

GOBESHONA 4

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Building local climate knowledge

at Independent University, Bangladesh (IUB)

Selected Abstracts



Session	3	Agriculture and Food Security		
Title	Evaluation of Climatic Impacts on Crop Production at Paikgacha Upazila of Khulna District			
Keywords	Climate change, Agriculture, temperature, salinity, rainfall			
Presenter	Mr. Shishir Reza	Coauthors	Research of	2017
Designation	Associate Member			
Institution	Bangladesh Economic Association			
Email	Shishiresrm@gmail.com			
Study Area	Khulna/Paikgacha Upazila	Problems	Salinity and variation of temperature	
Target Beneficiaries	Rural Farmers	Implementing Agency	Ministry of Environment and Forest/Ministry of Agriculture	
Abstract				
<p>Insurgencies of climate are a natural fact capable enough to alter the agricultural and environmental stability. Over the years, the variation of climate has become a serious natural threat for Bangladesh. This study explores the impact of climate change on the most commonly grown crops – Aman, Boro, Jute, Potato and Water Melon at Paikgacha Upazila under Khulna District. Climatic data – temperature, rainfall, and salinity (1996-2015) has used to explain the real figure of the study area. Field based data has incorporated through direct interview of the affected respondents. Secondary information was collected from Department of Agricultural Extension, Bangladesh Bureau of Statistics and Bangladesh Meteorological Department. Study refers that the three most vital parameters salinity, temperature and rainfall have impacted heavily on crop production. Through observing the status of climatic variables, salinity and crop production and the connection between crop production and climatic variables, it is finalized that the co-relation between crop production and climatic variables is significant. In this context, proper adaptation strategies, combine climate tolerant crops with adverse agro-ecology, financial incentives to farmers and public participation are essential to deal with the widespread calamity.</p>				

Session	3	Agriculture and Food Security		
Title	Methane Emission and Carbon Budget during Wet Season Rice Cultivation			
Keywords	Organic amendments, Methane emission, Carbon sequestration, Rice			
Presenter	Dr. Jatish Chandra Biswas	Coauthors	Research of	2017
Designation	Chief Scientific Officer and Head, Soil Science Division, BRRI			
Institution	Bangladesh Rice Research Institute			
Email	jatishb@yahoo.com			
Study Area	Gazipur, Bangladesh		Problems	Methane emission mitigation and carbon sequestration
Target Beneficiaries	Farmers		Implementing Agency	Department of AgrilExtrnsion, Ministry of Agriculture
Abstract				
<p>Greenhouse gas (GHG) emission from rice field varies depending on cultural management and varieties used, but inadequate data are available in Bangladesh. The experiment was conducted at BRRI farm Gazipur during T. Aman season, for determination of methane emission patterns from wetland paddy soils amended with different organic materials and to find out carbon budget. Treatments imposed were: cow dung (CD), vermicompost (VC) and poultry manure (PM) with IPNS based inorganic fertilizations and compared with chemical fertilizers (NPKSZn), non-fertilized control. Chemical fertilizers were applied at the rate of 80-10-80-5-5 kg ha⁻¹ of N-P-K-S-Zn as urea, triple super phosphate, muriate of potash, gypsum and zinc sulphate, respectively. The CD and PM were applied at 2 t ha⁻¹ with IPNS based inorganic fertilizers as basal dose. Methane emission was measured by static closed chamber method and carbon budget was estimated considering input-output components. Methane emission varied from 593-679 kg/ha depending on organic amendments, which was higher than chemical fertilizers use (326 kg/ha). Methane flux was 76-141 gm/kg grain production depending on treatments imposed. Carbon balance was negative for control and chemical fertilizers treatments. Vermicompost and CD had the highest carbon balance compared to PM amendment. Though higher amounts of CH₄ emission took place from VC, CD and PM application, 22-62 kg carbon/ha sequestrations took place for such integrated use of nutrients.</p>				

Session 3 Agriculture and Food Security				
Title	Productivity Improvement Opportunities in the Coastal Polders to Address Food Security Challenges of Bangladesh			
Keywords	Rice, rabi, cropping pattern, system productivity, polder, sluice gate, tidal river water			
Presenter	Mr. Manoranjan Kumar Mondal,	Coauthors	Research of	2012-2015
Designation	Project Scientist,			
Institution	International Rice Research Institute			
Email	m.mondal@irri.org			
Study Area	Coastal zone, in polders of Barguna and Khulna districts	Problems	Adoption of climate resilient production systems in the polders of the coastal zone of Bangladesh	
Target Beneficiaries	The farmers of the coastal zone of Bangladesh	Implementing Agency	Department of Agricultural Extension and Bangladesh Water Development Board	

Abstract

Over the past 50 years there have been tremendous improvements in cropping system technologies and Bangladesh has achieved self-sufficiency in rice using these technologies. But the coastal zone has been left way behind the rest of Bangladesh despite of huge efforts from the government, non-government and international organizations. There are tremendous opportunities to increase the productivity within the polders through the use of improved rice and rabi crops. But adoption of improved production systems in the coastal zone has been limited by the misperception that the river water is too saline. In reality, most rivers in the south-central coastal zone remain non-saline throughout the year, will remain non-saline until 2030 with moderate climate change scenario A1B with 22 cm sea level rise and a moderate precipitation change. And that in south-west Khulna and Bagerhat districts remains suitable for crop production from July to mid-February. Our study showed the feasibility of intensifying aus-aman-boro and aus-aman-rabi cropping systems in the south-central, and aman-boro and aman-rabi in south-west zone of Bangladesh having 2-3 times higher productivity than the current farmers' practice. The key prerequisite to enable cultivation of high yielding rice and rabi crops is the drainage during aman season and in early November prior to aman harvest. This can easily be achieved by systematic operation of sluice gates in the coastal polders synchronizing with high and low tides. Since cropping intensity and productivity in other parts of Bangladesh are already high, the under-utilized lands of the coastal zone may well be the only region where significant gains in food production can be made to address future challenges to the food security of Bangladesh.

Session 3 Agriculture and Food Security				
Title	Farmers Perception on Climate Change Impacts on Food Security and their Coping Strategies			
Keywords	Food security, climate change, crop production, coping strategies			
Presenter	Mr. Mohammad Ashik-Ur-Rahman	Coauthors	Research of	2017
Designation	Masters student			
Institution	Asian Institute of Technology, Thailand			
Email	st118483@ait.asia			
Study Area	Coastal area, Assasuni, Satkhira, Bangladesh	Problems	Rainy days, sea level rise or salinity intrusion	
Target Beneficiaries	Small Holder Farmers	Implementing Agency	Ministry of Food and Disaster management	
Abstract				
<p>Food Security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life. At household level, it is related with food production resources or access to enough food purchasing availability and sufficiency to meet the aggregate needs of all household members. Climate change impacts are very much visible in the south western coastal areas of Bangladesh where most of the small holder farmers remain in food insecure condition. In the study area of Assasuni, Satkhira, Bangladesh, crop production level is decreasing due to less scope to grow regular crops which again push them to the status of food insecurity. Only one season crop and decreased land for growing crops are the result of reduced number of rainy days and salinity intrusion due to sea level rise respectively. Switching to non farm activity, using saline resistant rice variety, washing the land with fresh water are some of the main coping strategies to increase crop production as well as remain food secured. In the study area about 45% respondents use saline tolerant rice variety though half of them remain food insecure to some extent of the whole year. It is needed to combine the current coping strategies with modern technologies for better food secure condition at household level in the study area.</p>				

Session	3 Agriculture and Food Security			
Title	Climate Resilient Cropping Pattern Under Drought Condition at High Barind Tract in Bangladesh			
Keywords	CRA, BCBD, Urea Deep Placement and High Barind Tract, Cropping pattern			
Presenter	Mr. Md. Rezaul Haque	Coauthors	Research of	Ongoing research
Designation	Research Officer-Agriculture			
Institution	Christian Commission for Development in Bangladesh			
Email	rezaul_me@yahoo.com			
Study Area	High Barind Tract, Godagari, Rajshahi		Problems	Drought, High Temperature, Lack of surface water, Low precipitation and ground water depletion
Target Beneficiaries	Farmers in the rural area		Implementing Agency	Research organization (BARI, BRRI) and govt. organization DAE and local community/farmers

Abstract

Climate resilient agriculture (CRA) seeks to increase sustainable productivity, strengthen farmers' resilience, reduce agriculture's greenhouse gas emissions and increase carbon sequestration. Soil, plant and climate characteristics are key in interpreting the impact on crop yields and mitigation of different agricultural practices. CCDB-Climate Change Unit are conducting the CRA experiment in High Barind Tract and drought prone area Godagari, Rajshahi. The objective of the study is "Review the best practices of resilient agriculture technologies and asses GHG emission reduction from agricultural practices". The study will assess various cropping patterns those address efficiency and the feasibility of climate resilient options in drought prone northwestern part (High Barind Tract) of Bangladesh. Methodology address the soil test (Chemical & physical), selection of crop and designing experimental plot with RCBD along with few cropping pattern. The followings are the parameter used in crop production in terms of CRA practices like water use efficiency, minimum tillage practice (less fuel) and fertilizer use efficiency for crop and furrow placement of seeds. Decision behind crop selection of cropping pattern & crop production systems are to increase crop productivity without further degrading soil and water resources, less fuel uses during tillage and irrigation practices, efficient use of fertilizer (Urea Deep Placement). It is shown that and that technology options which are most promising in enhancing food security at smallholder level are also effective on increasing system resilience in dry areas and mitigating climate change in humid areas.

Session	4 Health and Migration			
Title	Disasters and Forced Migration: A Case Study on Riverbank Erosion and Its Potential Impacts on Rural and Urban Bangladesh			
Keywords	Forced migration, riverbank erosion, internally displaced people (IDPs), urban slum, socioeconomic impact, policy recommendation, Bhola, Dhaka			
Presenter	Mr. Mohammad Mahbubur Rahman	Coauthors	Research of	2016
Designation	Campaign Associate			
Institution	Network on Climate Change, Bangladesh (NCC,B) Trust			
Email	mahbub.nccb@gmail.com			
Study Area	Coastal (Char Monpura, Char Fasson, and Char Tajimuddin of Bhola District) /City (Bhola Slum of Dhaka City)		Problems	Flooding, Riverbank Erosion
Target Beneficiaries	Rural/ Urban/ Displaced People		Implementing Agency	Policymakers/ Government and Non Government Agencies/ MoEF/ Researchers/ Academicians
Abstract				
<p>Riverbank erosion is a widespread natural disaster in rural Bangladesh which results in rapid growth in a forced internal migration of people. These internally displaced people (IDPs) migrate to the urban slum areas after losing their residents for a better work opportunity and essential services. This study focuses on people's migration pattern in Bangladesh particularly in the context of riverbank erosion. Hence, the study focused on three char lands of Bhola (a rural coastal district) district namely Char Monpura, Char Fasson, and Char Tajimuddin, and a small slum settlement (urban slums) namely 'Bhola slum' of Dhaka city. To this end, firstly, this study assessed river erosion and accretion pattern of Char Monpura, Char Fasson, and Char Tajimuddin for the year of 2006, 2010 and 2016. In addition, urban slums occupied by IDPs had mapped through the visual interpretation of Google high-resolution image focusing temporal patterns of 2006, 2010 and 2016. Furthermore, it measured the impact of riverbank erosion on the socioeconomic condition of the IDPs both in the rural and urban region. Finally, it finds out the gaps in tackling challenges associated with a forced internal migration and way forward with policy recommendations. The study reveals that Char Monpura, Char Fasson, and Char Tajimuddin had suffered considerable erosion whereas only a small portion of Char Fasson and Char Tajimuddin have experienced accretion since 2000 to 2016. Besides, erosion caused tremendous sufferings to the people living in the river erosion prone char islands of Bhola district. However, such situation arises in permanent migration to urban areas and growth in informal urban settlements and creating more challenges for the municipal government to deal with the growing urban population.</p>				

Session	4	Health & Migration		
Title	Impact and Adaptation Process of Adolescent Girls Displaced due to Climate Change Induced Internal (Rural to Urban) Migration in Bangladesh			
Keywords	Climate migrants, adaptation, adolescent girls			
Presenter	Ms. Rebecca Sultana	Coauthors	Research of	2016
Designation	Program development officer			
Institution	Bandhu social welfare society			
Email	rebecca_sultana24@yahoo.com			
Study Area			Problems	Identify the impact of climate change migration on adolescent girl's development
Target Beneficiaries	Adolescent girls living at slums of Dhaka city		Implementing Agency	Ministry of women and children, NGOs working for adolescent health
Abstract				
<p>The issue of 'climate change induced internal migration' has received immense importance in recent discourses. It is evident that the greatest single impact of climate change might be on human migration/displacement; a development estimation of the IPCC First Assessment Report 1990 (IPCC AR1) predicted migration of 150 million people by 2050. More recent studies show an even more terrifying figure of climate change induced migrants: a ten-fold increase from today's entire population of documented refugees and internally displaced persons (IDPs). This means that by 2050 one in every 45 people in the world and one in every 7 people in Bangladesh will become displaced by climate change. There are important gender perspectives in all aspects of climate change. Women make up a large number of the poor in communities and are disproportionately vulnerable to and affected by climate change. Early age increases the vulnerability of adolescent girls during rural to urban migration. Such displacement can cause a great impact (both positive and negative) on their social, economical, physical and psychological condition. In one hand it might give them access to better education and health system, utility services and livelihood opportunities on the other hand increase their vulnerability by reducing their safety and security in the new city life.</p> <p>Migration is considered as an adaptation process to cope up with the massive impacts of climate change. Adolescent girls can play an important role in propelling the social and economical growth by minimizing these impacts through migration. But to do so, their vulnerabilities must be addressed first to ensure their protection during displacement and enhance their well-being.</p>				

Session	4	Health & Migration		
Title	Disparities of Health Service for the Poor in the coastal area: Does Universal Health Coverage Reduces Disparities?			
Keywords	Universal Health Coverage, Logit model, Social safety net program, Southwest coastal region, Bangladesh			
Presenter	Mr. Md. Hafiz Iqbal	Coauthors	Research of	2017
Designation	PhD researcher			
Institution	Bangladesh University of Professionals (BUP)			
Email	vaskoriqbal@gmail.com			
Study Area	Southwest coastal area		Problems	Climate induced diseases
Target Beneficiaries	Coastal poor people		Implementing Agency	Ministry of Health
Abstract				
<p>Poor people in general get poor quality of health services. The situation is very much worsens for the poor who live in the remote areas in the coastal belt of Bangladesh as health care facilities and services are often less complete, farther away, and therefore mostly costly to reach than in urban hospitals and physician. Ensure of better health service for the poor, it is essential to examine the effectiveness of Universal Health Coverage. This study sets its objectives as evaluate the health service for the poor in the coastal area of Bangladesh and develop an approach of management strategy. To fulfill the research objective, this study followed a stratified sampling technique and carried out household interviews. This study applied the logit model approach to generate empirically supported assessments. Provision of government intervention through social safety net programs for the poor and cost sharing for health service can enhance the health service in the remote coastal area of Bangladesh. The findings of this study ensure improved and quality health care system for the poor in Bangladesh and ensure to meet the main building blocks of good health and well-being of SDGs.</p>				

Session	4	Health & Migration		
Title	Determinants of Universal Health Coverage for Climate Induced Diseases in the Coastal Bangladesh: Approach of Gravity Model			
Keywords	Health care service, Universal Health Coverage, Gravity model, Coastal Society, Bangladesh			
Presenter	Mr. Md. Hafiz Iqbal	Coauthors	Research of	2017
Designation	PhD researcher			
Institution	Bangladesh University of Professionals (BUP)			
Email	vaskorigbal@gmail.com			
Study Area	Southwest coastal region of Bangladesh		Problems	Climate change induced diseases
Target Beneficiaries	Coastal people		Implementing Agency	Ministry of Health
Abstract				
<p>Salinity, water logging, storm surge and cyclone are the most common natural events in any coastal region of Bangladesh. This natural event may affect human health directly or indirectly and are blamed to increase a number of mortality and morbidity. The situation is very much worse for the coastal people who live in the remote coastal areas as health care facilities and services are often less complete, farther away and therefore more costly to reach than in urban hospitals and physician. An effective health measure is a pre-requisite for minimizing the losses of lives of coastal people and also mitigates the health sufferings from the devastating effects of climate change. Universal Health Coverage (UHC) plays a vital role to tackle health problems with the full spectrum of services of good quality according to need and at an affordable cost to coastal people. This study explores the determinants of UHC and examines their effectiveness in the coastal society. To fulfill the research objective, the study followed a cluster sampling technique and carried out household interviews through questionnaire survey which covers the provision of coinsurance, telemedicine, medicare, social insurance, medicaid, payment for UHC and distance of health care service from the respondent's residence. The study used the gravity model to generate empirically supported assessment. Most of the determinants of UHC are statistically significant at convenient levels with expected sign. The findings of the study justify the relevant determinants of UHC and provide guideline to meet the target of good health and human well-being of SDGs.</p>				

Session	4 Health & Migration			
Title	Point-of-Use Water Treatment as an Adaptation Option to Prevent Climate Change-Induced Waterborne Diseases			
Keywords	point-of-use, adaptation, climate change, water treatment, surface water, waterborne diseases			
Presenter	Dr. Md. Sirajul Islam	Coauthors	Research of	May 2006 - April 2007
Designation	Emeritus Scientist			
Institution	icddr,b			
Email	sislam@icddr.org			
Study Area	Zone- Floodplain, Research area- Matlab, Chandpur, Bangladesh		Problems	Increased waterborne diseases
Target Beneficiaries	Rural households		Implementing Agency	Institution- icddr,b (and other NGOs)

Abstract

Safe drinking water is one of the key determinants of good public health. In the face of a rapidly changing climate, the supply of safe drinking water is likely to be jeopardized. Fluctuating patterns of precipitation compromises the supply of fresh water, which in turn contributes to the increased risk of water-borne diseases. One of the main causes of waterborne diseases in Bangladesh is related to the use of contaminated surface water. This pilot study was conducted to determine the acceptability and effectiveness of a recently developed surface water purifying mixture to prevent diarrhoeal diseases in a rural community in Bangladesh.

