

Proceedings of

2nd CSD Annual Conference on Sustainable Development 2017



This publication is based upon the outcomes of the conference and has been compiled from the notes taken by the session chairs and respective rapporteurs. The publication is a summary from the organizers' point of view, and does not necessarily express the views of each individual participant.

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Message from the Vice Chancellor

We all know that the world is progressing, and I am glad that I live in a time, when all countries started working together to tackle key development challenges around the world. As we know, after working together on the first ever globally agreed eight Millennium Development Goals (MGDs), the world has begun working on how to tackle some unfinished goals and new challenges through setting seventeen new Sustainable Development Goals (SDGs). We believe that SDGs are a roadmap to the future we want, since SDGs reflect the need to incorporate the three dimensions of sustainable development: social, economic and environment in a coherent, holistic, comprehensive and balanced manner. However, attainment of the SDGs would require strong and effective institutional mechanism involving stakeholders from public representatives, government and the bureaucracy, private sector, civil society, knowledge community, and development partners around the world.



To be a part of this great initiative, our university has developed the Strategic Plan for 2017-2023 to set out the vision to be recognized as a leader in embedding sustainability in all aspects of our operations, teaching and learning, research, engagement and governance. With this vision, ULAB in collaboration with CSD has proudly hosted the 2nd CSD Annual Conference on Sustainable Development 2017. This year, the conference particularly focuses on 8 of the SDG goals – zero hunger, water and sanitation, clean energy, sustainable cities, production and consumption, climate action, life below water and on land. Our Center for Sustainable Development already incorporates these values into academic curriculum, research, co-curricular programmes and other aspects of its operation.

It was truly impressive to see such a large gathering of intellectual minds during the conference. Everyone's collective presence had been a remarkable display of our development. The organization of these events is generally the result of close cooperation among several institutions and individuals. It is a privilege and a great joy for me to extend thanks to all those who have contributed in one way or the other to make this conference a success. I acknowledge the contributions of all presenters, session chair, moderators and the international resource persons who have shared with us their knowledge and experiences. Thanks to our generous sponsors – Prime Bank, Orion Group, Bitopi, ADD and Olympics Industries and the media which ensured smooth running of this conference. I would like to extend a special thanks to the CSD Team who has worked hard to make this event successful.

I hope you enjoy these proceedings, and I look forward to welcoming you to our next conference.

Professor Dr. H. M. Jahirul Haque
Vice Chancellor, University of Liberal Arts Bangladesh

Message from Advisor to the Board of Trustees

The social and environmental problems of our world have reached to the highest level. A global change is required for ensuring the wellbeing of every citizen of this world. Few countries have succeeded in integrating economic, social and environmental sustainability in their development strategies but we expect more progress to achieve a sustainable development pathway.

The sustainable development agenda of 2030 are also part of the core value of the University of Liberal Arts Bangladesh. The Center for Sustainable Development incorporates these values in academic curriculum, research, co-curricular programmes and other aspects of its operation. The focus of this 2nd CSD Annual Conference on Sustainable Development 2017 was on the eight SDG Goals. At this point, these eight Sustainable Development Goals are important for us to achieve economic, social and environmental sustainability.



ULAB, in collaboration with CSD, has successfully organized the annual conference on Sustainable Development 2017 where it has provided a platform for fruitful discussions around the challenges and possible solutions to these complex issues. Delegates representing a wide range of sectors - academicians, researchers, policymakers, multilateral organisations, civil society organisations and the private sector - came together to discuss how we can achieve these goals in the context of Bangladesh. However, efforts are needed at all levels, across all sectors, and by all stakeholders.

We are proud to host this Annual Conference on Sustainable Development 2017.

Professor Imran Rahman

Advisor to the Board of Trustees

University of Liberal Arts Bangladesh



Conference Background

On February 1, 2006, ULAB launched the Center for Sustainable Development (CSD) in order to carry out research pertaining to sustainability and to serve the national interests. CSD is dedicated to interdisciplinary research which explores and documents practices of sustainable development. It has evolved into a global platform to share research and policy decisions on issues around sustainable development and environmental conservation. Moreover, CSD envisions a knowledge-based society through interdisciplinary research, quality teaching, producing and disseminating knowledge, establishing networks with universities and research centers for collaborative research, and organizing actions to promote the greening of Bangladesh.

As we all know, Sustainable Development comes as a wave of modern environmentalism heralding a new approach to promote economic growth, social changes for vibrant communities now and into the future. The Sustainable Development Goals (SDGs) have been set to continue the development process among all the countries until 2030. The Center for Sustainable Development (CSD) at the University of Liberal Arts Bangladesh (ULAB) has successfully organized the 2nd Annual Conference on Sustainable Development 2017 to identify and share empirical research findings and practical, evidence-based solutions and public-private collaboration that can support the Sustainable Development Goals. This year, the conference particularly focuses on 8 of the SDG goals – clean energy, sustainable cities, water and sanitation, climate action, end hunger, production and consumption and life below water and on land. The conference provides a unique opportunity to bring together stakeholders from government, academia, private companies, international agencies, NGOs, and grassroots organizations to share practical solutions towards the achievement of more sustainable and inclusive societies.

Advisory Board Members

Representatives from Universities, Research Organizations, Practitioners from Bangladesh and overseas mainly worked on the advisory board of the 2nd Annual Conference on Sustainable Development 2017 to guide the ICSD. The advisory board includes the following members –

Professor Imran Rahman	<i>Vice Chancellor of the University of Liberal Arts Bangladesh (ULAB)</i>
Professor Brian Shoesmith	<i>Senior Advisor for Strategic Planning, Board of Trustees of the University of Liberal Arts Bangladesh (ULAB)</i>
Dr. Muhammad Ibrahim	<i>Professor and Head of the Department, General Education (GED), University of Liberal Arts Bangladesh</i>
Professor Carolyn Roberts	<i>Professor of Environment, Gresham College, London.</i>
Professor Emeritus A. Veeramani	<i>Professor Emeritus A. Veeramani, College of Asia Pacific Studies, Ritsumeikan Asia Pacific University, Japan</i>
Dr. Marion Glaser	<i>Social Scientist, Leader of Social-Ecological Systems (SES) Analysis, Leibniz Center for Tropical Marine Ecology (ZMT), Bremen, Germany</i>
Dr. Annette Breckwoldt	<i>Scientist, Social-Ecological Systems (SES) Analysis, Leibniz Center for Tropical Marine Ecology (ZMT), Bremen, Germany</i>
Dr. Amrita Sastry	<i>Assistant Professor and Head of the Department, Department of Sociology, Jesus and Mary College, University of Delhi</i>
Professor Dr. Md. Danesh Miah	<i>Professor and Director, Institute of Forestry and Environmental Sciences, University of Chittagong</i>
Professor A. Z. M. Manzoor Rashid	<i>Ph.D, Dean-School of Agriculture and Mineral Sciences & Head-Department of Forestry and Environmental Science, Shahjalal University of Science and Technology</i>
Dr. Samiya Selim	<i>Director and Associate Professor, Center for Sustainable Development, University of Liberal Arts Bangladesh (Conference Convenor)</i>

Key Learning of the Conference

The 2nd annual Conference on Sustainable Development 2017 focused on the UN Sustainable Development Goals but mainly covered 8 of the goals - clean energy, sustainable cities, water and sanitation, climate action, end hunger, production and consumption and life below water and on land. Academics, development practitioners and policymakers from diverse sectors have presented papers on a wide range of topics related to these goals at this conference. Details of the knowledge shared at the conference are documented in rest of the proceedings. Here are some of the key learnings from the conference:

SDG 2: Zero Hunger

The discussion focused on identifying specific reasons behind hunger and not getting proper nutrition in the context of Bangladesh. It was asserted that a legal framework for proper utilization of resources is needed to ensure food security. Further, the presenters also emphasized on the importance of behavioral change along with the knowledge on nutritional science to achieve this goal. It is also very important to create awareness on nutritional value of foods from the very beginning. Bangladesh should start creating awareness among pregnant mothers, so that in future, lack of nutrition awareness does not pose problems.

SDG 6: Water and Sanitation

The findings from this session highlight that water management is not properly done in our country, but to achieve the targets of SDG 6, we should make specific plan to work towards. Two major targets could be water supply & sanitation and water integrated resources. The session highlighted that to achieve this goal, we should prioritize having access to safe water for all.

SDG 7: Clean Energy

The two sessions on SDG 7 focused on achieving sustainable clean energy for Bangladesh. The discussants discussed about several sources of attaining clean and affordable energy i.e. wind and tidal energy, solar home system and biogas. However, there are few challenges and the session talked about how to overcome that challenges. At present, there is minimal use of biogas and solar home systems which are limited only to home cooking but measures should be taken to use it at industrial level. It was reported that the energy can be collected from all the available sources but efficient scientific planning and management are required to spread out that energy in every corner of Bangladesh.

SDG 11: Sustainable Cities

The present-day scenario of life in cities was discussed including the fact that urbanization has not been fair to everyone. Information has been shared on how cities can become more resilient using innovation and technology. For this purpose, smart phone can be used in different sectors covering from tax revenues to crime awareness. Participants asserted that development should be done through making a master plan incorporating innovative ways of urban planning. Our government representatives

inform that an initiation will be taken to create public awareness campaign from the ministry that will tackle the present issues of the city like water and waste management. Internal migration was another important issue raised by the participant. It was concluded that the authority must configure where our cities can be developed. We should rethink the physical form and planning of the cities.

SDG 12: Sustainable Production and Consumption

The discussion of this session evolved around the importance and limitations of the handicraft sector in Bangladesh. The presenters of this session were mostly from the private sector and they mentioned that the communities of handicraft sector need proper coordination because they have skills in demand, but no place to showcase their skills. Further, the development of this sector is stagnant mainly due to lack of innovation and resources. For this reason, a system should be developed for the artisan communities to ensure their direct access into the mainstream market.

SDG 13: Climate Action

This session discussed about the short-lived climate pollutants which assert a warming influence on climate change though they have very short lifetime in atmosphere. It was emphasized that conscious deliberate acts are needed to preserve and save the environment because only awareness is not enough at this stage. To reduce and mitigate the emission of these short-lived climate pollutants it was advised that policy formulation and implementation, like – controlling methane from livestock through anaerobic digestion, reduction of fugitive emission from gas transmission pipelines and establishment or expansion of sewerage system, are needed. Issues about the climate migrants have also been raised in this session because these climate migrants are quite different from economic migrants. They are less likely to attain own land and more likely to finance their migration and are creating extra burden on Dhaka city by refusing to go back to their roots. It is also recommended that both government and non-government organizations should come forward to play the key role in strengthening adaptation programs.

SDG 14: Life below Water

The SDG 14 panel session discussion focused on aquaculture and marine protected areas. Capacity building and short strategy level input are considered to be the most important approach to get achievement in aquaculture and marine sector. It was highlighted that the Sundarbans as well as the neighboring areas around the southwest coast of Bangladesh should be protected from industrial pollution. On a different note, the unregulated fishing patterns and the issue of climate change in Bangladesh were highlighted and the innovative initiatives regarding conservation of the seas were discussed. The ocean and its conservation should be given priority. It was suggested that government can provide security and safety to fisherman by giving them GPS so that it would be easier to regulate space during storms. Implications on blue economy and how government is working on improving this sector were also discussed.

SDG 15: Life on Land

The session identified the current threats to Coastal Mangrove Forest and Chittagong Hill Tracts. The presenters emphasized on the conservation of biodiversity and preservation of natural resources of those areas through empowerment of local communities. It is important to assess the value of ecosystem services. In addition, an integrated approach needs to be taken to combat desertification and promote sustainable natural resources management. Besides, empowerment of the native tribesmen also is import because they should be the real protectors of their own unique and endangered ecosystem, heritage and culture. The discussants also brought into attention that while making policies, policymakers should focus on cultural values as well as ecosystem functions.



Conference organizing committee with Advisory Board Members

Session Summaries

Inaugural Ceremony

Welcome Address:	Professor Imran Rahman, Vice Chancellor, University of Liberal Arts Bangladesh
Opening address:	Dr. Samiya Selim, Associate Professor and Director, CSD, ULAB and Conference Convener
Inaugural Speaker:	Mr. Md. Abdul Karim, Managing Director, Palli Karma Sahayak Foundation (PKSF)
Special Guest:	Professor A. Veeramoni, Professor Emeritus, College of Asia Pacific Studies, Ritsumeikan Asia Pacific University, Japan
Special Guest:	Dr. Kazi Anis Ahmed, Vice President, Board of Trustees, University of Liberal Arts Bangladesh

The inaugural session of CSD 2nd Annual Conference on Sustainable Development 2017 started at ULAB, on the 10th of February, 2017 and brought together researchers, academics and scientists from not only Bangladesh but also all over the world to exchange knowledge on sustainable development goals.

At the beginning, Professor Imran Rahman welcomed everyone to the 2nd Annual Conference on Sustainable Development 2017 and provided a brief introduction of Center for Sustainable Development (CSD) mentioning it as one of the first research centers of ULAB. He also highlighted that this kind of conference arranged by CSD opens the platform for academics, researchers, students to assemble together and exchange policies and ideas. Moreover, the outcome of this conference will be read by policy makers and other players in this game.

Following Imran Rahman, Dr. Samiya Selim also mentioned Center for Sustainable Development (CSD) as the oldest research centers of ULAB and last year CSD organized their 1st Annual Conference on Sustainable Development. She added, this year they wanted to narrow down the agenda, bring more focus and align the agenda with the work they do at CSD on Sustainable Development. She presented CSD as a common platform where they turned their focus on the increased ambition of the UN Sustainable Development Goals. The 2030 agenda for sustainable development is critical for Bangladesh, as it is for the entire world. In this regard, CSD stands together with the global community to contribute to its achievement.

Md. Abdul Karim, Managing Director of Palli Karma Sahayak Foundation (PKSF) took the podium and thanked everyone for being present there. He mainly focused on the relationship between economic growth and sustainable development goals. Now a days, there is growing income inequality along with threatening environmental challenges the world is facing. So, to tackle this situation they should be more focused on the availability and ability to meet the need for the people without compromising the demand of the future generation. That is exactly what sustainable development goal is concentrating on.

Then Professor A. Veeramani who is the Professor Emeritus from College of Asia Pacific Studies, Japan, highlighted that the problems related to sustainable development may be local but the solutions need to be global. He shared a story from North Korea where crops were affected by sea storm but the solution was found in Singapore. In case of Bangladesh, the solution is already available. Saltwater adopted rice is available in our country. So, we can see progress is not an impossible thing for us. For that reason, Governmental and Non-governmental dialogues and policies are important. We must look around for immediate solutions within our nationhood, local and other regions which are already evident before us.

In the end, Dr. Kazi Anis Ahmed, Vice President, Board of Trustees, University of Liberal Arts Bangladesh focused on ideas that are common to education and research. In case of Bangladesh, most people do not even realize the problems, let alone the solutions. Then he talked about their organization, Kazi Foundation and its contribution to development. He mentioned that they have the largest organic tea garden in the world measuring 1300 planted acres. They have also developed a small scaled biogas plantation. Not only are they conscious about the environment but also they are focused on the development of the livelihood of local people. Their projects involve community people so that the locals can improve their incomes. According to him, sustainability goes way beyond technical solutions, it is all about society, people and ideas that are the first requirements to incubate the sustainable goals.



Panelists of the Inaugural Ceremony of the 2nd Annual Conference on Sustainable Development

Panel Summaries

Day 1

Panel Session on SDG Goal 11: Sustainable Cities and Communities – Make cities inclusive, safe, resilient and sustainable

- Moderator: Dr. Debapriya Bhattacharya, Distinguished Fellow, Centre for Policy Dialogue (CPD)
- Panelists:
1. Mr. Kazi Khaleed Ashraf, Director-General, Bengal Institute- Architecture, Landscape and Settlements
 2. Mr. Ashekur Rahman, Urban Program Specialist, United Nations Development Program (UNDP)
 3. Mr. Kazi Humayun Kabir, Assistant Professor, Development Studies Discipline, Social Science School, Khulna University
 4. Mohammad Nurul Alam, Technical Program Director, Nabajatra Program, World Vision Bangladesh
 5. Dr. Khurshid Zabin Hossain Toufique, Director, Urban Development Directorate (UDD), Ministry of Housing and Public Works

The conference began with Panel sessions focusing on the SDG goals 11 and 14 respectively. The first Panel session which was held on Friday, 10th of February, 2017 focused on SDG 11, Sustainable Cities and Communities - Make cities inclusive, safe, resilient and sustainable.

Opening Speech

Dr. Samiya Selim, who is CSD Director, delivered the welcome speech and invited the Moderator and other panelists on stage. Dr. Debapriya Bhattacharya, Distinguished Fellow, Centre for Policy Dialogue (CPD) introduced the panelists and acknowledged the factors that are related to the topic of the panel session. He discussed the 2030 agenda i.e. “Leaving no one behind” and highlighted its relation to alignment issue with the SDG goals. He also stated the issues around understanding the various dimensions of the goals and the implementation of a global solution in a national context for Bangladesh.

Panel Discussion

Following Dr. Debapriyo, Mr. Khaleed Ashraf, Director-General, Bengal Institute- Architecture, Landscape and Settlements took the stage and put more emphasis on conception issue rather than data issue. According to him, we all know that a city contains two opposite sides: economy and ecology. Both of them are interconnected. He preferred using the term ‘urbanism’ instead of ‘urbanization’, because it holds a better meaning at present, as there is no adequate housing plan available. Apartment blocks are occupying Dhaka city which are not actually housing. Moreover, we seem to have lost that

tradition of living in communities. The second issue he put forward was inadequate transportation. He gave the audience a brief idea about an imaginary model of Dhaka's housing and raised the issue of having adequate transportation in Dhaka. Lastly he talked about the conceptualization of problems in context of current situation.

Focusing on “leaving no one behind” agenda Mr. Ashekur Rahman said, urbanization has become synonymous with economy. He also put forward the fact that urbanization has not been fair to everyone. Inequality and deprivation have become a major part of the new urbanization concept. There are various dimensions of exclusion. None of the institutions are designed to discuss the issue of urban poverty. Currently there is 40 % of people living in Dhaka City below poverty line.

Kazi Humayun Kabir spoke about how data and statistics are related to the SDG Goal 11. He mentioned that more than 85% disputes in the court are over land. There is lack of data on what would make resilient cities. He also discussed how a smart phone can be used to make a city safer with features covering from tax revenues to crime awareness. Acknowledging Mr. Humayun Kabir, Dr. Debapriya introduced a new aspect that is technology and how it can help cities to be more resilient.



Dr. Debapriya Bhattacharya, Distinguished Fellow, CPD moderating the Panel Session on SDG 11

Mohammad Nurul Alam said that different organizations such as UNDP, BBS (Bangladesh Bureau of Statistics) and others have different data sets for the same query. This inaccurate data misleads the organizations working in these sectors. He talked about the difference between Center for Urban Studies and BBS on their distinct data. For example, in 2010, Center for Urban Studies announced that the total number of slums in Dhaka is 4000 whereas BBS said that there is a total 4000 slums all over Bangladesh. So the difference can be seen here and this huge difference can create miscalculation in sorting out problem and solution. He also pointed out some future problems regarding the issue by giving percentage like 28% are living in the urban areas out of which 38% are living in Dhaka. By 2030, half of the population will live in urban areas. He also raised the issue on the necessity of allocation of low income masses. He said that we cannot evict 30% population of a city, which are the low-income masses, that are helping us in our daily lives. He also proposed a solution for that. Every community or colony will have a designated area for low income communities which will contribute

to that community. He raised question on the issue of relativity between informal and official data. Dr. Debapriya gave a solution on that the only data set known as the National Data collected by the Government should be linked with official data of UNDP and other organizations.

Neither urbanization nor urbanism, Dr. Khurshid Zabin Hossain Toufique approached towards a different issue that is political economic space. In reply to Mr. Khaleed Ashraf's statement, Dr. Taufique said that a survey was done in Mymensingh. The locals of Mymensingh were asked to write down their problems. He said that there are many data sets but the real problem lies in integration. So, the problem of data gap or inaccurate data is not there. The real problem does not lie in lack of enough resources but it remains due to lack of collaboration. He said everything got stuck to the cities but we need to synchronize. All development will have to be done through a master plan which will provide innovative ways of urban planning.

Questions from Audience

At the end of the session, Dr. Debapriya opened the floor for interactions from the audience. Mr. Shafiqul Alam, from the audience raised the issue on population growth and the acceptance of new urbanization concept. Mr. Mehedi Ahsan from German Government Bank asked if Bangladesh has an institutional body that can take charge of this SDG Goal 11. Dr. Debapriya responded that the most cited institutional body is Ministry of Housing and Public Works. Mr. Mehedi asked if this SDG Goal is being conceptualized on a broader context. Sate Ahmed, from the audience, said that internal migration needs to be discussed. His question was if there is any way to monitor internal migration flows. He also asked if the government is thinking of any other way to restore wetlands to tackle natural disasters such as floods. Mohammad Wahidur Rahman who is from Khulna University, asked if urban forestry is important or not. Joy Bhowmik, from Young Bangla, said that we often talk about the problems and we play the blame game instead of being more responsible. Overall public awareness should be elevated.

In response to questions from audience, Dr. Kazi Taufique said that Bangladesh has 12 types of lands and each of it has its own ecosystem. In last 40 years, Bangladesh is focusing on only Dhaka city. Bangladesh has no planning, policy or constitution but the proposal for forming one will be submitted in the parliament from the Ministry of Housing and Public Works. Mohammad Nurul Alam spoke about the waste management question. He said that we have not developed ourselves to be better citizens. He looked forward to initiating a public awareness campaign from the ministry that will tackle this issue. Mr. Humayun Kabir said that Ministry of Land is not the only body that works with land, but there are four to six other such bodies. We have the institutional capacity for mapping data in a better way. We need to look at the non-income aspects as well. Dr. Ashraf suggested that we must configure where our cities can be developed. We should rethink the physical form and planning of the cities. Bangladesh has made an opposition between agriculture and cities but we should rethink how to integrate them together.

Dr. Debapriya concluded by saying, though the issue of data collections had been discussed a lot, still data is not information, information is not knowledge and knowledge is not wisdom. Even if the SDGs did not exist, we should still prioritize the issues for the development of society.

Day 2

Panel Session on SDG 14: Life below Water - Conserve and sustainably use the oceans, seas and marine resources.

- Moderator: Dr. Marion Glaser, Social Scientist, Leader Of Socio–Ecological Systems (SES) Analysis, Leibniz Center For Tropical Marine Ecology (ZMT), Bermer, Germany
- Panelists:
1. Dr. Abu Nasar Abdullah, Deputy Secretary, Ministry Of Environment and Forests (MoEF), Government of the People’s Republic of Bangladesh
 2. Dr. Md. Niamul Naser, Professor, Department Of Zoology, University Of Dhaka
 3. Mr. Shahadat Ali Khan, Bangladesh Frozen Foods Exporters Association (BFFEA)
 4. Mr. Brian Smith, International Program Director, Wildlife Conservation Society, Bangladesh
 5. Dr. Benoy Kumar Barman, Senior Scientist, WorldFish, Bangladesh and South Asia

Day 2 began with Panel session focusing on the SDG goals 14 which is Life Below Water - Conserve and sustainably use the oceans, seas and marine resources. Dr. Samiya Selim, Director, CSD started the session with a welcome speech and then invited the Moderator and the Panelists to the stage.

Opening Speech

Dr. Marion Glaser who was Moderator of the session pointed out that SDG 14 should find a global platform. Attaining SDG 14 at national level right now is a big challenge, so to solve this issue, she recommended policies relevant for Bangladesh. After that she opened the stage for panelists to share their opinions regarding this issue.

Panel Discussion

Dr. Benoy Kumar Barman, the first panelist of this session, who is a Senior Scientist at WorldFish, Bangladesh and South Asia, clarified his point by focusing on aquaculture and potential areas of development for that. He illustrated targets for attaining goal which included pollution mitigation, improvement of sustainable fisheries within coastal and marines, collaboration between Department of Fisheries and Department of Hilsha. In order to translate these targets into practice, he emphasized on having knowledge about biology of fishes and regulatory resources especially in coastal areas.

Dr. Md. Niamul Naser, Professor from Department of Zoology, University of Dhaka highlighted the marine resources of Bangladesh. Though Bangladesh is supposed to depend on marine resources but

still it is much dependant on land for resources. In European countries, sea is the main source for fish but in our case, we are not dependant only on sea fish. Giving an account of fish found in Bangladesh, he said that among 400 classes of fish only 150 classes are found here. So, it becomes a crucial factor to search for other classes of fish in Saint Martin and clean part of Bay of Bengal. In search for marine fish, we need to apply specific mechanism which will not deteriorate the present situation of both fish and fishermen. As 70% of fishermen's livelihood depends on fishing so they need to start sea fishing as well.

Mr. Shahadat Ali Khan, on behalf of BD frozen food, raised the issue of blue economy which means marine based economy. Mentioning the coastal line about 7,010km, he talked about flora and fauna of coastal area of Bangladesh. Along with a unique ecosystem, the coastal area also contains 50,000 fishing rules. Raising the issue of importing frozen food, he suggested that food chain of Sundarban forest should be protected and maintained. He also discussed about a crucial issue like industrial pollution and advised that Sundarban and neighborhood must be protected from this pollution as well.

