gender, age, education and marital status are found to have weak or no association with RG preference. Respondents have been asked about their willingness to pay (WTP) for implementing RG. The average WTP is BDT 320 per month. RGs are people's own customized pieces of greens accessible anytime and sources of enjoyment. Social and economic benefits of RGs are expected to outweigh environmental benefits.

Relation with climate-resilient Bangladesh

Continuous urban expansion is degrading & drastically reducing Dhaka's ecosystems & ecosystem services that are inevitably affecting residents' well-beings. These effects are anticipated to be more intense given likely climate change. The residents can play crucial roles in making this city climate resilient. This research implies the importance of rooftop gardening as an adaptation measure that can be implemented by common people requiring less capital, technology and govt. intervention.

International Experience:

Spatiotemporal Changes of Water Logged Area In South-Western Bangladesh

Session: **Coastal Zone Management** Type: **On Going Research**

Keywords: **Agriculture, Bangladesh, Change Detection, Satkhira, Landsat, Water-logging, R, Random forest**

Presenter: **Hasan M Abdullah**
hasan.abdullah@bsmrau.edu.bd
Assistant Professor, Bangabandhu Sheikh Mujibur Rahman Agricultural University,
Gazipur

Abstract:

Water-logging is one of the major environmental problems and challenges of socio-economic development in the south-western part of Bangladesh. Riverbed siltation along with back water effect due to sea-level rise and high tide is leading to prolonged water-logging in this area. In this research paper, Satkhira district of Khulna division was selected as the study area to detect water-logging and damaged agriculture lands. To carry out this change detection, Landsat imageries from 1973, 1989, 1995, 2000, 2005, 2010 and 2015 were used. Training datasets were made in ArcGIS environment to classify the satellite imagery. Supervised classification was done using Random Forest Algorithm. Image pre-processing, processing (classification) and post-processing were carried out by R, QGIS and ArcGIS software. A post classification comparison or change detection was followed to calculate transformation of waterlogged area and land occupied by agriculture in the study area. About 204.52, 334.34, 369.42, 710.42, 941.98, 1079.04 and 1162.79 sq. km. area were extracted as waterlogged in 1973, 1989, 1995, 2000, 2005, 2010 and 2015 respectively, which is 51.19% of the total land in year 2015. In terms of environmental degradation and damage, the government and development agencies should take into account as serious issue in the entire south-western part of Bangladesh.

Relation with climate-resilient Bangladesh:

The research will help decision maker in identifying water logged area quantification in coastal Bangladesh.

International Experience:

I am a Norman E Borlaug fellow at LSU, Funded by US department of Agriculture

River deltas like Ganges Delta Started by Deforestation by early Hominids?

Session: **Coastal Zone Management** Type: **On Going Research**

Keywords: **Bangladesh, land, coast, river, delta, deforestation, early man, hominids**

Presenter: **Shahriar Khan**
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Professor, Independent University, Bangladesh

Abstract:

River deltas like the Ganges delta have been created largely by silt carried downriver, but the question arises as to how long has the land generation been going on. Assuming the Ganges delta to be about 400 km from North to South, and a km of land gain every 50 years, Bangladesh has been created in about the last 20,000 years. Owing to likely slower rates of silt carried downriver in previous thousands of years, the river delta creation should have been going on for much longer than 20,000 years. The question arises as to why the land has been created for only this short time in the much larger frame of geological time. The only explanation can be that the Ganges delta (and other river deltas) have been created from anthropogenic or man-made causes. But early hominids have only been around for a few million years, of which fire was controlled by them for more than a million years. This paper proposes that tree-cutting and deforestation by early hominids (Australopithecus, etc.) millions of years ago must have created the sharply increased silt generation that resulted in creation of the Ganges delta and other river deltas worldwide.

Relation with climate-resilient Bangladesh:

The origin of the Ganges delta of Bangladesh is an important issue that will not only tell us its history, it will help us in shaping the future of the delta. Identifying the factors that have generated land in the past will help us with generating more land in future, such as by growing more trees in the coastal areas.

International Experience:

I have presented two papers at the Conference "Anthropology, Adaptation and Resilience in Climate Change Regime 2016" held at Dhaka University. Also, I have presented a paper on river deltas at Carleton University, Canada in about 1991.

Dynamic Deltas: developing new knowledge for science policy interaction in Bangladesh

Session: **Coastal Zone Management** Type: **On Going Research**

Keywords: **Bangladesh, Delta, Science-policy interface, Climate change, Development**

Presenter: **Catharien Terwisscha van Scheltinga**
Catharien.Terwisscha@wur.nl
Director, Project Office Dhaka, Wageningen University and Research

Abstract:

As a delta country, Bangladesh is facing the challenge to address both climate change and development. A longer term, integrated and holistic plan is being formulated, the Bangladesh Delta Plan 2100. New knowledge is required in the process. The research presents insights of interdisciplinary research in urban and rural settings in both Bangladesh and the Netherlands and formulates lessons learned with regard to using such knowledge for policy development.

Relation with climate-resilient Bangladesh:

The research is done in Bangladesh and the Netherlands, by researchers of both Bangladesh and the Netherlands and is related to climate change and development in both countries

International Experience:

Presented and chaired sessions in various international conferences, e.g. Adaptation in Times of Climate Change, Rotterdam, 2014

Is groundwater table depleting in Barind tracts over times?

Session: **Disaster Management and Disaster Risk Reduction** Type: **On Going Research**

Keywords: **Drought, Groundwater Depletion, Irrigation, Organic agriculture, Rain fed agriculture**

Presenter: **Md. Shafiqul Islam**
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Assistant Professor, Center for Sustainable Development, University of Liberal Arts
Bangladesh

Abstract:

The study has been conducted to know the groundwater status in the Barind Tracts. The groundwater has been depleted over times. The groundwater depletion is a great shock in northwestern Barind due to its geographical settings. Groundwater has been recharged by rainfalls only. The rainfall pattern in the study area is erratic and lowest among the country. After analyzing data, the hydrographs represent the status of groundwater. Actually groundwater table is depleting over times. Groundwater table is depleting with the increase irrigated agriculture. Agricultural production has been increased through irrigation and cropping intensity, but groundwater table is incessantly declining at the rate of 2,028 ft/y in dry season and 1.892 ft/y in wet season. Irrigated agriculture through use of groundwater may increase the production but lead successive depletion of groundwater. Its a severe dilemma for water strained Barind Tract. Rain fed agriculture, Agroforestry, organic agriculture; diversification of crops, use of surface water, creation of surface water reservoir, increasing irrigation efficiency and rainwater harvesting can be greater options for agricultural production. The regression analysis has also been reported that declining trend of groundwater table. The tested hypothesis has been shown there is significance difference of groundwater table among locations over time.

Relation with climate-resilient Bangladesh:

This research findings will contribute in designing future project for implementation and research. Essentially this will help in adaptation practices.

International Experience:

Coping with natural disaster impacts: an example from a highly disaster prone coastal village of Bangladesh

Session: **Disaster Management and Disaster Risk Reduction** Type: **On Going Research**

Keywords: **Climate change, Disaster impacts, Coping strategies, Resilience**

Presenter: **Md. Humayain Kabir**

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Assistant Professor, Institute of Forestry and Environmental Sciences, University of Chittagong

Abstract:

South-western coastal region of Bangladesh is well known as landing station of different natural disasters. Local communities of this region have a long history of coping with adverse effects of these disasters as best they can. Consequently, this research explores the impacts of natural disasters and its coping strategies of the Kazirchar villagers in Muladi Upazila of Barisal. In this study, well-structured questionnaire survey, and focus group discussions were conducted to collect primary data. The study found that, the most prevalent coastal disaster in Kazirchar village was cyclones and 48% of surveyed people opined increased cost of living was the main reason for increasing the vulnerability. To cope with disaster impacts, 58% people of this village need to travel long distances to collect drinking water. On the other hand, during flood, 26% people take shelter on government land whereas 40% share their houses with the neighbors on high area. This study also found that villagers (60%) in flood prone site built their houses on raised land while 20% of people used Muchan frequently to rise up their homesteads and save their lives. Based on the resilience index, the study showed that the overall disaster resilience of this village was low. It is expected that this study will be act as reliable source of information for taking natural disaster management initiatives and policies to make more resilient communities in Kazirchar village.

Relation with climate-resilient Bangladesh:

The findings of this research will help to take appropriate actions against natural disaster impacts. Besides, resilience index will directly cooperate the local administration to build more climate resilient society in Barisal.

International Experience:

I have presented a number of research findings in international conference on climate change issues both in Bangladesh (BUET, Dhaka University, DUET, ICCCAD) and the UK.

Coupled human-landscape interactions in coastal Bangladesh

Session: **Disaster Management and Disaster Risk Reduction** Type: **On Going Research**

Keywords: **Poldering, Coastal Livelihood, Community Resilience, Social and environmental landscape, Coastal development planning.**

Presenter: **Bishawjit Mallick**
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Post-doctoral Research Fellow
International Migration Institute (IMI), University of Oxford, UK/ Vanderbilt University, USA

Abstract:

The coastal region of Bangladesh faces usually two types of environmental events; the sudden onset ones e.g. cyclone, and the slow onset ones i.e. salinity. In addition to this, the poldering system, which had been started since late 50s, is the defining attribute of the region. It changes and directs the social and economic landscape of the area inside the polder area. Despite the presence of polder it failed to contain the intensity of tidal surge during the cyclones (namely Sidr 2007, Aila 2009). The reasons can be defined by morphological changes, and the engineering and physical attributes of the environment. People living in this vulnerable regions have to compromise with short-term livelihood strategies. Even the coastal development policy planning ignores the importance of interactions between human-social dimensions of living on this landscape. Taking this context into consideration, in 2014 an empirical study was conducted in 26 coastal villages of Bangladesh under the ISEE project of Vanderbilt University, USA. Based on this empirical survey, this paper is aimed at: (i) to know the social, political, economic, and environmental factors that affect household's resilience, (ii) how these factors differ within and across vulnerable social and environmental landscapes, and (iii) how these findings can be useful for future adaptation planning in Bangladesh.

