



8th World Climate Congress

May 10-11, 2019 Bangkok, Thailand

Accepted Abstracts

8TH WORLD CLIMATE CONGRESS

May 10-11, 2019 Bangkok, Thailand

**Global warming and the role of exogenous shocks in enhancing international cooperation:
Are we there yet****Anna Malova**

University of Glasgow, Scotland

There are several well-established facts in the literature on climate change. First, is that international agreement are not able to sustain high levels of participation and deep emission cuts at the same time. Second, with appropriate use of sticks and carrots, they are. Third, that by deterring non-participation, we deter non-compliance as well. Fourth, from the story of the Montreal Protocol it follows that when necessary, countries can cooperate on the Pareto-efficient outcome of the underlying game. Lastly, climate change poses an existential threat to humanity and we do not have much time left to stop. Now, we nonetheless observe suboptimal levels of individual abatement and modest levels of cooperation. Thus, the purpose of this study is to establish the role of unilateral actions in the solution of the collective problem of climate change and to investigate whether external shocks can increase international cooperation. Using game-theoretic approach a model was built which incorporates uncertainty in the form of damages from the natural disasters that have a certain probability of occurring and can be altered by the levels of players' abatement. There are three major findings: (1) No IEA will be stable unless it requires unilaterally chosen levels of abatement; (2) time-inconsistent players tend to procrastinate, but under certain values of parameters can turn into time-consistent due to higher perceived probability of future damages; and (3) time-consistent players can, on the contrary, become time-inconsistent and deviate from transition to business-as-usual over time. External shocks will have no effect on the chosen abatement levels unless politicians exhibit some form of statistical biases when estimating the probability of future damages. To increase global abatement, it is necessary that countries unilaterally set more ambitious targets. Otherwise free riding and non-compliance are unavoidable.

a.malova.1@research.gla.ac.uk

8TH WORLD CLIMATE CONGRESS

May 10-11, 2019 Bangkok, Thailand

Fostering sustainable development by empowering indigenous abilities: The border zone case of rural South Lebanon**G Gharios and A Allan**

University of Dundee, Scotland

Lebanon has built its water sector on foundations laid down by Mesopotamian, Roman, Ottoman and French water laws that were superimposed on Muslim customs and practices and traditional Arab social water arrangements in Lebanon. Experts agree that Lebanon will be the first country in the Middle East to be affected by climate change. Rural communities in the region have historically adapted to the characteristic water scarcity by harvesting and storing rainwater. The focus of this study is on the role of indigenous water arrangements, customary law and inherited practices in developing the water sector in Lebanon. Indigenous water practices are the result of the complex interactions of changing practices imposed over time, combined with lessons learned regarding successful techniques, forming a palimpsest of legislative and administrative water competence that are potentially better able to address climate change because of their tested adaptive capacities. This work researches the influences and effects that strengthening customary, locally developed water arrangements could have on community resilience and adaptation to climate change. We were able to identify several ancestral social water arrangements that were developed in the region for the conservation of property and for the periodic distribution of water between interested parties that allowed for the mediation of disagreements between users and assured each of the equitable allocation of water to match needs. These include, Urf, Hima, Mushaa, Sabil, Birket, Jall, Aouna, Sulha, Mudaraba and Chaoui. Following the application of a series of criteria relevant to resilience and climate change adaptation (e.g. democracy, equity, equality, fairness, spontaneity, transparency, participatory, replicability, adaptability, flexibility, efficiency and effectiveness) particular focus was made on communal pools (Birket). Rainwater harvesting and storing has long been a traditional approach to water management in South Lebanon. Here, precipitation occurs ordinarily only during winter (e.g. in Jebel Amel, Bilad Beshara, Northern Galilee), so it is important for the inhabitants to conserve this water into the dry season. During the research, 99 birkets were identified using very old maps and their status assessed using comparison with modern aerial images, across 85 villages and cities in three administrative regions and nine sub-regions. Only one third of these pools are still functioning and the remaining is either abandoned or transformed. The case of the pool in the village of Marwaheen is of special interest, it was abandoned 30 years ago and transformed into a dump site, but was then restored by the municipality and currently functions as a communal water reservoir to which all farmers have access to irrigate their fields. This fact has contributed to a remarkable increase in vegetable farming which has risen from 12 to 25 ha in one year. Based on this experience, reclaiming these traditional rainwater harvesting pools are important in facing future challenges of water management at the local level.