Mr. Brian Smith, International Program Director from Wildlife Conservation Society, Bangladesh, uplifted the crucial issues such as unregulated fishing pattern and climate change which are now acting as risk factors on life below water. He mentioned that we should apply a holistic approach combining both Governmental and non Governmental organizations. Then he drew attention by talking about innovation and initiatives regarding conservation of the seas and the life associated with it. He elevated the issue of ensuring security and safety provided with GPS to fishermen. He added that successful stories can play inspirational role to improve this sector.

Dr. Abu Nasar Abdullah, Deputy Secretary from Ministry of Environment and Forests (MOEF), Government of the People's Republic of Bangladesh, started his speech by putting emphasis on sustainability. He included that to maintain sustainability the interests of both nature and people should be looked after. He informed about initiative plans taken by government in collaboration with Department of Ministry of Energy to collect proper data which is needed for assessment. To ensure proper monitoring capacity of coastal area including Sundarbans, he expected help from developing partners who have already showed their eagerness on this issue.

Questions from Audience

Dr. Marion Glaser, the Moderator of the session opened the floor for questions from the audience. Professor Mr. Masudul Haq from Department of Developmental Studies, University of Dhaka, drew everyone's attention on synchronizing issues and lacking of coastal management. A question came from the audience related to overexploitation of sea and the policy regarding this issue. In reply to that question, Mr. Abu Nasar Abdullah answered that 60 areas have been declared as protected areas since last year and management plan is launched for every protected area. As co management committee is working for 40 protected areas so he remained hopeful for the upcoming success within next 10 years. Mr. Md. Niamul Naser showed his concern on the issue of ship breaking which is related to exploitation. To trace the rate of exploitation we need proper data of boats and ships that are sailing over sea, he added. Dr. Benoy Kumar Barman exerted his opinion as Bangladesh has taken few initiatives to reduce exploitation in comparison to England. In this regard, if we can provide some alternative income and benefits to fishermen, with the co-management approach from Government, then exploitations could be reduced. Alifa Bintha Haque, Director of Research and Development, Save Our Sea; raised the question on blue economy as mineral and resources have big impacts on marine. Dr. Marion Glaser added that mineral and resources can be drawn from there but it needs technology.

Shahadat Ali Khan confronted a different issue regarding crabs that are collected from Sundarban area. Government should be more careful to provide license for exporting them. In addition to that, Mr. Binoy Kumar Barman said, in case of culture of shrimp and crabs, the shrimps are collected early. We have a hatchery for Gold eye but it is partially successful after 7 years because of diseases. For the crabs, government has taken lots of initiatives. Dr. Brian Smith talked about the idea of nature conflict. Human is linked to environment in Bangladesh and faces profound challenges for that. There are opportunities as it has biological elements, fauna, incredible rich sources and opportunities to work with fisherman. He thinks that the ideas are science based and challenging but if we can engage people and motivate to use resources sustainable, then we can get achievement.

Dr. Md. Niamul Naser said when we are looking into Bay of Bengal, we can see there needs to be coordination between zoologists and botanists. The second conflict is between intergovernmental organizations. In case of fish conservation, both environmental and forest departments declare methods but they need to be collaborated within interdepartmental activities. There are lots of materials which will benefit the people. Mr. Abu Nasar Abdullah also added that we have very comprehensive policy from government.

Dr. Glaser added another area i.e. the social energy behind the forces of social organization need to look for the problems. She concluded by saying that we have many ways of science and policy learning, initiatives for data collection, accessing the multiple ways we have not been able to do. Many of the panelists have agreed with the resistance, energy of human nature system, the affordability and sustainability of the subject.



Dr. Marion Glaser, Social Scientist, Germany moderating the Panel Session focusing on SDG 14 - Life below water

Parallel Session Summaries

Parallel Session 1: Zero Hunger (SDG 2)

- Chair: Mr. Ataur Rahman Miton, Country Director, Hunger Free World
- Co-Chair: Dr. Amrita Sastry, Assistant Professor and Head of the Department, Department of Sociology, Jesus and Mary College, University of Delhi, India.
- Moderator: Mr. Shafiqul Islam, Assistant Professor, ULAB
- Presentations:
1. *On the way towards alleviating household food insecurity: evidence from a rural floodplain of Bangladesh* - Sate Ahmad, M. Moinuddin Haider. Muhammad Zahirul Haq, Abdullah Al-Mamun and Nurul Alam, Initiative for Climate Change and Health, Health Systems and Population Studies Division, ICDDRDB.
 2. *Achieving food security and improved nutrition through nutrition sensitive agricultural practices: A case from ANF4W* - Shirin Afroz, Director - Nutrition and Amin Uddin, Nigar Sultana, Chowdhury Abdullah Al Asif, Meredith Jackson-deGraffenried, Helen Keller international, Bangladesh.
 3. *Prevalence of Chromium in fish feed and commercially cultivated Tilapia* - Ms. Shahnour Hasan, Senior Lecturer Cum Research Associate, Center for Sustainable Development, University of Liberal Arts Bangladesh, Dr. Lutfor Rahman, Professor, School of Environmental Science and Management, Independent University, Bangladesh and Dr. Shahana Afrose Chowdhury, Research and Development Manager, Kazi Shahid Foundation.

Food and nutrition always remains a critical issue for an underdeveloped country like Bangladesh. In this session, the presenters spoke about food insecurity and lack of improved nutrition. To achieve SDG 2 that means Zero Hunger for this country, food and improved nutrition should be secured for everyone. Before that, we need to go through statistical analysis and find out the reasons behind hunger and also the causes of not getting proper nutrition. These presentations will focus on that area.

The first presenter was Sate Ahmad from Initiative for Climate Change and Health, Health Systems and Population Studies Division, ICDDRDB, who presented the topic, "On the way towards alleviating household food insecurity: evidence from a rural floodplain of Bangladesh." The presentation started with the analysis of the data that tells 1 in 9 people are undernourished in Bangladesh and there is a lack of food for 16% i.e. 2.5 million+ people. The research focused on particularly statistical analysis, income diversity, micro credit access, sex and religion of the household head, agricultural land which are considered as determinants of security and wealth. The research mainly provided the statistical data related information. It showed that food acquirement depends on number of members and sex of household head, economy, livelihood diversification, scope for consumption, protection and land, assets, education. It can also be seen that the statistics were declining in case of microcredit, in terms of female headed-households.

Amin Uddin and Nigar Sultana from Helen Keller International, Bangladesh spoke about “Achieving food security and improved nutrition through nutrition sensitive agricultural practices: A case from ANF4W.” The ANF4W Project is mainly from Germany. The Project that the paper has highlighted is called “Affordable Nutritious Food for Women”. Basically the approach, strategy, goal, framework, statistics of household food production have been discussed. The approach is to have equal focus on production of diverse, nutritious food, consumption and gender equitable access and utilization. Evidence says that there is enhanced homestead food production approach in case of anemia, dietary, diversity, micronutrient, consumption and women’s empowerment. The areas on which they worked are-Chittagong Hill Tract, Eastern part of Sylhet, Northern part and some parts of Southern Bangladesh. The objective of the research is to improve the intake of micronutrients of reproductive aged women, invent nutrition sensitive agriculture, create demand for nutrition, agronomical bio fortification (i.e. increased zinc content in rice grains), gender integration. The goal is to increase nutritional status of reproductive aged woman (15-49years). The Framework of the research is to provide education about nutrition to men and women, conduct nutrition campaign through different channels (interpersonal, community, mass) and publicity through creating posters, booklets and stickers. Ultimately the lessons learned from the research were that, not only nutritional science but also behavioral change is needed. In answer to a question behind choosing the reproductive age in the project, the researchers said, as the reproductive aged girl is going to be a mother soon, it is very important to create awareness from the very beginning so that in future, the problem does not arise and awareness will help them to cope with the problem later on.

Ms. Shahnoor Hasan who is a Senior Lecturer Cum Research Associate, Center for Sustainable Development, University of Liberal Arts Bangladesh showed her research on “Prevalence of Chromium in Fish Feed and Commercially Cultivated Tilapia” At first the presenter talked about the development in our garments sector and leather industry, then she connected the leather materials to fish feed and the increased amount of chromium within fishes which are the effect of the waste products of the leather industry. In Hajaribagh, 220 metric tons of hide is processed in a day. The solid tannery waste



Dr. Amrita Sastry, University of Delhi and Mr. Ataur Rahman Miton, Hunger Free World chairing along with the Moderator Mr. Shafiqul Islam, Assistant Professor at SDG 2 - Zero Hunger

is boiled and then dried up. Meanwhile, Chromium is contaminated in waste and in the feed of poultry and fishes. She emphasized on our lack of awareness about food safety. If Cr is oxidized in feed production then it will be responsible for mutation, cancer and cell damage.

In the end of the session, there were discussions held by the chair and the presenters. Dr. Amrita Sastry, Assistant Professor and Head of the Department from Department of Sociology, Jesus and Mary College, University of Delhi appreciated the researchers' passion for their research and she commented that the researches were both alarming and informative. She also provided three important aspects of hunger from sociological point of view. She highlighted that hunger is a permanent issue and again its relation to utilization of food can also not be ignored. The major reasons behind hunger are growing population in a patriarchal society framework. In expectation of having male child the society keeps on increasing its population. To initiate mitigation from micro level we should put more emphasis on growing awareness among people on the issue of food wastage.

The concluding speech was conducted by Mr. Ataur Rahman Miton, Country Director, Hunger Free World and he said, "The hunger and nutrition are not different issues, they should be a collective term." He also added, to attain Zero hunger, it recruits a political way which can only be ensured by the government. Along with governmental support, we need to consider utilizing resources and the legal framework.

Parallel Session 2: Sustainable Cities and Communities (SDG 11)

- Chair: Professor A. Veeramani, Professor Emeritus, Ritsumeikan Asia Pacific University, Japan
- Moderator: Ms. Ayeleen Ajane Saleh, Adjunct Faculty, Bangladesh Youth Leadership Center (BYLC)
- Presentations:
1. *Making Dhaka green, clean and sustainable: A critical insight into rooftop gardening* - Muhammed Shahriar Haque, Professor, Department of English, East West University (EWU) and Executive Director, East West University Centre for Research and Training (EWUCRT) and Md. Tanvir Ahamed Siddiki, English Teacher at Lakehead Grammar School
 2. *Bringing ecosystem services into urban landscapes* – Dan Richards, Project Coordinator, Ecosystem Services in Urban Landscapes, Singapore
 3. *Challenges of White pollution for Green Chittagong City* - Dr. Sarmistha Das, Assistant Professor from Eastern Institute for Integrated Learning in Management (EILM), (Affiliated To Vidyasagar University), Kolkata, India, and Ms. Ananya Nandy, Lecturer at East Delta University, Chittagong, Bangladesh
 4. *Sustainable Rural Livelihood Practice: A Case of Bangladesh* – Rakib Hossain, Monitoring and Evaluation officer, Help the Needy Charitable trust.

The objective of this session was to aim at the sustainability of the cities by creating awareness at community level to make the cities green, clean and pollution free. Success can be achieved by implying innovative eco friendly method which is also discussed in this session.

The first presentation of this session was on “Making Dhaka green, clean and sustainable: A critical insight into rooftop gardening”, presented by Muhammed Shahriar Haque, Professor of Department of English from East West University (EWU) and Executive Director, East West University Centre for Research and Training (EWUCRT) and Md. Tanvir Ahamed Siddiki, English Teacher at Lakehead Grammar School. They started by taking an account of Dhaka city. They showed that Dhaka city buildings are flooded with rooftops though. It has failed to make the fullest of its asset. The presenter introduced two types of plantations suitable for rooftop gardening. One of which is Aquaponic or soilless garden and the other is Hydroponic garden; where plants are emerged or submerged in solutions and minerals get into solutions directly. Either way we can create a greenhouse right at our own rooftop.

A few important points that were brought up by the presenters were-the policy made by Bangladesh Government about 10% off on tax for rooftop gardening. The backdrop is that it remained unheard due to lack of proper advertising. As a reason it is not being implemented at a desired scale. In this regard, creating awareness is the only way to bring success. The teachers from different schools come into play for motivating students to start gardening at home. The presenters also provided solutions for tenants who do not have access to rooftops as they can do it in the balcony.

Dan Richards who is the Project Coordinator, Ecosystem Services in Urban Landscapes Singapore presented his research on “Bringing ecosystem services into urban landscapes.” His research focused on how we can use trees and vegetation to the fullest in urban setting. He informed about some crucial facts like tree sweating and how they play big roles to maintain urban temperature as they keep air temperature cooler from 1-2 degrees Celsius. He emphasized the trees role in humans being able to relax in the environment, he talked about the levels at which we should maintain the greenery. He included the ratio of grass and trees, the ratio of time and tree growing pattern; from which we can understand the lifespan of trees and its growing pattern. Mapping the shades can be considered as a key major aspect of the research.

Another research was on “Challenges of White Pollution for Green Chittagong City”, presented by Dr. Sarmistha Das, Assistant Professor from Eastern Institute for Integrated Learning in Management (EILM), (Affiliated To Vidyasagar University), Kolkata, India and Ms. Ananya Nandy, Lecturer at East Delta University, Chittagong, Bangladesh. At first, they opened the presentation by explaining the white pollution which is the effect of using excessive amounts of plastic bags. The research showed it as a threat to build a sustainable city. Most of the poly bags are supplied and used in non-branded retail sector. It has turned into a vicious circle where the buyers blame the sellers and vice versa. During discussion, recycling trash also came into light and for that we need awareness along with massive social engineering, To replace plastic layer we should find out energy out of trash, recycle water, compost and encourage using jute bags. Moreover, we need to incorporate these materials to get rid of white pollution.

The last presentation of this session was on “Sustainable Rural Livelihood Practice- A case of Bangladesh” presented by Rakib Hossain, Monitoring and Evaluation officer, Help the Needy-Charitable Trust. He defined livelihood as the capacity to overcome stock. He had portrayed the human-capital relationship, food-Capital and as well as the national – capital relationship. Though the entire phenomenon is divided into Human, Physical and Financial capitals but Bangladesh is mostly relied upon natural Capital than physical.

The session was ended by the speech of Dr. Veeramani, the Chair for the session. He pointed, it is high time we should stop relying fully on government and encourage people to do things locally. To create awareness among community, we need to think about community's benefit at first then individual benefit can be looked after. Now we do not have any communal feelings but we are in need to grow that to have the maximum participation from the community. So last of all, it was proposed that we must look into our culture and community first.

Parallel Session 3: Responsible Consumption and Production (SDG 12)

- Co-Chairs:
1. Mr. Asif Uddin Ahmed, Assistant Professor, School of Business, University of Liberal Arts Bangladesh.
 2. Dr. Samiya Selim, Director and Associate Professor, Center for Sustainable Development, University of Liberal Arts Bangladesh
- Discussants:
1. Ms. Marion Champoux-Pellegrin, Head of Sustainability, Olympics Industries Limited
 2. Mr. Miran Ali, Managing Director, BITOPI Group
- Presentations:
1. *An Innovative Dairy Model Leading to Sustainable Development for the Rural People of Bangladesh* - Dr. Shahana Afrose Chowdhury, Research and Development Manager, Kazi Shahid Foundation and Ms. Momtaz Faruki Chowdhury, Former Chief Executive Officer, Kazi Shahid Foundation.
 2. *Prospect and constrain of Responsible Consumption and production of Jute and Jute made product* - Arshad Siddiqui, Technical Manager, Learning & Advocacy, CARE Bangladesh.
 3. *Sustenance of craft through conservation and alliance* - Naushin Khair, Creative Director, Aranya, Founder of B Craft.

The main objective of this session was to provide knowledge about sustainable growth and development that requires minimizing the natural resources and toxic materials used, and the waste and pollutants generated throughout the entire production and consumption process.

The first research titled, "An Innovative Dairy Model Leading to Sustainable Development for the Rural People of Bangladesh" was presented by Dr. Shahana Afrose Chowdhury who is Research and Development Manager and Ms. Momtaz Faruki Chowdhury who is Former Chief Executive Officer of Kazi Shahid Foundation. They talked about Kazi Shahid Foundation's (KSF) continuous effort towards enhancing community. Based on dairy farming, it has now become one of the income generating activities for poor and marginal households. Kazi Shahid Foundation Dairy Model provides milking cows and calves to its women members and repayment is based on milk and cow dung instead of cash. The beneficiaries of this dairy program have initiated entrepreneurs to start their own business by dairy farming, selling milk which will also improve their household incomes. Not only that but also the Foundation has introduced organic vegetable farming to the people of Bangladesh. They gave the audience an idea about another initiative of Kazi Shahid Foundation which is known as vermicompost,

an excellent soil conditioner and nutrient-rich bioactive fertilizer. This initiative of Kazi Shahid Foundation encourages and trains the members to use the compost in their organic production.

The second presenter was Arshad Siddiqui, Technical Manager, Learning and Advocacy, CARE Bangladesh who presented his research on “Prospect and constrain of Responsible Consumption and production of Jute and Jute made product.” The presenter talked about promoting the adoption of Sustainable Consumption and Production (SCP) of jute and jute diversified products and his project aimed at training up 16,000 jute producers on modern jute cultivation. The purpose of the research is to increase the quality production of jute fiber and develop skills on quality production alongside acquaintance with international market trend. The working area was Upazillas in Rangpur. The project also looked for addressing the systemic challenges around three market systems within the jute subsector. He ended his presentation by telling about several challenges which are sourcing and use of quality inputs, the trade market systems (collection, sorting and grading of production) and adding values to jute products.



Mr. Asif Uddin Ahmed, Assistant Professor, ULAB moderating the parallel session on SDG 12- Responsible Consumption and Production

The third presenter was Naushin Khair, Creative Director of Aranya, Founder of B Craft and her research was titled, “Sustenance of Craft through Conservation and Alliance”. She started her presentation by addressing B Craft as a sustainable business model which will create opportunities for artisan communities in Bangladesh. The policy of this business is to access the market by vending their products through retail chains. Those communities which need development have skills in demand but no place to showcase their skills. For this reason, B Craft initiatives will create a system within which the artisan communities can directly access the mainstream market. The organization will also provide Research and development support, Knowledge Transfer through trainings, Design Collaboration and incubation of Product Development for these communities to further develop their business. B Craft intends to co work with two platforms to create a close loop system: one is Bengal Craft Society, which will function as an NGO and another is a profit making entity, Aranya. At this moment, the development of the handicrafts sector is stagnant mainly due to lack of innovation and resources. She added that B Craft mainly focuses on empowering underprivileged artisans and producers in Bangladesh along with reviving the use of Natural Dyes and promoting handicraft of Bangladesh while Aranya strives to promote and revive old traditional techniques of vegetable dye, use of handloom fabric and Bangladesh’s handicraftsmanship. Along with the survival of these traditional techniques handicrafts will depend on its capacity to adapt.

Parallel Session 4: Affordable and Clean Energy (SDG 7)

- Chair: Professor Muhammad Ibrahim, Professor and Head of the Department, General Education (GED), University of Liberal Arts Bangladesh
- Co-Chair: Ms. Asna Towfiq, Regional Market Manager, Clean Cook Stoves
- Moderator: Ms. Basundhara Tripathy, Assistant Professor and Research Project Manager, CSD, ULAB
- Presentations:
1. Solar Bottle Light: An Alternative Source of Energy in Bangladesh - Md. Jakariya, Sajid Iqbal, Navojit Dastidar and Mohammad Sujauddin.
 2. Feasibility of Solar-biomass Hybrid Cold Storage for Un-electrified Rural Areas of Bangladesh- Priyanka Chowdhury, Andrew Jenkins and Zainu Sadia Islam.

The objective of this session was to give a brief idea about alternative source of energy in Bangladesh which will enlighten not only the city dwellers but also will be within the reach of rural people of Bangladesh.

At first the session started with the discussion on “Solar Bottle Light: An Alternative Source of Energy in Bangladesh” and the discussants were Md Jakariya, Sajid Iqbal, Navojit Dastidar and Mohammad Sujauddin. This discussion highlighted the innovation of Solar Bottle Lights (SBL) which can be used at grass root level as an alternative source of light energy. This is especially effective for low and middle income countries where spread of modern technology is not rampant. The experiment was being conducted in the slums of Bangladesh in installing the Solar Bottle Lights. They ran campaigns, conducted survey and interviewed slum dwellers. Upon installations, they get track of its usage and people’s acceptance rate. These SBLs are highly effective in terms of energy conservation (by up to 171.4 GWh/year in slum areas of Bangladesh) and carbon footprint reduction (upto 87.9 Million MT/year in slum areas of Bangladesh).

Priyanka Chowdhury, Andrew Jenkins and Zainu Sadia Islam presented their research on “Feasibility of Solar-biomass Hybrid Cold Storage for Un-electrified Rural Areas of Bangladesh.” The aim of this research was to investigate the economic and technical feasibility of a solar-biomass hybrid cold storage to prevent the loss of potatoes at the farming level. This study mainly focused on a 20 MT cold storage facility. The two main objectives of this study were to determine whether the hybrid-cooling model is technically and economically feasible and to address the potential scope for its implementation in rural off-grid areas where no grid connection is expected within the next 15 years. Three renewable energy models were discussed and they were i) solar based model, ii) biomass based model iii) solar-biomass hybrid model. All these three models are expected to have a significantly negative NPV (Net Present Value), mainly due to the large investment costs, which implies the economic feasibility that will strongly rely on subsidies from governments or other organizations. All three of the evaluated renewable energy based cold storage models are feasible in Bangladesh. However, a number of issues need consideration beforehand such as the appropriate location and technology need to be chosen and expert opinion is needed during the design and implementation phase.

Parallel Session 5: Water and Sanitation (SDG 6)

- Chair: Dr. Liakath Ali, Director of Program and Policy Advocacy, Water Aid
- Moderator: Ms Shahnoor Hasan, Senior Lecturer And Research Associate, CSD, ULAB
- Presentations:
1. *Drinking water supply through reverse osmosis technology: A solution for water shortages in coastal rural areas of Bangladesh (ITN-BUET)* - Md. Shamsuzzoha, Md. Rasheduzzaman and Rajan Chandra Ghosh
 2. *Solid Waste Generation And Management: A Case Study of Chuadanga Municipality* - Shehab Uddin, Md. Easin Ali, Dr. Md. Mizanur Rahman
 3. *Suitable Water Options for The Arsenic and Salinity Zone of Bangladesh* - Prof. Dr. Muhammad Ashraf Ali, Dr. Md. Ehosan Habib, Md. Azizur rahman, Md. Sarwar Hossain

The objective of this session was to address the issues related to drinking water, sanitation and hygiene and to make people aware of the quality and sustainability of water resources.

The first presenter was Md. Shamsuzzoha who talked about “Drinking water supply through reverse osmosis technology: A solution for water shortages in coastal rural areas of Bangladesh (ITN-BUET)” At first the presenter discussed about the objective of the research that was to know the present water safety and how to strengthen the water safety. Then he mentioned about water resources i.e. ponds, deep tube well and shallow tube well. We get 60% of water from river bodies, 10 %from shallow tube well and 5% for deep tube well. We utilize that water for drinking and other household activities. It was informed that the distance of the supply of water from its sources was very important as, the distance between latrine and pond is also responsible for contaminating water. Several diseases are occurred due to drinking unsafe water like skin infection, diarrhea and dysentery. As his research is based on Reverse Osmosis Technology so he showed the feasibility Study of Reverse Osmosis (RO) Plant which stated that the Plant capacity was 2000l/hour and the Plant lifetime is 30 years. So, in case of safe water shortage we can use this alternative plant for reverse osmosis.

Shehab Uddin showcased his research on “Solid Waste Generation and Management: A Case Study of Chuadanga Municipality.” The main aim of his research was to identify the solid waste management system and its impact on urban environment at Chuadanga municipality. The findings of the research were the sources of solid waste in study area, i.e. Household waste (wastes measured in total 100kg waste per day), Retail shop wastes (2-5 kg) and Vegetable market waste. 26% of total wastes filled up land, 14% are dumped in pond and 38% are dumped in river. The presenter stated that waste management is a problem due to lack of proper drainage system, dustbin, manpower, wages and poor treatment of the sources. There are five important components of environment –water, air, soil, flora and fauna but solid wastes pollute them. Water color and odor are changed as water is contaminated. Air is polluted as well and 86% of people are suffering from air polluted diseases. Not only land is filling up by the wastes but also flora and fauna; the total biological life is destroyed by wastes. The waste does not spare human life and we can see that people are suffering from various diseases

due to pollution. His recommendations on this issue were to increase awareness, reuse and increase recycling of waste products. Last of all, rules and regulations should be imposed to control solid waste generation and management.