Relation with climate-resilient Bangladesh:

This paper addresses the reasons of vulnerability and resilience of coastal livelihood in Bangladesh, which is addressed by empirical evidences and will be helpful in adaptation policy planning of the country.

International Experience:

I have been working on the submitted research area as a post-doctoral researcher at Vanderbilt University, Nashville, USA.

Vulnerability of Coastal Resources to Climate Change and Sea Level Rise in Sub-Tropical Coast, Indian Ocean: A Case Study

Session: **Eco-System Resilience and Biodiversity** Type: **On Going Research**

Keywords: **Coastal resources, mangrove, salt marsh, sea level rise, Bangladesh**

Presenter: **Abu Hena M K**
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Senior Lecturer, Universiti Putra Malaysia

Abstract:

Global climate change and sea level rise over the past 30 years have produced numerous impacts in the distribution of coastal resources. Sea-level rise due to climate change is the greatest threat for sustainable coastal adaptation. The consequences in terms of flooding of low-lying deltas, retreat of shorelines, salinity intrusion and acidification of soils and changes in the water table have raised serious concerns for the well-being of coastal peoples and the resources they depend upon. Besides the stressors of climate change and abiotic factors, macrophyte habitats in the inter-tidal zone are vulnerable to sea level change because of their unique location. The changes of inter-tidal and supra-tidal zones could extend further toward inland resulting in the alteration of existing vegetation in the coastal area. The limitation of landward margin together with the vertical rise of water due to sea level rise may cause water logging resulting the stressing and sometimes killing of inter-tidal macrophytes and their dependent organisms. We assess the vulnerability of coastal macrophytes in response to climate change (CC) and sea level rise (SLR) at the changes in coastal inter-tidal resources and zonation of an estuarine area along the coast of Cox's Bazar, Bangladesh, Indian Ocean.

Relation with climate-resilient Bangladesh:

The findings of this research would help to make policy and strategy issues for the coastal zone management, adaptation and mitigation of Bangladesh.

International Experience:

Climate Change Conference, 2009, Switzerland, Adaptation Future, 2016, The Netherland, ANU Young Scientist Conference on Climate Change, 2010, Australia, ECS Conference, 2008 (Italy) and 2012 (Russia), ICCWP, 2012, South Korea etc.

Determination of optimal spatial arrangement component crops in jhum

Session: **Eco-System Resilience and Biodiversity** Type: **On Going Research**

Keywords: **Jhum cultivation, Tribal farmers, Chittagong hill tracts, Component crops, Spatial arrangement, Yield improvement**

Presenter: **Dr. Md. Kamrul Islam**
islam.mdkamrul@gmail.com
Senior Scientific Officer, Cotton Development Board

Abstract:

Jhum, a hill farming system found in the Chittagong hill tracts of Bangladesh, is characterized by the low yields of component crops. To maximize the yields, determination of spatial arrangement is necessary. The performances of 07 treatments viz. rice + cotton, rice + cotton + marpha + sesame, rice + maize + sesame, rice + cotton + Sesame, rice + cotton + marpha, rice + sesame and farmers practice (mixed cropping) were tested at 4 locations in Bandarban district and at 2 locations in Khagrachari district in 2015. The crop management practices were similar for all locations. The highest seed cotton yield (2118 kg/ha) and the highest rice yield (2877 kg/ha) were obtained from Rice + Cotton configuration, the lowest seed cotton yield (387 kg/ha) and the lowest rice yield (1358 kg/ha) were obtained from mixed cropping. Among the 7 different spatial arrangements, rice+ cotton gave the highest cotton equivalent yield (3225 kg/ha) and the mixed cropping gave the lowest cotton equivalent yield (2123 kg/ha). The results revealed that rice + cotton is the best spatial arrangement for jhum cultivation system.

Relation with climate-resilient Bangladesh:

Shifting cultivation is a dominant form of dry land farming supporting the livelihood of the tribal farmers in Chittagong hill tracts (CHT) of Bangladesh. The impact of climate change on the yields of jhum crops is affecting the livelihood of the resource poor tribal farmers. This work will help the tribal farmers to adopt the best practices for hill cultivation to mitigate the adverse effect of climate change.

International Experience:

Estimating the Economic Benefits of an Improved Aquatic Ecosystem and Watershed Management in the Tanguar Haor Wetland: An Application of Choice Modeling

Session: **Eco-System Resilience and Biodiversity** Type: **Action / Practice**

Keywords: **Improved aquatic ecosystem, Watershed management, Economic benefits, Choice model, Tanguar Haor, Bangladesh**

Presenter: **Md. Hafiz Iqbal**
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Assistant Professor (Economics), Government Edward College, Pabna, Bangladesh

Abstract:

Tanguar Haor is one of the most important wetlands not only of Bangladesh but also of South Asia. It is a unique wetland ecosystem of great national importance and has now gained international focus. The haven of biodiversity, place for migratory birds, and presence of wildlife are the most significant features of the Tanguar Haor that allowed this area to gain the designation as a Ramsar site. But aquatic ecosystem and watershed in this wetland is now in a captious situation. Some human induced and morphological factors are responsible for creating imbalance in the ecosystem of this wetland. Commercial fishing operations are exceeding the Tanguar Haor's ecological capacity. Furthermore, unsustainable use and destruction of Swamp Forest and Reed Beds, water pollution through oil spills by boats, over sedimentation, and current Wetland Leasing Policy bring negative impacts to fishing resources of this Wetland. In this study, choice experiment has been applied for valuation of the Tanguar Haor wetland's aquatic ecosystem and watershed management. Choice experiment can successfully create a sense of strong participation of the people and enhancing outcomes. Multinomial and random parameter logit models have been applied for estimation of the attributes. All the attributes included in the econometric model are significant factors that affecting the probability of choosing an alternative scenario.

Relation with climate-resilient Bangladesh:

The facts and findings of this research help to deliver improved Wetland Leasing Policy and regulations for sustainable wetland management.

International Experience:

Tidal River Management in Kalicharanpur, Jessore: Assessment from Cradle to Grave

Session: **Local Adaptation Planning** Type: **On Going Research**

Keywords: **Tidal River Management, Water-logging, Local Adaption, Climate Change**

Presenter: **Tahmid Huq Easher**
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Lecturer, Department of Environmental Science and Management,
North South University

Abstract:

In Khulna-Jessore belt, a village named Kalicharanpur in Keshobpur area is experiencing severe water-logging since the last two decades. These areas are characterized by numerous tidal river creeks and depressions of beel, and faced severe climate induced cyclone, floods, saltwater intrusion, and tidal interaction throughout the years. To minimize the risk, the inhabitants of the Keshobpur area took initiatives to adapt Tidal River Management (TRM) with the assistance of the local government. Wetland that surrounds Kalicharanpur village was selected to be submerged for 2 years to drain out the nearby water to the river, and proper compensation was promised to the local people, including ensuring alternative livelihoods opportunities. But these basic components of TRM were missing in reality and made TRM a nightmare rather than blessings for the local inhabitants. Finally in 2012, the village opted out from TRM, though they still want proper implementation of TRM in their village. This study is a snapshot between 2005-2015 of Kalicharanpur village, which has focused on the reasons behind TRM, impacts on surrounding areas of TRM, reasons for opting out from TRM and its consequences on livelihoods capitals, and reasons why local people still think and what should be done to make TRM a suitable adaption option for the vulnerable communities.

Relation with climate-resilient Bangladesh:

This research featured how local communities are suffering, coping and adapting with the conclusive water-logging, tidal flooding and river siltation in the study area. This research showcased how the local communities are being resilient to the consequences of unsuccessful intervention of tidal river management and still aspire for better future

International Experience:

IWRA World Water Congress 2011 in Montreal, Canada

Local Adaptation Plan for Action: A Tool for Climate Resilience

Session: **Local Adaptation Planning** Type: **Action / Practice**

Keywords: **Local adaptation plan, Climate change adaptation, Resilience, Risk informed planning.**

Presenter: **Munirul Islam**
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Program Manager, Climate Change and Disaster Resilience Program
Islamic Relief Bangladesh

Abstract:

Local Adaptation Plan for Action (LAPA), a participatory, contextual and inclusive bottom-up planning process, aims to integrate climate change resilience into local-to-national development planning process by leveraging funding from international adaptation funds. LAPA process operationalizes the policy objectives outlined in the National Adaptation Programs of Action (NAPA) and Bangladesh Climate Change Strategy and Action Plan (BCCSAP). Islamic Relief Bangladesh (IRB), with the technical support of Bangladesh Center for Advance Studies (BCAS), piloted LAPA in five rural areas (Syamnagar in Satkhira district, Golachipa and Rangabali of Patuakhali district, Koyra in Khulna district, Sulla in Sunamgonj district) considering Coastal and Haor ecological context and one in urban area (Ward#18 of DNCC). This study describes present status of policy, planning and practices of climate change adaptation as well as future prospects of LAPA as a risk informed planning tools for identifying the climate change impact at local level and exploring the possible adaptation options to enhance the climate resilience. This paper also demonstrates the effective delivery of adaptation services to the most climate vulnerable areas and people. This study shows the scope of integration of LAPA in to National Adaptation Plan (NAP).