The mixture is constituted by a combination of alum potash, bleaching powder and lime. One package of the mixture is added to 15 liters of surface water, which becomes suitable for drinking after 30 minutes. A total of 420 households from 15 villages in Matlab, Chandpur were provided with the mixture and were taught how to use it. Diarrhoeal disease incidence data from the study families were extracted from hospital records of icddr,b in Matlab. This was compared with diarrhoeal morbidity among 1613 control families who were not provided with the mixture. Of these control families, 83 diarrhoeal patients were treated at the Matlab Hospital, compared to only one patient from among the intervention families. In addition, 73 families from among the intervention group decided to shift from using tube well water to surface water treated with the mixture.

The mixture could be used as a cheaper, easier and simpler point-of-use water treatment strategy in Bangladesh. As such, this can serve as an effective adaptation measure to combat the increased prevalence of waterborne diseases induced by climate change.

Session	5 Mitigation & Gender			
Title	Challenges of Transition to Low Carbon Technologies: a Strategic Niche Management Analysis of Brick Manufacturing in Bangladesh			
Keywords	Transition, low carbon technology, brick manufacturing, Bangladesh			
Presenter	Ms. Nuzhat Imam	Coauthors	Research of	2017
Designation	Student			
Institution	University of Sussex			
Email	nuzhat.bangladesh@gmail.com			
Study Area	Dhaka, Bangladesh		Problems	Low carbon development
Target Beneficiaries	Both rural and urban people	Implementing Agency	Policy makers, ministries (MoEF, MoHPW, MoA), NGOs, private sector	
Abstract				
<p>Manufacturing of bricks, which is an important economic activity in Bangladesh that supplies the principal element to the booming construction industry, has long been recognised in the policy domain for its damaging impacts on human health, agricultural productivity and global warming. Emission of greenhouse gas and other local pollutants from inefficient burning of coal and firewood in firing bricks are mainly responsible for these damaging impacts. Extraction of fertile top-soils from agricultural lands also leaves a damaging impact on agricultural productivity. Many attempts to control these pollutions have been taken so far, mainly in the policy arena, aiming for a low carbon development in the sector. However, despite all those attempts, no significant progress has been achieved so far.</p> <p>In exploring the reasons behind this failure, the study attempts to identify the challenges of transition to low carbon development in the brick manufacturing sector of Bangladesh. Using strategic niche management as its theoretical framework, the study analyses the transition process from a holistic perspective incorporating different social, economic, technological and institutional dimensions. The study finds that the emergence of low carbon niche brick technologies is quite fragmented in several ways because the existing policies and practices have largely failed in providing a protective space for the low-carbon niche brick technologies to evolve; rather it provided a protective space to the polluting regime brick technologies to exist and continue.</p>				

Session	5 Mitigation & Gender (TBC)			
Title	AWD Technology Out-scaling Through Northwest Focal Area Network			
Keywords	AWD technology, climate change, water savings, GHG mitigation, collective action, network, water savings, cost of production			
Presenter	Dr. Ahmad Salahuddin	Coauthors	Research of	2016-2017 Boro season
Designation	Consultant			
Institution	IRRI			
Email	a.salahuddin@irri.org			
Study Area	Drought prone area of northwest Bangladesh which semi-barind		Problems	Saving and judicious use of ground water for irrigation water, GHG reduction
Target Beneficiaries	Farmers and organizations work with farmers		Implementing Agency	Extension agents work with farmers that includes public and civil and private agencies

Abstract

IRRI in collaboration with all actors in the field of AR&D active in the northwest of Bangladesh, started to out-scale and adopt Alternative Wetting and Drying (AWD) technology in farmers field covering five districts and ten upazilas during Boro rice season 2016-17. AWD was developed by IRRI in early 2000s and have been widely accepted as an effective GHG emission mitigation technology by all concerned. Farmers consider the technology as simple, useful and effective to reduce use of water without sacrificing yield. The main challenge was to distribute the benefit from water saving by stakeholders. The technology could only benefit the machine owners as contracts between farmers and owners are not based on amount used. IRRI introduced a social organizational approach. Farmers kept records of water use & consumption of fuel and compared. The savings of water, fuel and number of irrigation then becomes evident and it was not difficult for farmers to monetize the value of the volume of water saved. Around thirty percent water saving of water were reported from most tube well areas. First year, different extension approach was used by different social mobilization partner agencies those who have organized the farmer groups. Farmers also had different kinds of negotiation approach to share the benefit from the savings. This model is going to be replicated again during 2017-18 Boro season. Different actors have played their active role: supporting for farmer and extension agent training (BRRI & DAE), social mobilization to organize and learn with the farmers (NGOs, BARI, DAE& BMDA), keeping records and analyzing together with farmers (HSTU & NIDS), showing technology videos to farmers (AIS). The results so far has been very much appreciated by all partners.

Session	5	Mitigation & Gender		
Title	Flood Vulnerability, Local Perception and Gender Role Judgment Using Multivariate Analysis			
Keywords	Flood vulnerability, Char-land, Local perception, Gender participation, Resource accessibility and problem-based PFM			
Presenter	Mr. Md. Bodrud-Doza	Coauthors	Research of	2016
Designation	Researcher			
Institution	Department of Environmental Sciences, Jahangirnagar University			
Email	bodruddoza.env12@gmail.com			
Study Area	Floodplain		Problems	Flood vulnerability
Target Beneficiaries	Female		Implementing Agency	Planning Commission, Ministry of Women and Children Affairs

Abstract

This study focuses on some particular points of flood impacts and the local concept towards existing management capacity. Additionally, significant focus was given to gender roles and how they may impact measures that aim towards reducing flood risks. Both qualitative and quantitative techniques were applied during the research, in order to understand the perception of the char-land communities on natural hazards, social crisis, resource accessibility, climatic uncertainty and the gender role to cope with flood consequences. This study revealed that majority of the people was directly threatened by the destructive consequences of flood hazards. Some decades ago, the application of indigenous techniques was deemed successful as the communities managed to effectively reduce the risk involved with potential floods. Results showed the vulnerability of the local communities in terms of knowledge, resource access, communication system, proper information dissemination, health, and livelihood. The gender variability is believed to have significant value in terms of flood disaster risk reduction, household development, and family caring activities. Principal component analysis (PCA) and cluster analysis (CA) has clearly identified the gender role in the char-land community. The women's activities are profoundly focused in terms of the flood risk management, and the families generally do not properly appreciate the value of women and their role. However, the problem-based "Participatory Action to Future Skill Management (PFM)" for flood risk reduction in the char-land area can ensure to knowledge empowerment and capacity builds up, to achieve community resilience and sustainability in adverse climate conditions.

Session	6 Barind (Vulnerable areas)			
Title	Climate Resilient Sustainable Agriculture Options for High Barind Tract in Bangladesh			
Keywords	Climate Resilient Agriculture, Sustainable Agriculture, Drought, High Barind Tract, Crop selection, Cropping pattern, Soil conservation, low water requirement crops			
Presenter	Mr. Md. Kamruzzaman	Coauthors	Research of	January 2016 - June 2017
Designation	Coordinator - Research, Climate Change Unit			
Institution	Christian Commission for Development in Bangladesh (CCDB)			
Email	kamruzzaman.sagar@gmail.com			
Study Area	Barind / Saroil village under Godagari Upazila of Rajshahi district		Problems	Drought, Water scarcity, depletion of groundwater due to over extraction
Target Beneficiaries	Farmers in the High Barind Tract		Implementing Agency	DAE, BMDA, NGOs and Farmers

Abstract

Climate Resilient Agriculture reduces poverty and hunger in the face of climate change, improve the resources it depends on for future generations. Developing agricultural production technologies in pursuit of conservation of resources is crucial for combating climate change impacts and ensure food security. The present research aims to identify and recommend location specific Climate Resilient Agricultural Practices through adaptive research for drought prone High Barind Tract. The research identified low water requirement crops as well as six different cropping patterns to ensure crop diversification through field experiments. The adaptive research used seed priming, reduction of Nitrogen fertilizer use and different soil conservation practices (minimum tillage, mulching and water use efficiency) that involve reduction of GHG emission from crop fields, while crop production is expected to increase. The research has provided some recommendations which would be useful for agricultural extension services and farming communities in High Barind Tract.

Session	6	Barind (Vulnerable areas)		
Title	Water Saving in Rice Production: Implementation of a Climate-smart Solution			
Keywords	Rice, water, CSA, adaptation, greenhouse gases			
Presenter	Mr. Bjoern Ole Sander	Coauthors	Research of	2016-2017
Designation	Scientist			
Institution	International Rice Research Institute			
Email	b.sander@irri.org			
Study Area	Barind (district-country)		Problems	Water scarcity
Target Beneficiaries	Rice farmers, civil society		Implementing Agency	Policymakers (MoA, MoE), Agriculture Development Agencies
Abstract				
<p>Rice production consumes large amounts of water which results in shrinking water tables and high production costs. The International Rice Research Institute (IRRI) together with the Bangladesh Rice Research Institute (BRRI) has developed the alternate wetting and drying technology (AWD) which reduces irrigation water inputs by up to 30%. As a co-benefit, AWD reduces greenhouse gas (GHG) emissions by around 50% as compared to continuously flooded rice production. AWD doesn't reduce rice yield if practiced under 'safe' guidelines.</p> <p>IRRI is working with the Focal Area Network (FAN), a group of national organizations and NGOs, to implement AWD on large scale in the northwest of Bangladesh. This work is supported by the Climate & Clean Air Coalition (CCAC), a global effort of governments, civil society and the private sector, committed to reducing short-lived climate pollutants. IRRI is also working with remotely sensed information to assess the suitability for AWD across the various rice environments of Bangladesh. This presentation will highlight the ambitious action of the FAN but also showcase how GIS information can be used to inform the dissemination process of climate-smart agriculture (CSA) solutions.</p>				

Session	6	Barind (Vulnerable areas)		
Title	Soil Organic Carbon Sequestration and Greenhouse Gasses Emission as Affected by Tillage and Crop Residue in a Rice-Based System of Bangladesh			
Keywords	High Barind Tract, CO ₂ emission, strip planting system, Climate change, Cropping system			
Presenter	Dr. Md. Ariful Islam	Coauthors	Research of	2010-2013
Designation	Scientific Officer			
Institution	Pulses Research Centre, Bangladesh Agricultural Research Institute			
Email	arifbau06@gmail.com			
Study Area	High Barind Tract, Bangladesh Research of	Problems	Global warming, soil fertility loss, sustainable crop productivity is declining and under threat	
Target Beneficiaries	Farmers	Implementing Agency	Researcher/BARI, BIRRI, BJRI etc, Farmers	
Abstract				
<p>Conservation agriculture (CA) is being treated as an important strategy sequestering soil organic carbon (SOC), reducing greenhouse gasses emission, mitigating climate change and maintaining crop productivity across the planet. However, there is limited research on the effect of CA on SOC sequestration and emission of greenhouse gasses in intensive rice-based systems of Bangladesh. A field experiments were conducted during 2010–2013 to evaluate the effects of crop establishment options — strip planting (SP), bed planting (BP) and conventional tillage (CT) and crop residue management — high residue (HR) and low residue (LR) on SOC sequestration and CO₂ emission in a rice-based systems of Bangladesh. The system studied was a wheat-mung bean-rice rotation on an uplifted and weathered soil in High Barind Tract. After crop 7, however, the plots under SP and BP; LR had significantly higher SOC stocks at 0–7.5 cm soil depth compared with CT and HR. The intensive tillage and HR resulted in higher CO₂ emission while SP and BP decreased the emission of CO₂. Strip planting system sequestered 0.44-0.20 Mg C/ha/yr while losses were 0.41-0.66 Mg C/ha/yr in CT at 0-15 cm depth. However, a minimum of 1 Mg C/ha/yr are required to maintain equilibrium level of SOC under SP. The critical amount of C input to the soil to maintain the antecedent level of CT is 7.7 Mg C/ha/yr. We conclude that application of CA (SP and HR) is an effective strategy in improving C sequestration while reducing greenhouse gasses emission in intensive rice-based system of Bangladesh.</p>				

Session	6	Barind (Vulnerable areas)		
Title	Culture, Politics and Local Solution to Climate Change Adaptation: Reflection on Water Infrastructure in Drought Prone Northwest Bangladesh			
Keywords	Culture, participation and community			
Presenter	Mr. Muhammad Jahedul Huq	Coauthors	Research of	2013/14
Designation	PhD Candidate			
Institution	Durham University			
Email	shovonju@yahoo.com			
Study Area	Barind tract		Problems	Drought and water scarcity
Target Beneficiaries	Rural		Implementing Agency	NGOs
Abstract				
<p>The paper examines the conceptualization of ‘local solution’ in terms of culture and politics in a drought adaptation project, implemented in ChapaiNawabgonj district, Bangladesh. Following Foucauldian discourse analysis, the study does a comparative analysis of discursive construction of ‘local solution’ between the project implementing NGO and the community taking into account three water infrastructure systems (surface water, rainwater harvesting and ground water) at two different scales (individuals and community). The findings of the study reveal that NGOs construct the discourse of local solution to adaptation adopting a rationality of water efficiency and tends to emphasis on techno-managerial approaches to water conservation, rather than empowering the community to get access to khaspond located in the study village.</p> <p>In contrast, the finding shows that community constitutes local solution as an assemblage of sustainability of water infrastructure, a sense of ownership, purity, sustainable supply and availability of water in convenient time and essentially, keeping women and children as water collector at the centre of solution to water problem. The study demonstrates that culture is contingent to time and space, constantly negotiated and contested. In the adaptation project, NGO assumes community participation as a method and fails to capture local culture and politics in designing water interventions. Therefore, it is discernible that discourse analysis can be an effective method to realize local reality and in effect, community participation as a process is an imperative to produce a discourse on ‘sustainable local solution’ for adaptation to climate change.</p>				

Session	6 Barind (Vulnerable areas)			
Title	Perception on Drought and its Adaptation Measures -The Case of Northern Barind in Bangladesh			
Keywords	Climate change; drought adaptation; extreme drought; hot days; supports; Standardized Precipitation Index			
Presenter	Mr. MD. SHAFIQL ISLAM	Coauthors	Research of	2015-2016
Designation	Assistant Professor			
Institution	University of Liberal Arts Bangladesh			
Email	shafiquel.islam@ulab.edu.bd			
Study Area	Barind tract		Problems	Drought
Target Beneficiaries	Rural people		Implementing Agency	NGOs, DAE . BMDA and People

Abstract

Drought adaptation study was conducted in the northern Barind Tracts to bring out farmer's perception on drought adaptation. Drought is the common attributes in the study area. One extreme and four severe droughts were identified during April to June. Respondents mentioned that drought is frequently increased due to climate change. They noticed that local droughts occur regularly and affect crop production, livelihoods, health and society. Farmers changed their cropping times either prior to the beginning of the cultivation or later to reduce drought impacts. Maximum number of respondents changed cropping time 11 to 15 days prior to actual cultivation time as a drought adaptation measure. It was mentioned that the farmers of the study areas took few measures to reduce harmful effects of drought on agriculture and livelihoods. The measures included selection of suitable crops for cultivation during and after drought, plow the land before drought using compost manure to improve physical properties of soil and digging pond to create water reservoir for irrigation, organic agriculture, agroforestry and crop diversification. They recovered drought loss by taking loan from NGOs, cattle rearing, taking loan from others and selling own properties. The highest percentage of respondents mentioned that wheat grows well in the drought prone areas followed by mustard, corn, lentil, potato, linseed, masakalai, paddy and sugarcane. Farmers also reported that organic fertilizer prevents soil aridity and hence it increases soil moisture content. Farmers those have diverse livelihood opportunities can manage better livelihood during drought. They received support including seeds, fertilizers, loan and relief from NGOs to mitigate drought impacts.