Presenting research on “Suitable Water Options To The Arsenic And Salinity Zone Of Bangladesh”, Sajedur Rahman talked about the 3 phases that Bangladesh government has taken regarding the issue

1. 1st phase (within year 2016-2020 action plan has developed)
2. 2nd phase (within year 2021 -2025 action mentioned in 1st phase will be successful)
3. 3rd phase (within year 2026-2030 actions that are left in 2nd phase will be successful)

He added that Action plan which has developed in 1st phase will address arsenic issues, explore feasible technologies and approaches and will also explore water supply in remote areas which are hard to reach (coastal, char and haor areas). The objective of the research was to ensure availability and access of safe water to arsenic and salinity affected areas like Laksham, Comilla, and Shatkhira. He discussed about the technologies for extracting water from Aquifer and treatment of groundwater. He also mentioned the extracted ground water quality and its difference with treated water quality. It was showed by him that shallow tube well is slightly contaminated and deep tube well is free from Arsenic. In Asasuni and Shatkhira, there is alternative method for arsenic contaminated water and research has been done to ensure water quality. Though he addressed several water qualities such as PSF water quality, Rain water quality and MAR system water quality but he did not forget to mention the problem that users of MAR are reporting now a days.

In response to these presentations, Dr. Liakath Ali made his remarkable comment that in Laksham, there is also salinity problem along with arsenic issue. The statistics tells that water management is not proper in our country so we should have a definite goal and target. There are two major aspects of this goal and target: one is water supply and sanitation and the other is water integrated resources. Mentioning the open defecation rate in Bangladesh which is 1% he said that we have already mitigated the open defecation problem. So, this time SDG focuses on safe water than sanitation. He included, “though we claim DHAKA WASA supply to be safe, but can we really be sure of it? We are not guaranteed safe water; the children are also dying because of unsafe water. We are dealing with water supply and sanitation but still we are not able to reach the solution. We have to focus on coastal zone or vulnerable area, but our focus is reversed when it comes to allocate resources.”

Parallel Session 6: Responsible Consumption and Production (SDG 12)

- Chair: Dr. Marion Glaser, Social Scientist, Leader of Social-Ecological Systems (SES) Analysis, Leibniz Center for Tropical Marine Research (ZMT), Bremen, Germany
- Discussant: 1. Mr. Kishore Singh, Senior Skills Specialist, International Labour Organization
2. Dr. Md. Nasir Uddin, Economic Dialogue around Green Growth
- Moderator: Dr. Annette Breckwoldt, Scientist, Social-Ecological Systems (SES) Analysis, Leibniz Center for Tropical Marine Research (ZMT), Bremen, Germany
- Presentations: 1. *The Positive Inception and Flawed Progression of Aquaculture: The Case of Gurudaspur, Natore* - Mr. Samaan Saad, Undergraduate Student, Department of Environmental Science and Management (ESM), North South University; Raisa Bashar, Lecturer, Department of Environmental Science and Management (ESM), North South University; Nazmul A. Khan, Professor, Department of Environmental Science and Management (ESM), North South University
2. *Sustainability Assessment of the Shrimp Fry Collectors in Paikgacha Thana of Khulna District: An In-depth Study of Their Livelihood Pattern* - Md. Sajadul Alam, GIS Analyst in Department of Environmental Science and Management (ESM), North South University, Imtiaz Ahmad, Senior Monitoring Evaluation Accountability and Learning Officer, Oxfam, Bangladesh and Md. Zubaer Hossain, Research Assistant in Department of Environmental Science and Management (ESM), North South University, Bangladesh
3. *Social and Economic Transformation of the Ultra-poor (SETU): A model for graduation and sustainable empowerment of the poor* - Anowarul Haq, Director of Extreme Rural Poverty Program, CARE Bangladesh.

The main objective of this session was to focus on the transition to sustainable consumption and production of goods and services which is necessary to reduce the negative impact on the climate and the environment, and on people's life.

Mr. Saman Saad, an undergraduate student from Department of Environmental Science Management (ESM), North South University, stated the positive aspects of aquaculture and how it contributed to the economy of that area as he conducted his research on "The Positive Inception and Flawed Progression of Aquaculture: The Case of Gurudaspur, Natore." However, the research was mainly carried out centering the number of ponds in Natore. The Methodology of surveying contained two villages- Maharajpur and Brigarilla. Both the villages had a motivation to start fish farming. Annual income of fish farmers were 50% in Maharajpur. Though the research work resulted in the loss of biodiversity, even further incidents included impact on ground level, and due to pond cutting, fishes were affected. As the groundwater levels were going down, so pipes were installed. Then, comparative

analysis from both of the villages was shown. The banana trees help to eradicate water logging. People are also indulged in the secondary occupation. Number of government intervention is also observed which led to nice drainage system. Overall, they all have to be monitored. The researchers said they are preparing the report on Natore, which will push the government to take initiative. A discussion was initiated on the foods for the fishes. In this regard, it was suggested from audience to use worms for fishes as they do in South India. The presenter also agreed and said that in Maharajpur, they use snails for fishes and it has given birth to a new business to export snails to many countries like Malaysia.

Another research titled “Sustainability Assessment of the Shrimp Fry Collectors in Paikgacha Thana of Khulna District: An In-depth Study of Their Livelihood Pattern” was presented by Md. Sajadul Alam, GIS Analyst in Department of Environmental Science and Management (ESM), North South University, Imtiaz Ahmad, Senior Monitoring Evaluation Accountability and Learning Officer, Oxfam and Md. Zubaer Hossain, Research Assistant in Department of Environmental Science and Management (ESM) North South University, Dhaka, Bangladesh. The research showed that People in south-west coastal region are highly dependent on the natural resources to sustain their livelihoods. Shrimp culture has changed the livelihood pattern of the people from coastal region of Bangladesh. Even after that, most of the shrimp fry collectors are living with great sorrows as almost 85 percent of people are spending 4-9 hours for shrimp fry collection but they are gaining only about 2000-5000 taka per month. The livelihood of the shrimp fry collectors is affected by natural disasters but they are coping with their indigenous practices to sustain. Shrimp fry collectors are deprived in respect of social, physical, financial and natural capitals. The study was the initiative of identifying or developing best sustainable alternative livelihood based on the local resource through analyzing the existing livelihood of shrimp fry collectors.

The next presentation titled “Social and Economic Transformation of the Ultra-poor (SETU): A model for graduation and sustainable empowerment of the poor” was presented by Anowarul Haq, who is Director of Extreme Rural Poverty Program in CARE Bangladesh. The presenter discussed a little about the organization he belonged to and how it has helped the rural society. As poverty and marginalization is still an issue, he talked further about it. The presenter then talked about the conceptual model and the areas to be focused. Then he mentioned Economic Goal-which is expanding capabilities, social and political inclusion and resilience. CARE Bangladesh focuses on South East and North West regions of Bangladesh for development. Some of the aspects of a particular project were highlighted. He noted that through development, the graduation rate is progressing in South East region. Projects are also involved to enhance more on the graduation. Bangladesh has a facility of microcredit, but they encourage people for saving instead; to meet increased amount of household expenditures. Another alarming issue which became a matter of concern for ultra poor is nutrition. As they do not have direct collaboration with the government so they are facing problems. However, in local level, it is difficult to deal with local stakeholders. Still, the researchers go for participatory process. Though there remains a big challenge on coordination but things are happening and progressing.

Parallel Session 7: Climate Action (SDG 13)

- Chair: Dr. Saleemul Huq, Director, International Center for Climate Change and Development (ICCCAD)
- Moderator: Dr. Carolyn Roberts, Professor of Environment, Gresham College, London
- Presentations:
1. *Short-Lived Climate Pollutants (SLCPs) are adversely contributing to Climate Change and Mitigation Strategy in Bangladesh* - Abdul Wahab, Climate Change Consultant cum Project Coordinator, UNEP's Strengthening Institutional Capacity to Reduce Short-Lived Climate Pollutants (SLCPs) Project, Department of Environment, Dhaka
 2. *Climate induced displacement and livelihood choices: Evidence from slum areas in dhaka metropolitan city* - Meherun Ahmed, Associate dean of Special Program, Associate Professor of Economics, Asian University for Women, Chittagong
 3. *Numerical Simulation to estimate effect of climate change on water resources in South Asia* - Pankaj Kumar, Binaya Kumar Mishra, Yoshifumi Masago, Chitresh Saraswat and Shamik Chakraborty - United Nations University – Institute for the Advanced Study of Sustainability, Tokyo, Japan
 4. *An assessment of the climate change induced vulnerabilities of coastal regions and adaptation practices of coastal crop agriculture in Bangladesh* - Sabrina Zaman and Mohammad Sujauddin, Graduate Research Student. Department of Environmental Science and Management, North South University, Dhaka
 5. *Evaluation of standing order on disaster during Sidr in the coastal region of Bangladesh* - Niger Sultana, Junior Environmentalist, NKDM Association, Dhaka, Bangladesh.

Climate change presents the single biggest threat to development, and its widespread, unprecedented impacts disproportionately burden the poorest and most vulnerable. The objective of this session was to call for urgent actions to combat climate change and minimize its disruptions, which is integral to the successful implementation of the Sustainable Development Goals.

Abdul Wahab, the first presenter discussed the issue on “Short-Lived Climate Pollutants (SLCPs) are adversely contributing to Climate Change and Mitigation Strategy in Bangladesh.” Providing an introduction on Short-lived climate pollutants which have really short lifetime in atmosphere but assert a warming influence on climate change; he gave a typology of it which is referred as Black Carbon (BC) (soot); Methane; Tropospheric Ozone (O₃); and some Hydrofluorocarbons (HFCs). After CO₂ they are considered as contributors to greenhouse effect. By giving a brief account on the adverse impact of these pollutants he said that human health, agriculture, ecosystem, biodiversity and global and regional climate are affected by these pollutants. He also mentioned the major sources of Short

Lived Climate Pollutants (SLCPs) in terms of Bangladesh which include diesel vehicles, brick kilns, cooking stoves, rice parboiling, forest fires, open burning and some industrial facilities, re-suspended dust from construction activities, roads, metal smelting and cement factories. To reduce and mitigate the emission he advised that we should apply policy like – controlling methane from livestock through anaerobic digestion, reduction of fugitive emission from gas transmission pipelines and establishment or expansion of sewerage system.

The next presenter, Meherun Ahmed presented her research on “Climate Induced Displacement and Livelihood Choices: Evidence from Slum Areas in Dhaka Metropolitan City.” The research focused on the livelihood choices and labor market performances of displaced individuals for environmental reasons in contrast to economic migrants. She collected random survey data from five slum areas in Dhaka Metropolitan city. She identified the following issues- the occupation choice, number of hours worked, the remuneration received and the overall economic well being of the environmentally displaced individuals. She basically did not find any difference between climate and economic migrants in terms of occupational choices. She was successful in drawing some interesting fact about climate migrants which are quite different from economic migrants. Though they provide more working hours but their income is significantly low and they live below urban poverty line. They face nutritional deficiency due to insufficient intake of food. Moreover, they are less likely to attain own land and more likely to finance their migration. She added that they are creating extra burden on Dhaka city by refusing to go back to their roots.

Trend for water quality deterioration clearly indicates that current planned wastewater treatment plants and policies are not sufficient enough for sustainable water resource management within these cities and hence it is necessary to call for immediate and inclusive action. In this regard, a discussion was presented on “Numerical simulation to estimate effect of climate change on water resources in South Asia”. The research was conducted in Manila and Kathmundo by using WEAP model (numerical simulation tool). The research mainly focused on estimating the effect of rapid population growth, urbanization with infrastructure development and climate change on different aspect of water resources. The problems associated with water conflicts are well-recognized and the United Nations Sustainable Development Goals adopted in 2015 will not be achieved without sustainably solving the problem of water scarcity especially in developing nations with limited infrastructure. So, it is necessary to look after the issue.

Sabrina Zaman and Mohammad Sujauddin discussed about “An assessment of the climate change induced vulnerabilities of coastal regions and adaptation practices of coastal crop agriculture in Bangladesh.” They addressed the coastal belt of Bangladesh as a vulnerable area to climatic hazards .The agricultural sector of this region is at a risk. This study aimed to assess the climatic vulnerability of the coastal crop agriculture due to climate change impacts and the existing adaptation practices in the crop agriculture to battle against the climatic stressors. Furthermore, the study revealed sea level rise and cyclone as the major threats for the coastal agriculture and these two events are experiencing an increasing trend in the recent years in terms of their impacts. Then they came up with the solution like floating gardens, ditch-dyke cropping, crop diversification, mulching which seem to be the promising adaptation practices in the coastal region. They also recommended that both government and non-government organizations in collaboration with the coastal community should come forward to play the key role in strengthening the adaptation programs.

The last presentation of the session was on “Evaluation of standing order on disaster during Sidr in the coastal region of Bangladesh” and it was presented by Niger Sultana who is a junior environmentalist from NKDM Association. Patuakhali. She addressed Barguna district as the most affected coastal regions of Bangladesh. She talked about the following issues: Bangladesh is geographically very prone to natural disasters specially cyclones. Tropical cyclone Sidr was a category 5 cyclone which made landfall in Bangladesh on 15th November 2007, causing a storm surge of up to 5m across much of the country. Government of Bangladesh has the Standing Orders on Disaster (SOD) since 1997, which is a living document and the revised SOD has been prepared in 2010 where the tasks and responsibilities of the citizen, public representatives, ministries, agencies and non-government organizations have been clearly spelled out with clarity (SOD, 2010). Study on government level showed that 87.5% respondents thought that SOD was enough for the community and they thought the major reasons of the huge loss during Sidr were lack of better and earlier warning, unprotected and insufficient embankments, less developed infrastructure and communication system, lack of enough supportive people, insufficient and old cyclone shelters and lack of awareness. They also included that among three Disaster Management Committees, the highest amount of lacking of SOD can be seen in Union DMC which is measured as 83.33%. They also suggested that more cyclone shelters and vast warning telecasting should be prepared to lessen the loss.



Dr. Saleemul Huq and Professor Carolyn Roberts along with the presenters of SDG 13- Climate Action Session

Parallel Session 8: Life below Water (SDG 14)

- Chair: Dr. Annette Breckwoldt, Scientist, Social-Ecological Systems (SES) Analysis, Leibniz Center for Tropical Marine Research (ZMT), Bremen, Germany
- Moderator: Dr. Samiya Selim, Director and Associate Professor, Center for Sustainable Development, University of Liberal Arts Bangladesh
- Discussant: Alifa Bintha Haque, Director of Research and Development, Save Our Sea
- Presentations:
1. *Application of cultural services in coastal ecosystem management: Meanings, opportunities and associated pitfalls* - Dr. Shamik Chakraborty, JSPS-UNU Postdoctoral Fellow, UNU-IAS; Dr. Shantanu Kumar Saha, Senior Lecturer-cum-Research Associate, Centre for Sustainable Development, University of Liberal Arts Bangladesh (ULAB)
 2. *Optimizing fishing catch and the protection of marine megafauna through marine spatial planning with Hilsa fishermen in Bangladesh* - Rubaiyat Mowgli Mansur, Mahmud Rahman, Elisabeth Fahrni Mansur and Brian D. Smith
 3. *National Spatial Data Infrastructure for sustainable management of coastal mangrove in Bangladesh: Opportunities and challenges* -Kazi Humayun Kabir, Assistant Professor and Head (In-Charge) and Chairperson, Development Studies Discipline, Khulna University and Sharmin Aftab, Research Assistant, Coastal Center for Sustainable Development, Khulna
 4. *Resilience community contributing to SDG 14 by knowledge management using ICT* - Tapas Ranjan Chakraborty, M. B. Akhter, Priodarshine Auvi and Fatema Jannat.
 5. *Integrated Management of Coastal Resources in Saint Martin's Island (SMI)* - Md. Humayain Kabir

The objective of this session was to make people conscious of the sustainable use and preservation of marine and coastal ecosystem and their biological diversity because marine resources are extremely vulnerable to environmental degradation, overfishing, climate change and pollution.

The first discussion of this session titled, "Application of Cultural services in coastal ecosystem management: Meanings, opportunities and associated pitfalls" was presented by Dr. Shamik Chakraborty, JSPS-UNU Postdoctoral Fellow, UNU-IAS and Dr. Shantanu Kumar Saha, and Senior Lecturer-cum-Research Associate, Centre for Sustainable Development, University of Liberal Arts Bangladesh (ULAB). This research mainly focused on cultural ecosystem services and challenges to management and valuation. They defined cultural ecosystem service as non-material benefit that people obtain from ecosystem rather it is associated with spiritual enrichment, cognitive development,

reflection, recreation and aesthetic experiences. They gave examples from case studies of HIMESHIMA and NAKATSU. Dr. Annette Breckwoltd, the chair of the session concluded the presentation by giving suggestion on bringing in different cultures for comparison which needs a quantitative approach as well.

Next presentation titled, “Optimizing fishing catch and the protection of marine megafauna through marine spatial planning with Hilsa fishermen in Bangladesh” was presented by Rubaiyat Mowgli Mansur, Mahmud Rahman, Elisabeth Fahrni Mansur and Brian D. Smith. Since 2002, the team is working for Sundarbans and the coastal areas. Now they are working on sharks and dolphins. They found out five species of rays, seven species of sharks and four species of dolphins which are vulnerable. From their seven years of working experience on this area, they suggested that there should be a balance between conservation and demand of people. They also provided ways such as marine mega fauna conservation which engages fishermen at a large number. The other issues like Fisherman safety network, Hilsha gill net, (the net determines whether the Hilsa is large or Jatka). Spatial explicit model for marine spatial planning need to be ensured. It was concluded that large net fisheries catch sharks for international market, so eventually we are risking not just single species rather we are losing multiple data. Mr. Brian Smith who is International Program Director at Wildlife Conservation society, Bangladesh said that it is very important to offer fisherman a fundamental way to create awareness of climate change.

The presentation titled, “National Spatial Data Infrastructure for Sustainable Management of Coastal Mangrove in Bangladesh: Opportunities and Challenges” was presented by Kazi Humayun Kabir, Assistant Professor and Head (In-Charge), Development Studies Discipline, Khulna University. The report stated that due to the lack of Geospatial technology (remote sensing, GPS), the accessibility of geospatial information is very difficult in Bangladesh. The country has been facing problems in the use of data formats and different projection systems, because of lack of guideline for acquiring and processing. The research focused on the practicality of NSDI (national spatial data infrastructure) in policy and decision making in sustainable management of coastal mangrove of Bangladesh. They elaborated SDI (Spatial Data Infrastructure), its types and components and why it is required. They also talked about the partnerships, opportunities and possibilities of Mangrove management, as well the challenges in acceptability and adaptability. It is a matter of progress that the process of 3D designs has already started and 3D maps can be established from photographs too. But the challenge is that people do not know how to use the data. Again, acceptance remains the main challenge for this country.

Another research on “Resilience community contributing to SDG#14 by knowledge management using ICT” was presented by Tapas Ranjan Chakraborty, M. B. Akhter, Priodarshine Auvi and Fatema Jannat. The research highlighted that it is high time for Bangladesh to set the target for 2020. As well, the facts and figures were discussed i.e. our coastalline is 734 km and 50 million people, nearly 1/3rd of population of Bangladesh residing there. The working areas for this project were Shyamnagar and Shatkhira where the people are heavily suffering from diseases after Sidr. Oxfam and Monash University are jointly doing research on this topic so we can expect help. More progresses can be strengthened by using ICT (Information and communication Technology) in knowledge management, conservation and protection of marine and coastal ecosystems. They ended by giving advice such as the government plan has to be integrated with the local plan for a better result and the locals should set up a target then they will realize their responsibility.

The fifth presentation titled “Integrated Management of Coastal Resources in Saint Martin Island (SMI), Bangladesh” was presented by Md. Humayain Kabir. This research identified the major drivers, problems and prospects associated with the sustainable management of coastal resources in Saint Martin Island (SMI) in terms of ecological, socio-economic and governance issues. Both primary and secondary data were collected to fulfill the study’s objectives. The study found that the main drivers of depleting Saint Martin Island’s (SMI) resources are - increased population, poverty and unplanned tourism. Due to these drivers; overfishing, overexploitation of natural resources, solid waste and wastewater disposal, increased numbers of hotels and infrastructure development are creating more pressure on Saint Martin Island (SMI). As a result, degradation of ecosystems, loss of biodiversity and habitat are occurring. In response to these adverse impacts, both the government and non-governmental organizations have been working on alternative livelihood options for the local people to create environmental awareness and enforce existing laws and rules in relation to sustainable coastal resource management.



Dr. Annette Breckwoldt conducting the discussion along with interactive video presentation

Parallel Session 9: Life on Land (SDG 15)

- Chair: Professor A. Z. M. Manzoor Rashid, Professor & Head Department of Forestry and Environmental Science, Dean- School of Agriculture and Mineral Science, Shahjalal University of Science & Technology
- Moderator: Shahnoor Hasan, Senior Lecturer and Research Associate, CSD, ULAB
- Discussant: Professor Dr. Md. Danesh Miah, Professor and Director, Institute of Forestry and Environmental Sciences, University of Chittagong
- Presentations:
1. *Choice Modeling and Its Application to Sundarbans Mangrove Forest Preservation* - Md. Hafiz Iqbal, Assistant Professor (Economics), Government Edward College, Pabna
 2. *Biodiversity conservation through empowerment of the local communities: A case study from the Chittagong Hill Tracts, Bangladesh* - Shahriar Caesar Rahman, Chief Executive Officer, Creative Conservation Alliance.
 3. *Assessment of ecosystem service value of southwest coastal Bangladesh* - Shawan Khan (Corresponding Author), MSc student, Environmental Science Discipline, Khulna University; Md. Ali Akber, Assistant Professor, Environmental Science Discipline, Khulna University; Md. Atikul Islam, Dr. Eng., Professor, Environmental Science Discipline, Khulna University; Md. Munsur Rahman, PhD, Professor, Institute of Water and Flood Management (IWF), Bangladesh University of Engineering and Technology (BUET); Mohammad Rezaur Rahman, PhD, Professor, Institute of Water and Flood Management (IWF), Bangladesh University of Engineering and Technology (BUET).
 4. *Growth of *Azadirachta indica* A. Juss. Seedlings in water stressed condition to combat desertification* - Md. Shoaibur Rahman and Atiar Rahman.

The objective of this session is to discuss possible options to protect, restore and promote sustainable use of our terrestrial ecosystems, as well as sustainably manage forests, combat desertification, and halt and reverse land degradation and biodiversity loss. The session focused on managing forests sustainably and protecting areas which are important for biodiversity.

The first presenter of this session was Hafiz Iqbal, Assistant Professor (Economics) from Government Edward College, Pabna. His topic was “Choice Modeling and Its Application to Sundarbans Mangrove Forest Preservation.” The presenter started the discussion on how Mangroves are balancing the ecosystem. Giving the example of the Sundarbans, he mentioned how it helps to uplift the socio-economic condition of the coastal people and continuously contribute to GDP (Gross Domestic Product) growth. In addition, it happens to be the breeding ground for several globally threatened species, e.g. Ganges river dolphin, the water bird, Bengal tiger. But now the ecosystem of Sundarbans is threatened by insects, diseases, some climatic and human induced factors. The research objective is to find ways to preserve the forest. The method followed was questionnaire survey and attempted to apply choice experiment approach. The findings of this study provide robust basis for researcher, policy makers and government to provide specified policies and to preserve Sundarbans mangrove forest ecosystem.



Professor A. Z. M. Manzoor Rashid & Ms. Shahnoor Hasan conducting the discussion

The second presenter, Shahriar Caesar Rahman, Chief Executive Officer, Creative Conservation Alliance talked on the issue titled “Biodiversity conservation through empowerment of the local communities: A case study from the Chittagong Hill Tracts, Bangladesh.” He started with a brief description about the Chittagong Hill Tracts, where the forests and biodiversity of the region are being threatened by the slash-and-burn agriculture practice, increased hunting, poaching and logging of the ethnic groups. Little work has been done to protect the biodiversity of the region. The presenter then talked about the organization, Creative Conservation Alliance which is a government registered non-profit organization dedicated to ecological and cultural preservation within Bangladesh’s last remaining wild places. They have been working on the remote Sangu River Forest, where they empower local people to become stakeholders in their own landscapes. They have empowered the native tribesmen to be protectors of their own unique and endangered ecosystem, heritage, and culture.

The third presentation titled “Assessment of ecosystem service value of southwest coastal Bangladesh” was presented by Shawan Khan (Corresponding Author), MSc student, Environmental Science Discipline, Khulna University, Md. Ali Akber, Assistant Professor, Environmental Science Discipline, Khulna University, Md. Atikul Islam, Professor, Environmental Science Discipline, Khulna University, Md. Munsur Rahman, PhD, Professor, Institute of Water and Flood Management (IWFM), Bangladesh University of Engineering and Technology (BUET), Mohammad Rezaur Rahman, PhD, Professor, Institute of Water and Flood Management (IWFM), Bangladesh University of Engineering and Technology (BUET). In this presentation it was showed that the southwest coastal region of Bangladesh is richer in ecosystem but is also largely stressed by human intervention. The study was conducted to determine the ecosystem service value of the region. The results of a sensitivity analysis showed that 36.02% of the land is covered by mangrove forest (Sundarbans). About 25.65% of the area is under aquaculture (shrimp/prawn), whereas agriculture holds about 15.36% of the land. Mangrove alone holds 97.6% of the total value, whereas agriculture and aquaculture hold 0.24% of that. The presenters brought into attention that the land use policy should focus more toward the ecosystem function of the mangrove to promote sustainable natural resources management of that region.