Relation with climate-resilient Bangladesh:

The study findings show that Local Adaptation Plan for Action (LAPA) can integrate climate change resilience into local-to-national development planning process.

International Experience:

I have experiences of attending in CBA Conferences, Gobeshona Conference, and third UN World Conference on Disaster Risk Reduction etc.

Deltas, vulnerability and Climate Change: Migration and Adaptation: The problems of governance of climate change adaptation in coastal GBM-delta Bangladesh

Session: **Local Adaptation Planning** Type: **On Going Research**

Keywords: **Governance, Climate change adaptation, Delta, Planned and autonomous adaptation**

Presenter: **Mohammad Rashed Alam Bhuiyan**
rashedgreen@yahoo.com
Assistant Professor and Co-investigator
University of Dhaka and RMMRU

Abstract

This paper will try to explore the programmes, projects and practices made by government, NGOs and individual for climate change adaptation in four coastal delta districts of Bangladesh. Secondly, it will examine the governance mechanisms of these adaptations programmes, projects and practices particularly those are relevant to managing the impacts of climate change. Thirdly, an assessment on the effectiveness of current adaptation initiatives will be made on the basis of local people's perception.

Relation with climate-resilient Bangladesh:

The role of governance is pivotal in a changing climate particularly in adjusting the need and addressing the challenges faced by delta populations. This paper aims to understand the capacity of the governance system i.e. way of implementation, actors and institutions to support adaptation activities in the context of climate change.

International Experience:

Adaptation to Climate Change: Migration, an autonomous option presented in Climate Change and Population Conference (CCPOP) 2015 held on 29-31 July at the University of Ghana. Adaptation Strategies of Poor Urban Migrants in the Context of Climate Change: a case study of informal settlements in Natore, Sirajgang and Rajshahi jointly presented at the Thematic Session 6: Migration in the context of climate change: regional experiences and policy shortcomings on Friday, January 9, 2015 at the first Gobeshona Conference for Research on Climate Change in Bangladesh was held at the Independent University, Bangladesh, from 8-11 January 2015. Sensitivity of migration to climate change in Bangladesh, presented in the workshop on New Knowledge on Climate Change and Migration in Bangladesh. Held on 29 May, 2013 in Dhaka. Migration: From threat of Climate Change to Adaptation Tool presented in KNOMAD International Conference on Internal Migration and Urbanisation held on 30 April- 1 May, 2014 in Dhaka

Migration, Immobility and Climate change: gender dimensions of poverty in coastal Bangladesh

Session: **Migration** Type: **On Going Research**

Keywords: **Climate change, Migration, Immobility, Gender, Resilience**

Presenter: **Basundhara Tripathy**
basundhara.tripathy@ulab.edu.bd
Assistant Professor, University of Liberal Arts Bangladesh

Abstract:

Global environmental change has led to movements of people within and between various world regions. Bangladesh has been recognized as one of the most vulnerable countries in the world to the impacts of climate change. The issue of climate-induced migration and immobility of the trapped population are the key issues investigated in this paper. Gender complexities, the confinement of women to certain spaces and its relationship with poverty have been explored within the environmentally fragile region of south west Bangladesh.

Women and young girls who fall within the poorest of the poor umbrella category, but their experiences in the vulnerable environment vary according to inequalities such as age, class, religion, etc. These experiences of women and their lack of capability of movement from the place of origin have been analyzed using social theories of Amartya Sen (capabilities, freedom) and Naila Kabeer (household dynamics). The research has been carried out in 2 villages of Satkhira district, Khulna region over a period of 3 months in August-October 2016. In-depth interviews and Focus Group Discussions were used to collect data from the field.

The study contributes to the larger debate of migration and immobility which is under researched, highlighting gender dimensions in coastal Bangladesh.

Relation with climate-resilient Bangladesh:

The research is primarily based on the climate affected areas of Bangladesh. Women's role and understanding their social situation in this context of increased migration will help planning the future of the local communities, making them more resilient to the impacts of climate change.

International Experience:

I have presented at the IASFM 16: Rethinking Forced Migration and Displacement: Theory, Policy, and Praxis in Poland this year.

Climate Induced Migration: A South Asian Perspective

Session: **Migration** Type: **On Going Research**

Keywords: **Climate refugee, International Refugee Law, Climate migration, South Asia, Sri Lanka, India, Bangladesh, Nepal, Adaptation, Cancun Framework, Urban migration, Warsaw International Mechanism**

Presenter: **Vositha Wijenayake**
vositha@gmail.com
Executive Director, SLYCAN Trust

Abstract:

Climate migration is one of the key topics of discussion today which is gaining a lot of attention due to its diverse aspects. While the term climate refugees is used with a lot of freedom, international law definition of "refugee" presents difficulties in how climate change induced migration, and the displacement caused by it could be brought into the scope of a refugee in international law. This paper focuses on how climate change induced migration is impacting the regional of South Asia, and how this overlaps with with discussions on loss and damage under the Paris Agreement, and the UNFCCC Convention, as well as how institutional structures such as the Warsaw International Mechanism, and the Nansen Initiative could play a role in addressing gaps that exist in the international mechanisms addressing climate migrants. This will be done through analysis of existing law, policies, and case studies from South Asia.

Relation with climate-resilient Bangladesh:

The research will focus on the issue of climate migration in Bangladesh, and it will discuss how it will be better addressed, and how climate migration in Bangladesh could be seen as a more organised and structured manner, where rights and needs of the people impacted could be addressed in order to raise resilience to face climate change impacts.

International Experience:

UNFCCC, COP, Adaptation Committee, LEG, NAPEXpo, APAN

Challenges of governance for reducing climatic concerns in perspective of migration in Bangladesh

Session: **Migration** Type: **On Going Research**

Keyword: **Climate concerns, Challenges, Governance, Migration, Adaptation**

Presenter: **Md. Arif Chowdhury**

arifchowdhury065@gmail.com

Research associate, Institute of Water and Flood Management, Bangladesh University of Engineering and Technology (BUET)

Abstract:

People in Bangladesh especially coastal region people are facing major effects of climate change on their everyday life. To cope with climatic concerns, they use migration at local and international levels as a major adaptation strategy. This paper seeks to explore challenges of governance principles that encompass legal norms and policies in terms of safe migration as an adaptation strategy. , On this theme, this paper explores a research question, what are the current challenges of national laws, policies, and programs to address climatic concerns in the context of safe migration, adaptation in the perspective of human rights, natural resource management, climate change adaptation and disaster response? We use one questionnaire of the Work Package one of research project, DECCMA (Deltas, vulnerability and Climate Change: Migration and Adaptation) which describes effectiveness of local laws, policies, and programs to ensure adaptation. This paper designed on three major points : (i) linkage between climate change, migration, and adaptation; (ii) strengths of laws, policies, plans, and programs to ensure safe migration as an adaptation, and (iii) limitations of laws and policies in addressing challenges of the climatic concerns. The findings of this research paper argue that inclusion of multiple stakeholders to develop and implement legal and policy documents can reduce effects of climate change on local communities and can increase livelihood security.

Relation with climate-resilient Bangladesh:

My research conducted on governance status of different issues such as, human rights, natural resource management, climate change adaptation and disaster response in the context of climate change. It is important to ensure proper governance in the context of climate change to ensure safe migration as adaptation in Bangladesh.

International Experience:

Attended (1) "South Asia Youth Climate Journalism Workshop" in Colombo, Sri Lanka from 14th to 16th October, (2) 5th Asia Pacific Climate Change Adaptation Conference in Colombo, Sri Lanka from 17th to 19th October, (3) Workshop on Environmental Modeling by GIS held on 11-14 September, 2015 at the Institute of Forestry and Environmental Sciences (IFESCU), University of Chittagong (4) SERVIR-Himalaya Youth Forum (5-8 May, 2014), (5) International Conference on Governance in Transition, BARD, Comilla, Bangladesh

Forest carbon estimate and REDD+ implications in Bangladesh

Session: **Mitigation** Type: **On Going Research**

Keywords: **Carbon budget, Forest conservation, Forest ecosystem, REDD+, Bangladesh**

Presenter: **Sharif Ahmed Mukul**
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Postdoctoral Research Fellow, The University of Queensland / University of the Sunshine Coast, Australia

Abstract:

In tropical developing countries, reducing emissions from deforestation and forest degradation (REDD+) is becoming an important mechanism for conserving forests and protecting biodiversity. A key prerequisite for any successful REDD+ project, however, is obtaining baseline estimates of carbon in forest ecosystems. Using available published data, we provide here a new and more reliable estimate of carbon in Bangladesh forest ecosystems, along with their geo-spatial distribution. Our study reveals great variability in carbon density in different forests and higher carbon stock in the mangrove ecosystems, followed by in hill forests and in inland Sal (*Shorea robusta*) forests in the country. Due to its coverage, degraded nature, and diverse stakeholder engagement, the hill forests of Bangladesh can be used to obtain maximum REDD+ benefits. Further research on carbon and biodiversity in under-represented forest ecosystems using a commonly accepted protocol is essential for the establishment of successful REDD+ projects and for the protection of the country's degraded forests and for addressing declining levels of biodiversity.