Session	8	Coastal (Vulnerable areas)		
Title	Climatic Depreciation, Changing Rural Socio-Ecological and Cultural Landscape: A Resilient Development Philosophy? Lessons from Southern Delta			
Keywords	Resilience; social-ecological systems; rural development; complex adaptive systems; system dynamics			
Presenter	Mr. Abdur Rahaman	Coauthors	Research of	2016
Designation	Director			
Institution	Climate Change Adaptation, Mitigation Experiment & Training (CAMET) Park			
Email	rana.bries@gmail.com			
Study Area	Coastal zone (Char Majid, Subarnachar, Noakhali, Bangladesh)		Problems	Water logging, flood and salinity
Target Beneficiaries	Rural farmers		Implementing Agency	Farmers, agriculture scientists, Planning Commission professionals

Abstract

The rural areas of Bangladesh, particularly the southern delta is confronted with a variety of climate induced depreciation. These changes have multiple dimensions and characters, with variations of cultural and ecological landscape to vast socioeconomic impacts, such as social disintegration, fragile religio-anthropogenic cohesion, and outraged educational sovereignty, losing inheritance, food insecurity, livelihood and economic catastrophes. Thus they cause serious problems to rural economic custom and largely affect development and prosperities of riverine rural areas. By changing socio-ecological and cultural landscape of rural areas adopting resilience interventions is best philosophy towards resilient rural microcosm. The paper aims to illustrate new dimension of rural resilient development through a newly tested philosophical framework, changing rural socio-ecological and cultural landscape. The research was conducted in promoting in-situ resilient development approach through action mode of research. Multi-dimensional strategic methods were adopted in conducting the research like PVA, LRP, and local scenario generation through micro-climate downscaling, rural resilient land use planning, application of Soil, Water, and Agriculture and Climate (SWAC) model. The study was conducted in the char lands of Noakhali district, the part of extreme climate vulnerable southern delta of Bangladesh. The study reveals that in-situ resilient philosophy through changing socio-ecological and cultural landscape which is green introduction towards climate resilient rural development is fecund innovation in resilient dialect.

Session	8 Coastal (Vulnerable areas)			
Title	Information, Risk Perception and Climate Change Adaptation: Evidence from a Randomized Experiment			
Keywords	Bangladesh, coastal area, cyclone, salinity, polder rehabilitation			
Presenter	Ms. Sonia Akter	Coauthors	Research of	2016
Designation	Assistant Professor			
Institution	National University of Singapore			
Email	sonia.akter@nus.edu.sg			
Study Area	Coastal, Barguna district, Bangladesh		Problems	coastal cyclone, storm surge, salinity
Target Beneficiaries	Rural households		Implementing Agency	Ministry of Environment & Forests, Department of Disaster Management
Abstract				
<p>Climate change (CC) risk perception has been identified as an important determinant of CC adaptation in low income countries. A previous study in Bhola district of Bangladesh show that farmers' lack of concern about the negative impacts of climate change is significantly correlated with their low demand for weather index insurance (Akter et al., 2017). The aim of the current study is to examine whether risk perception can be shifted by imparting relevant information about CC. In a randomized experiment conducted in Barguna district of Bangladesh, 408 male and female respondents were randomly given scientific information about CC. Respondents were then asked to elicit their perceptions in three specific areas of CC risks: (1) the overall negative impacts of CC on their lives and livelihoods; (2) future events of catastrophic cyclone; (3) and the expected intensity of soil salinity in their farmland. Additionally, to test the nexus between risk perception and CC adaptation, respondents were asked to pay a one-off surcharge to co-finance a government led Coastal Embankment Improvement Project that aims to reduce the risk of cyclone damage and salinity intrusion. The results suggest that exposure to information leads to a significant shift in the risk perception of the overall negative impacts of CC and the expected intensity of soil salinity. Although a shift in the perception of cyclone risk is observed, the magnitude of the shift is insignificantly. Consistent with previous empirical evidence, the results also reveal a significant positive relationship between CC risk perception and willingness to pay for CC adaptation (i.e. coastal embankment reconstruction and rehabilitation).</p>				

Session 8 Coastal (Vulnerable areas)				
Title	Reviewing Rural Community Strength/ Resource in Climate Change Adaptation in Bangladesh			
Keywords	Community strength, community resource, Climate change adaptation, Bangladesh			
Presenter	Dr. Mujibul Anam	Coauthors	Research of	2015-2017
Designation	Associate Professor			
Institution	Department of Anthropology, Jahangirnagar University			
Email	labib303@gmail.com			
Study Area	Coastal zone in Bangladesh Research of		Problems	Access to drinking water
Target Beneficiaries	Disaster-prone coastal Bangladesh		Implementing Agency	Policymakers
Abstract				
<p>Climate change adaptation in Bangladesh is highly rely on external aids. The dominant development discourses see a scarcity of resources in climate change adaption in Bangladesh. This article argues that the external aids legacy often neglect peoples' agency in climate change adaptation. Based on ethnographic studies in coastal zone in Bangladesh, this article brings stories of community collectives and show peoples' strength in managing lives in disaster. This article shows evidences of collective initiatives where people did not wait for external support to move forward. They utilized their collective labours and resources to resolve the crisis. However, the external development initiatives often overlook those community collectives and potential community resources and continue the legacy of aid dependency. The central contention of this article is to support the idea of that mainstreaming community led adaptation to climate change and document a range of independent and successful community collectives in disaster-prone coastal Bangladesh.</p>				

Session	8	Coastal (Vulnerable areas)		
Title	An Innovative Water Management Approach for Increasing Land Productivity in the Polders of the Coastal Zone of Bangladesh			
Keywords	Water management, drainage, coastal polders, community participation, climate resilient production systems			
Presenter	Mr. Manoranjan Kumar Mondal	Coauthors	Research of	2012-2016
Designation	Project Scientist			
Institution	International Rice Research Institute			
Email	m.mondal@irri.org			
Study Area	Coastal zone, polder 30 in Khulna district		Problems	Water resources management in the coastal zone
Target Beneficiaries	Farmers in the coastal polders of Bangladesh		Implementing Agency	Bangladesh Water Development Board and Department of Agricultural Extension

Abstract

The polders of the coastal zone of Bangladesh are home to some of the world's poorest and most food insecure people. Despite huge investment and efforts productivity in the polders remains very low. The key challenges to increase productivity include lack of access to fresh water and soil salinity and severe cyclonic storms. These challenges are expected to exacerbate as a result of climate change. We hypothesized that the root cause of low productivity is the poor water management and there are tremendous opportunities to capitalize on polder ecosystem services (tidal river, natural drainage networks), and existing infrastructure (sluice gates, roads) and community organizations to greatly increase productivity in the coastal polders of Bangladesh. Our study showed improved production systems can be adopted in the polders through appropriate sluice gate operation involving the community; and productivity can be doubled in a medium salinity environment by improved water management practices. Improved water management involved formation of small water management units by constructing small farm levees, together with improved management of the sluice gate connecting the canals to the surrounding tidal river. The study proved that individuals alone cannot successfully adopt improved agricultural technologies in the polder ecosystem because of the prevailing hydrology of the coastal zone. It requires synchronized cropping among the farmers within small hydrological units and within the catchment area of a regulator/sluice gate. The study also proved that excess water from the floodplains can be drained by gravity during low tide and is a viable water management option for wide-scale adoption of improved production systems in the polders of the coastal zone of Bangladesh.

Session	8	Coastal (Vulnerable areas)		
Title	Climate Change Skepticism and Index Versus Standard Crop Insurance Demand in Coastal Bangladesh			
Keywords	Weather index insurance, Climate change adaptation . Skepticism, Bangladesh, Choice experiment, Maize			
Presenter	Dr. Timothy J. Krupnik	Coauthors	Research of	2015-2016
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Institution	International Maize and Wheat Improvement Center (CIMMYT)			
Email	t.krupnik@cgiar.org			
Study Area	Bhola	Problems	The viability of agricultural insurance options given farmers' degree of climate change skepticism	
Target Beneficiaries	Farmers	Implementing Agency	NGOs, planning commissions, banks, ag. dev organizations	
Abstract				
<p>This paper investigates if climate change skepticism, farmers' fatalistic beliefs, and insurance plan design influence interest in crop weather insurance. While studies of the influence of fatalism on disaster preparedness are common, the ways in which fatalism influences climate change skepticism, and in turn affects farmers' interest in crop insurance, have not been previously investigated. An additional objective was to understand farmers' preferences for index versus standard insurance options, the former entailing damage compensation based on post-hazard assessment, the latter tying damage compensation to a set of weather parameter thresholds. A discrete choice experiment was conducted with maize farmers on a climate-risk prone island in coastal Bangladesh. Most farmers were insurance averse. Those who chose insurance were however significantly more likely to select standard as opposed to index-based insurance. Insurance demand was significantly and positively correlated with farmers' concern about the adverse livelihood impacts of climate change. Farmers who exhibited fatalistic views regarding the consequences of climate change were significantly less likely to opt for insurance of either kind. These findings imply that the prospect for farmers' investment in insurance is conditioned by their understanding of climate change risks and the utility of adaptation, in addition to insurance scheme design.</p>				

Session	10	Urban & Modeling		
Title	Double Exposure Impacts in Dhaka City.			
Keywords	Double exposure, Climate change, Economic globalization, Vulnerability, Dhaka City.			
Presenter	Mr. Md. Badrul Hyder	Coauthors	Research of	2015
Designation	Researcher and Consultant			
Institution	Norwegian University of Life Science			
Email	mbhburp1@gmail.com			
Study Area	Dhaka City		Problems	Climate Change and Globalization impacts
Target Beneficiaries	Urban, Poor people, Women, Children,		Implementing Agency	Researchers, Policymakers, NGOs

Abstract

Double exposure refers to the negative impacts of both economic globalization and climate change in a particular region or sector or group of people. Globalization has given the opportunity to earn, but for rapid unplanned urbanization, rural-urban migration, population growth and lack of utility services making city dwellers vulnerable in developing countries. And climate induced hazards floods, excessive rainfall, heat wave and water logging are also making city people more vulnerable. From this perspective, double exposure has impact in Dhaka city. In addition, double exposure introduces winner and loser. A loser for the impacts of climate change in rural areas of Bangladesh becomes the partial winner for globalization in Dhaka city. Partial winners are winners for the cash income in Dhaka, but from other perspective, these partial winners might be more loser than they were before in rural areas. Grounded on this understanding, this paper has tried to illustrate the double exposure impacts in Dhaka city depending on different secondary data and scholarly articles. And this study has clearly noticed that Dhaka is confronting double exposure impacts and measuring the Double exposure impact is more crucial for reducing the vulnerability of Dhaka city.

Session	10	Urban & Modeling		
Title	City-Wide FSM Service for Improving Water Security and Public Health in Faridpur, Bangladesh			
Keywords	Faecal Sludge Management (FSM), public health, Water security, Sanitation, resilience			
Presenter	Mr. Rafiul Islam	Coauthors Uttam Kumar Saha, HasinJahan, Abdullah Al Mamun, Pritum Kumar Saha	Research of	2014
Designation	Project Manager			
Institution	Practical Action			
Email	Rafiul.Islam@practicalaction.org.bd			
Study Area	Faridpur municipality		Problems	The research is dealing with the health hazard and solution for climate induced health hazards
Target Beneficiaries	Urban/ Municipality/ City corporation		Implementing Agency	City corporation, Municipality, UDD, Urban Planner, Private sector

Abstract

Bangladesh has achieved 100% coverage in urban sanitation (JMP 2015). City level assessment on Faridpur 2014 revealed, sanitation coverage is around 94% and only 10% sludge from city sanitation facilities were safely managed and 90% sludge were going back to the environment. Illegal connection of sanitation facilities with storm drainage network, natural water bodies coupled with the indiscriminate disposal of emptied sludge by informal emptier and municipal emptying trucks were contributing to the pollution and posing threat to the city's public health. Higher and intense rainfall as the effect of climate change along with these unhealthy practices pushing the city into vulnerability. To overcome this challenge, the municipality envisioned to achieve 100% sanitation coverage and Faecal Sludge Management (FSM) service by 2025 and subsequently initiated a three years' catalytic FSM programme with the funding support from the Bill and Melinda Gates Foundation and UKAid with technical support from Practical Action. The catalytic programme has been implementing since December 2014 and facilitating private sector engagement to deliver a city-wide FSM services. The programme includes interventions for improving unsafe containment, establishing sludge emptying, transportation and treatment services in the city as well as creating awareness and demand for FSM services by sensitising city dwellers regarding health related risks associated with the unsafe management of sludge. This paper will highlight how the city is becoming resilient by implementing FSM services and specifically the progress toward achieving safe and sustainable sanitation services, water security and public health.

Session	10	Urban & Modeling		
Title	Rainwater Harvesting Can Reduce the Pressure on Ground Water Extraction in Keraniganj Upazila			
Keywords	Rain Water, Keraniganj, Water Supply, Water Demand, Ground Water			
Presenter	Mr. ShahadatHossain	Coauthors	Research of	2016-2017
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Institution	Institute of Water Modeling			
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Study Area	Keraniganj Upazila		Problems	Rainfall Change
Target Beneficiaries	Urban		Implementing Agency	Architects & Engineers

Abstract

Bangladesh experiences water shortage in the dry season due to less rainfall and water abundance in the wet season because of excess rainfall. These excess rain water can be a great natural resource of the country and if we can preserve it properly and use it at the dry seasons. In order to preserve the rain water, rooftop rainwater harvesting is an efficient method in context of Bangladesh. A study has been made at an upazila near Dhaka named Keraniganj on how rain water harvesting can reduce the pressure on ground water extraction at the upazila and help groundwater recharging. According to the 2011 Census, the population density of the upazila was approx. 4760 people/sqkm, which is higher than the national average (about 980 people/sqkm). Broad classification of land areas are: land area 157.08 sqkm and riverine 9.79 sqkm. On the other hand around 73% of the annual rainfall occurs within the months Jun to Oct. Max. Rainfall occurs in Jul (long-term average) which is increasing due to Climate Change. Other-hand Water demand for domestic and industry is estimated to be 27 MCM/yr (in the year 2020) and expected to increase to 35 MCM/yr in 2035 and 26 MCM/yr by 2060. Ground Water depth of this upazila is range from 25 to 85m which is increasing day by day. So we can increase the reservation of rainwater to use as a source of domestic water supply. From this study we can find out the amount of rain water can be used for this upazila to maintain the supply of water source and how it can have a great impact on reducing ground water extraction. Also we will find out the change of rainfall pattern due to Climate Change in this study area.