The fourth presenters of this session were Md. Shoaibur Rahman and Atiar Rahman who did their research on “Growth of *Azadirachta indica* A. Juss Seedlings in water stressed condition to combat desertification”. To make this research successful, an experiment was conducted in the Agroforestry Research Field of HSTU to find out the responses of shoot morphology and root architecture of *Azadirachta indica* (neem) seedlings to water stress. There were four treatments; namely- 100% watering, 50% watering, 25% watering and no water except rain water (control). Neem seedlings were collected from a Government nursery. From the overall results it can be concluded that neem seedlings can be established in drought environment with ensuring at least 50% additional water supply in the field at their early stages to combat desertification.

Parallel Session 10: Affordable and Clean Energy (SDG 7)

- Chair: Soheli Ahmed, Managing Director, Grameen Shakti
- Moderator: Dr. Shantanu Kumar Saha, Senior Lecturer-cum-Research Associate, CSD, ULAB
- Presentations:
1. *Sustainable Energy Options for Bangladesh: Emerging Challenges* – Mahfuzul Haque
 2. *The Drivers and Barriers to the Deployment of Solar Home Systems in Rural Bangladesh* - Asfara Ahmed
 3. *Renewable Energy Practice: A Sustainable Clean Energy for all People of Bangladesh* – Sumaia Islam, Samina Islam

The objective of this session was to aim at provision of affordable and clean energy which will help in achieving almost all of the Sustainable Development Goals. This session also discussed the ways of eradicating of poverty through advancements in health, education, water supply and industrialization.

Mahfuzul Haque who is Adjunct Faculty from Department of Development Studies, University of Dhaka talked on Sustainable Energy Options for Bangladesh: Emerging Challenges. His research focused on achieving sustainable energy for Bangladesh along with emerging challenges and how to overcome them. He reported that on 1 February 2017, energy generation was 6420 MW out of which the usage of gas was 61%, Coal and hydro were 2%, renewable energy was hardly 400 MW. By 2020, 17000 MW of power would be required and government says it may go up to 24000 MW. The question remains what would be its sources? Increased consumption of coal might be taken into consideration. But emission issue with coal will be on top of the sustainability agenda. The main challenge is by 2021, we have to reduce natural gas consumption and increase coal and renewable options of energy. The tension arises with the question of importing coal and maintaining the quality of it. Mr. Soheli Ahmed from Grameen Shakti, concluded by saying, “more than 4 million solar homes are being installed. We must have solar plants and lands for cultivation. Only one of the solar plants has started working. The main problem is lack of sufficient lands.”

Next presenter was Asfara Ahmed, Senior Researcher from Society for Environment and Human Development. She presented her paper titled, “The Drivers and Barriers to the Deployment of Solar Home Systems in Rural Bangladesh” She discussed about the drives and barriers to the deployment of solar. The main drives are at demand for better quality lighting which will help children to study, to

improve security and better safety. Also she added to increase a huge percentage use of charged cell phones is another key motive. It can be regarded as an effective way of increasing income; the users can keep their shops open for hours by the means of solar home system thus their income increases. Not only that, solar home systems are also means of accessing electricity during load shedding. However, there are some barriers of it which can be considered as financial barriers like high costs and down payment installation system. As most of the people in our country are living below poverty line so they do not earn enough to install solar homes. Moreover, tenants are not able to install solar panels. Technical barriers like sale service, service related issues, warranty are not less than financial barriers. These barriers must be looked after to drive Solar Home System in Bangladesh. Mr. Sohel Ahmed, added that we can expect a bright future as Grameen Shakti has installed over 1.5 million solar homes which are more than half of the total and 61% of them are used for mobile phone charges.

The session was ended by the presentations of Sumaia Islam and Samina Islam. They presented their research titled “Renewable Energy Practice: A Sustainable Clean Energy for all People of Bangladesh”. They started by saying that demand of power is growing all over the world due to high standards of living which is leading to more greenhouse gases. By 2030, there will be universal access to affordable clean and modern energy but at a doubled rate. Within 2-3 decades, reserved natural gas will run out if 4500 – 4600 MW of energy is produced per day. The researchers found out the ideal locations for solar plants which are lower lands with greater sunlight exposure. Moreover, solar radiation is sufficient in most regions of Bangladesh and mirrors can be used to concentrate the sunlight in a smaller area. PV technology can also be applied but for that extensive infrastructures are required. Government should offer financial incentives here. In addition, wind energy and hydro electricity can also contribute to clean and affordable energy. Plus, 16000 tons of waste per day is produced which can be used to create power using bio-gas technology. Ultimately, it is seen that prospects of solar energy is higher but initial cost is higher as well. Again, potential areas for wind energy are lower. Some demands for energy requirements can be met from hydro energy. In this regard, large scale projects should be taken by government. Mr. Sohel Ahmed gave his opinion on this aspect by saying that CSP is suitable for desert places. We need wind mapping but nothing is done yet though official wind mapping is in process. There are scopes to have energy from tidal. He talked about minimal use of biogas which is constrained only in home cooking but measures should be taken to use it at industrial level.



Participants from SDG 7-Affordable and Clean Energy Session

Science-Policy Dialogue Session Summaries

Sustainability, Climate Change and Natural Resource Management

- Chair: Dr. Md. Danesh Miah, Professor and Director, Institute of Forestry and Environmental Sciences, University of Chittagong
- Moderator: Dr. Samiya Selim, Director and Associate Professor, Center for Sustainable Development, University of Liberal Arts Bangladesh
- Presentations:
1. *Social energy for the self-organization of sustainable human-nature relations: The role of governance* - Dr. Marion Glaser, Social Scientist, Leader of Social-Ecological Systems (SES) Analysis, Leibniz Center for Marine Tropical Ecology (ZMT).
 2. *Discerning the Mayhem: Negotiating Climate Change and Sustainable Development* - Sharmi Palit, Student, MA Sociology, Centre for the Study of Social Systems, Jawaharlal Nehru University, India.
 3. *Climate Tracker: Engaging youth in climate action* - Sohara Mehroze Shachi, Climate Tracker South Asia, Cofounder & Hub Manager.

Dr. Marion Glaser, who is a Social Scientist, from Leader of Social-Ecological Systems (SES) Analysis, Leibniz Center for Marine Tropical Ecology (ZMT) started her presentation on “Social energy for the self-organization of sustainable human-nature relations: The role of governance,” by saying that sustainability is about the way humanity relates to nature. Social self-organization is classically rooted in local traditions and ecosystem knowledge has often been displaced by technical and economic change (Johannes et al, 1983). Social energy for sustainability is not always present, it changes over time, and it may be supported or undermined by governance. The presenter talked about the area of her long-term study which was capacitating self-organized coastal management in multiple sub national coastal regions in countries like Brazil, Indonesia and the Caribbean and even more terrestrial regions like Bangladesh and Colombia. Which answers the questions like which system features and processes activate self-organizing social energy towards more sustainable human-nature relations? Is a crisis always necessary to activate social energy for sustainability? Is social energy subjected to cyclical dynamics? Which system features and processes undermine, or even destroy the self-organizing social energy that enables sustainable human-nature relations? What are the options for governance to support sustainability enhancing social energy? And aimed to offer findings and thoughts on these questions that relate to the multiple spatial, institutional and temporal levels at which human-nature relations at the land-sea interface are known to have been successfully self-organizing. The talk also aimed to develop theory of systems. It also had a deeply applied purpose which is to support practitioners and decision-makers to work with rather than against social-ecological system dynamics. It therefore concluded with opening a discussion of what may be required to effectively support a self-organized transition towards sustainable human-nature relations in coastal Bangladesh, which is among the regions that are the most vulnerable to climate change on earth, and potentially also the most rich in social energy.

Sharmi Palit, Student, MA Sociology, Centre for the Study of Social Systems, Jawaharlal Nehru University, India presented her research on “Discerning the Mayhem: Negotiating Climate Change and Sustainable Development”. The presenter at first talked about the alarmingly degenerative climate conditions of New Delhi in the year of 2016 when the city witnessed an unprecedented amount of smog that engulfed the city and turned into a gas chamber. Study of the last couple of years showed cases of infant mortality, health problems like asthma, lung diseases, etc were at its peak. This paper aimed to explore understanding of city dwellers on climate change and sustainable development and their negotiation with it. Two case studies will be studied- on the adverse air quality and the proliferating pressure on land in and around the city. Jawaharlal Nehru University was the chosen area of study and intended to be youth-centric in approach, and thus there will be an emphasis on the perceptions of the youth, i.e. how they negotiate with and understand climate change with respect to the backdrop of this paper. What is needed now according to the presenter is not just an awareness of changing climatic patterns but simultaneously, conscious deliberate acts to preserve and save the environment.

The last presentation titled “Climate Tracker – Engaging youth in climate action” was presented by Sohara Mehroze Shachi. This research focused on the aim to foster interest, concern and drive among youth to contribute to building policy momentum by writing impactful stories on national and international media, highlighting the impacts of climate change and the need for urgent action. The presenter also disseminated information about the organization and how to get involved with the South Asia Hub.



The team of science policy dialogue along with Dr. Samiya Selim, Director, CSD on the left and the chair of the session Professor Dr. Md. Danesh Miah in the center

ADD International Research on SDGs & Disability, Quality Education (SDG 4) and Decent Work and Economic Growth (SDG 8)

Chair:	Ms. Quazi Rosy, Honorable Member of National Parliament
Moderator:	Mr. Shafiqul Islam, Country Director, ADD International Bangladesh
Introduction:	Mr. Shafiqul Islam, Country Director, ADD International Bangladesh
Keynote Presentation:	Dr. Nafeesur Rahman
Discussant's Remarks:	A.H.M. Noman Khan, Executive Director, CDD and Farida Yesmin, Executive Director, DRRA
Chair's Address:	Ms. Quazi Rosy, Honorable Member of National Parliament

Background

On the second day of the CSD Annual Conference, 11th February 2017, a talk session was held by ADD International: SDGs & Disability- Focusing on SDG 4 - Quality Education and SDG 8 - Decent Work & Economic Growth. The chair for the session was Ms. Quazi Rosy, the moderator for the session was Mr. Shafiqul Islam, a Keynote Presentation was given by Dr. Nafeesur Rahman and the Discussants were A.H.M. Noman Khan and Farida Yesmin.

Opening Speech

The Moderator began the session by thanking everyone for their presence at the program and introduced the Chair, Ms. Quazi Rosy, along with the attendees. Mr. Shafiqul Islam acknowledged the main topic of the session and introduced Dr. Nafeesur Rahman who was delivering a presentation on disability and sustainable development. He then introduced Noman Khan, Executive Director, CDD & Farida Yasmin, Executive Director of Disabled Rehabilitation and Research (DRRA), as the discussants of the session.

Key Note Presentation

At first Dr. Nafeesur Rahman introduced the topic that will be covered in his presentation. He described sustainable development as one of the latest jargons used by development practitioners across the world in recent years. However, concept of Sustainable Development goes long back. Since the 1960s, the concept of Sustainable Development has changed from conservation management to economic development. He addressed Sustainable Development as a pattern of growth in which resources are used to meet human needs simultaneously which aims at preserving the environment. So, these needs can be met not only in the present but also for generations to come. Dr. Nafeesur Rahman said that sustainable development is now seen from a social, environmental and economic perspective. The environmental and economic aspects must be viable while the social and economic aspects must equitable, and all three together will make it sustainable. SDG Goals have been adopted in 2015 and is expected to end in 2030. He also mentioned that the Sustainable Development Goals are universal, for all countries, not only the poor. SDG has 17 Goals, 169 Targets and 250 Indicators. It has an overarching principle to 'Leave No One Behind'. It is a commitment by the government to build a better future for all people, including millions who are currently denying the chance to lead a decent

life and succeeding in ending poverty, reducing inequalities. Focusing on his topic, he stated that disability is an evolving concept, as the definition or approach to it has changed overtime. People with disabilities include those who have long term physical, mental, intellectual or sensory impairments which in interacting with various barriers may hinder their full and effective participation in society on an equal basis with others. Though MDG (Millennium Development Goal) did not have any discourse or funding for disability. But SDG never forgot to include disability. SDG 4 ensures inclusive and quality education for all and promotes lifelong learning for persons with disabilities. That means all girls and boys with disabilities will complete free, equitable and quality primary and secondary level education. Not only that but also they will have access to quality early childhood development care and pre-primary education. He mentioned that, there are targets set to achieve the goal, i.e. 4.5 - by 2030, to eliminate gender disparities in education and ensure equal access to all levels of educations and vocational training for the vulnerable. After that he raised a valuable question by asking who are responsible for making it all possible. Then he provided a positive remark that the whole framework is of the people, for the people, by the people. So, now we cannot hold only one person responsible for this rather every single person has responsibility. To make SDGs successful, they must be addressed in national laws and policies and must be included in the educational curriculum. More academic discussions are needed at the highest educational level and more awareness is needed across the country amongst all stakeholders. All stakeholders need to be brought on board in the process of implementation. If we progress in the spirit of 'Leave No One Behind' only then we will come close to achieve the SDGs by the end of 2030.

At the end of the presentation, Mr. Shafiqul Islam agreed that the whole world is working to change the world for a noble cause and we all will be working together to overcome the targets.

Discussion

Ms. Farida Yesmin who is Executive Director from DRRA, started by stating that all the goals are interrelated. She spoke about life skills that the people with disabilities need, and there have not been much public awareness campaigns running in our country regarding this issue. Most of the people in our country do not know how we can maximize from minimum resources. We must put forward the main issues to the government that are arising in education and examination methods. We should train the teachers with braille boards. It is a matter of sorrow that huge numbers of disabled children are still dropping out of school and not continuing education. She emphasized that we must follow our policies and make improvements to it. As they are still being left behind and that is not fulfilling the "leave no one behind" agenda.

Following Mr. A. H. M. Noman Khan, Executive Director, CDD took the stage and said that we must compare our work and progress on a global scale to understand how much progress we have really made. On this issue, indicators are very important to measure progress. In reply to Dr. Nafeesur Rahman's presentation, he answered that effort was previously made to incorporate the issue of disability in MDG (Millennium Development Goal) but it never happened and finally it was made a part of SDG (Sustainable Development Goal). He added that priority is given to the disabled who are usually more vulnerable. He did not forget to mention that SDG has given targets but the solutions or ways of implementations are not given. Policies are being made by the government for the disabled. The tension arises when no one takes the responsibility because of the rules of business which says that all matters regarding the disabled will be handled by the Ministry of Social Welfare. He recommended that the rules of business should be reviewed and changed so that everyone can be included in taking the responsibility of persons with disability. He put emphasis on action plan and policy which are needed to work simultaneously. He ended by saying if we do not bring in the disabled into a decent

work environment, they will not be able to lead a decent life. To avoid these circumstances, we must integrate the SDG Goals within the National Structure.

Questions from Audience

After the discussions, the floor was opened for questions from the audience. An attendee of the session said that self-realization is very important and for that we must start to revalue and acknowledge how we look at the people with disabilities. We must know who will actualize the targets. Another participant of the discussion said that someone who has disabilities face a lot of problems regarding transport that leads to them being unable to go to educational institutes or places and working places as well. We must look at the bigger picture instead of smaller pieces. We must include women of all ages when we speak about SDG 4 and SDG 8.

Being thankful to Mr. Shafiqul Islam for inviting, Ms. Quazi Rosy who is an Honorable Member of National Parliament expressed that it is her immense pleasure to be the chair of such a wonderful discussion. She acknowledged the fact that there is still a lot to do if we want to achieve the goals that have been set. She again thanked Dr. Nafeesur Rahman for delivering such a wonderful keynote paper in such a short time. She mentioned that the people with disabilities have tremendous willpower exemplifying a teacher who writes with his legs to teach students in a school in Savar. She acknowledged Ms. Farida Yasmin's point of putting up the complete picture in front of the government instead of bits and pieces. She re-quoted the Prime Minister's statement that mentioned we should all work from wherever we are as there is no alternative to work. She acknowledged that to work towards sustainable development we need legal bindings that will force everyone to work towards the goals. She added that the path will not be easy and there will be obstacles but we must keep on working towards our goal and only then we shall achieve our goals. She concluded by saying that we must have an action plan to actualize our plans.

Mr. Shafiqul Islam showed his gratitude to CSD and ULAB for arranging such a wonderful session. He also thanked all the attendees for being present. He concluded by reminding everyone that unity is very important and we all need to work together to achieve the sustainable development goals by 2030.



Ms. Quazi Rosy, Honorable Member of National Parliament of Bangladesh chairing the Panel session of ADD Int on SDGs and Disabilities.

Conference Closing Ceremony

Closing Speaker:	Professor Carolyn Roberts, Department of Environment, Gresham College, London
Conference Summary:	Dr. Amrita Sastry, assistant Professor and Head of the Department, Department of Sociology, Jesus and Mary College, University of Delhi
Chief Guest:	Mr. Abdullah Al Islam Jakob, MP, Deputy Minister, Ministry of Environment and Forests (MoEF), Government of the People's Republic of Bangladesh
Awards Given:	Professor Imran Rahman, Vice Chancellor, ULAB and Dr. Samiya Selim, Associate Professor and Director, CSD, ULAB
Vote of Thanks:	Mr. Kazi Nabil Ahmed, MP, Member, Board of Trustees, ULAB

Dr. Samiya Selim, Director of Center for Sustainable Development (CSD), ULAB opened the concluding session by thanking everyone for being present there. Then she summarized that there were 14 sessions in which a total of 43 papers were presented. She expressed her gratitude to everyone involved in making this Conference a success and introduced the honorable guests of the conference closing ceremony to the audience.

Carolyn Robert who is a Professor of Environment from Gresham College, London, talked on the issue titled as, "Leading, Following and Collaborating: Innovation for Sustainability." Addressing inequality as an integral part of sustainability Carolyn presented three innovative methods for sustainability she named as leading, following and collaborating. She talked about future sustainability which depend on various issues like political decisions, population growth, resource and energy availability, urbanization and mobility, place and heritage, global connectivity, environment character and climate change and change in technology. She mentioned the innovation spectrum and the components of innovation. She also emphasized on implementation of solutions rather focusing on problems only. Collaboration and cross disciplined among organizations, sectors and regions are the key requirements for making future sustainability successful. She praised ULAB for playing the role as a leader in this sector by doing research, management and teaching which will guide others to make future sustainability happen.

Dr. Amrita Sastry summarized the whole ceremony by mentioning the significance of the SDG goals and she also called this conference as a platform for making sustainability persist in near future. She mentioned that it is the responsibility of individuals to look forward to opportunities that will support sustainable development goals to be successful.

The Chief guest of closing ceremony, Mr. Abdullah Al Islam Jacob, MP, deputy Minister, Ministry of Environment and Forests (MoEF), Government of the People's Republic of Bangladesh started by mentioning the Millennium Development Goals and how the world began working on how to tackle those unfinished goals and new challenges. He also added, it paved way for Sustainable Development Goals which are not just a means of fixing what is broken, rather they are roadmaps to the future sustainability.

The SDGs reflect the need to incorporate the three dimensions of sustainable development: social, economic and environment in a coherent, holistic, comprehensive and balanced manner, as well as the

need for transformational and integrated approaches highlighting interconnections and linkages across goals and targets. As Deputy Minister for MOEF, he is satisfied with the progress the department has made towards targets of the different SDGs but there is still more to be done. They aim to improve scientific data collection for more informed policy making. This data will help fill up the gaps in research and knowledge available. His clear message for this conference is the Sustainable Development Goals are not only important for global development policies; they are also critical for our domestic policies. Sustainable development is a way for people to use resources without the resources running out. For that, we need improved and innovative approaches to address persistent development challenges. We need to set concrete targets and indicators for different sectors in order to achieve sustainable development.

Professor Imran Rahman, Vice Chancellor of ULAB praised the contribution of Center for Sustainable development (CSD) towards dealing with sustainable development goals. He urged everyone to come forward and build capacities for long term solutions as sustainability is the key. He thanked everyone for being the part of the sustainable development conference 2017. After that Professor Imran Rahman and Abdullah Al Islam Jakob, MP gave awards to advisory board. During the conference, two research papers titled, “Prevalence of Chromium in Fish Feed and Commercially Cultivated Tilapia” and “Feasibility of Solar-biomass Hybrid cold Storage for Un-electrified Rural Areas of Bangladesh” have won prizes for their extraordinary projects. The best photography award went to Kaji Salauddin, an undergraduate student from Department of Media Studies and Journalism, ULAB for the photograph titled, “Rice Production.”

Mr. Kazi Nabil Ahmed, Member Board of Trustees, ULAB concluded the session by thanking the organizers, participants and volunteers for arranging such a conference which will make people more aware of these issues and how to find a solution.



Professor Carolyn Roberts, Greshma College, London receiving the crest at the closing ceremony

Abstracts

Parallel Session 1: Zero Hunger (SDG 2)

1. On the way towards alleviating household food insecurity: evidence from a rural floodplain of Bangladesh

Authors: Sate Ahmad¹, M. Moinuddin Haider¹, Muhammad Zahirul Haq¹, Abdullah Al-Mamun¹ and Nurul Alam¹

¹Initiative for Climate Change and Health, Health Systems and Population Studies Division, icddr,b

Abstract

Although Bangladesh has steadily made progress towards alleviating food insecurity, around one fourth of the population had to worry about food in 2014. With a projected increase in the frequency of severe weather events, climate change along with population growth, degradation of soil fertility, and decreasing arable land threaten future agricultural growth while poverty still results in lack of access to food. In addition, our understanding of the multiple determinants of household food insecurity still remains mostly theoretical while any policy to alleviate it is formulated based on limited empirical research. Therefore, this study aims at determining different socio-economic factors that are associated with household food insecurity, defined as household members not having three square meals a day for the previous 12 months of the censuses, in Matlab, Chandpur, a rural floodplain in Bangladesh. Furthermore, we explore how such determinants changed in 2014 compared to 2005 in the study area. We used data from 2005 and 2014 socio-economic censuses of the Matlab Health and Demographic Surveillance System (HDSS) which collected data from 46,727 and 53,223 households, respectively. Food insecurity reduced to 5 percent in 2014 from 11 percent in 2005. The preliminary results of the multiple logistic regression show that in 2005 the odds of being a food insecure household was negatively associated with having access to microcredit, education of household head, larger size of agricultural land owned, male-headed households, and higher household income diversity. Household food security was found to be positively associated with larger household size as well. Moreover, Households belonging to higher wealth quintiles had lower odds of being food insecure compared to those belonging to the lowest wealth quintile. The odds of being food insecure also depended on the main occupation of the household with the direction of the association depending on the type of occupation the household gained its income from. However, although most of these determinants remained significant, in 2014 the corresponding odds ratios changed, while the sex of the household head and household size no longer remained a significant factor. Moreover, households located outside the embankment became more likely to be food insecure. A similar analysis was repeated by pooling the data of both years for the same households, with year as a term and it revealed that in 2014 households were around 60% less likely to be food insecure compared to households in 2005, controlling for other factors. This indicates the country's progress towards alleviating food insecurity. The findings are important for policy makers, development practitioners and researchers as it gives a holistic view of determinants of food insecurity, in light of a growing population and increasing resource pressure.

Keywords: Household food security | food access | Matlab HDSS | sustainable development goals.

2. Achieving food security and improved nutrition through nutrition sensitive agricultural practices: A case from ANF4W

Authors: Shirin Afroz¹, Co Author- Amin Uddin¹, Nigar Sultana¹, Chowdhury Abdullah Al Asif¹, Meredith Jackson-de-Graffenried¹

¹Organization Name: Helen Keller international, Bangladesh

Abstract

In Bangladesh, Women and children generally face higher levels of malnutrition, including hidden hunger, than men because societal norms dictate that higher value foods be fed first and in greater quantities to men. With funding support from GIZ, HKI has been working to improve the nutrition status of women of reproductive age through its enhanced homestead food production program and nutrition campaign with marginal households in the northern part of Nilphamari District of Bangladesh. The overall goal of Affordable Nutritious Foods for Women (ANF4W) project is “to increase the local supply and demand of affordable nutritious foods presently lacking in markets around the world.”

Making existing food production systems more nutrition-sensitive through diversification which can be practiced on agricultural fields with the capacity to provide vegetables to local markets, as well as in homestead gardens. In addition to availability, knowledge and attitudes about food pose an important constraint on improved nutrition. Nutrition education may thus have substantial potential for influencing food purchase as well as food production to support improved diets. To address those issues HKI provide in ANF4W project three types of training as Homestead Food Production for women, Agronomic biofortification of Zinc rice for men and nutrition sensitive agriculture for both men and women together. Additionally, also have interpersonal and mass media communication tools and materials to ensure optimal nutrition through diversifying diet and reach more through nutritional awareness campaign. The major objective of the study is to assess the impact of the project on households regarding food production and consumption, household food security, knowledge about nutrition and practice of producing zinc enriched rice varieties.