Relation with climate-resilient Bangladesh:

Our paper highlights the contribution of Bangladesh's forests in climate change mitigation and the prospect of REDD+.

International Experience:

COP15 (Copenhagen, 2009), Planet Under Pressure (London, 2012)

Production of Bioenergy from Biosolids (Coffee Waste) Degradation: A Biotechnological approach to mitigation the emission of Greenhouse Gases

Session: **Mitigation** Type: **Action / Practice**

Keywords: **Climate Change, Greenhouse gases, Methane, Farming, Mitigation**

Presenter: **Dr. T. Selvan Kumar**
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Professor & Head, Mahendra Arts & Science College (Autonomous)

Abstract:

Global warming has serious implications for all aspects of human life. It is due to the green house gas emissions in the atmosphere by the human activities such as industrial processes, fossil fuel combustion, and the natural degradation of organic solid wastes. The biotechnological approach for methane gas and microbial metabolites production from organic wastes is the energy recovery methodology and also mitigate the direct emissions of green house gases.

In India, the coffee pulp obtained from coffee processing industries. The land filling of the coffee pulp waste disposal is the major impact for emissions of green house gases in the environment. These coffee pulp waste subjected with co-digestion of cow dung at 1:3 ratio showed maximum biogas yield of 2590 ml after 96 hours. The methane content in the biogas was analyzed by GC-MS. The rate of energy conversion from the organic waste coffee pulp to rate of methane gas emission was calculated by using Bushwell's equation. The field trial was done to recover energy (Biogas) for the production of kitchen gas by using portable Shakthi Surabi digester system. From this above findings, organic solid waste (coffee pulp) is also a one of the efficient substrate for the production of renewable energy such as biogas and microbial metabolites. This conventional move towards the use of agricultural by-products in the environment is to recover the energy and mitigate the direct emissions of green house gases in the environment.

Relation with climate-resilient Bangladesh:

In a historical perspective, bio-gas has been produced since the second half of the 19th century. India, China and Bangladesh were among the pioneering countries, where bio-gas produced from manure and kitchen waste has long been used as a fuel for gas cookers and lamps. On this way we can reduce the emissions of greenhouse gases (methane) from degradation of organic materials in the agricultural landfills.

International Experience:

Yes, I have worked my doctoral research programme on this field and published in international research articles.

Facilitating Renewable Energy in Urban Planning and its implication in Climate Change Mitigation: Scope and Opportunities in Megacity Dhaka

Session: **Mitigation** Type: **Action / Practice**

Keywords: **Landuse, Structural, Environmental hazards, Facilitating mechanism, RE policies**

Presenter: **Kamrul Hasan Sohag**
ksohag2001@yahoo.com
Depute Town Planner, RAJUK

Abstract:

A sanitary landfill based power plant in convenient location if the land is not allocated for that particular landuse in the master plans. Urban and regional Planning is facilitates the holistic system for promoting renewable energy use by policy and programs. Incorporation of REs in the urban system is a recognized function in climate change mitigation around the world. There is an emerging need to reduce energy consumption and emissions in urban areas to support sustainable development. Inefficient land use development practices have increased infrastructure costs as well as the amount of energy needed for transportation, community services, and buildings. At the same time, the idea which is being popularized is smarter growth approach to land use planning. The present urban planning practices in Dhaka does not consider insights how to incorporate RE policies under existing regulations. The existing master plan does not incorporate REs policies allocating space for waste segregation, biogas, biomass production and distribution, solid waste incineration. The present building construction rules facilitate scattered construction of high rise buildings which not only reduces potentials of solar installation but also structural end environmental hazards. This study is anticipated to reveal the facts of facilitating mechanism how to incorporate RE policies under the master plans to be prepared in near future.

Relation with climate-resilient Bangladesh:

Sustainable Development

International Experience:

Influence of Climatic Variables on Season Based Agricultural System in Satkhira District, Bangladesh

Session: **Climate Change and Livelihood** Type: **On Going Research**

Keywords: **Agriculture, Climate change, Temperature, Rainfall, Relative humidity**

Presenter: **Dr. Md. Younus Mia**
mdmia1998@gmail.com
Professor, Dept. of Environmental Science & Resource Management, Mawlana Bhashani Science & Technology University

Abstract:

The study was conducted to investigate the influence of climatic variability (temperature, rainfall and relative humidity) on cropping pattern of major food crops (aus rice, amon rice, boro rice and potato) at Shyamnagar and Tala upazila of Satkhira district. Thirty years data (1984-2014) on climatic parameters were used. The study identified a statistically insignificant decreasing trend of annual average temperature and average rainfall whereas average relative humidity has a statistically significant relation ($p < 0.05$) with year. Correlation between average relative humidity and potato production showed only significant ($p < 0.05$) relation. Pearson's correlations among the different parameters were done to identify the relationship among soil quality parameters. Average values of K, Ca, Mg, S and Zn were found higher than standard values in both seasons, which may be due to excessive use of fertilizers in the agricultural land of study area. Average value of P at Shyamnagar upazila was $7.53 \mu\text{g/g}$ soil and $3.95 \mu\text{g/g}$ soil, respectively in dry and wet season and at Tala upazila it was $756 \mu\text{g/g}$ soil and $6 \mu\text{g/g}$ soil, respectively in dry and wet season. In both season, the measured average value of B at Shyamnagar upazila was $0.529 \mu\text{g/g}$ soil and $0.53 \mu\text{g/g}$ soil respectively whereas at Tala upazila it was $1.45 \mu\text{g/g}$ soil and $0.63 \mu\text{g/g}$ soil. It may be concluded from the study that climatic variables has influence on season based agricultural crop production in the study area.

Relation with climate-resilient Bangladesh:

Due to climate change in Bangladesh, agricultural production has also been changed. My research is related to climate change and season based agricultural system. So, it is related to climate-resilient Bangladesh.

International Experience:

Exploring Uncertainties in Community Livelihood Adaptation for Adaptive Delta Management in Bangladesh: Tapping community adaptation decision for climate resilient Bangladesh

Session: **Climate Change and Livelihood**

Type: **On Going Research**

Keywords: **Community adaptation, Decision, Livelihood, Coastal, Bangladesh**

Presenter: **Umme Kulsum**

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PhD Fellow, Adaptive Delta Management Project, Delft University of Technology,
The Netherlands

Abstract:

Coastal communities are the frontline victim of sea level rise and climate change worldwide. However communities in Bangladesh showcase adaptation to climate change in recent years. Both policy processes and communities take adaptation decisions at different scale of time and space. Community adaptations are locally driven adaptation strategies, operating on learning by doing, bottom up, empowering paradigm that cuts across sectors. Policy processes consider stakeholder participation as a way to incorporate stakeholders including vulnerable community perception but yet to analyze how community as the frontline victim can bridge their adaptation decision in policy processes. This research analyzes two separate lines of adaptation decision in historical pathway. Firstly, how community adaptation is perceived and considered in relevant policy processes of Bangladesh is drawn upon review of policy documents and literature. Secondly, history of community adaptation decision in livelihood at the poldered area of southwest coastal region is drawn from interview with farmers' community and available literature. Results suggest that communities take adaptation decision based on a number of triggering factors and thresholds. Thus to enhance adaptive capacity of community towards climate resilient future, policy processes should acknowledge and facilitate community adaptation meaningfully.

Relation with climate-resilient Bangladesh:

Insights on adaptation decision of community in their livelihood, relevant factors, and thresholds will produce useful knowledge for policymaker that can contribute in making livelihood adaptation planning robust to address future uncertainty, therefore will contribute towards climate-resilient Bangladesh.

International Experience:

Campaign and participation in COP 15 in Copenhagen

Enhancing Climate Resilient Livelihood

Session: **Climate Change and Livelihood**

Type: **Action / Practice**

Keywords: **Climate change, Vulnerability, Hazards, Resilient, Adaptive livelihood**

Presenter: **Munirul Islam**

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Program Manager, Climate Change and Disaster Resilience Program
Islamic Relief Bangladesh

Abstract:

Numerous disasters like cyclone, floods, river bank erosion, salinity intrusion, water scarcity etc. are gradually swelling as consequence of climate change which is increasing risks and vulnerability particularly in the coastal and haor areas of Bangladesh. There is growing evidence that these hazards are appearing more frequently, expected to be detrimental for the lives and livelihoods of climate vulnerable people. Given the threat to livelihood, Islamic Relief Bangladesh (IRB) supported these vulnerable people with technological assistance and guidance for climate adaptive livelihood options, which improved their status by multiplying and diversifying their productive assets. IRB conducted a study on how climate adaptive livelihood activities can improve capacity of vulnerable people to plan for a resilient future and to manage risks of further shocks. This paper describes that how climate vulnerable people have adopted diverse climate adaptive on-farm and off farm livelihood options, which increased household incomes significantly. Study findings showed that total 2136 beneficiaries diversified Income Generating Activities (IGAs) for 1 time, 1128 have 2 times and 600 beneficiaries have diversified their income sources for 3 times respectively. Thus the average income of on-farm and off-farm livelihood households increased from BDT 2500 to BDT 7004 (180.16% increase). Results also narrated the improvement of livelihood security of the climate vulnerable poor people.