Session	10	Urban & Modeling		
Title	Forcing Ocean Model with Atmospheric Model Outputs to Simulate Storm Surge in the Bangladesh Coast			
Keywords	Tropical cyclone, storm surge, numerical model, the Bay of Bengal			
Presenter	Mr. Nabir Mamnun	Coauthors	Research of	2017
Designation	Graduate Student			
Institution	Nansen-Bangladesh International Centre for Coastal, Ocean and Climate Studies			
Email	nabir.mamnun@gmail.com			
Study Area	The Bay of Bengal		Problems	Tropical cyclone
Target Beneficiaries	Coastal people		Implementing Agency	Meteorological Department
Abstract				
<p>Tropical cyclones are devastating hazards and have been a major problem for the coastal population of Bangladesh. The most severe coastal damage tends to result from short-lived extreme flooding events induced by storm surges. Among the advancements in atmospheric and oceanic prediction, accurate forecasting of storm surges is of specific interest due to their great potential to inflict loss of life and property. For decades, the numerical model based storm surge prediction systems have been an important tool to reduce the loss of human lives and property damage. In order to improve the accuracy in predicting storm surge and coastal inundation, recent model development efforts tended to include more modelling components, such as meteorology model and surface wave model in storm surge modeling. In this study, we used the outputs of an atmospheric model [the Weather Research and Forecasting model (WRF)] to force the ocean model [the Proudman Oceanographic Laboratory Coastal Ocean Modelling System (POLCOMS)] for simulating storm surges in the Bay of Bengal. The ability of the modelling system was investigated simulating water levels in the Bangladesh coast of two tropical cyclones Sidr (2007) and Aila(2009). The effectiveness of the model was verified through the obtained computational outputs against tide gauge data. The model is found to reproduce surge elevation with a relatively good accuracy, although errors still exist. Large tide-surge interactions are evidenced by the model. Skill is also gained through forcing the ocean model with higher-resolution wind and pressure fields.</p>				

Session	10	Urban & Modeling		
Title	Introduction to the Nationwide Climate Vulnerability Assessment of Bangladesh: First Results for West Bangladesh			
Keywords	Bangladesh, Climate Change, vulnerability assessment			
Presenter	Mrs. Catharien Terwisscha van Scheltinga	Coauthors	Research of	2016 - present
Designation	Director Project Office Dhaka			
Institution	Wageningen University and Research			
Email	Catharien.Terwisscha@wur.nl			
Study Area	National, for this paper we focus on west Bangladesh		Problems	Water management problems as well as heat stress
Target Beneficiaries	Rural and urban		Implementing Agency	Policy makers in various sectors at local, regional and national level
Abstract				
<p>Bangladesh is threatened by climate risks related to existing variability and future climate impacts. In order to take into account the country's vulnerability, an integrated approach is needed that gives specific information regarding different regions and sectors. Vulnerability assessments can assist to define the nature and extent of the threat that may harm a given human and/or ecological system. It is the basis for defining and financing measures to address the vulnerability, and to adapt. The article explains the main steps in a nationwide climate vulnerability assessment that is currently undertaken, and which follows the GIZ Vulnerability Sourcebook which is a worldwide accepted and standardized approach. The paper also presents some first results on water management and heat stress in the western part of Bangladesh</p>				

Session	11	Resilient Livelihood		
Title	Does Systems Thinking Improve our Understanding on Resilient Livelihoods? Insights from Coastal Bangladesh			
Keywords	Systems Thinking; Coastal Bangladesh; Resilient Livelihoods; Climate Change; Vulnerability			
Presenter	Mr. Saleh Ahmed	Coauthors	Research of	2017
Designation	Ph.D. candidate			
Institution	University of Arizona			
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Study Area	Coastal Bangladesh; Patuakhali District		Problems	Sea level rise; coastal erosion; tidal surge; tropical cyclones
Target Beneficiaries	Local Populations; Government; Development Partner		Implementing Agency	Government of Bangladesh; Donors
Abstract				
<p>Coastal Bangladesh is at the frontline of global environmental change impacts. In most cases, people who live in disaster-prone regions are highly vulnerable. However, peoples' vulnerability to the impacts of climate change is as much defined by socio-economic conditions as by exposure to natural stressors. Various climatic and non-climatic factors influence the capacity and performance of resilient livelihoods. In this situation, we need to understand the dynamic interactions of various components of "systems" that will shape the overall climate-society interactions. A systems thinking is the interdisciplinary and integrated study of systems, where various systems (e.g. social, economic, and political) are interrelated and interdependent. To develop resilience we need to understand the overall dynamics of the systems and should have better understanding how changing one part of the system affects other parts of the system. Using the theoretical insights of systems thinking and social vulnerability to climate change and with a regional focus on coastal Bangladesh, this paper highlights the importance of understanding the climate-society interactions in a holistic manner and provides insights how we, as society, can address resilience challenge and ensure resilient livelihoods in a more appropriate way.</p>				

Session	11	Resilient Livelihood		
Title	First-and Second-order adaptation to Salinity and Water Logging: Case of Coastal Embankment in Satkhira District of Bangladesh			
Keywords	First-and second-order adaptation, Salinity, Water-logging, Coastal embankment, Bangladesh			
Presenter	Mr. Md. Hafiz Iqbal	Coauthors	Research of	2016-17
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Institution	Government Edward College, Pabna, Bangladesh			
Email	vaskoriqbal@gmail.com			
Study Area	Satkhira district (Southwest coastal region)		Problems	Salinity problem and water logging caused by floods, cyclones and storm surges
Target Beneficiaries	Salinity and water logging affected people		Implementing Agency	Planning commission, Ministry of Food, Ministry of Fisheries
Abstract				
<p>Satkhira district of Bangladesh has common characteristics such as the inundation by high tides, salinity intrusion, water logging and frequent cyclonic storms along with tidal surges. Coastal embankment, or locally known as Polder projects in Satkhira district was initiated in 1960s to solve the problems of tidal flooding, flooding from storms, salt water intrusion and sedimentation. The Polders were originally designed without much attention to its further impacts. Breaching the Polder due to cyclones and the sediment of peripheral rivers surrounding the polders enhanced water logging and salinity which led to large scale environmental, social and economic degradation. This paper deals with coping and adaptation process under water logging and salinity condition. Selected measures to water logging and salinity critically examines with respect to this current and potential hazardous situation that these measures might imply for additional adaptation needs and changes within social-ecological systems. Under this circumstance, this study examines the feasibility of the concept of first-and second-order adaptation process under different coping measures, e.g., floating garden, cage aquaculture, seed variety, pit system gardening, pork and crab cultivations and coconut plantation under water logging and salt water intrusion condition. The observation was conducted in different villages adjacent to Polder no. 3 in Satkhira district. The findings of this study might help to understand the adaptation process with the local or regional context, help to understand how a stabilization process is influenced by adaptation measures and show the ways and means to cope with unexpected climatic hazards.</p>				

Session	11	Resilient Livelihood		
Title	Measuring Resilience of Two Coastal Fishing Communities of Bangladesh			
Keywords	Climate change, resilience, coastal, fishing community			
Presenter	Mr. Md. Manjurul Islam	Coauthors	Research of	2017
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Institution	University of Dhaka			
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Study Area	Coastal zone; Bholasadar and Manpura sub-districts		Problems	Vulnerability
Target Beneficiaries	Fishing community		Implementing Agency	Policy makers, ministry of environment, fisheries and local government

Abstract

Measuring resilience of community is essential for helping them to adapt to climate change and improve their livelihoods. We measured resilience of the two coastal fishing communities of Bangladesh – Dhaniala and Sitakunda of Bhola district– using 53 attributes under six specific fields - financial, human, natural, institutional, physical and social – where a lower attribute value represents a higher resilience. The results show that Dhaniala fishing community is a little bit more resilient (total resilience score = 8.16) than those of Sitakunda (total resilience score = 8.28), although both of them have the low levels of resilience compare to a standard level. Dhaniala community are more resilient in four fields - natural, financial, physical and institutional – compare to Sitakunda. While, other two fields - human and social – show opposite result. This study has identified specific attributes and fields for policy intervention to reduce vulnerability and increase resilience of the two coastal fishing community. In order to scale up, more such study need to be conducted.

Session	11	Resilient Livelihood		
Title	Making Livelihood of Vulnerable Communities More Resilient			
Keywords	Climate Change, Disaster, Vulnerable Communities, Livelihood, Adaptation			
Presenter	Mr. Munirul Islam	Coauthors	Research of	2017
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Institution	Islamic Relief Bangladesh			
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Study Area	Jessore, Satkhira		Problems	Water logging, salinity
Target Beneficiaries	Poor families of water logged area		Implementing Agency	Local Government Institutions, Policy Makers, NGOs, Local Service Providers

Abstract

Monirampur Upazila of Jessore district is one of the water logged areas having three rivers - Mukteshori, Horiho and Kopotakkho - and fourteen canals spilling over the area which remains for 7-8 months a year. Communities specially the poor face challenges of loss of livelihood, sanitation, pure drinking water, shelter, education. To increase the resilience of these communities, Islamic Relief Bangladesh (IRB) as a member of NARRI has been implementing a project "Scaling up Inclusive Resilience amongst Water Logged Communities in South Western Bangladesh" funded by ECHO. Sorting resilient livelihood option and piloting at field level is one of the major activities of this project. IRB took a number of initiatives to make poor communities' livelihood into climate and disaster resilient. With the support of government service providers at sub-district level, communities received capacity building on how to analyze current livelihood practices and identify resilient options. Targeted poor households prepared their plan for resilient livelihood and formed groups for better coordination. 150 families piloted their plans and has become successful. With additional income, beneficiaries are also doing additional income generating activities, enjoying better life. For this reason neighboring communities are now interested to start cage fish culture. The beneficiaries who once passed their daily life with very less income as a day laborer or bamboo trap maker for caching fish are now have better income thus more resilient to hazards and shocks.

Session	11	Resilient Livelihood		
Title	Enhancing Climate Resilient Livelihood in Bangladesh Through Climate Smart Village Practices			
Keywords	Climate change, rice crop manager, temperature, livelihood			
Presenter	Mr. M.M. Haque*,	Coauthors	Research of	2016-2017
Designation	Senior Scientific Officer	D.S. Rana**, Sheetal Sharma**		
Institution	*Bangladesh Rice Research Institute (BRRI), Gazipur, Bangladesh, **International Rice Research Institute (IRRI), India Office, New Delhi, India			
Email	mhaquesoil@yahoo.com			
Study Area	Kishoriganj		Problems	changes in rainfall pattern and increasing temperature
Target Beneficiaries	Farmers		Implementing Agency	Farmers, policymakers, NGOs, Institutions and stakeholders
Abstract				
<p>Rice covers more than 80% of the land area and it provides food security and livelihood of the peoples of Bangladesh. Recently rice growth rate is reported to have declined might be due to poor crop and soil management practices followed by the farmers and changing climate particularly changes in rainfall pattern and increasing temperature. Increases in temperature would also shorten the winter season in Bangladesh. A short winter would adversely affect the vegetative as well as reproductive growth of most of the winter crops and consequently reduction in yield. High temperature reduces yields of HYVs of Aus, Aman and Boro rice. A change in air temperature by 10⁰ C influences the virulence of some races of rust infecting wheat.</p> <p>Most farmers follow conventional crop and resource management practices which result in poor crop yield and input use efficiencies. We have introduced newly released short duration T. Aman varieties, like BRRI dhan66, BRRI dhan70, BRRI dhan71, BRRI dhan72 and BRRI dhan73 along with rice crop manager based management practices that includes balanced fertilizer, 20-25 day-old seedlings, optimum planting time, proper spacing, water management and pest control.</p>				

Session	11	Resilient Livelihood		
Title	Soil Organic Matter: a 'Win-Win' Situation for Maintaining and Improving Productivity of National Food Security and the Ability of Farmers to Adapt with the Climate Change.			
Keywords	Sustainable, agro ecology, climate change, soil, organic fertilizer			
Presenter	Ms. Afsari Begum	Coauthors	Research of	Continuing
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Institution	Practical Action Bangladesh			
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Study Area	18 upazillas under 7 districts		Problems	Climate change Adaptation
Target Beneficiaries	Farmers, SRDI, DAE, DoE		Implementing Agency	MoFA, DoE, DAE, SRDI, KGF
Abstract				
<p>We should talk about the way our agriculture is affecting our soils and how our land influences the amount of carbon in the soil by considering both issues; how we deliver the SDG's and tackle climate change. Soil organic matter is reducing with modern practices to increase yield and profit. But reducing fallow periods, repeated cropping, ploughing and chemical fertilizers are in fact degrading the land! In many places the soil is not well, and the only way productivity can be maintained is by using even more chemical fertilizer. Bangladesh blessed by the nature but the country's farmer still feeding the population of over 160 million people. At present the organic matter they use to return to the field; cow dung and crop residues is mostly used as fuel for cooking. The falling levels of soil organic matter should be ringing an alarm for us to look at the long term impacts of our 'modern' agriculture practices. While we are not returning enough organic matter to our fields, our cities and towns are producing more organic waste than they can cope with; around 55% of urban waste which has been estimated for not disposed correctly. It should be possible to connect these two problem to use the organic urban waste to improve the inherent fertility of agricultural land. Practical Action working with a whole range of actors to see, if together they can reverse these trends and practices. Success is slow but farmers already producing vermi-compost, though they use only in the homestead or own land. So bringing change is going to need much more work, and most importantly bringing the diverse range of actors in the agriculture sector together to find innovative, market and non-market solutions along with the awareness in the national food security and adaptation to climate change</p>				

Session	12	Adaptation Technology		
Title	Sustainable Intensification of Rabi Cropping through Cotton + Lentil Intercropping in Southern Bangladesh			
Keywords	Cotton, Rabi season, Southern areas, Crop intensification			
Presenter	Dr. Md. Kamrul Islam	Coauthors	Research of	2016-2017
Designation	Senior Scientific Officer			
Institution	Cotton Development Board, Ministry of Agriculture			
Email	islam.mdkamrul@gmail.com			
Study Area	Farmers field at Southern Bangladesh		Problems	Soil salinity, water salinity and farmers knowledge gap
Target Beneficiaries	Farmers		Implementing Agency	Cotton Development Board

Abstract

Southern Bangladesh accounts for 27% of the area and 21% of the total population, where farmers currently grow only one rain-fed rice crop per year and 50% of the land remains fallow in the Rabi season (mid November to mid March). With the objective of sustainable intensification of Rabi cropping in southern Bangladesh the performances of cotton + lentil intercropping was compared with sole cotton at 43 farmers field during 2016-2017 growing period. Crops were sown in mid November. In case of intercropping, lentil was broadcast in the field followed by cotton that was sown in line maintaining 90 × 45 cm spacing. The results indicated that the number of boll (19.5), boll weight (4.5 g) and seed cotton yield (1.8 t/ha) were higher in sole cotton. However, the cotton equivalent yield (3.02 t/ha) was obtained from cotton + lentil intercropping. The average net income (79548.00 Taka/ha) was higher in cotton+lentil intercropping than the sole cotton (34000.00 Taka/ha). Our on-farm trials result indicates that sustainable intensification of Rabi cropping in southern Bangladesh can be achieved through expansion of cotton + lentil intercropping

Session	12	Adaptation Technology		
Title	A Novel Bacillus Aryabhatai MS3 Promotes Growth In Rice Under Salinity Stress			
Keywords	Adaptation, Agriculture, Bangladesh, Biofertilizer, Climate change, PGPR, Salinity			
Presenter	Mr. Muhammad Manjurul Karim	Coauthors	Research of	2015
Designation	Professor			
Institution	Department of Microbiology, University of Dhaka, Dhaka 1000, Bangladesh			
Email	manjur@du.ac.bd			
Study Area	Coastal areas: Barguna, Patuakhali		Problems	Salinity intrusion in the agricultural lands reducing the productivity
Target Beneficiaries	Farmers		Implementing Agency	Ministry of Agriculture, BARC, farmers
Abstract				
<p>Salinity intrusion as a result of sea-level rise in the coastal areas is one of the many effects of climate change leading to reduction of normal crop production of coastal agriculture. Use of bio-fertilizers which works efficiently in saline stressed soil could be a way out to address this issue. Here we isolated a salt-tolerant, plant growth-promoting bacteria (PGPB) (identified as Bacillus aryabhatai MS3) from a rice field of Borguna, a coastal region of Bangladesh which is frequently washed with repeated floods by sea water in recent years. The strain showed profound PGP activities under laboratory condition that included nitrogen fixation (11%), production of Indole-3-acetic acid (25 to 30 µg/ml), solubilization of phosphorus (2 to 4.5 µg/ µL) and production of siderophore (10-20% unit) under 200 mM salinity. In soil conditions, pot experiment cultivating a salt-sensitive rice variety, Oryza sativa BR-28 was fertilized with an inoculum of 10⁹ cells. Under non-saline condition, plant growth in biofertilizer-added pots was recorded 87.50% than that of controls (78%). When challenged with salts at day 67, 46% plants survived in biofertilized group as opposed to 8% in controls. Biochemical analyses revealed that B. aryabhatai MS3 supported the plants under salinity by increasing the availability of nutrients (Fe, P), accelerating the levels of IAA and chlorophyll content, enhancing proline accumulation, and decreasing melondialdehyde formation. A SQRT-PCR analysis demonstrated that B. aryabhatai MS3 selectively up-regulated the expression of NHX1 under salinity what was absent in controls. Overall, the results of this study show that B. aryabhatai MS3 can act as an efficient biofertilizer even for salt sensitive rice in saline stressed soils.</p>				