A panel study was conducted among 332 female farmers and 325 male farmers to assess the true impact of the intervention. Twenty villages that were suitable for the implementation of the ANF4W project were randomly assigned to intervention and control conditions and ANF4W activities were undertaken in the ten villages assigned to the intervention group.

A significant increase of vegetables varieties observed among target beneficiaries at baseline from 11.8 to 19.9. Women had higher consumption of dark green leafy vegetables, legumes and eggs compared to the baseline. Moreover, nutrient rich foods (6 or more group) named by women has risen from 24% to 69%. Alternatively, the proportion of men aware increased 37% compared to the baseline about the benefits for both mother and fetus. Household food security also increased 29% and 77% from baseline and end line respectively. Land size devoted for cultivating vegetables on homestead significantly increased at the end of the project. Additionally, proportion of farmers using foliar spray in their rice field to enrich zinc in rice, has also increased from 43% to 86%.

The program is effectively contributing to improving household food security and adaptation of nutrition sensitive agriculture practices, improving access to the number of diversified food among target households.

Keywords: Nutrition sensitive Agriculture, Food Security

3. Prevalence of chromium in fish feed and commercially cultivated tilapia

Authors: Ms. Shahnoor Hasan¹, Dr. Lutfor Rahman², Dr. Shahana Afrose Chowdhury³

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³Research and Development Manager, Kazi Shahid Foundation

Abstract

The use of solid tannery waste in poultry and fish feed poses serious health risk for consumers. Studies suggest that tannery waste contains the amount of chromium (Cr) higher than permissible level, which is used in poultry or fish feed, enters the food chain. People eating such fish, chicken or eggs may be subjected to cancer or liver and kidney-related diseases. Levels of contaminants in fish are of particular interest because of the potential risk to humans who consume these contaminated fishes. This study was carried out to investigate contamination of heavy metals in commercially cultivated Tilapia fish species available in different kitchen markets of Dhaka city as well as, in the fish feeds and fishes from controlled fish farm. Liver and a certain portion of muscle tissues of the collected tilapia fishes were extracted and analyzed for the presence of chromium. The digested samples were analyzed by using Graphite Furnace Atomic Absorption Spectrophotometer (GFAAS), in the Institute of Analytical Research and Service, BCSIR Laboratories, Dhaka, Bangladesh. The results showed that the mean concentrations of heavy metal, Cr was higher in liver than muscle. Higher levels of Cr were found in the fish feeds commercially available. Interestingly, there was also significant level of Cr observed in the controlled fish feed and fishes.

Keywords: Tilapia, bioaccumulation, chromium toxicity, fish feed, Hazaribagh tannery.

Parallel Session 2: Sustainable Cities and Communities (SDG 11)

1. Making Dhaka green, clean and sustainable: A critical insight into rooftop gardening

Authors: Muhammed Shahriar Haque¹, Md. Tanvir Ahamed Siddiki²

¹Professor of Department of English, East West University (EWU), and Executive Director, East West University Centre for Research and Training (EWUCRT).

²English Teacher, Lakehead Grammar School.

Abstract

In a megacity like Dhaka, where space is very scarce, rooftop gardening has the potential of making the city green, clean and sustainable. Hydroponic, aquaponic, soilless garden/gardening, requires less space and yields more productivity. However, how many people actually have the basic knowledge of such forms of rooftop gardening? To accommodate the constant inflow of people high-rise apartments are adorning the skyline of the capital of Bangladesh, which is fast-tracking into a concrete jungle. With the disappearance of greenery and the increase of air pollution, if long-term sustainable measures are not put in place now, this megacity will become not only uninhabitable and unsafe, but will also lose its resilience in terms of transforming into a modern cosmopolitan city. The intention of this study is twofold: to explore whether people are aware of the variety of rooftop gardening; to delineate the relevance of rooftop gardening in a megacity like Dhaka. The significance of this study cannot be undermined, as it is quite relevant to improve the quality of life in one of the densest, overcrowded and overpopulated cities in the world. Among myriad ways of making Dhaka inhabitable, green, clean and sustainable, one of them is through various types of rooftop gardening. Hence, a pioneering study of this nature is timely and quite pertinent. Methodology: This is a qualitative study, attempting to not only explore the significance of rooftop gardening but also find out whether people, in general, are aware of this form of gardening in Dhaka. Convenience sampling was employed to collect the data, through semi-structured interviews, from 100 people who owned and lived in their own building. Clear indications of major findings: People have a general concept of gardening, and not necessarily about rooftop gardening. None of the participants had a specific idea regarding the various aspects of rooftop gardening like hydroponic, aquaponic and/or soilless gardens. However, they were interested and would consider developing such forms of rooftop gardens if they were made aware and were given basic knowledge of these forms of agriculture. This small-scale study suggests even though people had limited or no knowledge regarding specific forms of rooftop gardening, they were quite interested in such forms of gardening.

Keywords: Rooftop gardening, hydroponic, aquaponic, soilless garden.

2. Bringing ecosystem services into urban landscapes

Author: Dan Richards

Project Coordinator, Ecosystem Services in Urban Landscapes Singapore-ETH Centre Future Cities Laboratory

Abstract

Cities have developed with little consideration of ecological principles and process. As a result, they face a number of environmental issues, including the urban heat island effect, and increased flood risk. Elevated urban temperatures, and elevated flood risk, may have even greater impacts on human well-being in tropical climates, due to their relatively high temperature and rainfall. To make cities more sustainable as they continue to grow in the future, we must integrate ecosystems, and the ecosystem services that they provide, within the urban fabric. Examples of ecosystem services include the cooling effect of vegetation, the role of tree canopies in regulating flood water, the aesthetic value of street greenery, and the potential for urban food production. A key first step in using ecosystem services within urban planning is to understand how the provision of ecosystem services depends on the quantity, quality, and distribution of trees and other vegetation within a city. This talk will outline the potential role that ecosystem services could have in future cities, and will discuss several ongoing research projects that aim to quantify ecosystem services in Singapore. The focus of the talk will be on regulating ecosystem services, and particularly temperature regulation; a key benefit that nature could provide in hot, humid, tropical cities. Data from a network of weather stations in Singapore, and a novel method of quantifying the provision of shade by street trees, will be discussed. The role of vegetation in providing opportunities for recreation and exercise will also be discussed.

3. Challenges of White Pollution for Green Chittagong City

Authors: Dr Sarmistha Das¹, Ms. Ananya Nandy²

¹Assistant Professor, Eastern Institute for Integrated Learning in Management (eiiim), Kolkata, India (Affiliated to Vidyasagar University),

²Lecturer, East Delta University, Chittagong, Bangladesh

Abstract

Widespread use of plastic bags in the unorganized retail sector is a growing concern in Chittagong City of Bangladesh. Among many environmental problems created by plastic bags, poor drainage system, water logging and flood are the major concerns for the city dwellers. Regardless the ban on plastic bags in 2002 by Bangladesh government, people are very much inclined to use low quality plastic bags for their daily shopping of fruits, vegetables and groceries, fish and meat from the local market, hence contributing to unlimited white pollution in the city. It is known that blanket ban policy of the government cannot be the key effective solution for such kind of problems. Hence to manage uncontrolled use of plastic bags can become policies of win-win solution from the users. This is mainly because the buyers in the market places receive the bags at free of cost and on the other hand the sellers are also prone to use the plastic bags though it involves cost for them. This study is an attempt to estimate a vivid picture of the present scenario towards the random use of plastic bags in the

unorganized retail market of Chittagong city, Bangladesh in respect of people's concern, knowledge and awareness along with their attitude. Primary data was collected using two separate structured questionnaires for both buyers and sellers from different categories of non branded retail shops such as fruits and vegetable, fish & meat, grocery, fast food and sweet corners in five different markets of Chittagong city were collected. The exploratory factor analysis is used to analyze the knowledge and behavior of both the groups separately in respect of required action for controlling while pollution and their eagerness for individual initiatives for such action.

4. Sustainable Rural Livelihood Practice: A case of Bangladesh

Author: Rakib Hossain

Monitoring and Evaluation officer, Help the Needy Charitable trust

Abstract

Like elsewhere, sustainable livelihood is now the buzzword in the sustainable development parlance of Bangladesh, the concept of sustainable livelihood (SL) is an attempt to go beyond the conventional definitions and approaches to poverty eradication. Those had been found to be too narrow because they focused only on certain aspects or manifestations of poverty such as low income, employment or did not consider other vital aspects of poverty such as vulnerability or social exclusion. In SLA recognized various factors and processes which either constraint or enhance poor's livelihood. In its simplest form, the framework depicts stakeholders as operating in a context of vulnerability, within which they have access to certain assets, these gain their meaning and value through the prevailing social, institutional and organizational environment (Transforming structure and process). This context decisively influences the livelihood strategies that are open to people in pursuit of their self-defined beneficial livelihood outcome. The sustainable livelihood links with security to basic human needs, food security, sustainable agricultural practices and poverty has integrating concept. The study used the SLA as a foundation or main basis of analytical tools to identify the means and ways to enhance livelihood of rural farmer or agricultural labor. Primary and secondary source of data used in the study. As data collection technique used both qualitative and quantitative methodologies. 300 structural interview and two FGD was conducted with 12 respondents. Modern statistical software SPSS used in analysis process. Data was collected from five village of Naogaon and Jessore (Naogaon two Village, Jessore three Village). From each village ten respondents were interviewed. A household where main wage earner consider agriculture as their first mean of livelihood elected as respondent for this study. Purposive sampling was followed during the study with set of quota to find the appropriate respondent to get a reliable result. The study investigated and synthesized the antecedents of relationship between livelihood outcome and its several independent variables. Peoples necessitate a range of assets to achieve their positive livelihood outcomes.

Parallel Session 3 and 6: Responsible Consumption and Production (SDG 12)

1. An Innovative Dairy Model Leading to Sustainable Development for the Rural People of Bangladesh

Authors: Dr. Shahana Afrose Chowdhury¹, Ms. Momtaz Faruki Chowdhury²

¹Research and Development Manager, Kazi Shahid Foundation

²Former Chief Executive Officer, Kazi Shahid Foundation

Abstract

Kazi Shahid Foundation (KSF), an independent welfare organization has promoted an innovative “Specialized Dairy Farming Model” linking with the commercial organic tea plantation, organic produces and biogas production to improve the rural community, particularly women, in the northern part of Bangladesh, Panchagarh district. This model aims to develop innovative farming systems to deliver economic value and environmental benefit and is implemented entirely through rural women. Due to KSF’s continuous efforts towards enhancing community based dairy farming, has now become one of the income generating activities for poor and marginal households. In the course of innovation and outreach development for entrepreneurial opportunity, such as, demonstration, commercialization, adopting scientific farming practices, significant increase in quality milk production and animal performance occur. The typical dairy farming models involve exchanging of cash, limit the potential for sustainable development, whereas, KSF Dairy Model provides milking cows and calves to its women members and repayment is based on milk and cow dung and also ensures risk minimization through cow insurance and veterinary care. Additionally, poor households receive technical and financial management support. Increasing opportunities for women is considered to have a powerful impact on productivity and agriculture-led growth. The beneficiaries of this dairy program become entrepreneurs and started dairy farming, selling milk and compost, improving their household incomes. Another direct advantage of small-scale milk production is the immediate nutritional benefit provided to growing children, which greatly contributes to a balanced diet. The distressed women who lived in utter miseries are now leading a better life by taking three meals a day along with other members of their families and sending their children to schools. The female dairy entrepreneurs now have been able to support their families financially and also been able to participate in decision making process. The Kazi Shahid Foundation has introduced organic vegetable farming to the people of Bangladesh. KSF provides the resources, financial capital and knowledge necessary for the community to grow organic food as well as collect vegetables directly from beneficiaries and supply them to the largest super market. Vermicomposting is generally known as a nutrient rich source of organic compost used in farming and small scale sustainable, organic farming. Vermicompost is an excellent soil conditioner and nutrient-rich bioactive fertilizer. Another KSF initiative is vermicomposting which encourages and trains the members to do it and use the compost in their organic produces.

Keywords: Dairy Model, “No cash” Microfinance, Organic Farming, Family Nutrition, Sustainable Development.

2. Prospect and Constrain of Responsible Consumption and production of Jute and Jute made product

Author: Arshad Siddiqui

Technical Manager, Learning & Advocacy, CARE Bangladesh.

Abstract

SWITCH-Asia Jute Value Chain project which implemented with the objective to promote the adoption of Sustainable Consumption and Production (SCP) of jute and jute diversified products. The project aims to train up 16,000 jute producers on modern jute cultivation to increase the quality production of jute fiber. The project also facilitates training of organic fertilizer and jute diversified products workers. There is also a series of activities to develop the skills of SMEs on quality production and acquainted with the international market trend. At national level coordination & advocacy level activities are also designed. The project working area were Upazillas in Rangpur and Kurigram districts are targeted to address pro-poor farmers and workers in jute sector. Based on the targeting of beneficiaries and geographic location, we can conclude that the project activities are designed to benefit right beneficiaries in right geographic location. Moreover, the project selected jute as the project can target pro-poor farmers and workers engaged in jute products to ensure green environment/economy. The project aims to address systemic challenges around three market systems within the jute subsector: Sourcing and use of quality inputs, the trade market systems (collection, sorting and grading of produce) and Value addition in jute products. It can be observed that the focus rests almost solely on the systemic constraints (for instance lack of knowledge of jute producers for retting jute fiber) that are impeding the private sector to contribute to the growth of the jute subsectors. The project does not necessarily address the systemic constraints that restrict the poor from accessing the services and products required to become productive.

3. Sustenance of craft through conservation and alliance

Author: Naushin Khair

Creative Director, Aranya, Founder of B Craft

Abstract

B Craft Initiatives is as a social enterprise aiming to set up a sustainable business model that will allow artisan communities in Bangladesh, which are under threat to access the market by vending their products through Aranya and other retail chains. These communities have skills in demand but no sustainable system in place, which is why it will create a system within which the artisan communities can directly access the mainstream market and sustain a better lifestyle supported by a social business framework. By ensuring market access and ethical practice in the supply chain, Bcraft Initiatives will structure a sustainable model to support the development of these communities. The organization will provide Research and Development support, Knowledge Transfer through trainings, Design Collaboration and incubation of Product Development for these communities to further develop their

business. It will continue to educate and train them to help produce cutting edge products up to par with the international market. The organization aims to contribute back to the communities addressing welfare and wellbeing of the artisan communities it works with. Bcraft Initiatives intends to co work with two platforms to create a close loop system: One being Bengal Craft Society, it will function as an NGO and A profit making entity, Aranya. One of the main concerns of Bengal Craft Society (the NGO) will be preservation and promotion of the handicrafts industry in Bangladesh. At the moment development of the handicrafts sector is stagnant. The system that exists is such a way that there is barely any innovative progression or advanced education in the said sector. There is also lack of resources to improve the design process. There is no solid market protection for the handicraft sector either. As a result the artisans lack motivation, they are limited to making products that are outdated and have minimal utilization, many limited to the use of decorative purposes and are offered very little pay. Bengal Craft Society while ensuring the preservation of these techniques will try to bridge the need of the artisans to enhance their skills while B craft Initiative will support the Creation of value added products which will give artisan a better chance to access wider consumer market. B craft Initiatives, the social business will work with an aim to revive and sustain the industry commercially therefore the focus of Bengal Craft society, the NGO will be on research and development, welfare aspects of the artisans. Initially, the RnD will occur in three phases: a) mapping - tracing the roots and activities of the artisans and their products b) Formulate welfare schemes, and c) Creating platforms for the Handicraft sector. Bcraft will provide them guaranteed market access, specifically through Aranya which is a local Fair trade label established in 1992. Its philosophy has always focused on empowering underprivileged artisans and producers in Bangladesh along with reviving the use of Natural Dyes and promoting handicraft of Bangladesh. Aranya strives to promote and revive old traditional techniques of vegetable dye, use of handloom fabric and Bangladesh's handicraftsmanship. As more time passes, the need to adjust to the contemporary market is becoming more necessary. In fact, the survival of these traditional techniques and handicrafts will depend on its capacity to adapt.

4. The Positive Inception and Flawed Progression of Aquaculture: The Case of Gurudaspur, Natore

Authors: Saman Saad¹, Raisa Bashar², Nazmul A. Khan³

¹ Undergraduate Student, Environmental Science and Management (ESM) department, North South University

² Lecturer, Environmental Science and Management (ESM) department, North South University

³ Professor, Environmental Science and Management (ESM) department, North South University

Abstract

Aquaculture is perceived as a game-changer in several small towns and villages of Bangladesh, and Gurudaspur of Natore region is no different. From as early as the late 1970s, aquaculture has been a part of this area's people's livelihoods, improving their economic/social statuses, and from 1990s onwards it brought about a great economic boost. However, this was not always the scenario; the main livelihood of Gurudaspur's villages was agriculture. The economic condition of the residents, then,

was very poor and many families would not be able to earn enough to eat three meals, let alone invest to expand their incomes. So, it would not be wrong in saying that aquaculture was the main driving force that brought about poverty alleviation in the region. The mud/tin houses were replaced by brick and mortar ones which were often two-storeyed high now, women of the house no longer worked hard for household chores like bringing water from far away tube wells (some could even afford maids) and there was plenty of income to consume necessary items, luxury goods and also invest to expand the aquaculture business. However, in the last decade and at present, several negative externalities of this practice has started to surface, including severe water-logging, depletion of water resources and economic losses. These issues can be attributed to unplanned fish-pond cutting and free entry into the arena. Although, smaller businesses were ousted by the larger ones and those who were former owners of smaller fish-farms now work at the larger farms, there's still too many farms in a place too small: hence, economies of scale has long run out. Keeping this scenario as background and with the rationale to present the story of Gurudaspur's aquaculture arena to the people, identify the production flaws along the years and attempt to find some solutions to the problems, this research was initiated. The resulting report tried to capture the change in the economic condition of people associated with small-scale aquaculture through focused group discussions with the owners and workers about their past and present incomes, before and after they started fish-farming, in two villages of Gurudaspur, namely Brigarila and Maharajpur. The authors' observations about the present status of the owners of the fish-farms are also noted in the report, along with some recommendations based on the local governments' advices and initiatives to stop new pond-cutting (which isn't seeing much success). There is no doubt that even though aquaculture in Gurudaspur saw a positive inception, its progression was flawed and, consequently, the mentioned problems are becoming bigger as days go by. Although, Maharajpur's water-logging problem is not that severe (due to the higher literacy level of its residents), Brigarila's condition is already very dire and worsening day by day. It is the conclusion of the authors that Gurudaspur's aquaculture practices are unplanned and hence, unsustainable and will soon not yield any more profits, leaving several hundreds in an economic downturn, if proper drainage systems and laws are not implemented, coupled with relevant training and education.

Keywords: aquaculture; Gurudaspur; Natore; fish - farming; water logging.

5. Social and Economic Transformation of the Ultra-poor(SETU): A model for graduation and sustainable empowerment of the poor

Author: Anowarul Haq

Director, Extreme Rural Poverty Program, CARE Bangladesh

Abstract

SETU aimed at achieving economic, social and political empowerment for targeted extreme poor households of northwest Bangladesh for sustainable graduation out of extreme poverty. The SETU project had been implemented by CARE-Bangladesh from March 2009 to August 2016. In this period of 7 years the project has worked with 1,454 communities (hamlets) in 25 Unions of 7 Upazillas under 4 districts of the northwest region of Bangladesh. The number of total direct beneficiary households (BHHs) reached through the project is 45,000 households. Methodology The core of SETU approach is community-led total development that helped to develop Community Action Plan based on Participatory Poverty Analysis to address underlying causes of deprivation and marginalization. The process enhanced pro-poor and inclusive local leadership, community solidarity and building resilient communities through self-help groups and constructive engagement with Union Parishad and both Government and private service providers. The project facilitated access to economic opportunities—expanding opportunities, exploring untapped potentials and linking markets/industries. It used value chain analysis to identify potential sectors for engaging the poorest. SETU then provided beneficiary households (BHH) with assets (start-up capital) for income generating activity (IGA). It also provided nutrition supplements and counselling, business and other forms of training. The SETU model consists of following major areas of intervention - Facilitation of community-led total sanitation (CLTS) as entry point for community mobilization; - Provide cash input support for Income Generation Activities based on locally available skills, resources and opportunities; - Private Sector Engagement for sustainable income/employment of the targeted household members; - Supporting development of social enterprise (NCVI) and entrepreneurship for socio-economic uplifting; - Facilitating rural market development and external linkage for promotion of income opportunities; - Building and strengthening community action groups/platforms (Para unnayan committee, community based savings groups, EKATA groups, Natural Leaders Organizations-NLO) for community solidarity, collective actions and empowerment. Indication of major findings & conclusion Major achievement of SETU project lies on graduating the extreme-poor specially women by securing sustainable livelihood options and building community resilience. By the end of the project, women from SETU beneficiary households are running 698 community-based savings groups and 225 EKATA groups, dealing with the issues around their lives and livelihoods, and participating in decision-making process at household and community level, and some at UP level through Natural Leader Organization (NLO). They have also participated in the UP standing committees. Early marriage, domestic violence and men-women wage gap are at a decline. With this, CLTS ensured 99% sanitation in the intervention area. Nijera Village and Cottage Industry (NCVI), branded as Living Blue, has been established that has created work opportunity for 1700 households. To strengthen household resilience against health shocks of the disadvantaged communities, a total of 2477 BHHs enrolled in 100 Community Based Savings Groups (CBSG) have been brought under micro health insurance support.

6. Sustainability Assessment of the Shrimp Fry Collectors in Paikgacha Thana of Khulna District: An In-depth Study of Their Livelihood Pattern

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Abstract

The Southwest Coastal Region of Bangladesh is a tidal flood plain located at the southern end of the Ganges delta in Bangladesh. People in south-west coastal region are highly dependent on the natural resource base to sustain their livelihoods. Shrimp culture has changed the livelihood pattern of the people from coastal region of Bangladesh. Since 80th decade fry collection has become the chief source of livelihood for women and children in many coastal areas. Most of the shrimp fry collectors are living with great sorrows. The overall condition of this area is very squat. Salinity and water logging is the general characters of this area. Shrimp fry collectors are the deprived people of this deprived zone of Bangladesh. Surviving the livelihood near about 85 percent population, both males and females were engaged in shrimp fry collection in all around the year. Almost 85 percent of people are spending 4-9 hours for shrimp fry collection but they are gaining only about 2000-5000 taka per month. Moreover, the income depends on seasonal variation. Therefore, they are lying in the deprivation stage of poverty. The level of income and income distortion determines their way of life. The occupation of shrimp fry collectors is playing the negative role by perpetuating gender discrimination. As above 60 percent of women must work both in shrimp fry collection and household works. The deprivation of shrimp fry collectors ranges up to housing and settlement, as about 42% dwellings occupies type-C housing, which built of mud and bamboo mat with golpata or straw roof while 61% kitchen unit constructed with wood/straw/golpata wall and golpata or straw roof. The poor land ownership signifies that only 18% households have their own homestead, 28% households lived on the lands, which belonged to Water development board. That is why the livelihood of the shrimp fry collectors remain in the vicious cycle of poverty. The livelihood of the shrimp fry collectors is affected by natural disasters but they are coping with their indigenous practices to sustain. Shrimp fry collectors are deprived in respect of social, physical, financial and natural capital. Therefore, they are not enjoying a sustainable livelihood. For the betterment of natural ecosystem and social welfare incentives is necessary to ensure a better and sustainable livelihood for the shrimp farmer. Moreover, due to the ecological and environmental changes caused by shrimp culture, the people are forced to change their age-old profession and asset. The study was the initiative of identifying or developing best sustainable alternative livelihood based on the local resource base through analyzing the existing livelihood of shrimp fry collectors.

Keywords: Sustainable livelihood, salinity, water-logging, Shrimp culture, fry collectors, natural disaster, natural ecosystem.

Parallel Session 4 and 10: Affordable and Clean Energy (SDG 7)

1. Solar Bottle Light: An Alternative Source of Energy in Bangladesh

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Abstract

The alarming rise in global warming and rapidly depleting non-renewable natural resources have sent ripples of anxiety which, at present, is being demonstrated by the widespread research being carried out on alternative, clean and sustainable energy sources. This article highlights the innovation of Solar Bottle Lights (SBLs) which are to be used at grass root levels as an alternative source of light energy. This is especially effective for low and middle income countries where spread of modern technology is not rampant. We conducted experiments by approaching slums in Bangladesh to install the SBLs. We did so by means of running campaigns, survey and interviewing the slum dwellers. Upon installing the SBLs for the enthusiasts, we kept track of electric bulb usage and people's acceptance rate. This gave us an opportunity to understand that the SBLs are highly effective in terms energy conservation (by up to 171.4 GWh/year in slum areas of Bangladesh) and carbon footprint reduction (by up to 87.9 Million MT/year in slum areas of Bangladesh). The enormous potential of SBLs as a mean to sustainable energy acquisition can be unlocked if it can be produced and consumed at a massive scale across the globe.