Relation with climate-resilient Bangladesh:

This study shows that the climate adaptive livelihood activities can improve capacity of vulnerable people to plan for a resilient future and to manage risks of further climatic shocks.

International Experience:

I have experiences of attending in CBA Conferences, Gobeshona Conferences, Third UN World Conference on Disaster Risk Reduction etc.

Climate Change Vulnerability of Dhaka City: Suggestive Measures for Enhancing Resilience

Session: **Urbanization and Development Control** Type: **On Going Research**

Keywords: **Climate Change, Resilience, Urbanization, Planning, Dhaka City**

Presenter: **Ripan Debnath**
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MSc Researcher
North South University, Dhaka

Abstract:

The mega city Dhaka has huge migrating population pressure leading to rapid urban land-cover changes and consequent climate change is apparent. The city has climate change vulnerabilities, mainly, in the forms of heat stress and flooding. To obtain the benefits of urbanization and maintain their sustainability, climate change resilient urban development is necessary. Therefore, this study analyzes current urban development management plans and practices in quest of resilience enhancement options. Such proposals were sought by studying current development planning, management practices, institutional setup etc. of Dhaka Metropolitan Development Plan (DMDP) area. Here, to manage the (migrating) population pressure, regional urbanization may reduce the pull of Dhaka and requires Government intervention to enhance the rural-urban linkage via proper regional improvement plan. Besides, development authority needs to adopt and execute strict environment conservation policy. Successful and time bound implementation of formulated plans/ policies are equally important which requires efficient management practices. The institutional reform of the development authority can contribute sufficiently in this regard for the desired and planned urban development. Therefore, improvisation of decentralized governance in an integrated and participatory manner can perform efficiently in resilient city development.

Relation with climate-resilient Bangladesh:

The study emphasizes on city resilience development recommendations against climate change.

International Experience:

The Need of Compact Township in Bangladesh

Session: **Urbanization and Development Control** Type: **Publication**

Keywords: **Agglomeration, Bangladesh, Compact township**

Presenter: **Ishrar Tabassum**
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Student
North South University

Abstract:

Population growth rate has been increasing in an exponential growth rate in Bangladesh, despite several efforts for family planning. Rural areas such as Barisal for example has faced high amount of sea level rise causing the rural residents' houses to go under water. In the formal sector proper infrastructure is absent causing several problems. A compact township is an agglomeration of houses, schools, hospitals, markets, rural industries and government units that provide all basic services to a population of about 20,000. It is to be largely self-governing and self-financing. The size is small enough for traffic within the CT to be conducted by non-motorized vehicles and for motorized traffic to be thus isolated from the CT itself, making it well connected yet environmentally friendly. As the size is small enough to provide effective protection from floods, the CTs will permit Bangladesh to do with many fewer embankments and thus encourage the re-emergence of a wetlands environment as well as serve to stimulate the renewal of freshwater fisheries, a critical source of nutrition.

Relation with climate-resilient Bangladesh:

My research shows that compact townships will help people living in the coastal zone area from floods that are washing away their residence, schools and other public needs. It is vital for Bangladesh to have a proper planning before sea level rises beyond our predictions.

International Experience:

Urbanization and Climate Change: Urbanization Strategies of Baluchar induced Climate change.

Session: **Urbanization and Development Control**

Type: **On Going Research**

Keywords: **Urbanization, Climate Change, Strategies.**

Presenter: **Mst. Gulajannath Prianka Choudhury**

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Post graduated in anthropolgy student.

Shahjalal University of Science and Technology, Sylhet.

Abstract:

Urbanization is a process by which people are shifting from rural to urban. But unplanned urbanization induced climate change roughly. The aim of the paper is to examine the urbanization strategies of Baluchar in Sylhet. The study has been carried out using a combination of ten in depth interviews, two focus group discussions, and observation notes to explore the urbanization strategies and how it is induced climate change. The result shows that the hilly area of Baluchar become urbanized through hill and forest destroying, filling low land and canals, creating slum and multistoried building, Inappropriate solid waste disposal system and water logging state etc. It is also founded that violence and socioeconomic insecurity are also increased. It is high time to take proper steps for unplanned urbanization and conserve natural resources for healthy climate.

Relation with climate-resilient Bangladesh:

My research wants to focus the unplanned urbanization which process induced climate change. And in Bangladesh urbanization process are totally go on unplanned and unauthorized ways. This is the main point of my research which would be related with climate-resilient Bangladesh.

International Experience:

Conferences

Building Climate Resilience to Noapara Town: A Coastal Urban Centre of Bangladesh

Session: **Urbanization and Development Control**

Type: **Publication**

Keywords: **Resilience, Climate Change, Water and Sanitation**

Presenter: **Sarder Shafiqul Alam, Neaz Rassel**

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Coordinator, Urban Climate Change, International Centre for Climate Change And Development (ICCCAD) at Independent University, Bangladesh (IUB)

Abstract:

This study explores ways of making Noapara a coastal urban centre in Bangladesh, resilient to the impacts of climate change, with specific focus on the water and sanitation sector. It further investigated if building resilience of such coastal towns could be effective in attracting migrants. The study used key informants interview and focus group discussions to collect information on existing water and sanitation infrastructure and service systems, climate change induced disasters risks and vulnerabilities, identified current coping mechanism and adaptation needs to increase resilience of the sector. It was found that the town's lacks access to safe water and basic sanitation. Municipal water supply covers only 01% of households, and as such dwellers primarily depend on hand tube wells and other sources. Poor people living in informal settlements suffer most due to lack access to safe water, lack of proper drainage systems, adequate sanitation facilities and waste management facilities. Under the influence of climate change the situation is expected to exacerbate. Respondents indicated that in addition to job opportunities, improved and increased access to safe water and sanitation facilities could play a role in attracting migrants to Noapara. Institutional support from the government, public-private partnerships and collaboration of stakeholders and community-based organisations, can play a key role in improving resilience of the water and sanitation sector in Naopara.

Relation with climate-resilient Bangladesh:

The study objective was to know climate change impacts and vulnerability assessment on water and sanitation sectors in a coastal town. It also investigated if building resilience of such coastal towns could be effective in attracting migrants. Lessons of this study are can be used in other coastal cities in Bangladesh.

International Experience:

Yes, I have participate several COPs and large number of International Events on Climate Change Adaptation and Urban Cliamte Change issues.

Scenario guided strategic planning for a climate-resilient Bangladesh

Session: **National Adaptation Planning** Type: **On Going Research**

Keywords: **Climate change, Bangladesh, Future scenarios, Agriculture, Food security**

Presenter: **Maliha Muzammil**
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Researcher, University of Oxford

Abstract:

The CCAFS South Asia Future Scenarios team has been working with the Bangladesh Planning Commission and the International Centre for Climate Change and Development (ICCCAD) since 2014. Initially a two-day workshop was held in Dhaka to test the robustness of the 7th Five Year Plan (FYP) for the Government of Bangladesh through future socio-economic and climatic scenarios.

The 7th FYP, follows a structured and flexible framework that helps the country stay on track of economic and social development policies and goals which are also very relevant for climate change adaptation and mitigation planning. Working together with the Scenarios team meant the Planning Commission were able to generate new ideas and content for the upcoming Plan based on the challenges offered by the scenarios.

In 2015, the Planning Commission incorporated the major systemic interventions and suggested improvements that came out of the workshop into the 7th FYP. Along with ICCCAD, the Scenarios Team is now developing a long-term partnership with the Planning Commission to provide training and capacity building on scenarios development to aid the upcoming vision 2040 and the National Adaptation Plan (NAP).

Relation with climate-resilient Bangladesh:

Scenarios help explore key national socio-economic and governance uncertainties for food security, environments and livelihoods under climate change through integrated qualitative- quantitative scenarios describing long term futures. These scenarios help understand the impacts of combined stressors and will be used for strategic planning and research for a climate resilient Bangladesh.

International Experience:

UNFCCC COP 2009, ECI's 1.5 Degrees Conference at the University of Oxford, 2016, etc.

Managed Aquifer Recharge for Artificial Storage (MARAS) of Water to Improve Groundwater Conditions in Vulnerable Climatic Areas of Bangladesh

Session: **National Adaptation Planning**

Type: **On Going Research**

Keywords: **Climate change, Overstressed aquifers, Salinity encroachment, Artificial recharge**

Presenter: **Anwar Zahid**

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Deputy Director, Ground Water Hydrology, Bangladesh Water Development Board and University of Dhaka

Abstract:

Artificial recharge by means of spreading basins, recharge wells or induced infiltration of treated safe and fresh surface water and harvested rain water needs to be carried out for overstressed aquifers and aquifers suffer from water quality e.g. salinity problem. Areas where groundwater is either already over-exploited like Dhaka city and drought-prone Barind area or saline prone, like in the coastal areas, recharge enhancement has potential to store excess runoff and to reduce salinity. Over exploitation is usually the result of irrigation abstraction in rural areas and huge domestic and industrial usage in cities as well as due climatic variability including impact of changing rainfall pattern. High rates of pumping from the shallow aquifers and anticipated impact of sea-level rise may result in widespread saltwater intrusion in coastal areas, and the degradation of water resources. Traditional approaches of watershed development that stress enhancing managed aquifer recharge for artificial storage of groundwater do not pay adequate attention in developing countries like Bangladesh. The objective of this study is to select the appropriate and potential recharge technologies for different climatological and physiographical areas of Bangladesh considering variables like Precipitation intensity and duration, Surface geology, hydrogeological conditions, groundwater table and quality, land-use pattern and demand etc.