Session	12	Adaptation Technology		
Title	Seasonal Prediction of the Monsoon onset in Bangladesh			
Keywords	South Asia, rainfall, forecast, agriculture, climatic variability			
Presenter	Mr. Carlo Montes	Coauthors	Research of	2017
Designation	Research Scientist			
Institution	CIMMYT			
Email	c.montes@cgiar.org			
Study Area	Country		Problems	Inter annual variability of the monsoon onset
Target Beneficiaries	Farmers, extension agents		Implementing Agency	BMD, DAE, NGOs, international donors, BARI, BRRI, BARC, other research institutions in Bangladesh
Abstract				
<p>The onset timing of the monsoon is a major climate feature impacting agriculture in Bangladesh. Farmers' decision as to when to begin land preparation, the date of sowing and transplanting, are highly dependent on monsoon onset date, with consequences for rice crop productivity. A late onset can also delay the date of rice transplanting and therefore harvest date, causing further sowing delays for subsequent dry season crops that can experience heat stress due to late sowing. Variability in the timing of monsoon onset consequently crucial in mitigating agricultural risk and increasing the resilience of Bangladesh's rice-based cropping systems. In this research, we assess the potential for one to two-month advance monsoon onset predictability in terms of probabilities of "early", "normal" or "late" occurrence. To achieve this, we use a monsoon onset definition that has been previously applied and validated using multiple data sources and indigenous knowledge of farming communities in Bangladesh. This analysis is combined with long-term last generation high-resolution gridded precipitation data to assess the inter-annual variability of the monsoon onset and its relationship with large-scale climate drivers. We examine monsoon onset for different regions obtained by statistical classifications of precipitation time series (e.g. cluster analysis), for which the monsoon onset predictability is evaluated by using multivariate statistical tools. The subsequent implementation of this information as a climate service for meteorological and agricultural institutions are discussed.</p>				

Session	12	Adaptation Technology		
Title	Transforming Lands, Transforming Lives Hope for Millions of Displaced Communities Living on the Edge of Mighty Rivers in Bangladesh			
Keywords	food insecurity, climate change, river erosion, extreme poverty			
Presenter	Mr. AZM Nazmul Islam Chowdhury	Coauthors	Research of	2004-2017
Designation	Agriculture Lead			
Institution	Practical Action Bangladesh			
Email	Nazmul.Chowdhury@practicalaction.org.bd			
Study Area	Rangpur and Kurigram		Problems	Climate Change Adaptation
Target Beneficiaries	Rural/Male/Female/Farmers/Government/Agriculture		Implementing Agency	DAE, MoFA, SAARC Agriculture Center, Agricultural Universities and Research institutions

Abstract

Bangladesh is a deltaic country located within the floodplains of the GMB river system. These rivers drain a total catchment area of 1.72 m Sq. km of which only 7% lies within the country, and has an estimated 2709 Sq.km (IWM, 2017) of newly accreted transitional lands, locally known as charland, along the banks of these river system in the North and the southern coastal districts. These charlands in the river systems are composed of coarse sands and by definition these belong to the government, but in reality these are used by settlers in the vicinity of these transitional lands for sandbar cropping of food crops. The poor farmers, who are displaced due to river erosion, produce crops such as pumpkins, squash, high value crops, flowers & fodder on these “mini deserts”. Accessing to these transitional sandbars provides alternative livelihood opportunities, food & nutritional security for thousands of landless families. Over a decade, the innovation has offered a chance 22,000 poor families. An international recognized innovation by the Asia-Pacific Forum, Cannes, University of St. Andrews & the Times India.

It has proved that, the technology can be applied in other dry areas and could even become an important coping strategy in some areas adversely affected by climate change to address multiple solutions to the big national and global causes. It should be a policy priority of the government in line with its on-going poverty reduction programs to minimizing food supply vs population growth and land loss (@ 1%/Yr) By 2050.

Session	12	Adaptation Technology		
Title	Assessment of water quality of Rain Water Harvesting Systems in a Coastal Community of Bangladesh			
Keywords	Potable Water, Rain Water, Harvesting, Coastal, Community			
Presenter	Mr. Md. Shahinur Rahman	Coauthors Hossain, M.A., Rahman, S.H ., Rahman, M.S.	Research of	Early 2017-Ongoing
Designation	Assistant Project Coordinator (Environment), LICHSP			
Institution	PKSF			
Email	kabires9@yahoo.com			
Study Area	Gabura Union, Shyamnagar, Satkhira, Bangladesh		Problems	Adaptation
Target Beneficiaries	Basically rural people in the study area		Implementing Agency	National & international Org. with academic expats. Yes, Universities, PKSF/NGO, DPHE, ICDDR,B etc..
Abstract				
<p>Coastal region along the south boarder line of Bangladesh has been suffering fresh water crisis since long. People living in this area have been using rainwater for meeting their daily need of fresh water. A cross sectional study was conducted to assess the rain water harvesting (RWH) practice in a coastal community at Gabura, Shyamnagar, Satkhira, Bangladesh. Multistage sampling technique was used for sample selection, where sample was calculated as 385 households for the study. A semi-structure questionnaire and a structured observational checklist were also used for assessment of household RWH system. Water samples from 15% of the households using rain water was collected and tested for bacteriological quality. The study revealed that more than 70% of the households using rain water collected from the roof top as the catchment area. Respondents used stored water mostly for their drinking purpose. Majority of the water samples had unacceptable level of bacteriological contamination. Government and non-government agencies should extend the health education related to potable water collection through RWH system in the coastal region.</p>				

Session	14	Video		
Title	A Selfie Brings About Happiness			
Keywords	ICT, Participatory Research, Community Empower, Mobile Phone, Agriculture			
Presenter	Ms. Priodarshine Auvi	Coauthors	Research of	Sept 2016
Designation	Senior Program Officer			
Institution	Oxfam			
Email	pauvi@oxfam.org.uk			
Study Area	Coast and Charlnad, Bangladesh		Problems	(Agro) Crop loss
Target Beneficiaries	Development actors and Academics		Implementing Agency	NGOs, Academic
Abstract				
<p>The participatory action research intervention PROTIC has been initiated to address women's economic empowerment in agriculture for resilience. Through the Participatory Action Research approach, PROTIC aims to enhance the economic situation of poor and marginalized climate change vulnerable community by developing relevant, trusted, reliable, comprehensive and accurate interactive and timely information. Developing digital content like SMS, OBD, Call Center and IVR for the mobile phone on crop farming, fisheries, livestock and poultry the project being working in Satkhira coast, Nilphamari Charland and Sunamganj Haor. Three hundred women are equipped with devices for this research project where 5 universities including Monash University are partner to assess the effectiveness of ICT in community capacity building through resilience. Women in the time rapid filmization of agriculture with the help of technology can reduce the Care Work burden. Through a photograph sharing having expert advice on crop fertilizer and disease is possible. Symptom of common and seasonal disease of livestock and poultry can also understand by description and photos. Market information on price made harvesting profitable. Agrometeorological advices help community planning the farming. Community build themselves a mechanism of knowledge sharing using Facebook. Devices makes the community empowered and confident.</p>				

Session	22	Video on Climate Awareness, Mitigation and Justice		
Title	Boyati's Story: Climate Induced Loss and Damage of the Coastal Fishers in Bangladesh			
Keywords	Loss and Damage, Climate Change, Coastal Fisherman			
Presenter	Mr. Habib Torikul	Coauthors	Research of	Patharghata Upazila of Barguna District
Designation	Communication and Documentation Officer			
Institution	Christian Commission for Development in Bangladesh (CCDB)			
Email	torikku0516@gmail.com			
Study Area	Village: Padma, Union: Patharghata Sadar Union, Thana: Patharghata, District: Barguna, Country: Bangladesh		Problems	Cyclone, Salinity, Sea Level Change, Storm
Target Beneficiaries	Coastal Fisherfolk Community		Implementing Agency	Policymakers, NGOs, International participants
Abstract				
<p>Climate change impacts miserably on the livelihood of the fishermen by deteriorating their financial conditions and compelling them to change their century-old fishing occupation. This documentary video "Boyati's Story" is about a coastal fisherman who fight back repeatedly against natural adversities and climate change.</p>				

Session	15	River and Haor		
Title	Monitoring Assessment of Heavy Metal Contamination in Surface Water and Sediment at the Old Brahmaputra River, Bangladesh			
Keywords	Heavy metals, Contamination, Water, Sediment, Statistical analysis, Old Brahmaputra River			
Presenter	Mr. Md. Simul Bhuyan	Coauthors	Research of	2015-2016
Designation	Research Associate			
Institution	Institute of Marine Sciences and Fisheries, University of Chittagong			
Email	simulbhuyan@gmail.com			
Study Area	River		Problems	Pollution of River Water
Target Beneficiaries	Rural, University going to people		Implementing Agency	policymakers, ministries, NGOs, Institutions
Abstract				
<p>The present study was conducted to measure globally alarming of ten heavy metals (Pb, Cd, Cr, Cu, Hg, Al, Ni, Co, Zn, Mn) in surface water and sediment of the Old Brahmaputra River in Bangladesh. The observed order of heavy metals mean concentration in water and sediments Al > Mn > Ni > Co > Cu > Pb > Zn, Cr > Cd, Hg in mg/l and Al > Mn > Zn > Ni > Pb > Cr > Cu > Co > Cd > Hg in mg/kg, respectively. The significant variations of Cr, Cu, Al and Ni were found in the water of all seasons ($p < 0.05$) while sediment showed Pb and Hg exhibited substantial changes in terms of seasons ($p < 0.05$). Principal Component Analysis (PCA) and Correlation Matrix (CM) revealed that significant anthropogenic input of Pb, Cd, Cr, Cu, Hg, Al, Ni, Co, Zn, Mn in water and sediment. In case of water, very strong linear relationships exhibited in Ni vs Cu (0.911), Ni vs Al (0.910), Mn vs Co (0.882), Cr vs Al (0.877), Cu vs Cd (0.853), Ni vs Pb (0.850), Zn vs Cr (0.833), Ni vs Cd (0.828), Cu vs Cr (0.827), Al vs Cd (0.827) and Zn vs Co (0.804) at the significance level 0.05. Whereas in sediments, very strong linear relationships were noted in Zn vs Cr (0.889), Al vs Pb (0.848), Co vs Al (0.819), Mn vs Co (0.806) at the significance level 0.05. The result discovered that water and sediment quality of Old Brahmaputra River become contaminated due to the anthropogenic sources of industrial, domestic and irrigation discharges. This environmental monitoring and assessment research will be useful for the management and plan to protect this river.</p>				

Session	15	River and Haor		
Title	A Holistic Approach to Mitigate the Damage Due to Flash Flood in Haors area of Bangladesh Against the Threat of Climate Change			
Keywords	Flash Flood, Climate Change, Rainfall Intensity, Flood Frequency, Crop Damage			
Presenter	Mr. Sajal Kumar Roy	Coauthors	Research of	2000/2017
Designation	sajalkumar1a@gmail.com			
Institution	Bangladesh Water Development Board			
Email	Assistant Engineer			
Study Area	Sunamganj, Bangladesh		Problems	Temperature Rise/ Rainfall pattern
Target Beneficiaries	People living in Haors		Implementing Agency	MoWR/Plandiv
Abstract				
<p>The haors in Bangladesh are of tectonic origin and constitute the the floodplains of the meghna tributaries. Originally, haors are large bowl shaped depressed areas located in the north-eastern region that include Sunamganj, Sylhet, Habiganj, Maulvibazar, Netrakona, Kishoreganj and Brahmanbaria districts. There are 373 haors in north-eastern region of Bangladesh. The agriculture and fish culture are the prime source for the economic contribution of the haor region has been on average around 6-8% of the national GDP. The runoff from Meghna Basin causes the flash flood every year. The flash flood event has occurred from the month of late March to early June for the past few decades. Recently, flash flood intensity is increasing with high peck water level from flash flood runoff and leading to the severe damage of agricultural crop production. Climate change is global concern and Bangladesh is affected badly this phenomenon. Due to the climate change Bangladesh is experiencing the higher frequency of flood event and the uneven of rainfall distribution or in drought pattern. The climate change has profound impact on rainfall intensity and variability. Thus, climate change affecting the frequency of early flash flood in the north-east regional haor areas of Bangladesh. The study has included the analysis of flash flood event in haor areas from 2000 to 2017 considering the rainfall and temperature analysis. The author has made a holistic approach to mitigate the crop damage due to early flash flood. This approach has included the flash flood management, crops patterns, crop variety, fish culture and finally early warning system for minimizing the agricultural damage and enhancing the economic growth of haor areas.</p>				

Session	15	River and Haor		
Title	The Impact of Climate Change and Socio-economic Development on Microbial water Quality in the Betna River, Bangladesh			
Keywords	Climate change, socio-economic development, river, faecal indicator bacteria, modelling			
Presenter	Dr. M.M. Majedul Islam	Coauthors	Research of	2014-2016
Designation	Senior Assistant Chief			
Institution	Ministry of Planning, Government of Bangladesh			
Email	majed25bd@gmail.com			
Study Area	Betna river basin in southwest coastal region (Satkhira district) of Bangladesh		Problems	Climate and socio-economic change is likely to increase flooding and deteriorate water quality
Target Beneficiaries	both urban and rural population of Satkhira		Implementing Agency	policymakers/planning commission and local government
Abstract				
<p>Consumption of contaminated water still causes high numbers of death and disease. Understanding the factors that influence the distribution of waterborne pathogens is important, as this will help understanding improvements and possible solutions. This study explores the present dynamics and future impact of socio-economic and climate changes on faecal indicator bacteria (E. coli and enterococci) concentrations in the Betna river using MIKE21-ECOLab model. The model for the river was calibrated and validated using measured water level, discharge, water temperature, salinity and bacteria data during October 2014–September 2015. The model output during the base year (2014–2015) corresponded very well with the measured FIB concentrations in the river. Then, the model was applied to investigate the impact of future scenarios (changes in population, urbanization, land use, sanitation, sewage treatment and temperature, precipitation and sea level rise) for the 2040s and 2090s. The scenarios are based on the combined socio-economic (SSPs 1 and 3) and climate change (RCPs 4.5 and 8.5) scenarios. The results revealed that an uncontrolled future results in a deterioration of the microbial water quality (+75% by the 2090s) due to socio-economic changes, such as higher population growth, and changes in rainfall patterns. However, microbial water quality improves under a sustainable scenario with improved sewage treatment (-98% by the 2090s). This revealed that wastewater treatment would result in a considerable improvement of the microbial water quality of the river. This study provides a basis for faecal contamination reduction. The results will help policy makers and water managers in reducing the widespread faecal contamination and the risks of waterborne disease outbreaks.</p>				