2. Feasibility of Solar-biomass Hybrid Cold Storage for Un-electrified Rural Areas of Bangladesh

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Abstract

The aim of this research was to investigate the economic and technical feasibility of a solar-biomass hybrid cold storage to prevent the loss of potatoes at the farmer level. This study mainly focused on a 20 MT cold storage facility. A similar model based on a hybrid between solar and biomass energy has already been tested successfully in India. This model will be used as an example with possible adjustments made to fit it in the context of Bangladesh. This study has two main objectives: to determine whether the hybrid-cooling model is technically and economically feasible and to address the potential scope for its implementation in rural off-grid areas where no grid connection is expected within the next 15 years. In order to fulfill the objectives of the feasibility study, field and company visits were undertaken in Bangladesh, India and the Netherlands. The study was mostly qualitative in nature and utilized standard data collection techniques: In-Depth Interviews (IDIs), Key Informant Interviews (KIIs), Focus Group Discussions (FGDs) and direct observations, with some quantitative

calculations. The report starts with a review of relevant literature on the importance of potato storage, cold storage techniques and various renewable energy based cooling technologies. Three renewable energy models are discussed in the paper, i) solar based model, ii) biomass based model iii) solar-biomass hybrid model. The economic and technical feasibility of solar cooling, biomass-based cooling and solar-biomass hybrid cold storage is discussed to get a broader sense of the feasibility parameters. All three models are expected to have a significantly negative NPV, mainly due to the large investment costs. This implies that the economic feasibility will strongly rely on subsidies from governments or other organizations. Given the fact that India is already operating cold storage facilities that are run by solar and biomass energy with the support of their government, it is assumed that this may be possible for the case of Bangladesh. The hybrid model will require a larger investment outlay due to the additional components, but there are significant cost reduction opportunities once the model is standardized and commercialized. Furthermore, the findings suggest that implementation of all three of the evaluated renewable energy based cold storage models is feasible in Bangladesh when appropriate use is made of potential revenue streams from by-products such as silica, from ash and from excess electricity for village electrification. However, a number of issues need consideration beforehand such as the appropriate location and technology need to be chosen and expert opinion is needed during the design and implementation phase.

Keywords: cold storage, potatoes, solar, biomass, hybrid, energy.

3. Sustainable Energy Options for Bangladesh: Emerging Challenges

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Abstract

Fossil fuels, especially coal, are known to be “dirty energy” for emission of greenhouse gases (GHGs) and there is a global emphasis on renewable energy. On the other hand, Bangladesh Power Development Board is setting up more coal-fired power plants including that of Rampal power plant in an energy-deficient country, like Bangladesh. Based on these two contradictions, the paper looked into emerging challenges in energy sector and how to overcome them in order to achieving sustainable energy in Bangladesh. As we are heading towards coal energy, should we explore our own indigenous coal lying untapped in four economically accessible coal mines? Or we import to run our coal-fired power plants and keep our indigenous coal buried underground? If we explore them, what method do we follow? Open pit, underground or gasification? Having a “National Coal Policy” in draft form in last two decades, question arises, should we be using this GHG emitting fuel or looking for other alternatives? Whether we should say “No” to coal for polluting the environment and concentrate more on renewable energy? Or go for coal-based power plants? With a miserably frustrating slow growth renewable energy, against the backdrop of a fast growing economy with steady growth rate, energy policy planners, policy executives, environmentalists, natural resource conservationists are looking for a viable alternative for Bangladesh energy sector. As the developed countries continue to remain heavily dependent on coal-based power plants, can Bangladesh have the luxury of shying away from indigenous coal and look for other alternatives? The paper tried to address some of these emerging questions in a candid manner. Objectives: The objectives of the paper are to look into the

pollution of coal-fired power plants and other polluting nonrenewable energy operated plants, while searching for a viable energy policy option for Bangladesh. The paper intends to deliberate on the current debate between renewable and nonrenewable energy and suggest a viable energy policy option for the country. Research Statement: Before saying “No” to coal, the utility of a coal-fired power plant to be further examined for achieving sustainable energy development for Bangladesh. Methodology: The paper would mainly use secondary sources of data available in print and electronic media. The author’s book on Environmental Governance: Emerging Challenges for Bangladesh and similar other literatures would be found handy in writing this paper. Key themes/Findings/Discussions: The paper is expected to come out with a series of recommendations promoting sustainable energy for the country.

4. The Drivers and Barriers to the Deployment of Solar Home Systems in Rural Bangladesh

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Abstract

Bangladesh faces a variety of energy related constraints to development. However, it has vast untapped renewable energy resources. Harnessing of these untapped renewable energy resources is necessary to bring Bangladesh closer to achieving the sustainable development goal of ensuring access to affordable, reliable, sustainable and modern energy for all.

This investigation identifies the drivers and barriers to the deployment of Solar Home Systems (SHSs) in rural Bangladesh from the consumers’ perspective through the framework of the consumer buying process. The term drivers refer to factors that motivate consumers to purchase the renewable energy technologies (RET) whereas barriers refer to factors that deterred respondents from purchasing the product or delayed the purchase of the technology. This study used a qualitative approach with in-depth semi-structured interviews. One hundred and nine interviews were conducted of three groups of respondents: customers, non-customers, and employees of Grameen Shakti, Bangladesh’s largest renewable energy company, in field locations in Gazipur, Shariatpur and Manikganj districts of Bangladesh. Opportunistic sampling was utilized to select respondents with the aid of local Grameen Shakti employees as key informants. The research specifically targeted small scale SHS customers with system capacity ranging from 20 to 85 Wp.

Observed drivers include demand for better quality lighting, housekeeping considerations and conveniences, demand for modern communication devices as well as financial, technical, social, environmental and aesthetic factors. Barriers include financial, technical and informational considerations.

The lessons derived from this investigation contribute to existing academic literature on RET deployment and may be utilized in helping develop RET products, programs and services in other developing countries facing similar challenges.

Keywords: Solar home systems, solar energy, Bangladesh.

5. Renewable Energy Practice: A Sustainable Clean Energy for all People of Bangladesh

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Abstract

Power is one of the most significant factors for development of any countries. The demand for power is growing in all over the world including Bangladesh as a result for thirst of having better living standards. However, the country cannot meet the total demand of 7000 MW energy per day, we only can produce 4500-4600 MW per day. Most of the generated power in Bangladesh comes from fossil fuel (natural gas, diesel and coal) driven power stations. Reserved natural gas has been depleted at an alarming rate because of extensive withdrawal; current projection shows that it will last only a few decades at existing consumption rate. Over 70% of Bangladesh lies outside the national grid system, 40% of the people in this area are living below the poverty line. On the other hand, increasing use of fossil fuel puts additional threats on climate change. To combat these circumstances, renewable energy technology should be the most prospective source to meet the energy demand and can contribute to achieve sustainable environmental-friendly development as our country has plentiful supply of some renewable energy.

Bangladesh is a subtropical country with 70% of year sunlight is dropped here. For this reason, we can use solar panels to produce electricity largely which will bolster household and transport energy demand. Germany produces 18 GW of energy with only half the solar radiation received by Bangladesh. This study has identified suitable locations, amount of probable produced energy and estimated cost. The prospects of wind energy and hydro-electricity are also being studied. The cities of Bangladesh generate almost 16,015 tons of waste per day which will increase up to 47,000 tons per day by 2025 due to growth both in population and the increase in per capita waste generation. Waste to Energy can be another source for fulfilling country's energy demand. Biomass fuel using cattle dung, agricultural residue, poultry dropping, risk husk and urban organic waste is a perfect source of renewable energy in the context of Bangladesh. Cost and supply chain of Waste to Energy has been discussed in the paper. Existing national and international policies and agreements for renewable energy to combat climate change impacts are being reviewed. It has been found that Bangladesh has the capacity to achieve 100% renewable energy by 2050 since we have access to renewable energy sources. However, the main constraint is financial. The initial installment cost of solar panel to produce large amount of energy is very high. Establishment of incinerators for burning waste to produce energy is also very costly. Nevertheless, because of the Paris Agreement, our country will get some financial support from developed countries to increase the ability for mitigating greenhouse gas emissions, adapting to the adverse impacts of climate change and fostering climate resilience. We should take renewable energy projects using this fund. Moreover, instead of investing more money for fossil fuel power plant, our Government should finance in renewable energy industry.

Parallel Session 5: Water and Sanitation (SDG 6)

1. Drinking water supply through reverse osmosis technology: A solution for water shortages in coastal rural areas of Bangladesh

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Abstract

Reverse Osmosis (RO) technology is a newly generated feasible option of fresh water source in the coastal rural areas of Bangladesh. The research has been undertaken to know the present water security status of the study area. The study also focuses to strengthen water security for the coastal households by using reverse osmosis technology. The people of the study area face safe drinking water shortages problem all year round but during dry season the problem becomes more acute. The study was conducted using questionnaire survey method, Focus Group Discussion (FGD), Key Informant Interview (KII), water sample collection and testing to find out the water security status of the study area. During questionnaire survey, mainly the head of the households were interviewed. Drinking water samples were collected from the randomly selected households of the study area for laboratory testing. The present status of drinking water sources, respondent's perception of drinking water facilities, distance of water sources, general information of the pond, water collection system, water samples test result and health risk problems were assessed to measure the water security status of the area. From the survey and test results, it reveals that the people of the area facing severe fresh drinking water crisis. It is found that about 60% households of the study area are in water insecurity problem. A generalized feasibility test of a reverse osmosis plant was done which indicates that the reverse osmosis system is more technical and economically feasible drinking water source among other technologies of the study area. The system can also play a great role for strengthening water security for the coastal rural households of the study area.

Keywords: Drinking Water Supply; Reverse Osmosis; Water Shortages.

2. Solid Waste Generation and Management: A Case Study on Chuadanga Municipality

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Abstract

Solid waste is the unwanted or useless solid material generated from combined residential, industrial and commercial activities in a given area. And waste management is all those activities and action required to manage waste from its inception to its final disposal. To know the solid waste management system and the impacts of it on environment some phenomena as like as sources of solid waste, waste storage and management system etc. are considered in this study. For this study, a questionnaire survey was conducted on 50 respondents and informal interview on 45 respondents of Chuadanga municipality in Chuadanga Sadar Upazila. It is observed that household, vegetable market, hospital and clinic are the main sources of solid waste. Mainly 40% wastes are collected in morning and pick up, van gari are used to collect waste. Among total waste 38% are threw in river and 26% are used in land filling. To find the impact of solid waste on different elements of environment, this study considered people's perception. Most of the people said that river water is polluted by solid waste that spread different types of infectious diseases such as Diarrhoea, Dysentery, Cholera, Typhoid, itching and others. Solid waste has a great impact on flora and fauna. Many biological habitants are ruined and many types of plant species are extinct. Solid waste also has an impact on air. About 86 percent people responded positively and 4 percent negatively and 10 percent people did not respond about air pollution by solid waste. Municipality dwellers believed lacking of proper management of solid waste are responsible for environment pollution. For preventing environmental degradation it is urgent need to take proper steps. In this respect it is important to increase awareness among people.

Keywords: Solid Waste, Management, Land Filling, Diseases, Pollution, Degradation, Awareness.

3. Suitable Water Options for the Arsenic and Salinity Zone of Bangladesh

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Abstract

Bangladesh has successfully achieved Millennium Development Goal (MDG) target on water supply by attaining 87% water supply coverage from improved water sources; this is a remarkable success. Now the Government of Bangladesh and relevant stakeholders are focusing their attention on achieving Target 6.1 of Sustainable Development Goals (SDGs) – “By 2030, Achieve Universal and Equitable Access to Safe and Affordable Drinking Water for All”. Achieving SDG Target 6.1 is a significant challenge for Bangladesh. Among other issues, ensuring “safe” water for all is a particularly difficult challenge; and with regard to safety, ensuring arsenic-safe water is probably the single most difficult and important challenge; microbial contamination of water is the other major safety concern. Although over 97 percent of households in Bangladesh use water from improved sources, but after adjusting for arsenic contamination, the coverage figure is reduced to about 87 percent. The widespread arsenic contamination of groundwater in south, south-west, south-central and north-eastern regions of Bangladesh is posing a major threat to safe water supply. The other major challenge toward achieving SDG Target 6.1 is ensuring supply of potable water in the salinity-affected coastal areas; many of these salinity-affected areas also suffer from arsenic contamination of groundwater. Water supply in coastal areas is predicted to become more vulnerable due to possible impacts of climate change, including sea level rise, reduction in upstream flows and increased frequency of extreme weather events. In this backdrop, World Vision Bangladesh and ITN-BUET took up a study on “Suitable Water Options for the Arsenic and Salinity Zone of Bangladesh”. The specific objectives of the study were to assess available water options for mitigation of arsenic problem and salinity problem in selected areas of Bangladesh (arsenic affected Laksam, Comilla and salinity-affected Assasuni, Satkhira). The assessment was carried out through extensive field visits, questionnaire survey, evaluation of technology and water quality, and consultation with all relevant stakeholders. The water options/ technologies assessed in this study included STW, DTW, deep-set pumps; arsenic removal technologies (e.g., Sidko plant and READ-F); and alternative technologies such as rainwater harvesting (RWH), pond sand filter (PSF), and managed aquifer recharge (MAR). Based on this study, deep tubewell and certain arsenic treatment technologies (e.g., AIRPs and Sidko plant) appear to be the most promising option for arsenic-affected areas; PSFs (fitted with pumps) could also be a promising option in such areas. In salinity prone areas, deep tubewells (where feasible) and alternative technologies such as PSF and RWH appear to be the promising options; desalination (using suitable technologies) could also be a promising option. An interesting finding from the study was that groundwater quality as well as subsurface geology varies significantly over small spatial scales (e.g., two adjacent Unions in an Upazila). Hence, technology mapping (with regard to groundwater based technologies) based on studies carried out over larger spatial scales could be misleading in some cases. This study by World Vision Bangladesh and ITN-BUET would contribute to our national efforts in achieving SDG Target 6.1 by addressing the two most difficult challenges in the path of achieving this target.

Parallel Session 7: Climate Action (SDG 13)

1. Short-Lived Climate Pollutants (SLCPs) are adversely contributing to Climate Change and Mitigation Strategy in Bangladesh

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Abstract

Short-lived climate pollutants (SLCPs) are agents that have a relatively short lifetime in the atmosphere - a few days to a few decades - and a warming influence on climate change. Short Lived Climate Pollutants (SLCPs) refer to four types of pollutants: Black Carbon (BC) (soot); Methane; Tropospheric Ozone (O₃); and some Hydrofluorocarbons (HFCs), which are the most important contributors to the human enhancement of the global greenhouse effect after CO₂. The HFCs created to replace ozone-depleting chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs). The emission associated with Short-Lived Climate Pollutants (SLCPs) are harming millions of peoples around the world through their direct and indirect impacts on human health, agriculture, ecosystems, biodiversity, and global and regional climate. The SLCPs have significant adverse impacts on health, agriculture, and climate. Black carbon (BC) and ozone cause adverse health impacts, leading to premature deaths worldwide. Ozone is also the most important air pollutant responsible for reducing crop yields. Possible crop yield loss from high O₃ is also a major concern. Black carbon and ozone in lower atmosphere also have regional and global climate impacts. They disturb tropical rainfall and regional circulation patterns such as the Asian monsoon, affecting the livelihoods of millions of people. In addition to that, black carbon influences the formation of clouds that have a negative effect on photosynthesis that impacts plants growth. Every year, nearly 7 million people die prematurely from indoor and outdoor air pollution. In Bangladesh, the major sources of BC from diesel vehicles, brick kilns, cookstoves, rice parboiling, forest fires, open burning agriculture and some industrial facilities, re-suspended dust from construction activities, roads, metal smelting and cement factories. It has a warming impact on climate 460-1500 times stronger than CO₂. Important methane sources in the country include domestic wastewater, livestock/ poultry, flooded rice cultivation, and solid waste. The major sources of methane emissions include domestic wastewater, rice cultivation, livestock, paddy, poultry, and solid waste. Livestock contribute both directly and indirectly to climate change through the emissions of greenhouse gases such as carbon dioxide, methane and nitrous oxide. As the SLCPs have direct adverse impacts on the economy, health, agriculture production, ecosystems and biodiversity conservation and a warming influence on climate change, so it should take strategic measurement to reduce and mitigate the SLCPs. To reduce black carbon emissions from three sectors such as transport, residential and industry like brick kiln and rice parboiling. Among these measures, it is necessary to focus on introducing clean burning biomass stoves for cooking, encouraging diesel to CNG conversion vehicles, replacing traditional brick kilns with modern technologies and stopping the burning of agricultural residue. To reduce methane emissions from three sectors, like fossil fuel production and transport, waste management and agriculture and livestock. To reduce and mitigate the impact 5 measures are necessary- controlling methane from livestock through anaerobic digestion, reduction of fugitive emission from gas transmission pipelines, establishment/expansion of sewerage system and municipal wastewater treatment plant in major urban centers, landfill methane gas collection and intermittent aeration of continuously flooded rice fields. To reduce HFCs, considering use of R-600a for refrigerator and R-290 for small air coolers.

2. Climate Induced Displacement and Livelihood Choices: Evidence from Slum Areas in Dhaka Metropolitan City

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Abstract

People of Bangladesh, particularly in the coastal areas face serious and relatively rapid alterations to ecological and social systems induced by climatic factors and are forced to adopt migration to cities as a coping strategy. Disasters such as floods, cyclones, erosion of land, tornados, arsenic contamination in groundwater, water logging, salinity intrusion are intensifying gradually because of climate change and adding to the risk and vulnerability of the rural and extremely poor community. This paper focuses on the livelihood choices and labor market performances of displaced individuals for environmental reasons in contrast to economic migrants. Using a representative and random survey data from five slum areas in Dhaka Metropolitan city, I try to identify the occupation choice, number of hours worked, the remuneration received and the overall economic well being of the environmentally displaced individuals. I also investigate whether the nature of climate induced displacement is temporary or permanent, *ceteris paribus*. The role of land holdings in origin, human capital, savings and access to credit for coping in a new, unfamiliar system of social protection is also analyzed. I find that some of the occupation choices in the informal sector are propelled by lack of credit and skill deficiency. There is no discernible difference between climate and economic migrants in terms of occupation choice but climate migrants work longer hours and have significantly less average monthly household income, well below the urban poverty line. They spend significantly less on food, and may face nutritional deficiency compared to the counter facts. The propensity of savings is lower for climate migrants. They are less likely to own any land and are more likely to finance their migration by eroding savings and assets. They are unlikely to return to their roots adding to the pressure on the urban metropolitan areas or cities.

Keywords: Economic and Climate migrants, Coping strategy, Dhaka slums, Well-being, Labor Market.

3. Numerical Simulation to estimate effect of climate change on water resources in South Asia.

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Abstract

Climate change is the latest entrants to a long list of variables that may enhance the temporal and spatial variation in resource availability. All forecasts point towards increasing water stress with exploding demand, especially urban, putting pressure on unevenly distributed, limited and increasingly variable resources. Climate change and extreme weather condition along with non-organized local governance and policies making this even worse. Unless local, national and global communities come together and dramatically improve the way we envision and manage water, there will be many more hungry villages

and degraded environments and economic development itself will be put at risk in many countries. The problems associated with water conflicts are well-recognized and the United Nations Sustainable Development Goals adopted in 2015 will not be achieved without sustainably solving the problem of water scarcity especially in developing nations with limited infrastructure. Considering the above fact, this study focused on estimating the effect of rapid population growth, urbanization with infrastructure development and climate change on different aspect of water resources (both quantity and quality) using WEAP model (numerical simulation tool) in Manila and Kathmandu. Here reference year is 2000 and projection is made for the year 2030. Five indicators important for aquatic ecosystem health viz. Dissolved Oxygen (DO), Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD) and Nitrate (NO₃), were simulated to assess river pollution. It is found that despite having master plan (including addition wastewater treatment plan to take care of addition wastewater treatment generated due to population burst) water quality (unmet demand) and quality getting worse in year 2030. Trend for water quality deterioration clearly indicates that current planned wastewater treatment plants and policies are not sufficient enough for sustainable water resource management within these cities and hence call for immediate and inclusive action.

Keywords: BOD, DO, river pollution, wastewater management, water quality modelling.

4. An assessment of the climate change induced vulnerabilities of coastal regions and adaptation practices of coastal crop agriculture in Bangladesh

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Abstract

Even though Bangladesh is the least contributor to the impacts of climate change, this country is one of the worst victims of its consequences. The coastal belt of Bangladesh is naturally inclined to vulnerability of climatic hazards and the agricultural sector in that region is under serious threat where climate poses disappointing effects on agriculture. This urges the need for adaptation in the agricultural sector to fight against the climatic stressors, reduce vulnerability and for sustainable agriculture. This study aims to assess the climatic vulnerability of the coastal crop agriculture due to climate change impacts and the existing adaptation practices in the crop agriculture to battle against the climatic stressors. This study is based on climatic scenarios, impact analysis of climatic vulnerability particularly sea level rise and cyclone. This study gives a glimpse on climate change impacts, vulnerabilities of the coastal zone due to climate change and adaptation practices in the crop agriculture through a systematic review. We devised our own ranking method based on the pool of literature resources and identified the agricultural sector as the most vulnerable due to climate change induced impacts in the coast. Furthermore, the study reveals that sea level rise and cyclone are the major threats for the coastal agriculture and these two events are experiencing an increasing trend in the recent years in terms of their impacts. The study also mentions that the adaptation practices in the crop agriculture are not satisfactory however, the number and range of the practices are increasing. Floating gardens, ditch-dyke cropping, crop diversification, mulching are some of the promising adaptation practices in the coastal region. The study recommends that government and non-government organizations in

collaboration with the coastal community should come forward to play the key role in strengthening the adaptation programs. Higher level of research for the development of more climate resilient adaptation practices, evaluation of their effectiveness, and scaling up these practices are required.

5. Evaluation of standing order on disaster during Sidr in the coastal region of Bangladesh

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Junior Environmentalist, NKDM Association MRT Line-6 Gulshan-1, Dhaka Bangladesh.

Abstract

The study was conducted to get an idea about the level of implementation of Standing Order on Disaster in the Patuakhali and Barguna Districts, the most affected coastal regions of Bangladesh, during one of the most devastating cyclone Sidr. History shows that Bangladesh is geographically very prone to natural disasters specially cyclones. Tropical cyclone Sidr was a category 5 cyclone which made landfall in Bangladesh on 15th November 2007, causing a storm surge of up to 5m across much of the country. It was one of the worst natural disasters to occur in Bangladesh, with estimates of up to 10,000 deaths (GoB, 2008). Government of Bangladesh has the Standing Orders on Disaster (SOD) since 1997, which is a living document and the revised SOD has been prepared in 2010 where the tasks and responsibilities of the citizen, public representatives, ministries, agencies and non-government organizations have been clearly spelled out with clarity (SOD, 2010). The study was designed to bring out the level of concern about the SOD in three stages of disaster of both the government level people and local people. Study on government level showed that 21.86% respondents thought that there were lacking in warning period of SOD; 18.75% respondents thought that there were lacking in post disaster period of SOD; 87.5% respondents thought that SOD was enough for the community and they thought the major reasons of the huge loss during Sidr were lack of better and earlier warning, unprotected and insufficient embankments, less developed infrastructure and communication system, lack of enough supportive people, insufficient and old cyclone shelters and lack of awareness. It showed that there was overall 85.85%, 78.7% and 89.07% implementation of SOD during the three stages of Sidr in the surveyed area. Though according to the general inhabitants, there is only 43.32% implementation of SOD in the three stages of Sidr. Overall lacking of SOD among three Disaster Management Committees in three stages of Sidr has been observed as 16.67%, 83.33% and 19.44% according to the Upazila DMC, Union DMC and Pourashava DMC members respectively. As the demand of people towards the authorities are concentrated in more and strong embankments alongside the rivers and localities, supply of pure drinking water and dry foods during disaster, building faithful list of affected people for serving relief, more cyclone shelters close to localities, fighter field workers and vast warning telecasting for being prepared.

Parallel Session 8: Life below Water (SDG 14)

1. Application of Cultural services in coastal ecosystem management: Meanings, opportunities and associated pitfalls

Authors: Dr. Shamik Chakraborty¹, Dr. Shantanu Kumar Saha².

¹JSPS-UNU Postdoctoral Fellow, UNU-IAS

²Senior Lecturer-cum-Research Associate, Center for Sustainable Development, University of Liberal Arts Bangladesh (ULAB)

Abstract

Ecosystem service (ES) assessment has recently become a widely applied concept for holistic management of ecosystems for human well-being. ES oriented landscape management has increased particularly since the publication of Millennium Ecosystem Assessment (MEA). Among different ES categories and their application to landscape level, still a relatively less studied aspect remains to be cultural services; particularly because of methodological challenges they incorporate. This is particularly in the case of coastal ecosystems since the interaction between these ecosystems and humans take place with a handful of people who are directly related to coastal resources. Accordingly, this paper, through a review of literature, critically analyzes the meanings, opportunities, and potential pitfalls of application of cultural ES in coastal ecosystems. Assessment of cultural ES often requires qualitative research designs for visualization of the particular ESs they provide. Cultural ES assessments also need stakeholder/community value judgments and thus may be more efficient in bringing the 'real' situation that is based on the affected communities and not based on researcher's ideas of ecosystem management that may set management interventions apart from real world scenario. Their mismanagement (especially those arising from misconception) and loss may lead to ecosystem disservices - a much less explored area of ES assessments - with impairment of human's connection to biodiversity and ecosystem services. Connections of humans and ecosystems are often linked through traditional systems of resource management, the erosion of which can make co-evolution of coastal communities with balance of intrinsic (optional or bequest) and instrumental (direct use) values a difficult. These aspects are integral for managing coastal resources such as fisheries, coastal agriculture, and estuarine habitats. Elements such as biodiversity and their functional characteristics over these seascapes make ES available for human well-being. Thus, a critical analysis of these issues may lead to better understandings for assessing wide array of cultural connections to coastal ecosystems: a vital parameter for achieving universal calls for achieving sustainable development such as the SDGs with ecosystem oriented development in the coming future.