Relation with climate-resilient Bangladesh:

Over exploitation is usually the result of irrigation abstraction in rural areas and huge domestic and industrial usage in cities as well as due climatic variability including impact of changing rainfall pattern. High rates of pumping from the aquifers and anticipated impact of sea-level rise may result in widespread saltwater intrusion in coastal areas, and the degradation of water resources. The appropriate recharge technologies can support to mitigate water shortage and quality situation.

International Experience:

Collaborating Deltares, Netherlands and International Water Management Institute to study on ASR and MAR potential in Bangladesh and visited Netherlands and India for this purpose.

How sustainable are alternative income generating activities? A case study of mega adaptation projects from Bangladesh

Session: **National Adaptation Planning**

Type: **On Going Research**

Keywords: **Sustainability, AIGAs, Resilience, Adaptation, Maladaptation**

Presenter: **Remeen Firoz**
firozremeen@gmail.com
Consultant, Adam Smith International

Abstract:

Bangladesh is recognized as one of the most vulnerable in the world to the manifestations of climate change such as frequent natural disasters. There is a unanimous agreement that economic freedom and livelihood security determine a person's adaptive capacity and whether a person is vulnerable. Over the past couple of decades, policies, financing, institutional framework, governance and implementation of adaptive strategies have been geared towards creating resilient communities. Alternative Income Generating Activities (AIGAs) have gained much popularity as in situ adaptation activities amongst the Government, NGOs and development partners. These have been successful in most instances and transformed the lives of hundreds and thousands of rural poor. However, if adaptation activities are not specific to the local context, owned by the communities and do not sustain beyond the scope of the project period, these may lead to increased risk of adverse climate-related outcomes and turn into maladaptation. Therefore, 'how sustainable are the in-situ adaptation activities, like the AIGAs that are promoted in Bangladesh? To answer this question, this paper investigates 5 mega projects, spread over 2001-2015, where AIGAs have been promoted as adaptive options. It seeks to identify the good practices as well as the maladaptation activities in Bangladesh.

Relation with climate-resilient Bangladesh:

This paper recommends guiding principles for AIGAs, so that they do not transpire into maladaptation. Because climate change uncertainties are there, it is crucial that adaptation activities be planned judiciously so that people are not pushed into further vulnerability. Moreover, this paper is to guide planning and programming in Bangladesh.

International Experience:

Conservation actions for sustainable livelihood: Case studies of Socio-Ecological Models from Rajasthan, India

Session: **Natural Resource Management**

Type: **On Going Research**

Keywords: **Conservation, Livelihood, Citizen Social Responsibility (CiSR), Socio-Ecological Model, Rajasthan, India**

Presenter: **Dr. Satya Prakash Mehra**

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Advisor, Rajputana Society of Natural History & Rajputana Rural Enviropreneurship Development Centre

Abstract:

In the age of Information, conservation of natural resources has received a worldwide attention with a priority of every nation. On the other side, priority of any developing nation is source of livelihood for human population to meet out the basic needs. Every planning and strategy will prove to be successful only if it generates income for the local community. The natural landscapes and local biodiversity of developing countries could be used as a source of income for local people through nature tourism. The interventions by Rajasthan (India) based non-governmental organization Rajputana Society of Natural History (RSNH) had been discussed. The socio-ecological models of the based on the concept Conservation Practices for Sustainable Livelihood are briefed in the present work. It further, highlights the activities of sensitizing the target community based on the constitutional provisions of the Republic of India. The concept of Citizen Social responsibility (CiSR) had been given by the team to engage common mass. It was observed that the success of any conservation program depends on the level of local participation. Thus, conclusions were drawn through long-term investigation that conservation of any species requires employment and income generation of the local community.

Relation with climate-resilient Bangladesh:

The paper described site specific Socio-Ecological Models with the global application especially for the developing nations.

International Experience:

UN Solution Exchange Events in India

Living with environmental change: Perception of environmental quality among coastal people of Bangladesh

Session: **Natural Resource Management**

Type: **On Going Research**

Keywords: **Perception, Environmental quality, Climate change, Coastal Bangladesh**

Presenter: **Mohammed Mofizur Rahman, Sate Ahmad, Mahin Al Nahian, Abdullah Al Mamun, Ali Ahmed, Helen Adams, Peter Kim Streatfield**

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Research Investigator, Initiative for Climate Change and Health, icddr,b

Abstract:

In a time of climatic and environmental change, perception studies are important for countries with limited funding for environmental research. Coastal populations of Bangladesh, as with many other countries, are living with and experiencing changing environmental quality on a daily basis. Therefore it may be possible to capture, through their lenses, the quality of their surrounding environment. The aim of this study is to analyze people's perception of environmental quality in coastal Bangladesh and how it changes across different seasons. Following systematic random sampling, approximately 1500 households were selected from eight districts of south west and south central coastal Bangladesh and surveyed over three seasons. The list of environmental aspects that people were interviewed about were water quality and quantity (such as salinity in drinking and irrigation water, arsenic in drinking water, availability of drinking and irrigation water), environmental hazards and management (embankment and polder management, riverbank erosion, water logging) and availability of fish in the rivers and the sea. Moreover we measured actual salinity with electric conductivity meter which helped us to compare perceived salinity with actual salinity in drinking water. Initial analysis shows that a majority of the people are able to report salinity in drinking water when there is actually a high level of salinity present, although with some mismatch.

Relation with climate-resilient Bangladesh:

This study is expected to have relevant policy implications while future research should explore perceptions on other environmental parameters. Only with understanding the people of the coast, that we will be able to contribute to proper policy formulation for a climate resilient future.

International Experience:

International Climate Change Adaptation Conference, Netherlands; Alexander von Humboldt Climate Protection Conference, Germany

Payment for Ecosystem Services for Natural Resources Management in Bangladesh: The Potential of Ecotourism

Session: **Natural Resource Management** Type: **Action / Practice**

Keywords: **Ecosystem service, Ecotourism, Protected Area, Payment for ecosystem services, Ecosystem conservation**

Presenter: **Md. Shams Uddin**
msuddin.shams@gmail.com
Winrock International, Manager-Landscape Planning, Ecosystems and Biodiversity

Abstract:

Payment for Ecosystem Services (PES) is thought to be a suitable management option for the institutional and financial sustainability of Protected Areas (PAs). This paper presents the potential challenges and strategies to implementing ecotourism as a means of PES in three PAs of Bangladesh. This study draws on different studies, government records and field surveys. It reveals that all elements of the PES market models are present in the PAs of Bangladesh. Namely, providers (forest department, tour operators, local community) and buyers (tourists and other resource users). Nevertheless, despite the sustained growth of ecotourism, PES-based management schemes are not adopted in institutional and financial mechanisms of PAs. Key informants suggest that current ecotourism management practices can be turned into PES schemes through proper valuation of ecosystem services of PAs and adopting PES-related policy and institutional mandates for stakeholders (public, private and communities). This will need to include improvements in infrastructure, and defining roles of the providers and buyers for ensuring ecotourism services and benefit-sharing. The findings from this study provide new insights for policy makers implementing PES through ecotourism for better ecosystem conservation in Bangladesh.

Relation with climate-resilient Bangladesh:

The study will contribute to manage finance for building climate-resilient natural resources in Bangladesh

International Experience:

I have presented research papers to almost 6 international conferences around the globe

Do existing social protection programs address the emerging socio-ecological vulnerability of coastal households in Bangladesh?

Session: **Political Economy and Climate Finance**

Type: **On Going Research**

Keywords: **Climate Change, Livelihood Vulnerability Index, Social Protection, Bangladesh**

Presenter: **Iftekharul Haque**

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PhD Candidate, University of Ottawa

Abstract:

Social protection programs are generally used as strategies of social risk management in developing countries by governments, donor agencies and non-government organizations. In recent years, researchers and development practitioners became increasingly concerned about using social protection programs as a mechanism to support livelihoods of population vulnerable to climate change. This paper attempts to explore whether social protection programs in Bangladesh are addressing climate change related vulnerabilities. Using International Food Policy Research Institutes Bangladesh Integrated Household Survey-2011, this paper first constructs a Livelihood Vulnerability Index at Bangladeshs district level (Hahn et al, 2009), and then with the help of national social protection data it investigates whether existing social protection programs targeted to ensure food security are addressing vulnerabilities of population living in regions affected by climate change related hazards. Preliminary findings suggests that the majority of these programs, designed decades ago, rendering them inadequate for addressing new forms of vulnerabilities emerging with changing environmental patterns.

Relation with climate-resilient Bangladesh:

The effectiveness of social protection programs in reducing economic vulnerability is well theorised in the development literature. In recent years, researchers and development practitioners became increasingly concerned about the idea of using social protection programs as a mechanism to reduce vulnerability to climate change, and increase resilience. This paper will contribute to shaping social protection policies appropriate for reducing climate change related vulnerability in Bangladesh.

International Experience:

ICARUS IV conference @ University of Illinois, Urbana-Champaign, Initiative on Climate Adaptation Research and Understanding through the Social Sciences.