Session	15	River and Haor		
Title	Flood Inundation Mapping of Jamuna River Floodplain Using HEC-RAS 2D Model			
Keywords	Jamuna river, HEC-RAS 2D, Flood Parameters, Flood Inundation Mapping			
Presenter	Ms. Ummay Sumaiya	Coauthors	Research of	2017
Designation	Post Graduate Student			
Institution	BUET			
Email	sumaiyanishat2013@gmail.com			
Study Area	Floodplain of Jamuna River		Problems	Flood
Target Beneficiaries	Farmers, Planners, NGOs, Local People		Implementing Agency	Planning Commission, Policymakers, NGOs
Abstract				
<p>Bangladesh lies within the GBM (Ganges-Brahmaputra-Meghna) Basin. Among them, Brahmaputra River Basin (BRB) is one of the largest basins carrying enormous volume of water through Bangladesh. Therefore, Bangladesh is highly vulnerable to flood. To analysis the flood parameters (flood arrival time, flood recession time, flood duration time, flood depth) an attempt has been made to generate a two dimensional hydrodynamic model in HEC-RAS. The study area has been chosen based on the 1998 flood's inundated area. In the upstream of the reach Bahadurabad station and in the downstream of the reach Sirajganj station has been chosen. The calibration is done in Mathurapara station and the validation is done in Kazipur station. A quantitative comparison of flood inundated area has been done in between MODIS Flood Map and the Simulated Flood Map for year 2004 and 2005. The correlation between these two maps are 0.80 and 0.87 for year 2004 and 2005 respectively. The analysis of flood parameters is done for year 1988, 1998 and 2004-2012 by using inundation maps produced by Ras Mapper in HEC-RAS. The results revealed that among these years, in year 1998, the flood has inundated maximum area and it is 49.31% of the total floodplain. Flood arrived early in the floodplain in year 2010, which is almost at the end of the march. The flood receded lately in year 1998, which is almost at the end of October. The flood duration is highest in year 2005. In this year, almost 28.79% of area has been flooded for almost 90 days. The flood depth is maximum in year 2004 and the depth varies from 1.69 m to 2.91 m in the floodplain. These analysis will help the planners, farmers and the concerning authorities to make the best use of the floodplain.</p>				

Session	15	River and Haor		
Title	Exploring Rights and Entitlement Situation of marginalized and Poor Communities in Bangladesh			
Keywords	Rights, Entitlement, Situation, Marginalized, Poor, Resilience			
Presenter	Mr. Md. A. Halim Miah	Coauthors	Research of	From July to October 2015
Designation	Founder General Secretary and Director (Research & Development)			
Institution	Bangladesh Social Scientists Foundation (BSSF)			
Email	bssf.gs@gmail.com			
Study Area	Fulchari, Matherbunia and Magan Siadhar Unions of Fulchari, Patuakhali Sadar and Mohonganj Upazila respectively		Problems	Adaptation strategies for combating the climate Change effect
Target Beneficiaries	Rural poor live in geographically fragile areas		Implementing Agency	LGRD & Cooperatives, MoDM& Relief, Planning Commission, NGOs
Abstract				
<p>This study was conducted in the three communities of three environmentally fragile locations of Bangladesh from the period of July to October in 2015. An international NGO was mobilizing those communities through some national NGOs by providing technical and financial support. It has been revealed poor people are vulnerable those who live in geographically fragile areas. development initiatives both public and nonprofit organizations are contributing to increase the number of hunger free population with increasing opportunities to diversification of livelihoods. Poor people's access to public assets has been increased significantly with increased their negotiation skills through external supported poor people's platform. Development planners and policy makers can learn from these social lab and take the good practices into its rural development policies for combating the climate change affect.</p>				

Session	17	Forestry and Hills		
Title	Deforestation Leads to Larger Biomass Generation Per Year, Which Supports Population Increase			
Keywords	Deforestation, Biomass, Population			
Presenter	Prof. Shahriar Khan	Coauthors	Research of	2017 Jan to present
Designation	Prof and Dean, School of Engg and Comp Science			
Institution	Independent University, Bangladesh			
Email	khandhaka@gmail.com			
Study Area	Generally, the area of Bangladesh.		Problems	The problem of deforestation and its associated effects on the climate
Target Beneficiaries	General Population of Bangladesh and Elsewhere		Implementing Agency	Academicians, Scientists, and Policymakers, who would have more in-depth understanding
Abstract				
<p>In the competition for sunlight, trees have evolved to overshadow each other, maximizing height and accumulated biomass in forests. But paradoxically, the trees must have minimized biomass generation per year because of the difficulty in raising water and nutrients up to the tree tops. In comparison, grasses have much higher rates of biomass generation per acre per year, because there is no need to transport water and nutrients high above the ground. Paradoxically, artificial deforestation leads to loss of biomass in forests, but results in the creation of grasslands, with much higher rates of biomass generation per acre per year. For thousands of years, human populations must have been limited by biomass and food generation in the world. The ongoing artificial replacement of forests by grasslands in Bangladesh and elsewhere implies greater biomass production per year, implying more food production, more grazing animals, more meat in human diets, and larger populations. Deforestation may have led to mass extinctions from habitat loss, but must have supported the exponential growth and evolutionary progress in human populations. The widespread clear-cutting of forests to create farmlands, and a survey of relevant data support the above hypothesis.</p>				

Session	17	Forestry and Hills		
Title	Local Ecological Knowledge (LEK), Ecosystem Services and Resilience to Climate Change in Pacific Islands: Relevance to Forest Conservation in Bangladesh			
Keywords	Local Ecological Knowledge, Ecosystem Services, Resilience, Climate Change, Pacific Islands, Agroforestry, Biodiversity			
Presenter	DR. SHIMONA ANNOOR QUAZI	Coauthors	Research of	2009-2011; 2014
Designation	ADJUNCT RESEARCHER			
Institution	UNIVERSITY OF HAWAI'I AT MANOA			
Email	shimona.quazi@gmail.com			
Study Area	Hill Forests, Sylhet District; Coastal Agroforests, Fiji; Coastal Forests, Hawaii		Problems	What is the role of LEK for resilience in the Pacific? Is there scope for such work in Bangladesh?
Target Beneficiaries	Forest dwelling communities, hill communities		Implementing Agency	Forest Department/ agroforesters/ forest villagers

Abstract

An urgent challenge today is understanding how social-ecological systems can be resilient to climate and environmental change. How can people have healthy ecosystems while maintaining quality of life? This is particularly important in Pacific Islands, which are especially vulnerable to climate change and are also suffering rapidly declining levels of native biodiversity. We used a biocultural approach to assess the main drivers of resilience on communities in Fiji and Hawai'i, their cultural knowledge and practices, and linking that to the natural resource base that people depend on. We asked, how do different land use choices and ocean uses in the Pacific affect ecosystems, people's ways of life, and livelihoods? We carried out field studies in 3 ridge-to-reef systems in Fiji and Hawai'i, encompassing native forests, agroforests, other land-use types, and coral reefs, in order to gather data on indicators of resilience. We used existing marine data (e.g., herbivore biomass, coral to algae ratio), conducted household and key informant interviews, FGD and participatory mapping (for data on variables that relate to flexibility, capacity to learn, capacity to organize, and material assets), and collected vegetation data (e.g. tree cover, species, crop and cultivar diversity, spatial heterogeneity, and invasive species cover). Here we present partial results, their implications for conservation and resilience in Pacific Island coastal communities, and relevance of this work to biodiversity conservation and building climate resilience in one of the authors' previous study sites in the forests of Sylhet. We specifically discuss the case of the Khasiapaanjhum agroforest systems and their role in building resilient forests and communities in the upland forests of Bangladesh.

Session	17	Forestry and Hills		
Title	Migration Impacts on Environment: A Case of Rohingya Refugees in UkhiaUpazila, Cox's Bazar			
Keywords	Migration, Hill Cutting, Deforestation, Sustainability			
Presenter	Mr. Abdullah Al Nayeem	Coauthors	Research of	2017
Designation	Student			
Institution				
Email	nayeem.env58@gmail.com			
Study Area	Ukhia Upazila, Cox's Bazar		Problems	Rainfall Variation
Target Beneficiaries	Rural People		Implementing Agency	Government
Abstract				
<p>Hills are one of the exclusive components for our Environment which despoliation is one kind of criminality against environment and sustainability. Forced Migratory people basically depend on the natural resources for livelihood in an unfamiliar place. Our study focuses on the changes of hill cover occurred by Ruhingha Refugees in the Ukhia Upazila of Cox's Bazar district, Bangladesh. Ruhingha Refugees are cutting hills for surviving which is very alarming issue for the environment in this region. This satellite image based study has revealed that a considerable deduction in forest and hill covers in this Upazila that will lead to defer our goal of achieving 20% of national forest land cover by 2020. Our study is scrutinizing this issue that urges for a sustainable solution for solving the Ruhinga issue.</p>				

Session	17	Forestry and Hills		
Title	Coping with Climate Change and Scoping Adaptive Capacities of the Indigenous Communities of the CHTs			
Keywords	climate change, indigenous, biodiversity, culture and development			
Presenter	Ms. Remeen Firoz	Coauthors	Research of	2013-2014
Designation	Consultant - BCCSAP Action Plan Review			
Institution	GIZ Bangladesh			
Email	firozremeen@gmail.com			
Study Area	Thanchi upazila of the Bandarban Hill District	Problems	Migration from low-lying areas, anomalies in seasons and temperature and disasters	
Target Beneficiaries	Indigenous communities of the CHTs	Implementing Agency	NGOs, development partners and GoB	
Abstract				
<p>The indigenous communities of Thanchi upazila of the Bandarban Hill District in CHTs face a unique set of environmental problems. They have experienced a ‘low intensity armed conflict’, for about 2 decades and encounter environmental problems like climate change and deforestation. This paper presents the environmental perils faced by the indigenous communities and discusses the potentials for sustainable development. The research was carried out following a combination of tools and techniques, including literature review, key informant interviews, and collection of testimonies from 6 ethnic communities. The key findings can be summarized as follows:</p> <ul style="list-style-type: none"> • Enhanced climate-change induced migration from low-lying coastal areas of Bangladesh has exerted more pressure over scarce land resources and led to more conflicts • Erosion and landslides occur especially during the monsoon and there are anomalies in the seasons like delayed start of winter or monsoon and increase in the temperature • Hill cutting, logging and deforestation for construction of military camps and settlements has degraded biodiversity, ecosystems and local culture <p>Based on the findings, this paper recommends strategies for sustainable development in the region, addressing the adaptive capacities of indigenous communities. The recommendations can guide future development programmers in the CHTs, as well as the other indigenous communities in the Himalayan region.</p>				

Session 17 Forestry and Hills				
Title	Structural Diversity of Present and Sketching Future Forest of Teknaf Wildlife Sanctuary Applying Climate Change Scenarios			
Keywords	Plant biodiversity, Climate Change, Regeneration, Temperature, Rainfall, Vulnerable species.			
Presenter	Mr. Aznabi Majumder	Coauthors	Research of	2015-2016
Designation	Program Officer			
Institution	Young Power In Social Action (YPSA)- NGO			
Email	nahidmail91@gmail.com			
Study Area	Vulnerable zone- Forest, Research area- Teknaf Wildlife Sanctuary, Teknaf Upazilla of Cox's Bazaar District.		Problems	Temperature & Rainfall might be changed & significant decrease of the remaining plant diversity.
Target Beneficiaries	Rural		Implementing Agency	Forest and Environment Ministry & Environmentalist.
Abstract				
<p>The study reflects the species composition, present regeneration status and scenarios of future forest stand in the Changing Climate. The study has resulted a total of 195 vascular plant species under 141 genera belonging to 66 families. Of them 178 species are angiosperm and 17 pteridophytes. For each species scientific name, bangla name, family and habit are provided. Of 195 species, 58 represented by herbs, 41 by shrubs, 50 by trees, 28 by climbers and 18 by pteridophytes. The study found significance difference between the slope hill and top hill. From this it is clear that the number of species in foot hill is decreasing. It also revealed that the species from foot hill may be migrated to slope and top hill. But there is no significant differences among the hill positions for mature tree and seedlings individually. The mature tree represents 76% of the total population in compare to seedlings. This indicates that the natural regeneration of tree seedlings is decreasing in compare to the present number of mature tree in the forest. There is a prediction of mean temperature increment in 1°C by the year 2100 in summer of the study area. Predicted rainfall line also shows that precipitation in the winter will decrease whereas in the summer it will increase. The study found some vulnerable tree species which are <i>Aquilariaagalocha</i>Roxb. , <i>Buteamonosperma</i> (Lam.) Taub. , <i>Nyctanthes arbor-tristis</i> L., <i>Prosopis cineraria</i> (L.) Druce, <i>Gardenia coronaria</i>Buch.-Ham, <i>Tamarindusindica</i> L. and <i>Terminaliabellirica</i> (Gaertn.) Roxb. on the basis of low IVI%, less regeneration and the response in predicted temperature and rainfall. All such threats are enough to significant decrease of the remaining plant diversity from the sanctuary.</p>				

Session	17	Forestry and Hills		
Title	Climate Change Adaptation through Community Based Village Common Forest Management in the Chittagong Hill Tracts (CHTs) of Bangladesh			
Keywords	Climate change adaptation, community based approach, village common forest, natural resources management			
Presenter	Mr. Md. Arif Chowdhury	Coauthors	Research of	2015-2016
Designation	Research Associate			
Institution	Research Associate, Institute of Water and Flood Management, Bangladesh University of Engineering and Technology			
Email	arifchowdhury065@gmail.com			
Study Area	Kamalchari VCF (locally called reserve) area in Buarchari Mouza, KhagrachariSadar		Problems	Damaging of natural resources and increasing vulnerabilities of tribal communities
Target Beneficiaries	hill tracts communities		Implementing Agency	MoEF, DoE, BCCT
Abstract				
<p>Indigenous communities of Chittagong Hill Tracts in Bangladesh depend on natural resources especially for food, fuel wood, medicinal plants, timber and water supply. To adapt with the impact of climate change people living in Village Common Forest (VCF) of Kamalchari in Khagrachari is adopting Community Based Management (CBM). Questionnaire survey and FGD were conducted among the settlers in VCF, non-settlers in Kamalchari, Thana Chandra para and Jadu Ram para villages. KII was done too on two NGOs and Headman of Kamalchari VCF. Non-settlers were more liable in case of conserving VCF where women played a crucial role as they were directly involved in forest products and water collection. Vulnerability due to Jhum cultivation induced soil erosion made community people more aware about forest degradation. Training program provided by Arannayak Foundation and Proshika on different horticultural techniques and "Saving-Credit program" improved livelihood condition and reduced the pressure from VCF. Moreover, they had "Pally KallyanSamiti" which ensured traditional communal rights in organized way like paying fee for consuming forest products and penalty for rule breaking. This study enriched the knowledge on increasing CBM approach in conserving natural resources which improved watershed condition and environmental services as strong weapon against climate change.</p>				

Session	18	Disaster Management		
Title	Role of Disaster Governance in Disaster Risk Management			
Keywords	Disaster, Governance, Risk Management, Bangladesh,			
Presenter	Mr. Abu-Hena Mostofa Kamal	Coauthors	Research of	From 2012-2013
Designation	Lecturer(Sociology)			
Institution	Khulna University of Engineering & Technology(KUET)			
Email	mostofakamal@hum.kuet.ac.bd			
Study Area	Mohesripur and North Betkasi union under KoyraSubdistrict of Khulna district		Problems	This study was conducted on cyclone Aila affected people
Target Beneficiaries	Rural people of the disaster prone coastal areas		Implementing Agency	Findings of this study will be helpful for the policy makers of NGOs and GOs
Abstract				
<p>Background: The study aimed to explore the efficacy of the existing disaster governance system is in the coastal communities to mitigate the vulnerabilities of the disaster prone people of the coastal area.</p> <p>Methodology The data were collected from disaster prone people of the coastal communities using multiple techniques, such as survey(111), case study (30), KII (10) and FGD(5).</p> <p>Results: The findings also suggests that due to respondents lower middle class socio-economic and political origin, they fail to cope with the gradual change of environment and to mitigate disaster caused vulnerabilities with their own efforts and resources. Approximately 73.15 respondents opined that community based voluntary committees' required government and non-government patronization in order to perform adequately. The findings suggest that in spite of increasing women's participation in disaster governance, their roles in decision making haven't been changed due to traditional societal system.</p> <p>Conclusion: Formulation of alternative or new policies emphasizing the needs and obstacles of the target population and its implementation is necessary to have more effective disaster governance in the coastal areas.</p>				