Keywords: Coastal ecosystems, cultural services, human well-being, qualitative research design.

2. Optimizing fishing catch and the protection of marine megafauna through marine spatial planning with Hilsa fishermen in Bangladesh

Authors: Rubaiyat Mowgli Mansur¹, Mahmud Rahman, Elisabeth Fahrni Mansur², Brian D. Smith³

¹Country Representative and Principal Researcher, World Conservation Society (WCS), Bangladesh

²Director, Education & Livelihoods, World Conservation Society, Bangladesh

³International Program Director, World Conservation Society, Bangladesh

Abstract

Wildlife Conservation Society Bangladesh Program The estuarine and marine waters of Bangladesh support extraordinary high levels of biological productivity including productive fisheries vital to the economy and food security of Bangladesh. These waters also support among the world's largest populations of globally threatened cetaceans, sharks, rays and marine turtles. The Wildlife Conservation Society is engaging gillnet fishermen in Bangladesh as "Citizen Scientists" for developing a science-based decision making framework to ensure that Hilsa fisheries focus not only on production but also on sustainability through biodiversity protection. The Citizen Science Fishermen Safety Network also enhances community resilience and livelihood security by improving safety conditions at sea for coastal gillnet fishermen through the provision of training and equipment to help them navigate to safety during extreme storms which are increasing in frequency and intensity due to climate change. This innovative, science-based, participatory approach uses photo-verified, geo-referenced data collected by the fishermen to guide sustainable fisheries management in coastal waters. Ninety Hilsa fishing captains and senior crew from 45 vessels were trained in identifying cetaceans, sharks, rays and marine turtles; rescuing live entangled dolphins, porpoises and marine turtles; using a Global Positioning System (GPS) for safe navigation and data collection; and collecting information on dolphin and porpoise sightings, fishing practices, and catches and bycatches. After completing the training workshops, 31 fishing vessels whose captain demonstrated basic understanding of camera-equipped, waterproof GPS. High quality data on fishing practices, catches and bycatches were collected by 19 fishing vessels during 124 fishing trips and 1,010 net sets targeting Hilsa and 20 fishing trips and 155 net sets targeting large finfish. To sustain fishery related livelihoods while minimizing bycatch risk to non-target species, the overlap between priority fishing areas and priority species habitat was examined. For example, catch data of Spadenose shark, considered Near Threatened according to IUCN Red List criteria, were used to predict their priority habitat. This analysis indicates that no-gillnet fishing zones would only be required in 5% (winter) and 3.5% (monsoon) of the overall Hilsa fishing area to protect the area of overlap between the highest catch probability and the highest fishing intensity. Exploratory modeling to predict Hilsa fishing catch according to habitat using Sea Surface Temperature and static environmental variables from remote sensing sources indicates that nets were often set where it was unlikely the fishermen would catch Hilsa. Further data is needed, but preliminary results indicate that through science.

3. National Spatial Data Infrastructure for Sustainable Management of Coastal Mangrove in Bangladesh: Opportunities and Challenges, Coastal Center for Sustainable Development, Zero Point, Khulna-9208

Authors: Kazi Humayun Kabir¹, Sharmin Aftab²

¹Assistant Professor and Head (In-Charge), Development Studies Discipline, Khulna University, Khulna-9208

²Chairperson, Development Studies Discipline, Khulna University, Khulna-9208, Coastal Center for Sustainable Development, Zero Point, Khulna-9208

Abstract

Bangladesh has been facing several development challenges with its limited resource and management capacity for decades. The poverty and hunger, food security, human deprivations, protective security, management and access to the resources are still of highest concern. Geospatial technology (GIS, Remote Sensing and GPS) have been successfully utilized worldwide in natural resources (e.g. water resources, coastal ecosystem and mangrove forest) management for sustainable development. Recent discussion on climate change and its impacts on coastal mangrove like SUNDARBAN, Bangladesh seek an extra attention to protect it. In Bangladesh, several development organizations (both GOs and NGOs) are responsible for the management of different aspects in the coastal mangrove e.g. fisheries, environment, agriculture, transport (inland and marine), land management and cadastre. A mixed method approach for data collection, manipulation and analysis has been considered during the study. This research approach utilized both quantitative and qualitative methods. Different organizations or institutions are working within the same jurisdiction and preparing the same maps in different purposes as well as projects in Natural Resource Management. There is no active collaboration among the organizations. A National Spatial Data Infrastructure (NSDI) forms the geospatial platform for wider government strategies and initiatives which enhance the availability (access and use) for up-to-date, fit for-purpose and integrated geospatial data and services. However, this research attempts to determine practicality of NSDI in the spatial domain of Bangladesh and will argue and underpin that NSDI will assist policy and decision makers as well as resource managers for analysis based planning in their respective domains. It emphasizes the needs to have NSDI in the country for good governance, natural and water resource management, food and agriculture, natural and human made disaster, environment protection and standardization of datasets etc. This attempt is for the first time in Bangladesh implementing NSDI, would introduce an effective system of data sharing for natural resource managers.

Keywords: Sustainable Management, Coastal Mangrove, Sundarbans, Geospatial, National Spatial Data Infrastructure (NSDI).

4. Resilience community contributing to SDG#14 by knowledge management using ICT

Authors: Tapas Ranjan Chakraborty¹, M. B. Akhter, Priodarshine Auvi, Fatema Jannat

¹ICT & Development Coordinator, Oxfam, Dhaka, Bangladesh

Abstract

Borokuput village under Shyamnagar sub-district of Satkhira district is vulnerable to climate change because of increasing salinity in the environment. Up to 1976 the community was agrarian but to cope with the climate change and also because of development influence the community is mostly fisher now. There are new forms of fisheries, like, crab fattening, shrimp farming and cultivation of brackish

water fishes. Climate response capacity and social acceptance build social and ecological resilience. Response capacity of a community is the scale of action that promotes adaptive capacity. Application of adaptive ecosystem management evolves through learning-based integrated resource management. For the management of the natural resources community is being practising sustainable harvesting and also restoring the coastal ecosystem. Monash University and Oxfam's joint participatory action research PROTIC is working with Information and Communication Technology in knowledge management of a resilience intervention. In the village 100 animators has been trained with the participatory research tools. To avoid adverse impact on the marine and coastal ecosystem community is also making the optimum use of the terrestrial ecosystem. Participatory planning, knowledge management and warning mechanism made the community responsive to the Target 2 of the SDG 14 in the west of coast of Bangladesh. Scope of livelihood diversification has reduced the dependence to the Sundarbans significantly. Knowing the value of the mangrove the community has form a belt of 6 km that contributing to the increase of the population of biodiversity and the strength of the embankment. Agro-meteorological warning system is helping community planning the cropping to cope with the adverse weather situation that contributing to economic resilience. The conservation and protection of marine and coastal ecosystems can be strengthened through ICT enabled tools that monitor and communicate levels of marine diversity and water quality and that can help to achieve the SDG 14.

5. Integrated Management of Coastal Resources in Saint Martin Island (SMI), Bangladesh

Author: Md. Humayain Kabir

Assistant Professor, Institute of Forestry & Environmental Science, University of Chittagong, Bangladesh

Abstract

Saint Martin Island (SMI) is the only coral reef island in Bangladesh with an area of 8 km². SMI has a very rich biodiversity, including a total of 66 coral species, five species of seagrass, 137 species of seaweed and more than 240 fish species. However, the resources of this island has been depleting gradually due to both the natural and anthropogenic factors. Therefore, an integrated and holistic approach is badly needed for management of its resources. Consequently, this paper aims to identify the major drivers, problems and prospects associated with the sustainable management of coastal resources in SMI in terms of ecological, socio-economic and governance issues. Both the primary and secondary data were collected to fulfill the study's objectives. We collected secondary data through a literature review of existing published documents on concepts and advancement of coastal management in Bangladesh. On the other hand, focus group discussions and field observations used for collecting primary data. After compiling and processing of collected data stakeholder mapping, institutional arrangement, whole system analysis, SWOT (Strength-Weakness-Opportunities-Threat) analysis, and DPSIR (Driver-Pressure-State-Impact-Response) analysis were conducted. Besides, internal sensitivity and external exposure factor analysis and finally problem tree analysis were accomplished. The study found that the main drivers of the depleting resources of SMI include increased population and poverty, unplanned tourism. Due to these drivers, overfishing, overexploitation of natural resources, solid waste and wastewater disposal, increasing hotels and infrastructure development are creating more pressure on SMI. As a result, degradation of ecosystems, biodiversity loss, loss of habitat has been occurring. In response to these adverse impacts, both the government and non-governmental organizations have been working on alternative livelihood options for the local people, creating environmental awareness, and enforcing existing laws and rules in relation to sustainable coastal resources management. The study also found that District Commissioner, Department of Environment, Local Government Chairman, Upazila Nirbahi Officer, Department of Fisheries, and local communities have the highest power and interest about the conservation of coastal resources of SMI. Finally, we suggest an integrated management strategy of this unique island through identifying the DPSIR chain and the Key Ecological Factors (KEF) and SWOT analysis of involved institutions.

Parallel Session 9: Life on Land (SDG 15)

1. Choice Modeling and Its Application to Sundarbans Mangrove Forest Preservation

Author: Hafiz Iqbal

Assistant Professor (Economics), Government Edward College, Pabna

Abstract

Mangroves (Tidal forests) have substantial and economic importance at local, national and global perspectives. It has balancing the ecosystem-serving as fish nurseries, havens of biodiversity and carbon storehouse. Like the other mangrove forests, Sundarbans mangrove forest plays a vital role in the reclamation of land, protection of coastal habitat from cyclones and tidal surges and uplifts the socio-economic condition of the coastal people. It provides wood and non-wood forest products and continuously contributes to GDP growth. It is the breeding ground for several globally threatened species, including the endangered the Ganges river dolphin, the masked fine foot, the water bird, the Bengal tiger and other species of reptiles. Sundarbans mangrove ecosystem service is now in captious position. It is affected by insects, disease and some climatic and human induced factors. Depletion of this forest is responsible for creating imbalance ecosystem and other natural hazards. To fulfill the research objective, this study carried out through random sampling followed by the National Oceanic and Atmospheric Administration (NOAA) and Food and Agriculture Organization (FAO) guided questionnaire survey in the adjacent villages and tourist spots of the Sundarbans and attempts to apply choice experiment approach to assess the villagers and tourist attitudes for establishment of different attributes of amount of donation needed to preservation option, visit option, cutting option of Golpata (*Nypa fruticans*) and location. Multinomial Logit and Random Parameter Logit models are used to quantify the attitudes of the respondents. Most of the used attributes and socio-economic-demographic (SED) variables are statistically significant. Based on the estimated results from the models, this study estimates marginal willingness to pay and welfare effects. The findings of this study provides robust basis for researcher, policy makers and government to provide specified policies to preserve Sundarbans mangrove forest ecosystem.

Keywords: Choice modeling, Experimental economics, Mangrove forest, Sundarbans, Bangladesh.

2. Biodiversity conservation through empowerment of the local communities: A case study from the Chittagong Hill Tracts, Bangladesh

Author: Shahriar Caesar Rahman

Chief Executive Officer, Creative Conservation Alliance

Abstract

The Chittagong Hill Tracts (CHT) is an extensive, hilly area that is part of a 1,800 km mountain range that runs from the eastern Himalayas in China, south into western Myanmar and eastern Bangladesh. With an area of 13,295 km², it comprises approximately 10 percent of the total land

area in Bangladesh. This area falls within the Indo-Burma Biodiversity Hotspot and harbours many globally threatened species including more cat species than anywhere else in the world. The region is sparsely populated by various ethnic groups of Tibeto-Burmese origin: such as the Chakma, Marma, Tripura, and Mro. Unsustainable slash-and-burn agriculture practice, subsistence hunting, poaching and logging are the major threats for the remaining forests and the biodiversity in this region. To date, little work has been done on the biodiversity of this region, mainly due to remoteness and political instability of the area. To address these issues, our organization, the Creative Conservation Alliance, has been working in the remote Sangu Reserve Forest, located in the extreme south-eastern part of Chittagong Hill Tracts, for the last five years. Through our comprehensive approach, we empower local people to become stakeholders in their own landscapes. The Creative Conservation Alliance (CCA) is a government registered non-profit organization; dedicated to ecological and cultural preservation within Bangladesh's last remaining wild places. Our organization is achieving conservation success through partnerships with government and non-government stakeholders, provision of alternative income sources of the local communities, rigorous scientific research, and the sustainable protection of natural resources. Since the inception of the program, we have recruited and trained former tribal hunters as para biologists who conducted the most comprehensive biodiversity survey in the region and documented 27 globally threatened species persisting within the Sangu Reserve Forest. Additionally, our organization has established four primary schools for the local communities, provided alternative livelihood program by creating market access of the craft and natural dye products, and has established hunting and logging moratoriums in four villages. In the first two years subsistence hunting on eight species of highly threatened wildlife in these regions is estimated to have dropped over 50% which is a statistic that is simply unheard of in the world of conservation. Our sustainable, community-owned conservation initiative empowers the native tribesmen to be protectors of their own unique and endangered ecosystem, heritage, and culture. Expanding this program will significantly relieve subsistence hunting pressure throughout the region; the most immediate threat that these species face. It is truly a grand opportunity to forge ahead with larger-scale sustainable conservation efforts in this incredibly unique biodiversity hotspot.

3. Assessment of ecosystem service value of southwest coastal Bangladesh

Authors: Shawan Khan¹, Md. Ali Akber², Md. Atikul Islam³, Md. MunsurRahman³, and Mohammad Rezaur Rahman⁴

¹MSc student, Environmental Science Discipline, Khulna University, Khulna-9208, Bangladesh.

²Assistant Professor, Environmental Science Discipline, Khulna University, Khulna-9208, Bangladesh.

³Professor, Environmental Science Discipline, Khulna University, Khulna-9208, Bangladesh.

⁴Professor, Institute of Water and Flood Management (IWFM), Bangladesh University of Engineering and Technology (BUET), Dhaka, Bangladesh.

Abstract

Quantification of the services generated by this dynamic coastal landscape can help promote sustainable management of the natural resources. This study was conducted to determine the ecosystem service value of southwest coastal area of Bangladesh. Ecosystem service value was quantified combining Landsat image data of 2015 with published coefficients of ecosystem service value of the land use categories. A sensitivity analysis was conducted to determine the effect of manipulating these

coefficients on the estimated values. Our results show that 36.02% of the land is covered by mangrove forest (Sundarbans). About 25.65% of the area is under aquaculture (shrimp/prawn), whereas agriculture holds about 15.36% of the land. We estimated the total value of ecosystem services equivalent to 86.27 billion US\$ (value of US\$ in 2007). Mangrove alone holds 97.6% of the total value, whereas agriculture and aquaculture holds 0.24% of that. Therefore, land use policy should pay more attention toward the ecosystem function of mangrove forest to balance the relationship between the livelihood of local farmers and ecosystem services to promote sustainable natural resources management of southwest coastal area of Bangladesh.

4. Growth of *Azadirachta indica* A.Juss. Seedlings in Water Stressed Condition to Combat Desertification

Authors: Md. Shoaibur Rahman¹, Atiar Rahman

¹Associate Professor, Department of Agroforestry & Environment, Hajee Mohammad Danesh Science & Technology University, Dinajpur.

Abstract

The southwest coastal Bangladesh is richer in ecosystem services and largely stressed by human intervention. Quantification of the services generated by this dynamic coastal landscape can help promote sustainable management of the natural resources. This study was conducted to determine the ecosystem service value of southwest coastal area of Bangladesh. Ecosystem service value was quantified combining Landsat image data of 2015 with published coefficients of ecosystem service value of the land use categories. A sensitivity analysis was conducted to determine the effect of manipulating these coefficients on the estimated values. Our results show that 36.02% of the land is covered by mangrove forest (Sundarbans). About 25.65% of the area is under aquaculture (shrimp/prawn), whereas agriculture holds about 15.36% of the land. We estimated the total value of ecosystem services equivalent to 86.27 billion US\$ (value of US\$ in 2007). Mangrove alone holds 97.6% of the total value, whereas agriculture and aquaculture holds 0.24% of that. Therefore, land use policy should pay more attention toward the ecosystem function of mangrove forest to balance the relationship between the livelihood of local farmers and ecosystem services to promote sustainable natural resources management of southwest coastal area of Bangladesh.

Keywords: Ecosystem service, land use, coastal area, Bangladesh, remote sensing.

Science Policy Dialogue Sessions

1. Social energy for the self-organization of sustainable human-nature relations: The role of governance

Author: Dr. Marion Glaser

Social Scientist, Leader of Social-Ecological Systems (SES) Analysis, Leibniz Center for Marine Tropical Ecology (ZMT)

Abstract

Sustainability is about the way humanity relates to nature. Human-nature dynamics that are supported by self-organization are more diverse, and more likely to be sustainable over the long term than those that are not (Sneppen, 2014). On the social side, setting the conditions for self-organization may work better than setting down rules (Westley et al, 2011). Under conditions of change, a good understanding of the drivers of and obstacles to self-organization can enable a transformation towards more sustainable system dynamics. Social self-organization is classically rooted in local traditions and ecosystem knowledge and has often been displaced by technical and economic change (Johannes et al, 1983). Even more recent, innovative forms of self-organization towards more sustainable human-nature relations have declined over time, or operated in a “parallel universe” in the same regions where attempts to elicit sustainable forms of behavior via formal institutions are failing (Glaser et al 2010). All this indicates the existence of some form of “social energy” (Hirschman, 1983; 1984) as an essential ingredient of sustainable human-nature relations and a key condition for the long-term survival of institutions (Ostrom 1990). Social energy for sustainability is not always present, it changes over time, and it may be supported or undermined by governance. This presentation discusses: Which system features and processes activate self-organizing social energy towards more sustainable human-nature relations? Is a crisis always necessary to activate social energy for sustainability? Is social energy subject to cyclical dynamics? Which system features and processes undermine, or even destroy the self-organizing social energy that enables sustainable human-nature relations? What are the options for governance to support sustainability enhancing social energy? This presentation offers findings and thoughts on these questions that relate to the multiple spatial, institutional and temporal levels at which human-nature relations at the land-sea interface are known to have been successfully self-organizing. It arises from my long-term work in Brazil, Indonesia and the Caribbean. I have been involved in studying and capacitating self-organized coastal management in multiple sub-national coastal regions in these countries, as well as in other, more terrestrial regions in Bangladesh and Colombia. I will use my in depth knowledge of these regions and countries to illustrate some thoughts on the above questions, complement with relevant literature. The talk aims to develop systems theory. It also has a deeply applied purpose, to support practitioners and decision-makers to work with rather than against social-ecological system dynamics. It therefore concludes with opening a discussion of what may be required to effectively support a self-organized transition towards sustainable human-nature relations in coastal Bangladesh, which is among the regions that are most vulnerable to climate change on earth, and potentially also most rich in social energy.

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2. Discerning the Mayhem: Negotiating Climate Change and Sustainable Development.

Author: Sharmi Palit

Student, MA Sociology, Centre for the Study of Social Systems, Jawaharlal Nehru University, India.

Abstract

“Recognition is famously a passage from ignorance to knowledge.” - Amitav Ghosh Background and Introduction In 2014, the World Health Organization declared New Delhi to be the most polluted city in the world. Although the state government is trying to create awareness and sensitize the citizens of the city to the environmental concerns and problems of pollution, a general lack of apathy of the citizens towards either can be found. Alarm bells rang, when the year of 2016 witnessed unprecedented amount of smog, i.e. a deadly mixture of smog and fog that engulfed the city and turned into a gas chamber. However, this alarmingly degenerative climate conditions is neither new to the country nor to citizens of New Delhi. A careful reading of the newspaper or study of any hospital records will clearly show how in the last couple of years cases of infant mortality, health problems like asthma, lung diseases, etc. are much more frequent than can be imagined. Resultantly, in this paper, what we seek to explore is how do the citizens of the city understand climate change and sustainable development and how do they negotiate with the ill effects of the detrimental conditions of the former and the complete ignorance of the latter when development is carried out. In this context, in the latter part of the study, two case studies will be studied- on the adverse air quality and the proliferating pressure on land in and around the city. With requisite sociological tools in hand, attempts will be made to tackle the issue based on the parameter of social class on one hand and health and government policies on the other. Significance of Study C W Mills while discussing the “sociological imagination” argued that it primarily refers to the recognition of the relationship between personal problems and public issues. In another context, Amitav Ghosh proposes that recognition is indeed the “already existing awareness that makes possible the passage from ignorance to knowledge”. Consequently, the significance of the study stems from the fact that since human beings- with their individual actions and cultural practices are the primary perpetrators for the deplorable environmental conditions, an insight into their understanding, awareness and everyday struggle will help bridge the gap between societal understanding and governmental laws as well as bring in a new perspective in a domain dominated by physical and political science. Resultantly, for the course of this paper Jawaharlal Nehru University is the chosen area of study with its students constituting as the primary sample of the

study. The paper intends to be youth-centric in approach, and thus there will be an emphasis on the perceptions of the youth, i.e. how they negotiate with and understand climate change with respect to the backdrop of this paper. Moreover, the diversity of the student composition in terms of social class, regional and disciplinary backgrounds will help to make it a holistic study. In addition to bring in further insight in the study workers, professors and experts will be interviewed. As a result, the sample size of the study will comprise of 100 respondents, and a mixture of snowball and stratified sampling techniques will be used. As a sociologist, I understand the shortfalls of epistemic standpoint and I hope to overcome the biases associated with it to the best of my capabilities and successfully prevent subjectivity to overshadow my Conclusion Post August 1947, one of the main concerns of the leaders of the newly independent India was regarding development. Rapid development was believed to be the critical key that would help India regain its lost glory and 'golden days'. However, in this course of rapid development what was completely overlooked was the impact of this development on the environment. Resultantly, the environment has suffered a great deal in these years and as the capital, New Delhi itself has been a witness to some major climate changes that has had a violent impact on the citizens and the surrounding ecosystem of the city. Today, what is needed is not just an awareness of changing climatic patterns but simultaneously, conscious deliberate acts to preserve and save the environment. For a nation like India, development is critical for progress and improving the standard of living for its 1.25 billion people. But what needs to be understood is that it must not be achieved by compromising the environment and sustainable means of development must be developed to mitigate the changing climatic patterns and other environmental problems.

Keywords: Climate Change, Sociology, Odd-Even Policy, Youth, New Delhi, Air Pollution and Solutions.

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3. Climate Tracker – Engaging youth in climate action

Author: Sohara Mehroze Shachi

Climate Tracker South Asia, Cofounder & Hub Manager

Abstract

Climate change is one of the greatest threats the planet is facing today, and recognizing this fact, SDG 13 – take urgent action to combat climate change and its impacts - was formulated. To address this goal, Sohara Mehroze Shachi co-founded the South Asia Hub of Climate tracker - the world's largest network of youth journalists focusing on climate change, environment and sustainable development issues. Through Climate Tracker Sohara conducts workshops and training sessions in various educational institutions and through radio and online platforms to raise awareness of climatic impacts and mobilize youth for climate action.

As a recognition of her work with Climate Tracker and as a freelance journalist, Sohara was awarded the Asian Young Environmental Journalist of the Year Award last year and was invited to take part in the World Economic Forum's Annual meeting in Davos, Switzerland this year as a Global Shaper. In Davos she attended various talks on climate change and interviewed climate action leaders from around the world, including Patricia Espinoza, Executive Secretary of the United Nations Framework Convention for Climate Change (UNFCCC).

In this session Sohara will disseminate information about the organization, how to get involved with the South Asia Hub, and share snippets of her experience at Davos. The aim is to foster interest, concern and drive among youth to contribute to building policy momentum by writing impactful stories on national and international media, highlighting the impacts of climate change and the need for urgent action.