Mutual Accountability in Support and Utilization of Adaptation Finance

Session: **Political Economy and Climate Finance** Type: **On Going Research**

Keywords: **Transparency, Accountability, Adaptation finance, UNFCCC, Paris Agreement, Bangladesh**

Presenter: **Mizan R. Khan**
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Professor, Dept of Env Sc & Mgt, North South University

Abstract:

Mutual accountability in providing development assistance by donors and its utilization by recipient countries has been agreed upon and reinforced in Paris, Accra and Busan. The UNFCCC in 2011-12 has provided for enhanced guidelines for donor countries on reporting and communicating their support of climate finance. Again the Paris Agreement provides for an enhanced framework of action and support for the purpose including transparency at recipients' end. SBSTA has been given a specific responsibility to this end. In view of all this, what is the status of transparency and accountability in support and delivery of climate finance? Has it improved over these years? Then, what is the status of transparency and accountability in utilization of adaptation finance, in LDCs like Bangladesh in particular? The proposed paper will explore this increasingly important but persistently intractable issue on both sides,

Relation with climate-resilient Bangladesh:

In order to achieve the goal of a climate resilient Bangladesh, it is of utmost importance that Bangladesh negotiates for ensuring a transparent and accountable system of delivery of adaptation finance and then its effective utilization for programs at national and local levels.

International Experience:

Lead negotiator on climate finance from Bangladesh since 2001.

Climbing an oily bamboo: accessibility and additionality issues of global climate finance for Bangladesh

Session: **Political Economy and Climate Finance** Type: **On Going Research**

Keywords: **Bangladesh, Climate finance, Additionality, Green Climate Fund, Adaptation Fund**

Presenter: **Mohammed Abdul Baten**
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Senior Lecturer, Independent University Bangladesh

Abstract:

Discussion on financial mechanism under UNFCCC seems to be an disputable issue between developed and countries. Financial mechanism was regarded as separate pillar in Bali Action Plan (COP13), since then global climate finance has experienced many mechanisms and terminologies. In response to Bangladesh's proven vulnerability to climate change, the country has established different financial mechanisms both from its internal resources and multi donor assistances, i.e., BCCTF, BCRF, PKSf, PPCR. Based on available information, this paper reviewed national and international climate finance mechanisms and found that despite urgency, adaptation and mitigation efforts by the developing countries could not advance to its expected level due to insufficient financial scale and institutional framework. Recently, due to complexity in delivery and dispute over operational mechanisms, Bangladesh has returned millions of pounds of climate change aid to the British government. Another ongoing debate on climate finance is additionality; which is partly due to overlap between Official Development Assistance (ODA) and the financial flows to address climate change. ODA diversion from traditional development assistance to mitigation and adaptation activities in developing countries gives rise to few questions like how the poor developing countries will reduce poverty and achieve economic growth while coping with climate change?

Relation with climate-resilient Bangladesh:

This is no more rhetoric that Bangladesh contributes zero level GHG in global carbon emission, but suffers the most as the IPCC asserts the issue in their many reports. Bangladesh's demand, therefore, for support in climate change actions is rational and international communities should pay more attention both in the form of unrestrained fund and technology.

International Experience:

UNFCCC COP, UNCBD COP

Beyond Coal: Scaling up clean energy to fight global poverty

Session: **Renewable Energy**

Type: **On Going Research**

Keywords: **Renewable energy**

Presenter: **Eshrat Sharmen Akand**
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Senior Programme Officer, Christian Aid

Abstract:

Energy is playing key role to growth of nation which is fundamental issue in terms of achieving long-term development goals in Bangladesh. Access to clean energy is crucial for reducing poverty in country like Bangladesh. This was acknowledged when sustainable development goals agreed in 2015 included SDG7 which aims at universal energy access by 2030, with targets for significant increase in renewable energy and energy efficiency. To achieve ambitions of Paris Climate Agreement, SDG1 on eradicating global poverty by 2030 and SDG7 on universal access to affordable, reliable, sustainable and modern energy by 2030, an urgent shift to renewable and efficient energy systems is required. Considering the context, Christian Aid undertakes an international campaign called Big Shift to deliver shift of investment away from centralized fossil fuel based energy towards diverse renewable energy sources, effectively delivering clean energy access and helping to overcome energy poverty in context of climate justice and global goal of keeping temperature rise well below 2 degree C/1.5 degree C. This study report critically analyses implementation challenges of SDG 7 and Nationally Determined Contributions on mitigation in context of country's energy sector plans and policies in Bangladesh.

Relation with climate-resilient Bangladesh:

Make community people access to energy for study, computing and charging phone

International Experience:

Solar Powered Integrated Farming System: Irrigation, Rice Husking and Fishing.

Session: **Renewable Energy**

Type: **On Going Research**

Keywords: **Integrated Farming System, Thin Film PV Module, Climate change, Sustainable productivity, Bangladesh, Field implementation, Performance Analysis**

Presenter: **Mohammad Rejwan Uddin**
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Research Assistant
Independent University, Bangladesh

Abstract:

Agricultural technology is changing rapidly with sustainable development. Farm machinery, farm building and production facilities are constantly being improved leading to economic, environmental and social sustainability. Agricultural applications suitable for photovoltaic (PV) solutions are numerous. These applications are a mix of individual installations and systems installed by utility companies when they have found that a PV solution is the best solution for remote agricultural need such as water pumping for crops or livestock, low deep water fishing and rice husking. Such a system is environmental friendly and cost effective that can also enhance agricultural productivity. In addition, agriculture contributes to carbon emission through the use of fossil fuels directly and indirectly. Usage of solar energy to power such a system will not only reduce the pressure on the grid but also reduce carbon emissions for power production.

A solar powered integrated farming system consists of some basic components. These are PV panels, DC-DC converters for DC mini grid, pumps and pump controller, motor and motor controller, charger for battery charging and other equipment's for lightening and cooling system. Solar powered integrated farming system could be a sustainable solution since the annual average solar irradiation is higher in Bangladesh.

Relation with climate-resilient Bangladesh:

An integrated farming system using solar energy will increase sustainable agricultural productivity strengthening the food security of our overpopulated country besides improving the environment factors. It will also reduce carbon emissions alongside reducing the energy demand on utility grid.

International Experience:

Global Warming Minimization Through Solar Power: Challenges for Bangladesh

Session: **Renewable Energy**

Type: **Action / Practice**

Keywords: **Solar Home System, Solar irrigation, Feed in Tariff, Net metering, Mini grid**

Presenter: **Shah Zulfiqar Haider**

szhaider123@hotmail.com

General Manager, Bangladesh Rural electrification Board (BREB)

Abstract:

Bangladesh has to its credit the record of fastest growing Solar Home System (SHS) in the world mainly possible due to mechanism set up by IDCOL. It earned huge name abroad and many African countries came to follow it. As per IDCOL 4.1 million SHS were installed till October 2016, a global record. Bangladesh is mostly flat over populated country with few islands not accessible by grid like Swandip, Bhola etc. At that time Grid connected Consumers including Urban were less than 50%. But with extensive electrification under Bangladesh Rural Electrification Board (BREB) which is 99% Grid connected electricity connection, the SHS started to face financial problem as earlier SHS customers easily switched to grid connected electricity through BREB and were reluctant to pay balance installment payment to IDCOL. Another challenge is Government heavily subsidized costly electricity through fossil fuel to meet its rapidly growing demand whereas solar power is less subsidized. Again with absence of Net metering and Feed in Tariff (FiT) due to pressure from the Utilities the Renewable energy through roof top solar is not taking momentum. The Large scale solar power plants are also at a very slow speed due to expensive land where average sunshine round the year is more and return through solar power plants is not that lucrative. Solar irrigation of mini grid is also facing bottleneck due to extensive and fast expansion by BREB. These are some of the challenges for solar power.

Relation with climate-resilient Bangladesh:

Bangladesh strongly believes that global warming is due to extensive fossil fuel use for power generation etc. and renewable is a means of decreasing global warming. For that so far solar power is the most suitable as wind mapping is not fully complete. Solar power is facing challenges from grid connected rural electrification and tariff problems.

International Experience:

LEDS Asia, Alliance to Save Energy USA, EESD Pakistan

Converting local conflicts over water to cooperation in a changing climate

Session: **Water Resource Management**

Type: **On Going Research**

Keywords: **Conflict, Cooperation, Water, Community, Bangladesh, Adaptive learning**

Presenter: **Parfvin Sultana**
parvin@agni.com

Senior Research Fellow, Flood Hazard Research Centre, Middlesex University

Abstract:

Conflicts over natural resources are likely to worsen with climate change which may reduce their quantity and quality. Action research focused on understanding the impacts climate stresses have on conflict and cooperation over commons, institutions enabling conflict resolution, and the role of adaptive learning in overcoming challenges. Two cases are analysed where climate stresses, competing demands for water, and unclear rights give rise to local conflicts.

In the northeast, mediation failed to change the position of an upstream village that diverted a stream away from neighbouring villages, but participatory research revealed knowledge of long lost springs. Elders and youths from the downstream community dug out springs and through collective action could irrigate their lands and bypass the conflict. In the southwest, sluice operation was dominated by adjacent farmers, more distant lower level farmers and fishers suffered waterlogging and poor fish catches. Joint planning led to representation of the lower community in decision making, contributions to repair the sluice, and more balanced operation.

Adaptive learning between community organisations, based on exchange of good practices and testing innovations, has created peer pressure and spread successes to similar communities. Linking networks of community organisations with government agencies has improved recognition and mobilised government support for strengthening resilience based on collective interest.

Relation with climate-resilient Bangladesh:

Understanding how to enable communities to overcome climate impacted conflicts over natural resources impacts resilience via practice and policy.