Session	18	Disaster Management		
Title	Disaster Preventive Geodesic Dome: The Best Home for the Coastal People of Bangladesh			
Keywords	Geodesic dome, Disaster risk reduction, Engineering structure, Cost-benefit analysis, coastal region			
Presenter	Mr. Md. Hafiz Iqbal	Coauthors	Research of	2016
Designation	Assistant Professor (Economics)			
Institution	Government Edward College, Pabna, Bangladesh			
Email	vaskoriqbal@gmail.com			
Study Area	Villages of coastal region		Problems	Disaster risk reduction
Target Beneficiaries	Coastal people		Implementing Agency	National Housing Authority and NGOs
Abstract				
<p>Coastal area is vulnerable to cyclones. On average, a severe cyclone strikes coastal area of Bangladesh every three years. Over the last 50 years, 15 severe cyclones with wind speed ranging from 140-225 km/h hit the coastal Bangladesh and create huge loses and damage in different sectors. Coastal housing is one of the leading sectors destroyed by the cyclones like Sidr and Aila. In the super cyclone Sidr, the total housing damage was estimated at BDT 57.9 billion. Nearly 537,775 households' dwellings (15 percent) of the 3.5 million households were completely destroyed and another 854,244 (24 percent) were partially damaged. Under this circumstance, geodesic dome based housing structure plays an important role to prevent disaster, reduce loss and damage and protect livelihood of coastal people from the Sidr type cyclone. This study examines the effectiveness of geodesic dome in the cyclone and storm surge prone coastal region of Bangladesh with respect to cost and benefit, develop a construction guideline and management approach of the geodesic dome. To fulfill the research objectives, this study carried out questionnaire survey (n=172), and used natural log linear regression model and cost-benefit analysis (CBA). The findings of the study provide a robust basis for planners, researchers, government, development partners and coastal people for further research, project implementation and making more resilient coastal housing.</p>				

Session	18	Disaster Management		
Title	Lived Experiences in Constructing Vulnerabilities: A Discussion within the Sirajganj District, Bangladesh			
Keywords	Lived Experiences, Vulnerability, Risk, Flooding, Sirajganj District			
Presenter	Mr. James Totton	Coauthors	Research of	2016
Designation	Visiting Researcher			
Institution	International Centre for Climate Change and Development (ICCCAD)			
Email	tottonjames82@gmail.com			
Study Area	5 villages were studied along the Brahmaputra river floodplain within the Sirajganj District		Problems	Increased frequency and severity of monsoon flooding as well as the DRR response
Target Beneficiaries	Rural poor and marginal groups		Implementing Agency	Addressing NGOs and specifically project designers and implementers
Abstract				
<p>This research looks to discuss the extent to which villages lived experiences of vulnerability have influenced their constrictions of vulnerability within the local context of the Sirajganj District of Bangladesh. This research looks to engage with the concept that what local people construct and process as vulnerability may differ to what other epistemologies have understood it as. In light of this, the social ecological approach to vulnerability is considered, drawing attention to the Pressure and Release (PAR) Model and Hewitt's (1987) understanding of the 'human ecology of endangerment' as two key sources for engagement and critique.</p> <p>To fully explore these themes, an in depth study of five villages, with over 150 participants alongside theoretical concepts from the field of humanistic geography have helped this research to identify what perceptions and lived experiences of vulnerability were, analyse how these have been formed and discusses why these are important within the wider vulnerability discourse and disaster risk reduction (DRR). It is with this consideration of the what, how and why that this research concludes that lived experiences do have a significant influence over the construction of vulnerabilities within the villages of the Sirajganj district and that this is primarily driven by an intrinsic relationship between lived experiences and 'place'. It is from here that this research critiques the linear modelling of vulnerability processes through the PAR model, instead staking the claim for one that highlights the role of positive feedback in local constructions of vulnerabilities.</p>				

Session	18	Disaster Management		
Title	Climate Change Induced Flood Risk And Adaptation In The Padma River Island, Bangladesh : A Local Scale Approach			
Keywords	Hazard, Exposure, Vulnerability, Resilience and Disaster risk			
Presenter	Dr. Rumana Sultana	Coauthors	Research of	2012-2013
Designation	Assistant Professor			
Institution	Center for Sustainable Development, University of Liberal Arts			
Email	rumanaslt@gmail.com			
Study Area	Narayanpur Mauza, Nawabganj District, Bangladesh		Problems	Flood disaster
Target Beneficiaries	Rural		Implementing Agency	Community people
Abstract				
<p>Assessment of hazard characteristics, exposure, vulnerability, resilience and risk at a local scale is an important tool for identifying the capacities of households and local communities to adapt with climate change induced flood. Repeated floods with different magnitudes under variable climatic conditions are great catastrophe for the people living in flood prone regions specifically in Islands. People, infrastructure and economy are highly exposed to flood and that results in devastating flood disaster. In the Padma river Islands frequent flooding in pre monsoon and monsoon period makes the life and livelihoods of people vulnerable and this vulnerability is conditioned by different factors such as people's physical, social, economic and environmental condition. The higher is the level of vulnerability the higher is the level of flood risk. Hence, people's resilience can minimize the negative impacts of flood disaster. A composite risk index (related to the probability of occurrence of the event, magnitude of the event, quantity and cost of the element at risk, vulnerability and resilience) was prepared to realize the climate change induced flood disaster risk. Pre, during and post disaster period adaptive strategies are explored and pre disaster period adaptive strategies are determined more suitable to adapt with climate change induced flood risk. Finally, Local Scale Disaster Risk Model (LSDR) was proposed to present the framework of climate change induced flood disaster risk and adaption at a local scale.</p>				

Session	18	Disaster Management		
Title	Vulnerability of an Indigenous Population Group to the Recent Extreme Flood in Barind Area			
Keywords	Barind, Indigenous population, Extreme flood, Climate Change, Santals, Flood Management			
Presenter	Mr. Partho Das	Coauthors	Research of	Sep. and Oct. 2017
Designation	Lecturer			
Institution	Institute of Water and Flood Management(IWFM), Bangladesh University of Engineering and Technology (BUET)			
Email	partho@iwfm.buet.ac.bd			
Study Area	Vulnerable Zone: Barind ; Research District: Dinajpur	Problems	Unexpected flooding in highland Barind district of Bangladesh	
Target Beneficiaries	Policy makers, Indigenous group and related agency	Implementing Agency	Policy makers, planning commission, Local administration, DDM, NGOs etc	
Abstract				
<p>Dinajpur the NW barind district is a relatively highland compared to the other districts of Bangladesh where regular flooding is not common at all. Due to global climate change, this Barindland is no longer flood free anymore. The aim of this study is to assess the vulnerability of an endogenous group (Santals) due to an unforeseen August 2017 flood. Vulnerability was assessed through several KII of this stakeholder group. Open ended questionnaire was based on Messner and Meyer (2006) framework for vulnerability assessment. This widely used framework assess flood vulnerability based on exposure indicators, susceptibility indicators keeping risk elements at center to evaluate the damage potential. Based on those semi structured interview along with the reconnaissance visit to an affected Santal village, several dimensions of vulnerability of this marginal Santal population came up. This unanticipated flood was caused by heavy rainfall, silted up river bed along with heavy flow from upstream area, breaching in earthen dams and so on. With time the Santals are now the most marginalized group in this area who are forced to live in a relatively lowland under archaic mud house which having more exposure and is more susceptible to flood damage. Absence in flood preparedness program, flood shelter add dimension to their vulnerability. Moreover govt. agencies do not enlist the classified damage information. Santals maintaining agriculture as their archaic profession had to suffer most for this extreme flood where many of them couldn't replant Aman right after the flood due to increased seed price whereas day laborer was out of work. Based on KII all other dimensions of vulnerability was assessed and required measures for management of such extreme flood event has been suggested.</p>				

Session	19	Ecosystem and Loss & Damage			
Title	Assessing Climate Induced Non-Economic Loss and Damage in Coastal Fisher Folk Communities of Bangladesh				
Keywords	Loss and Damage, Coastal, Fishermen				
Presenter	Mr. Habib Torikul	Coauthors	Research of	2017	
Designation	Communication & Documentation Officer				
Institution	Christian Commission for Development in Bangladesh (CCDB)				
Email	torikku0516@gmail.com				
Study Area	Coastal, PatharghataUpazila, Barguna District		Problems	vulnerabilities that threatens the livelihood of coastal fisher folks due to climate extremes	
Target Beneficiaries	Rural/Coastal Fishermen		Implementing Agency	MoFL, JBC, Researchers, Policy Makers, NGOs, Insurance Companies	
Abstract					
<p>The report explores the numerous forms of loss and damage experienced by coastal fisher folk communities due to the exposure of multiple weather-related extremes such as cyclones, storms, and floods are increasing in magnitude and frequency due to climate change. Climate change further aggravates the livelihood of coastal people who directly and indirectly depend on fishing and other related activities. Coastal fisher folk are compelled to stop fishing for days after facing numerous early warnings. This incurred a significant monthly economic loss, not taking into account non-economic losses that are difficult to quantify, such as loss of life, health, culture, biodiversity, and ecosystem services. Hence the extent of NELD affecting fishing communities is needed to be explored to understand loss and damage more comprehensively. The research was concentrated in two villages at Patharghata Upazilla in the Barguna district, next to the Bay of Bengal, based on the exposure level of different types of climatic hazards and socio-economic vulnerability. Although the research achieved its objectives, there are some limitations. Due to the time limit, the research was conducted with a limited number of participants. To generalize the results for larger groups, the report would need to involve more participants at different levels.</p>					

Session	19	Ecosystem and Loss & Damage		
Title	Climate Induced Slow onset Disaster and Agricultural Land Loss in Bangladesh			
Keywords	Climate, slow onset, agricultural land, loss			
Presenter	Mr. Abdur Rahaman	Coauthors	Research of	2014-2016
Designation	Director			
Institution	Climate Change Adaptation, Mitigation Experiment & Training (CAMET) Park			
Email	rana.bries@gmail.com			
Study Area	Kalapra Upazila, Patuakhali		Problems	salinity, flood, water logging, loss and damage
Target Beneficiaries	Farmers		Implementing Agency	Planning Commission, Agriculture Ministry, Land Ministry
Abstract				
<p>Land degradation is an impediment to sustainable development in general, and to sustainable agriculture in particular. Land degradation and soil loss threaten the livelihood of millions of people and future food security, with implications for water resources and the conservation of biodiversity. Bangladesh has a total land surface of 13.31 million hectares, of which presently 7.85 million hectares are under agriculture. It accommodates more than 130 million people. This amounts to an average of 27 percentile of land and 17 percentile of cultivable land per head. Moreover, due to population growth, this share of land per capita is shrinking every year making the resource base for agriculture, forest and wetlands more vulnerable and marginalized. This is mainly due to conversion of land into urban, peri-urban, industrial uses, and climate induced slow on set disaster. Agriculture production is being seriously affected by different levels of vulnerabilities/risk caused by integrated effects of soil salinity, water salinity, sea level rise, tidal surge, cyclone, drainage congestion and water stagnancy and thus Bangladesh is losing agricultural land rapidly which causes food insecurity in the country. The study was conducted in KalaparaUpazila of Patuakhali District in where agricultural land loss is in alarming situation due to climate induced slow onset disasters. The broad objective of the research project is to assess/evaluate the extent and rate of of agricultural land loss due to slow onset disasters and provide database and relevant input to help policy formulation to minimize agriculture land loss in climate vulnerable areas of Bangladesh. It is found that in Kalapara agricultural land was decreased 1303.75 acre during 2004-2014</p>				

Session	19	Ecosystem and Loss & Damage		
Title	Action Research on Eco Village in the Sundarbans coastal region of Bangladesh			
Keywords	Mangrove ecosystem, Climate Change, Renewable energy, Eco tourism, Environmental Education, Drinking Water, Conservation, poverty.			
Presenter	Mr. Md. Maksudur Rahman ¹ , Saumitra Chakrabarti ²	Coauthors	Research of	June 2015 to Feb 2017
Designation	1. Chief Executive ² . Assistant Programme Coordinator			
Institution	Bangladesh Environment and Development Society (BEDS)			
Email	info@bedsbd.org			
Study Area	Sundarbans coastal region i.e Banishanta union under Dacopeupazilla of Khulna district in Bangladesh	Problems	The major Natural Hazards are Cyclone, Salinity intrusion, Sea level rise, River bank erosion etc	
Target Beneficiaries	Sundarbans rural families	Implementing Agency	NGOs with local government and community assistance from University and technology providing company	
Abstract				
<p>Eco-village is a new concept for the perspective of Bangladesh. It is a time being concept for Bangladesh especially for Sundarbans coastal region. Eco Village Project is very important to reach the Sustainable Development Goals (SDGs) and Education for sustainable Development (ESD). As it is an ecosystem based adaptation tool, it ensures natural resource management. This project aims at solving major local problems of the region considering the environment and stability of the mangrove ecosystem. For this region we need to take comprehensive initiatives for solving the local problems such as; Solar Pond Sand and Filter (SPSF) and desalination system for solving safe drinking water crisis. Improved Cooking Stoves (ICS) is a technology for reducing the quantity of cooking fuel and deforestation. Community Based Mangrove plantation is a good way to protect river bank erosion. Solar energy is an alternative way to fulfill the demand of local electricity. Community Based Eco Tourism is a great alternative livelihood for maintaining the ecological. Eco fishing and farming is a suitable tool to use our natural resources for a long time. Finally Environmental Education is one of the key ways to overcome the climate change crisis in Bangladesh. All of these comprehensive grass-roots initiatives are ecosystem based Climate Change adaptation tools in the Sundarbans coastal region of Bangladesh which keep balance and create harmony between human and nature. So, Eco village is a showcase of combine initiatives that focuses on solving local problems without damaging the ecological state.</p>				

Session	19	Ecosystem and Loss & Damage		
Title	Cultural Resilience in Complex Mangrove Ecosystem Affected by Climate Change: Lessons from Sunderbans in Bangladesh			
Keywords	Resilience, social-ecological system, narrative research, mangrove ecosystem, sunderbans, Bangladesh			
Presenter	Mr. ShamikChakraborty and Shantanu Kumar Saha	Coauthors	Research of	February 2017 to Present
Designation	Senior Lecturer-cum-Research Associate			
Institution	University of Liberal Arts Bangladesh			
Email	shantanu.kumar@ulab.edu.bd			
Study Area	Coastal / forest/ village		Problems	Social resilience to climate change/ natural resource management
Target Beneficiaries	Rural people/ subsistence harvesters		Implementing Agency	Policy makers, development practitioners, universities, research institutions, NGOs
Abstract				
<p>Coastal mangroves are unique ecosystems that are affected by climate change and anthropogenic land degradations. Studying these systems therefore has wide implications of addressing multiple issues of biodiversity and climate change together. Addressing social ecological resilience is an important aspect in this sense for maintaining ecosystem functions that are affected by climate change and land degradation. Resilience in social ecological system approach has mainly been studied at the macro level (i.e. institutions). This makes connection of resilience at the individual level an underestimated aspect in socioecological systems research. Accordingly, in this paper, we look at the resilience of local communities, studied through individual subsistence harvesters in complex mangrove ecosystems of Bangladeshi Sunderbans against climate change and forest degradation. Individual level studies make ideal situation for Sunderbans ecosystem as families (e.g. honey collectors, fishermen) are supported by individual resource harvesters who enter the mangroves. We have used a qualitative research framework mainly using narratives to bring the socioecological interactions at the individual level that tend to maintain resilience of the community. We go on to argue how this human resilience at the individual level is connected in maintaining the resilience of the forest. We point out that this is a vital but under addressed adaptive capacity present in the Sunderbanssocioecological system that can help mangrove ecosystem protection, increasing climate resilience while also maintains local livelihoods.</p>				

Session	20	Natural Resource Management		
Title	Nutrient-rich Fisheries Enhancement in Seasonally Flooded Rice Fields in Southern Coastal Bangladesh			
Keywords	Nutrition-sensitive, Fish microhabitat, Rice fields, SIS, Climate Change			
Presenter	Mr. Md. Emdad Hossain	Coauthors	Research of	2016
Designation	Project Leader			
Institution	WorldFish			
Email	Md.E.Hossain@cgiar.org			
Study Area	Coastal zone, Rajapur and Kawkhali Upazila under Jhalokhati and Pirojpur District respectively, Bangladesh		Problems	Erratic rainfall, High Temperature
Target Beneficiaries	Rural		Implementing Agency	Policymakers (MoFL), NGOs
Abstract				
<p>Aquatic species migrating into the floodplains during the first floods of the monsoon is not well recognized in Bangladesh. To promote seasonally inundated flooded rice fields for enhancing migrated small indigenous species (SIS) through microhabitat development the present study was conducted in Southern coastal Bangladesh. The study sites located between two adjacent Upazillas of two districts. Three intervention and two control rice fields with similar physical characteristics, tidal flow influence, water feeding channels, and biodiversity pattern were selected. A set of three locally available cemented rings were installed in a single hole with 1m depth and 76cm diameter. The fish abundance employed species wise catch data sampled 47 (weekly basis). Water quality (DO, Temperature) data showed microhabitats were suitable for fish compare to rice field. Fish availability in interventions areas with installment of ring increased 49% compared with control rice fields. Fish consumption data revealed that 90% fish captured from ring were consumed and rest of the fish was stocked in the homestead ponds which were finally consumed by the households. Ring owner households obtained 5.24% more fish for consumption which provided 26.48% additional SIS in the diet of the family annually.</p>				