Appendix

Photo Gallery









Conference Program Schedule



CSD 2nd Annual Conference on
**SUSTAINABLE
DEVELOPMENT 2017**



PROGRAM

DAY 1 - FRIDAY, 10 FEBRUARY 2017

9:30 onwards	<p>REGISTRATION Auditorium Lobby, Campus A, ULAB</p>			
10:00 - 11:00	<p>Inaugural Ceremony Auditorium, Campus A, ULAB</p> <p>Welcome Address: Professor Imran Rahman, Vice Chancellor, University of Liberal Arts Bangladesh Opening Address: Dr. Samiya Selim, Associate Professor & Director, CSD, ULAB and Conference Convener Inaugural Speaker: Mr. Md. Abdul Karim, Managing Director, Palli Karma Sahayak Foundation (PKSF) Special Guest: Professor A. Veeramani, Professor Emeritus, College of Asia Pacific Studies, Ritsumeikan Asia Pacific University, Japan Special Guest: Dr. Kazi Anis Ahmed, Vice President, Board of Trustees, University of Liberal Arts Bangladesh</p>			
11:00 - 11:30	<p>Tea Break and Registration - Auditorium Lobby</p>			
11:30 - 1:00	<p style="text-align: center;">Panel Session Auditorium, Campus A, ULAB</p>			
1:00 - 2:30	<p>SDG Goal 11: Sustainable Cities and Communities - Make Cities inclusive, safe, resilient and sustainable Moderator: Dr. Debapriya Bhattacharya, Distinguished Fellow, Centre for Policy Dialogue (CPD)</p> <p>Panelists: Dr. Md. Akter Mahmud, Professor, Department of Urban & Regional Planning, Jahangirnagar University, Bangladesh Dr. Khurshid Zabin Hossain Taufique, Director, Urban Development Directorate (UDD), Ministry of Housing and Public Works, Government of the People's Republic of Bangladesh Mr. Khaleed Ashraf, Director-General, Bengal Institute –Architecture, Landscape and Settlements Mr. Ashekur Rahman, Urban Programme Specialist, United Nations Development Programme (UNDP)</p>			
1:00 - 2:30	<p>Lunch- ULAB Canteen, Basement</p>			
2:30 - 4:00	<p style="text-align: center;">PARALLEL SESSIONS</p>			
2:30 - 4:00	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="background-color: #e8f5e9; padding: 5px;"> <p>Parallel Session 1: Zero Hunger- SDG 2 Location: Room 401</p> <p>Chair: Mr. Ataur Rahman Mito, Country Director, Hunger Free World Co-Chair: Dr. Amrita Sastry, Assistant Professor and Head of the Department, Department of Sociology, Jesus and Mary College, University of Delhi</p> </td> <td style="background-color: #e8f5e9; padding: 5px;"> <p>Parallel Session 2: Sustainable Cities and Communities-SDG 11 Location: Room 402</p> <p>Chair: Professor A. Veeramani, Professor Emeritus, Ritsumeikan Asia Pacific University Moderator: Ms. Ayeleen Ajaneer Saleh, Adjunct Faculty, Bangladesh Youth Leadership Center (BYLC)</p> </td> <td style="background-color: #e8f5e9; padding: 5px;"> <p>Parallel Session 3: Responsible Consumption and Production- SDG 12 Location: ULAB Auditorium</p> <p>Co-Chairs: Mr. Asif Uddin Ahmed, Assistant Professor, School of Business, ULAB Dr. Samiya Selim, Director and Associate Professor, Center for Sustainable Development, University of Liberal Arts Bangladesh</p> </td> </tr> </table>	<p>Parallel Session 1: Zero Hunger- SDG 2 Location: Room 401</p> <p>Chair: Mr. Ataur Rahman Mito, Country Director, Hunger Free World Co-Chair: Dr. Amrita Sastry, Assistant Professor and Head of the Department, Department of Sociology, Jesus and Mary College, University of Delhi</p>	<p>Parallel Session 2: Sustainable Cities and Communities-SDG 11 Location: Room 402</p> <p>Chair: Professor A. Veeramani, Professor Emeritus, Ritsumeikan Asia Pacific University Moderator: Ms. Ayeleen Ajaneer Saleh, Adjunct Faculty, Bangladesh Youth Leadership Center (BYLC)</p>	<p>Parallel Session 3: Responsible Consumption and Production- SDG 12 Location: ULAB Auditorium</p> <p>Co-Chairs: Mr. Asif Uddin Ahmed, Assistant Professor, School of Business, ULAB Dr. Samiya Selim, Director and Associate Professor, Center for Sustainable Development, University of Liberal Arts Bangladesh</p>
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Moderator: **Mr. Shafiqul Islam**,
Assistant Professor, ULAB

Paper Presenters:

1. On the way towards alleviating household food insecurity: evidence from a rural floodplain of Bangladesh - **Sate Ahmad, M. Moinuddin Haider, Muhammad Zahirul Haq, Abdullah Al-Mamun** and **Nurul Alam**
2. Achieving food security and improved nutrition through nutrition sensitive agricultural practices: A case from ANF4W - **Shirin Afroz, Md. Amin Uddin, Nigar Sultana, Chowdhury Abdullah Al Asif** and **Meredith Jackson-deGraffenried**
3. Prevalence Of Chromium In Fish Feed And Commercially Cultivated Tilapia - **Shahnoor Hasan, Luffor Rahman** and **Shahana Afrose Chowdhury**

Paper Presenters:

1. Making Dhaka green, clean and sustainable: A critical insight into rooftop gardening- **Muhammed Shahriar Haque** and **Md. Tanvir Ahamed Siddiki**
2. Bringing ecosystem services into urban landscapes - **Dan Richards**
3. Challenges of White Pollution for Green Chittagong City - **Dr. Sarmistha Das** and **Ms. Ananya Nandy**
4. Sustainable Rural Livelihood Practice-A case of Bangladesh- **Rakib Hossain**

Discussant: **Ms. Marion Champoux-Pellegrin**, Head of Sustainability, Olympics Industries Limited
Discussant: **Mr. Miran Ali**, Managing Director, BITOPI Group

Paper Presenters:

1. An Innovative Dairy Model Leading to Sustainable Development for the Rural People of Bangladesh- **Shahana Afrose Chowdhury** and **Momtaz Faruki Chowdhury**
2. Prospect and constrain of Responsible Consumption and production of Jute and Jute made product- **Ahmad Sadequ Amin**
3. Sustainance of Craft through Conservation and Alliance – **Naushin Khair**

4:00 - 4:15

Tea Break, Auditorium Lobby

4:15 - 5:45

PARALLEL SESSIONS

Parallel Session 4: Affordable and Clean Energy - SDG 7

Location: ULAB Auditorium

Chair: **Professor Muhammad Ibrahim**, Professor and Head of the Department, General Education (GED), University of Liberal Arts Bangladesh
Co-Chair: **Ms. Asna Towfiq**, Regional Market Manager, Clean Cook Stoves
Moderator: **Ms. Basundhara Tripathy**, Assistant Professor and Research Project Manager, CSD, ULAB

Paper Presenters:

1. Talk on Clean Cook Stoves - **Asna Towfiq**

Parallel Session 5: Water and Sanitation- SDG 6

Location: Room 401

Chair: **Dr. Liakath Ali**, Director of Programme and Policy Advocacy, WaterAid
Moderator: **Ms. Shahnoor Hasan**, Senior Lecturer and Research Associate, CSD, ULAB

Paper Presenters:

1. Drinking Water Supply Through Reverse Osmosis Technology: A Solution For Water Shortages In Coastal Rural Areas Of Bangladesh- **Md. Shamsuzzoha, Md. Rasheduzzaman** and **Rajan Chandra Ghosh**

Parallel Session 6: Responsible Consumption and Production- SDG 12

Location: Room 402

Chair: **Dr. Marion Glaser**, Social Scientist, Leader of Social-Ecological Systems (SES) Analysis, Leibniz Center for Tropical Marine Research (ZMT), Bremen, Germany
Discussant: **Mr. Kishore Singh**, Senior Skills Specialist, International Labour Organization
Discussant: **Dr. Md Nasir Uddin**, Economic Dialogue around Green Growth
Moderator: **Dr. Annette Breckwoldt**, Scientist, Social-Ecological Systems (SES) Analysis, Leibniz Center for Tropical Marine Research (ZMT), Bremen, Germany



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**SUSTAINABLE
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2. Solar Bottle Light: An Alternative Source Of Energy In Bangladesh- Md. Jakariya, Sajid Iqbal, Navojit Dastidar And Mohammad Sujauddin

3. Feasibility of Solar-biomass Hybrid Cold Storage for Un-electrified Rural Areas of Bangladesh - Priyanka Chowdhury, Andrew Jenkins, Zainu Sadia Islam

2. Solid Waste Generation and Management: A Case Study on Chuadanga Municipality - Shehab Uddin, Md. Easin Ali, Dr. Md. Mizanur Rahman

3. Water Conflict: An Emerging Obstacle In Sustainable Development - Mr. Pradip Kumar Sengupta

4. Post-defecation handwashing in hard to reach area: An example of present practice and efficiency perspectives - Md. Towhidul Islam

5. Suitable Water Options for the Arsenic and Salinity Zone of Bangladesh - Prof. Dr. Muhammad Ashraf Ali, Dr. Md. Ehosan Habib, Md. Azizur Rahman, Md. Sarwar Hossain

Paper Presenters:

1. The Positive Inception and Flawed Progression of Aquaculture: The Case of Gurudaspur, Natore – Mr. Saman Saad

2. Social and Economic Transformation of the Ultra-poor (SETU): A model for graduation and sustainable empowerment of the poor – Meherul Islam

3. Sustainability Assessment of the Shrimp Fry Collectors in Paikgacha Thana of Khulna District: An In-depth Study of Their Livelihood Pattern - Md. Sajadul Alam, Imtiaz Ahmad, Zubaer Alam

DAY 2- SATURDAY, 11 FEBRUARY 2017

9.30 onwards

REGISTRATION

Auditorium Lobby, Campus A, ULAB

10:00 - 11:30

Panel Session

ULAB Auditorium, Campus A

SDG Goal 14: Life Below Water - Conserve and sustainably use the oceans, seas and marine resources

Moderator: **Dr. Marion Glaser**, Social Scientist, Leader of Social-Ecological Systems (SES) Analysis, Leibniz Center for Tropical Marine Research (ZMT), Bremen, Germany

Panelists:

Dr. Abu Nasar Abdullah, Deputy Secretary, Ministry of Environment and Forests (MoEF), Government of the People's Republic of Bangladesh

Dr. Md. Niamul Naser, Professor, Department of Zoology, University of Dhaka.

Mr. S. Humayun Kabir, Director, Bangladesh Frozen Foods Exporters Association (BFFEA); and Chairman & Managing Director, Amam Sea Food Industries Ltd.

Mr. Brian Smith, International Program Director, Wildlife Conservation Society, Bangladesh

Dr. Benoy Kumar Barman, Senior Scientist, WorldFish, Bangladesh and South Asia

11:30 - 12:00

Tea Break- Auditorium Lobby



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12:30 - 1:30

PARALLEL SESSIONS

Parallel Session 7: Climate Action- SDG 13

Location: ULAB Auditorium, Campus A

Chair: **Dr. Saleemul Huq**, Director, International Center for Climate Change and Development (ICCCAD)
Moderator: **Dr. Carolyn Roberts**, Professor of Environment, Gresham College, London

Paper Presenters:

1. Short-Lived Climate Pollutants (SLCPs) are adversely contributing to Climate Change and Mitigation Strategy in Bangladesh - **Abdul Wahab**
2. Climate Induced Displacement and Livelihood Choices: Evidence from Slum Areas in Dhaka Metropolitan City - **Meherun Ahmed**
3. Numerical simulation to estimate effect of climate change on water resources in South Asia - **Pankaj Kumar, Binaya Kumar Mishra, Yoshifumi Masago, Chitresh Saraswat and Shamik Chakraborty**
4. An assessment of the climate change induced vulnerabilities of coastal regions and adaptation practices of coastal crop agriculture in Bangladesh - **Sabrina Zaman and Mohammad Sujauddin**
5. Evaluation of standing order on disaster during Sidr in the coastal region of Bangladesh- **Niger Sultana**

Parallel Session 8: Life Below Water- SDG 14

Location: Room 401

Chair: **Dr. Annette Breckwoldt**, Scientist, Social-Ecological Systems (SES) Analysis, Leibniz Center for Tropical Marine Research (ZMT), Bremen, Germany
Moderator: **Dr. Samiya Selim**, Director and Associate Professor, Center for Sustainable Development, University of Liberal Arts Bangladesh
Discussant: **Alifa Bintha Haque**, Director of Research and Development, Save Our Sea

Paper Presenters:

1. Application of cultural services in coastal ecosystem management: Meanings, opportunities and associated pitfalls - **Shamik Chakraborty and Shantanu Kumar Saha**
2. Optimizing fishing catch and the protection of marine megafauna through marine spatial planning with Hilsa fishermen in Bangladesh - **Rubaiyat Mowgli Mansur, Mahmud Rahman, Elisabeth Fahrni Mansur and Brian D. Smith**
3. National Spatial Data Infrastructure for Sustainable Management of Coastal Mangrove in Bangladesh: Opportunities and Challenges - **Kazi Humayun Kabir and Sharmin Aftab**
4. Resilience community contributing to SDG#14 by knowledge management using ICT - **Tapas Ranjan Chakraborty, M. B. Akhter, Priodarshine Auvi, Fatema Jannat**
5. Integrated Management of Coastal Resources in Saint Martin's Island (SMI), Bangladesh - **Md. Humayain Kabir**

Parallel Session 9: Life on Land- SDG 15

Location: Room 402

Chair: **Professor A. Z. M. Manzoor Rashid**, Professor & Head Department of Forestry and Environmental Science, Dean - School of Agriculture and Mineral Science, Shahjalal University of Science & Technology
Moderator: **Shahnoor Hasan**, Senior Lecturer and Research Associate, CSD, ULAB
Discussant: **Professor Dr. Md. Danesh Miah**, Professor and Director, Institute of Forestry and Environmental Sciences, University of Chittagong

Paper Presenters:

1. Choice Modeling and Its Application to Sundarbans Mangrove Forest Preservation - **Md. Hafiz Iqbal**
2. Biodiversity conservation through empowerment of the local communities: A case study from the Chittagong Hill Tracts, Bangladesh - **Shahriar Caesar Rahman**
3. Assessment of ecosystem service value of southwest coastal Bangladesh - **Shawan Khan**
4. Climate Resilient Ecosystems And Livelihoods: An Integrated Approach To Conservation - **Shahzia Mohsin Khan**
5. Growth Of Azadirachta indica A.Juss. Seedlings In Water Stressed Condition To Combat Desertification - **Md. Shoaibur Rahman and Atiar Rahman**



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1:30 - 2:30	Lunch (Canteen, Basement)	
2.15 - 3.45	ADD International: SDGs and Disability- Focus on SDG 4- Quality Education and SDG 8- Decent Work and Economic Growth Auditorium, Campus A, ULAB Chair: Ms. Quazi Rosy , Honorable Member of National Parliament Moderator: Mr. Shafiqul Islam , Country Director, ADD International Bangladesh Introduction - Mr. Shafiqul Islam , Country Director, ADD International Bangladesh Keynote presentation - Dr. Nafesur Rahman Discussant's remarks - A. H. M. Noman Khan , Executive Director, CDD and Farida Yesmin, Executive Director, DRR Open discussion Chair's address - Ms. Quazi Rosy , Honorable Member of National Parliament Closing remarks	
2:30 - 3:30	Science-policy Dialogue Session Around Sustainability, Climate Change and Natural Resource Management Location: Room 401	Parallel Session 10: Affordable and Clean Energy-SDG 7 Location: Room 402
	Chair: Professor Dr. Md. Danesh Miah , Professor and Director, Institute of Forestry and Environmental Sciences, University of Chittagong Moderator: Dr. Samiya Selim , Director and Associate Professor, Center for Sustainable Development, University of Liberal Arts Bangladesh Paper Presenters: <ol style="list-style-type: none"> Social energy for the self-organization of sustainable human-nature relations: The role of governance - Dr. Marion Glaser Discerning the Mayhem: Negotiating Climate Change and Sustainable Development – Sharmi Pallit Climate Tracker - Engaging youth in climate action - Sohara Mehroze Shachi 	Chair: Sohel Ahmed , Managing Director, Grameen Shakti Moderator: Dr. Shantanu Kumar Saha , Senior Lecturer - cum - Research Associate, CSD, ULAB Paper Presenters: <ol style="list-style-type: none"> Sustainable Energy Options for Bangladesh: Emerging Challenges - Mahfuzul Haque The Drivers and Barriers to the Deployment of Solar Home Systems in Rural Bangladesh - Asfara Ahmed Renewable Energy Practice: A Sustainable Clean Energy for all People of Bangladesh- Sumaia Islam, Samina Islam
3:30 - 4:00	Tea Break - Auditorium Lobby	
4:00 - 5:30	Conference Closing Ceremony Auditorium, Campus A, ULAB	
	Closing Speaker: 'Leading, Following and Collaborating: Innovation for Sustainability' Professor Carolyn Roberts , Professor of Environment, Gresham College, London. Conference Summary: Dr. Amrita Sastry , Assistant Professor and Head of the Department, Department of Sociology, Jesus and Mary College, University of Delhi Chief Guest: Mr. Abdullah Al Islam Jakob, MP , Deputy Minister, Ministry of Environment and Forests (MoEF), Government of the People's Republic of Bangladesh Awards given: Professor Imran Rahman , Vice Chancellor, ULAB and Dr. Samiya Selim , Associate Professor & Director, CSD, ULAB Vote of Thanks: Mr. Kazi Nabil Ahmed, MP , Member, Board of Trustees, ULAB	
5:15 - 5:45	Refreshment	

Media Coverage



Guests attend an international conference on sustainable development organised by Centre for Sustainable Development at University of Liberal Arts Bangladesh auditorium on its Dhanmondi campus in Dhaka on Saturday. — press release



Md Abdul Karim, Managing Director, PKSF, presides over an 'International Conference on Sustainable Development' in the city on Friday. Prof Emeritus A Veeramani, Asia Pacific University, Japan and Dr Kazi Anis Ahmed, Vice president, Board of Trustees of ULAB were present among others.



'Govt needs to incorporate SDGs into policy making decisions'

Abu Hayat Mahmud



Dr Debapriya Bhattacharya speaks at a session of the 2nd Annual Conference on Sustainable Development at ULAB on Friday.

The two-day long Annual Conference on Sustainable Development 2017 organised by Centre for Sustainable Development (CSD) at the University of Liberal Arts Bangladesh (ULAB) concluded yesterday. "The government needs to incorporate SDGs into policy making decisions on every level and to direct the private sector to do the same in helping develop the country," said Professor Imran Rahman, vice-chancellor of ULAB.

The international conference provides a unique opportunity to bring together stakeholders from the government, academia, international agencies, NGOs, NGOs and grassroots activists to share practical solutions towards achieving sustainable development goals (SDGs).

The conference aims to identify and share empirical research findings and practical, evidence-based solutions that can support the nation, particularly focusing on 6 of the

SDGs in Bangladesh, especially in terms of international context. "To achieve the SDGs, high powered committees were formed under the Prime Minister's Office (PMO) in Bangladesh," he said.

He added the government, private sectors, NGOs, INGOs and Civil Society all have important roles in implementing the SDGs.

"Businesses have one of the most important roles to play by introducing sustainable production methods, they can help achieve SDGs as well as improving the GDP," he explained.

The conference featured a total of 41 research papers presentations that had been selected from over 350 applications.



ইউনিস্ক্রিপটি অব বিশ্বব্রহ্মের আর্টস বাংলাদেশে টেকসই উন্নয়ন সম্মেলন

ইউনিস্ক্রিপটি অব বিশ্বব্রহ্মের আর্টস বাংলাদেশে (ইউনিস্ক্রিপটি) সম্মেলন দুই দিনের টেকসই উন্নয়ন সম্মেলনের সমাপনী দিনে প্রধান অতিথি হিসেবে বসে ও পরিবেশ উপমন্ত্রী আব্দুল্লাহ আল ইমদাদ জারকেন। ইউনিস্ক্রিপটির সেন্টার ফর সাসটেইনেবল ডেভেলপমেন্ট (সিসডি) নিয়ে একটি আন্তর্জাতিক সম্মেলন করে নেওয়া হয়েছে। সম্মেলনে প্রধান অতিথি হিসেবে অংশগ্রহণ করেছেন বাংলাদেশের স্বরাষ্ট্রসচিব জেনারেল এ. এ. ইউসুফ, বাংলাদেশের পরিবেশ, পরিষ্কার ও জনস্বাস্থ্যের উপসচিব ড. আব্দুল হাশেমের অধ্যক্ষ ড. নাহিদুল নাসের প্রভৃতি। সম্মেলনে ইউনিস্ক্রিপটির উপসচিব ড. হুমায়ুন কবীরের উপস্থাপনায় প্রধান অতিথি হিসেবে অংশগ্রহণ করেন। ইউনিস্ক্রিপটির পরিচালক প্রোগ্রামার সাফিয়া বেগম।



ইউনিস্ক্রিপটি অব বিশ্বব্রহ্মের আর্টস বাংলাদেশে টেকসই উন্নয়ন সম্মেলন

ইউনিস্ক্রিপটি অব বিশ্বব্রহ্মের আর্টস বাংলাদেশে (ইউনিস্ক্রিপটি) সম্মেলন দুই দিনের টেকসই উন্নয়ন সম্মেলন (সিসডি) নিয়ে একটি আন্তর্জাতিক সম্মেলন করে নেওয়া হয়েছে। সম্মেলনে প্রধান অতিথি হিসেবে অংশগ্রহণ করেছেন বাংলাদেশের স্বরাষ্ট্রসচিব জেনারেল এ. এ. ইউসুফ, বাংলাদেশের পরিবেশ, পরিষ্কার ও জনস্বাস্থ্যের উপসচিব ড. আব্দুল হাশেমের অধ্যক্ষ ড. নাহিদুল নাসের প্রভৃতি। সম্মেলনে ইউনিস্ক্রিপটির উপসচিব ড. হুমায়ুন কবীরের উপস্থাপনায় প্রধান অতিথি হিসেবে অংশগ্রহণ করেন। ইউনিস্ক্রিপটির পরিচালক প্রোগ্রামার সাফিয়া বেগম।



2nd annual confce on SDGs at ULAB

Campus Report

A two-day international conference on Sustainable Development has commenced on Friday at the University of Liberal Arts Bangladesh (ULAB) Auditorium, Dhanmondi in the capital.

Organized by Centre for Sustainable Development (CSD) at the University of Liberal Arts Bangladesh (ULAB), the aim of the conference is to identify and share empirical research findings and/or practical, evidence-based solutions that can support the Sustainable Development Goals (SDGs). The conference provides a unique opportunity to bring together stakeholders from the government, academia, international agencies, NGOs, and grassroots organizers to share practical solutions towards the achievement of more sustainable and inclusive societies.

Prof Emeritus, College of Asia Pacific Studies, Ritsumeikan Asia Pacific University, Japan, Dr Kazi Anis Ahmed, Vice president, Board of Trustees, University of Liberal Arts Bangladesh (ULAB), Prof Imran Rahman, Vice-Chancellor ULAB and Dr Samiya Selim, Director, CSD ULAB were also present during the inaugural session of the conference.

After the inaugural session, a plenary session was held on 'Sustainable Cities and Communities- Make Cities inclusive, safe, resilient and sustainable' moderated by distinguished fellow Dr Debapriya Bhattacharya from Centre for Policy Dialogue (CPD). The conceptualization of a city and its definition was contested during the session. The remarks and discussions from this session would culminate in a policy brief which will be shared with the relevant authorities at the government level.



Md. Abdul Karim, Managing Director, PKSF is seen along with the guests at a two-day international conference on Sustainable Development held at the University of Liberal Arts Bangladesh Auditorium, Dhanmondi in the capital on Friday.

This year's conference is based on 8 Sustainable Development Goals (SDGs): SDG 2: Zero Hunger, SDG 6: Clean Water and Sanitation, SDG 7: Affordable and Clean Energy, SDG 11: Make Cities Inclusive, Safe, Resilient and Sustainable, SDG 12: Responsible Consumption and Production, SDG 13: Climate Action, SDG 14: Life below Water, and SDG 15: Life on Land. The conference will feature a total of 41 research paper presentations that has been selected from over 150 applications.

The inaugural speech at the conference was delivered by MD, Abdul Karim, Managing Director, PKSF. The special guests of the program were Prof A



ইউনিস্ক্রিপটি অব বিশ্বব্রহ্মের আর্টস বাংলাদেশে টেকসই উন্নয়ন সম্মেলন সমাপ্ত

ইউনিস্ক্রিপটি অব বিশ্বব্রহ্মের আর্টস বাংলাদেশে (ইউনিস্ক্রিপটি) সম্মেলন দুই দিনের টেকসই উন্নয়ন সম্মেলনের সমাপনী দিনে প্রধান অতিথি হিসেবে অংশগ্রহণ করেছেন বাংলাদেশের স্বরাষ্ট্রসচিব জেনারেল এ. এ. ইউসুফ, বাংলাদেশের পরিবেশ, পরিষ্কার ও জনস্বাস্থ্যের উপসচিব ড. আব্দুল হাশেমের অধ্যক্ষ ড. নাহিদুল নাসের প্রভৃতি। সম্মেলনে ইউনিস্ক্রিপটির উপসচিব ড. হুমায়ুন কবীরের উপস্থাপনায় প্রধান অতিথি হিসেবে অংশগ্রহণ করেন। ইউনিস্ক্রিপটির পরিচালক প্রোগ্রামার সাফিয়া বেগম।

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