International Experience:

Conferences related to commons (eg IASC) and programmes organised by NWO, but not major climate change events

Optimum Solution for Safe Drinking Water Sources in Tala Upazila

Session: **Water Resource Management**

Type: **Action / Practice**

Keywords: **Coastal area, Safe drinking water, Optimum solution, GIS based multi-criteria analysis**

Presenter: **Sajidur Rahman, Moniruzzaman Khan, Roufa Khanum, Reaz Uddin Khan, Asif Rahman and Hasnaeen Zakir**

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Abstract:

Coastal area of Bangladesh is most vulnerable due to its physiographic location and natural calamities. Huge number of people suffers from shortage of safe drinking water, though there is significant improvement as part of the millennium development goal commitments. However there is still a large portion of the country suffers from this problem. The situation of the coastal belt is even worse due to its exposure to natural perils. The article mainly analyzes the current situation of one of the vulnerable coastal upazilla in the country and formulates a GIS based multi-criteria analysis to locate suitable location and sources for future solution. Severity of drinking water crisis will acute due to climate change in coastal areas, especially in southwestern coastal zone. It is difficult to find alternative safe sources for drinking water, because analysis showed the surface and ground water based drinking water sources are already contaminated, and nearest distance of available safe drinking water sources are not easily accessible due to long distance. Groundwater based drinking water sources are contaminated due to arsenic, iron and salinity, and surface water based drinking water sources are out of use due to maintenance and proper management and planning. Considering all those limitations a GIS based spatial analysis was conducted incorporating field data to find alternative safe drinking water sources, and found some potential options in distributed locations.

Relation with climate-resilient Bangladesh:

The research proposed that storm surge protected design and rainwater collection system of a pond, may make sustainable and safe source of drinking water under climate change scenarios, which further help to build community resilience.

International Experience:

Conflicts and cooperation around water management infrastructure in a hydro-social system in peri-urban Khulna

Session: **Water Resource Management**

Type: **On Going Research**

Keywords: **Conflicts, Cooperation, Water Scarcity, Mayur River, Peri-Urban, Khulna**

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Abstract:

Socio-economy and ecosystem sustenance of the urban and peri-urban areas of Khulna are predominantly dependent on the hydrological network Rupsha-Bhairab and Mayur rivers. Alutala sluice gate, located at the outfall of the Mayur river, was constructed to protect the city from tidal floods. Viewing peri-urban Khulna as a hydro-social system, this study aims at exploring the implications of the community practices and sluice gate management to understand how conflicts emerge when water infrastructure is designed and managed without taking the needs of different social groups into account. Stakeholder diagramming and power mapping along with FGD, KII, and Stakeholder meetings were conducted to analyze the evolution, nature and level of conflicts over water use, and the potential areas of cooperation. Major sources of conflict were identified to be urban wastewater dumping, salinity intrusion into the Mayur river due to inequitable operation of the sluice gate and drinking water scarcity. Khulna City Corporation (KCC), is the most powerful and active stakeholder to create areas of cooperation. KCC's current operation practices damage the crop, kill the fish and degrade drinking water quality. DPHE, local media and NGOs are protesting the wastewater dumping in the Mayur river to save it as fresh water reservoir. Community farmers and fishermen are using alternative cultivation techniques to adapt with the fresh water scarcity and demanding installation of more deep tube wells.

Relation with climate-resilient Bangladesh:

Future projections say that sea-level rise and salinity intrusion due to climate change will further complicate the conflicts of the study area and aggravate the water insecurity. So, finding the area of potential cooperation would contribute to improve the climate resiliency of the communities.

International Experience:

Exploring mental health services among climate victims in a cyclone affected area of coastal Bangladesh

Session: **Health and Wellbeing (Climate Change Context)** Type: **Action / Practice**

Keywords: **Climate change, Disaster, Coastal Bangladesh, Mental Health, Policy**

Presenter: **M. Tasdik Hasan**

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Research Investigator, Infectious Diseases Division

Abstract:

In 2014 German Watch declared Bangladesh as the 5th ranked country in climate risk. Every year it is affected by cyclone creates huge impact on mental well being but this issue is still a neglected topic. We conducted this exploratory study with a view to explore the situation of mental health services in a cyclone affected village. A social mapping, KII with different stakeholders (10) & IDI with affected people (10) were done for identification of location of health care service centers, activities of government institution, NGOs, local volunteers, informal health care providers, resources & possible future steps related to mental health care. It was revealed that natural disasters like cyclone had many psychological impacts on population. People have suffered by post traumatic stress disorders, anxiety, panic, acute stress reaction, sad feelings, suicidal thoughts & children and female were more vulnerable. The government/NGOs had no specific plan of action/initiative to address these issues. There was a visible gap in thinking about finding of an effective way to give the people proper psycho social services. To make resilient & responsive health systems for this vulnerable group of population, implementation of effective mental health program with a strong mental health policy is needed.

Relation with climate-resilient Bangladesh:

My research has tried to explore the gaps in health care services with a specific focus on mental health by analyzing the voices of the victims to deal with natural disasters-the worst impact of climate change.

International Experience:

Gobeshona Young Researcher Program 2016 (GYRP-ICCCAD)-4 Workshops of GYRP, World Health Summit 2016, Berlin, Germany, GOBESHONA Resilient Livelihood Subgroup

Impact of climatic variables on cholera outbreaks in Dhaka

Session: **Health and Wellbeing (Climate Change Context)** Type: **On Going Research**

Keywords: **Cholera outbreaks, Climatic variables, SARIMA, Forecasting**

Presenter: **Salima Sultana Daisy**
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Abstract:

Cholera is a severe diarrheal illness, caused by the bacterium *Vibrio cholerae*, and without treatment, it can cause death within 24 hours. Regional hydroclimatic processes play an important role in propagating cholera outbreaks. This study shows the effects of climatic variables in the forecasting of cholera outbreaks in Dhaka, Bangladesh using laboratory-confirmed Cholera data collected for the last 14 years (2000-2013) from the International Centre for Diarrheal Disease Research, Bangladesh (icddr,b) and climatic variables data from the Bangladesh Meteorological Department (BMD). A significant correlation with cholera was found with monthly average maximum temperature ($r = 0.50$, $p < 0.001$), minimum temperature ($r = 0.46$, $p < 0.001$) and monthly total rainfall ($r = 0.38$, $p < 0.001$). Using a Seasonal Auto Regressive Integrated Moving Average (SARIMA) model, the contribution of different climatic variables on cholera outbreaks has been presented; a multivariate model structure showed better forecasting accuracy than that for an unadjusted model. Within the multivariate model, the effect of six climatic variables (rainfall, maximum temperature, minimum temperature, relative humidity, rainy days and sunshine hours) together showed higher forecasting accuracy in comparison with the contribution of three statistically significant climatic variables (rainfall and maximum temperature) with cholera outbreaks.

Relation with climate-resilient Bangladesh:

Climate plays a vital role on cholera outbreaks in Bangladesh

International Experience:

Economic benefits of universal health coverage for the climate induced disease in southwest coastal region of Bangladesh: An empirical study

Session: **Health and Wellbeing (Climate Change Context)** Type: **On Going Research**

Keywords: **Universal Health Coverage, Choice experiment, Willingness to pay, Southwest coastal region, Bangladesh**

Presenter: **Md. Hafiz Iqbal**
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BCS Cadre Officer & Assistant Professor (Economics), Government Edward College, Pabna, Bangladesh

Abstract:

Devastation of climate change and its negative impacts on public health is a common phenomenon of any coastal region and southwest coastal region of Bangladesh is not free from such circumstances. An effective health measure is a pre-requisite for minimizing the losses of lives and mitigates the health sufferings from devastating effects of climate change induced natural disaster. In order to formulate affordable, equitable, available and acceptable Universal Health Care (UHC) policy for the coastal people, this study identified some relevant attributes e.g., payment for UHC, ambulance service to carry the patient, tele-medicine, coverage of family members, medicine facilities and reproductive health for its choice experiment. Choice experiment is depends upon and support the preference of the coastal people (n=517). Multinomial and random parameter logit models are applied for estimation of the attributes. All the attributes included in the econometric model are significant that affecting the probability of choosing an alternative scenario. The welfare changes from quality or quantity of coastal health coverage service could be given by the measure of compensating surplus. The findings of this study will be helpful for the similar coastal region that has frequently faces climate induced health problems to its coastal inhabitants.

Relation with climate-resilient Bangladesh:

The findings of this study ensure improved and quality health care service with reduce out of pocket (OOP) expenditure for the coastal people who frequently suffered climate induced disease in the southwest coastal region of Bangladesh.

International Experience:

the 5th International Degrowth Conference, Corvinus University, Budapest, Hungary; the 5th Conference of Initiative on Climate Adaptation Research and Understanding through the Social Science (ICARUS), Indian School of Business (ISB), Hyderabad, India; the Bergen Summer Research School (BSRS), University of Bergen, Norway; the Eight Biennial Conference of Indian Society for Ecological Economics (INSEE), Indian Institute of Science (IISc), Bengaluru, India; the Seventh Biennial Conference of Indian Society for Ecological Economics (INSEE), Tezpur University, Sonitpur, Assam, India; the 3rd Asia-Pacific Climate Change Adaptation Forum, Incheon, Republic of Korea; and the Advance Education for Global Environmental Leaders, Nagoya University, Japan