Session	20	Natural Resource Management		
Title	Cooperation and Conflict Over Swamp Forests in Bangladesh			
Keywords	mitigation, adaptation, haor, swamp forest			
Presenter	Dr. Parvin Sultana	Coauthors	Research of	2014-16
Designation	Senior Research Fellow			
Institution	Flood Hazard Research Centre, Middlesex University			
Email	parvin@agni.com			
Study Area	haor - Moulvi Bazar & Sunamganj Dists		Problems	flood and wave action, mitigation challenges
Target Beneficiaries	rural		Implementing Agency	Ministry of Land, NGOs
Abstract				
<p>Freshwater swamp forest is unique to the deeply flooded haors of northeast Bangladesh. These forests had almost disappeared until recent efforts to restore them. Swamp forest contributes to climate change mitigation, more resilient ecosystems and fisheries, and protection of villages from waves and floods. This paper relates conflicts, incentives to cooperate, and adaptive performance with tenure.</p> <p>In HakalukiHaor public lands were planted in the mid 2000s onwards and protected by Village Conservation Groups. Fish catches improved with flooded trees providing nursing grounds and sanctuaries. However, fisheries leaseholders and villagers cut trees, and attempts to enforce protection using local informal village courts failed as parts of the area on paper were allocated to landless people for agriculture.</p> <p>In Sunamganj patches of mature swamp forest were harvested by the owner and leaseholder for branches, but they did not allow regeneration or plant saplings. After leasing from the owners, the NGO planted saplings, and helped the community set limits on harvesting branches. Encroachment for agriculture is declining with clear lease rights.</p> <p>The scope to exploit trees in Ratargul is limited by formal protection of this government forest, but three local villages earn significant amounts from hiring boats to visitors to go into the flooded forest. Tourism infrastructure has been strongly contested by some environmental groups, while formal protection has failed to prevent encroachment to build private fish ponds.</p> <p>Projects have focused on ecological restoration. Unclear tenure and rights make the sustainability of mitigation and adaptation benefits of recovering forest uncertain. Where use rights are clear there is scope for just resolution of competing claims.</p>				

Session	20	Natural Resource Management		
Title	Integrated Water Resource Management of Catchment Consisting Kushiyara River and Haors, Sylhet, Bangladesh			
Keywords	Kushiara River, Haors, Multicriteria Analysis, Environmental Flow, Bank Erosion			
Presenter	Ms. Fatima-tuz-Zahra	Coauthors	Research of	October 2016-April 2017
Designation	Research Assistant			
Institution	Institute of Water and Flood Management, BUET			
Email	zahraifescu@gmail.com			
Study Area	haors and Kushiyara river flowing through Sheola, Fenchuganj, Sherpur, Moulovibazar		Problems	climate change induced river bank erosion and insufficient environmental flow during dry period
Target Beneficiaries	Rural people depending on natural resources		Implementing Agency	MoEF, DoE, DoP, MoWR, WDB, DoF, LGED etc.
Abstract				
<p>Integrated water resources management (IWRM) is a systematic process for the sustainable development, allocation and monitoring of water resource use in the context of social, economic and environmental objectives. The study area is very important for its diversity, water supply and navigation property, along with several haors in the selected portion of Kushiyara river catchment (Catchment 119). The surface water system of the area consists of the major river networks, haors, beels, and the massive flood plains which become inundated during the monsoon and used for cultivation for the rest of the year to supply most of the agricultural crops. However, at upper reach of this river occurs serious flash flood during peak flow of rainy season which ranges up to 30 or more times than average flow of the river. This hazard causes continuous erosion and deposition of large sediment load which further affects in river bank stabilization, navigation, flood control, fisheries and agriculture. Two major issues- insufficient lean period flow and river bank erosion, are included in this study to be brought under IWRM. The main objectives of this study are to: Conduct a situation analysis of water resources management in the catchment; Develop/ improve upon a Water Management Plan by incorporating IWRM principles and tools. To achieve these goals the objectives as maintenance of environmental flow and bank stabilization and protection were set. Under these objectives the strategies were set and best criteria under each strategy was analyzed using Multi criteria decision Analysis (MCA) system. Therefore, integrated water resources management should be applied properly for the sake of holistic approach to manage this river basin in the north east area.</p>				

Session	20	Natural Resource Management		
Title	Co-management and Natural Resources Management in Bangladesh			
Keywords	Co-management, NRM, Biodiversity, Protected Area			
Presenter	Mr. Md. Shams Uddin	Coauthors	Research of	2017
Designation	Manager-Landscape Planning, Ecosystems and Biodiversity			
Institution	Winrock International			
Email	msuddin.shams@gmail.com			
Study Area	Sylhet, Chittagong, Cox'sbazar and Khulna areas in Bangladesh	Problems	Carbon emission, resiliency	
Target Beneficiaries	Policy maker, forest manager, academic	Implementing Agency	Bangladesh Forest Department and its Ministry, NGOs, local people	
Abstract				
<p>Co-Management has been adopted by the Government of Bangladesh for biodiversity conservation of Protected Areas (PAs) since 2003. The paper reviews Co-Management of forest protected areas in Bangladesh including its development, structure, stakeholders' interest, strength, weakness, opportunities, threats and also offers policy recommendations to strengthen and expand accordingly. The paper is based on intensive multi-stakeholders and expert consultations, learnings from project experiences, literature review and published papers on Co-Management, Government and project documents to analyze various aspects of Co-Management. The paper highlights critical concerns and a modern Co-Management structure is proposed for conserving biodiversity and ecosystem services of protected areas in Bangladesh. A method to measure Co-Management Committee sustainability is also recommended. The paper will guide policy makers and practitioners to strengthen Co-Management for improved biodiversity and ecosystems management in changed environment in Bangladesh and Southeast Asian countries. The paper proposes the first time inclusive Co-Management that is socially acceptable, economically pro-forest dependent people, covering improved governance of biodiversity and natural resources management with sustainable long-term visioning for sustainable forest protected areas management in Bangladesh and Southeast Asian countries.</p>				

Session	21	Renewable Energy		
Title	Peer-to-Peer solar trading in remote and climate vulnerable areas			
Keywords				
Presenter	Ms. Aziza Sultana	Coauthors	Research of	
Designation	Head of Operations			
Institution	SOLshare			
Email	aziza.sultana@me-solshare.com			
Study Area			Problems	
Target Beneficiaries			Implementing Agency	
Abstract				
<p>We identified the following main pain points in the current energy access context in Bangladesh:</p> <ol style="list-style-type: none"> 1) off-grid population (45M+ people): first time clean and affordable energy access 2) SHS population (25M+ people): access to more flexible and profitable (indirect and direct income related) energy services 3) EV drivers (1M): a more affordable, safe and convenient way to charge their vehicles; financing for expensive batteries/ battery replacement <p>Our proposed solution, the SOL share Energy Platform allows millions of solar home system users and non-users to swap electricity coupled with an automatic and real time mobile money enabled billing systems.</p>				

Session	21	Renewable Energy		
Title	Governance of Solar Mini-grid: A case study of Shouro Bangla Solar-Diesel Hybrid Mini-grid in Raipura, Narshingdi			
Keywords				
Presenter	Mr. Sami Shahid Al Islam	Coauthors	Research of	
Designation				
Institution	United International University			
Email	Sami678@live.com			
Study Area			Problems	
Target Beneficiaries			Implementing Agency	
Abstract				
<p>Solar Mini-grid is a viable off-grid clean energy alternative for remote areas in Bangladesh such as char where there is no coverage of national electricity grid. With the rapid increase of Solar home system in Bangladesh, the rural people have accepted solar power as an affordable solution to meet their energy need instead of conventional fossil fuel usage. Electrifying every individual household in this country is not technically and financially feasible by extending the national grid. Currently, 2.86 percent of all power generated in the country comes from renewable energy, including solar power, according to power and energy ministry data. To electrify remote and off grid areas, SREDA (Sustainable and Renewable Energy Development Authority) and BREB (Bangladesh Rural Electrification Board) has signed a MoU identifying 1027 off grid villages eligible for development of renewable energy based projects such as Solar PV where there is no conventional grid and less likely future possibility of expansion by next 5 years. Bangladesh government has a target of 25 MW electricity generation from solar mini-grids by 2021 and in this context, we need better understanding of the governance issues of solar mini grid. To achieve government's 'Power for all by 2021' target and in the long-run for a sustainable Bangladesh, existing solar mini grid projects need to be assessed to verify the potential of scaling up and be implemented to a greater extent in the remote areas of the country. In-depth evaluation in terms of proper monitoring coupled with social acceptability and market mechanisms is necessary to surface any existing flaws and their solutions for future projects. Given this scenario, this thesis will evaluate the critical aspects of governing a solar mini grid project and explore the challenges of such projects. Findings of this research will work as policy guideline for future solar mini grid projects.</p>				

Session	21	Renewable Energy			
Title	Stakeholder Scenario and Mapping in the Renewable Energy Sector of Bangladesh				
Keywords					
Presenter	Ankon Ivan	Coauthors			
Designation					
Institution					
Email					
Study Area		Research of		Problems	
Target Beneficiaries			Implementing Agency		
Abstract					
<p>Energy is vital for the sustainability of the world we live in now. Renewable energy such as wind, solar, geothermal, biomass and hydroelectric power have little environmental and health problems. With enough dissemination of knowledge and technical know-how, the world is slowly starting to recover, from the negative to a zero. To turn towards having a positive outcome, there needs to be an effective collaboration within and between bilateral and multilateral stakeholders both nationally and internationally from policy formulation and ease of funding and disbursements of loans, grants, technical assistance and credits to implementation of projects, not only will this create millions of beneficiaries but it will also develop the intertwined roots of the tree of sustainability. A study of stakeholder mapping in renewable energy sector has not yet been previously formulated in Bangladesh, therefore, this research aims to create an in-depth web of stakeholders (donors, I/L/NGOs, GOs, suppliers, manufacturers, and research institutions) whose footprint in the renewable energy sector of Bangladesh is intertwined and has stayed prominent. This research aims to accumulate in-depth information of the stakeholders and present it through a stakeholder map, hence, will act as the base for further additions to the stakeholder scenario of Bangladesh in the future.</p>					

Session	22	Video on Climate Awareness, Mitigation and Justice		
Title	Alternative Wetting and Drying (AWD) Technology			
Keywords	Climate Change, Rice Production, Water saving, Mitigation, GHG reduction			
Presenter	Dr. Ahmad Salahuddin	Coauthors	Research of	2009
Designation	Consultant			
Institution	International Rice Research Institute			
Email	a.salahuddin@irri.org			
Study Area	Philippines		Problems	Drought management and GHG reduction
Target Beneficiaries	Scientists, environmentalists, extension agents		Implementing Agency	Climate change scientists, rice scientists, farmers, extension agents
Abstract				
This video on AWD briefly introduces the video, the technology, how it is used in the field and what are the benefits of the technology.				

Session	22	Video on Climate Awareness, Mitigation and Justice			
Title	The citizens' science of climate in Sylhet Division				
Keywords	Citizen Science, Climate Variability, Climate Knowledge				
Presenter	Mr. Nabir Mamnun	Coauthors	Research of	March - April 2017	
Designation	Senior Research Officer				
Institution	Bangladesh Centre for Advanced Studies				
Email	nabir.mamnun@gmail.com				
Study Area	Haor; Sylhet Division		Research of	March - April 2017	Climate Variability
Target Beneficiaries	Scholars and practitioners		Implementing Agency	Academic, Students and NGOs	
Abstract					
<p>'Citizen Science' enlists a network of non-scientist volunteers to help collect and analyse data. Citizen science has become increasingly popular over the past 20 years, including for measuring indicators of climate change in developing countries, because it is cost effective, it permits gathering data over a large geographic and temporal scale, and it improves the 'broader impact' of the research by involving citizens. This video presents how 'citizen science' is helping us in co-producing climate knowledge with communities in northeast Bangladesh. We highlight the learning and capacity building associated with citizen science.</p>					

Session	22	Video on Climate Awareness, Mitigation and Justice		
Title	Deserving Climate Justice: The Tale of Climate Induced Loss and Damage in Bangladesh			
Keywords	Climate justice, loss and damage, climate change, impacts, Warsaw International Mechanism, Bangladesh			
Presenter	Mr. Mizanur Rahman Bijoy	Coauthors	Research of	2017
Designation	Coordinator-NCC'B Trust			
Institution	Network on Climate Change, Bangladesh (NCC,B) Trust			
Email	bijoyrahmanbd@gmail.com			
Study Area	Coastal/Haor		Problems	Loss and Damage
Target Beneficiaries	Policy makers/ Professionals/ Academicians		Implementing Agency	Policy makers, ministries, NGOs, Academicians, Students, International Delegates, Researchers/CSOs
Abstract				
<p>Bangladesh is a land of dream, aspiration, and potential. The people of this country have been experiencing flooding, cyclone, drought and other natural disasters all most every year. Thus, the people of this country have long experiences in dealing natural disasters with tremendous spirit and competence. Increasing frequency and intensity of natural disasters due to climate change has negatively impacted the lives and development of the poor people of Bangladesh. Bangladesh is facing changing pattern of climatic system, appears as uneven and untimely disasters, increasing loss and damage of lives and properties and of course hindering development. However, the issue of climate change-associated loss and damage have received sizeable global recognition in recent years. Substantially, a work programme for enhancing understanding of loss and damage had introduced by the UNFCCC at COP 16 in 2010. In 2013, UNFCCC established the Warsaw International Mechanism (WIM) to address loss and damage from the impacts of climate change in developing countries. It is expected that loss and damage issues will get more attention at COP 23 in 2017. To deal with the climate-induced loss and damage, people seek for climate justice. To this end, this video documentary explores the scenario of loss and damages in Bangladesh triggered by climate variability and change. It has shown experts opinions, field level experiences of community people who suffer extreme due to adverse impacts of climate change and showcase stakeholder opinions who deal with matters of climate-induced loss and damage and help people to cope with this undesirable situation. The documentary exposes stories of climate-induced loss and damages in Sunamganj Haor districts, Kutubdia island, St. Martin's island and Koyra Upazila of Khulna district. The documentary revealed that the climate vulnerable poor people of Bangladesh want solidarity and cooperation from Global community.</p>				

Session	22	Video on Climate Awareness, Mitigation and Justice		
Title	Solution based photo-storytelling: participatory visual approaches to North-South dialogue in urban climate resilience			
Keywords	participatory visual methods, photovoice, urban climate resilience, multi-site ethnography, climate justice, international dialogue			
Presenter	Mr. Michael Chew	Coauthors	Research of	2016-2017
Designation	Doctorial Researcher			
Institution	Monash University			
Email	michael.chew@monash.edu			
Study Area	Dhaka		Problems	Climate issues affecting urban youth
Target Beneficiaries	Urban youth		Implementing Agency	Youth and youth services/NGOs
Abstract				
<p>Climate change in Bangladesh is usually represented in the global media through natural disaster imagery which tends to show communities as victims rather than agents. In contrast participatory visual methods such as photovoice can empower communities responding to climate impacts through allowing them to create their own visual storytelling. This presentation will highlight preliminary results from the Climate Resilience Media Exchange (CRME), a doctoral research project at Monash University that uses participatory photography to explore emerging grassroots responses to climate impacts across urban communities in Bangladesh (Dhaka), Australia (Melbourne), and China (Beijing/Hangzhou). These local responses, while differing culturally, economically and technically, are often informed by shared social and environmental values as a basis for community resilience. The project uses participatory image-making and online platforms to support real and virtual international dialogue between these communities, with the intent of promoting mutual learning and enhancing the effectiveness of local project activities.</p>				

THE END