g.gharios@dundee.ac.uk

8TH WORLD CLIMATE CONGRESS

May 10-11, 2019 Bangkok, Thailand

Securing livelihood amidst climate change through adaptation among farming households in Roxas mountain range city of Koronadal, PhilippinesLorena L Sabino¹, Juan M Pulhin¹, Rex Victor O Cruz¹, Ma Victoria O Espaldon² and Josefina T Dizon³¹College of Forestry and Natural Resources-UPLB, Philippines²School of Environmental Science and Management-UPLB, Philippines³College of Public Affairs and Development-UPLB, Philippines

The study assessed the security of livelihood in the face changing climate among the farming households in Roxas mountain range, City of Koronadal, South Cotabato. Livelihood security was measured based on the concept of human security advanced by the United Nations Development Program (UNDP), namely, Freedom from fear and Freedom from want. Freedom from fear indicators were based on support received from Local Government Units (LGUs) and predictable weather while freedom from want was based on household income. Data were gathered through a household survey involving 265 respondents complemented by Key Informant Interviews (KIIs), Focus Group Discussions (FGDs) and field observations in 2013-2015. Climate data and downscaled projections from the Philippine Atmospheric Geophysical and Atmospheric Services Administration (PAGASA) were used to examine the changes for the past three decades and in identifying potential adaptation options. Data were statistically analyzed qualitatively and quantitatively. Quantum GIS was also employed for visual presentation of the household livelihood security. Results showed that for three decades, temperature and rainfall patterns had changed in the study area. Also, the study revealed that majority (67.9%) of the households has insecure livelihoods. Many are still struggling to cope from their insecurities resulting from climate change and need urgent collective actions in securing their livelihood sources. Taking into consideration the scenario for future changes in rainfall and temperatures in 2020 and 2050, the respondents also identified potential adaptation strategies in securing their livelihoods which include investment on children's education, adoption of diversified farming system or agroforestry, seeking government support, financial management and development of alternative livelihood. Family planning was also raised by a minimal number of respondents. Further, the study suggested that LGUs should consider the identified options for policy development in enhancing the security of forest dependent communities residing at the Roxas Mountain range.

llsabino@up.edu.ph

8TH WORLD CLIMATE CONGRESS

May 10-11, 2019 Bangkok, Thailand

Distribution of natural organic matter in drinking water supplies of eastern region of India: Challenges and issues**Jaydev Kumar Mahato, Ashok Kumar and S K Gupta**

Indian Institute of Technology (Indian School of Mines) Dhanbad, India

Disinfection by chlorine in drinking water treatment is of paramount importance to prevent water borne diseases, spread by microorganism or bacteria. Tragically, an undesirable harmful byproduct such as Trihalomethanes (THMs) formed during the disinfection practices. The present study investigated the effects of Natural Organic Matter (NOM) and other operational water quality parameters on THMs formation. The statistical analysis of THMs and other variables for five major drinking Water Treatment Plants (WTPs) in India revealed that amongst four THMs compound, chloroform exists in the highest levels, ranged varied from 275.8 to 367.2 μL , exceeded the prescribed limits of Bureau of Indian Standard (IS 10500: 2012) (200 $\mu\text{g/l}$) in all five WTPs. Additionally, the maximum concentration of Total Trihalomethanes (TTHMs) were obtained in VWTP (400 μL) followed by IGWTP (381 μL), BWPT (335 μL), RWPT (326 μL) and lastly DWTP (309 μL) all exceeded the US EPA regulatory limit of 80 $\mu\text{g/L}$. Applied Pearson correlation matrix were identified TOC, DOC and UV254 as key surrogate of NOM liable to form the THMs. Elevated concentration of THMs found in these water supply systems warrants an in depth attention to the regulatory agencies and management authority for controlling their levels in supply water to protect the community from the probable health hazards.

jay_devkumar@rediff.com

8TH WORLD CLIMATE CONGRESS

May 10-11, 2019 Bangkok, Thailand

Climate change impacts and adaptation measures at buffer zone area of Shuklaphanta wildlife reserve, Kanchanpur, Nepal**Deepak Chaulagain and Prashu Ram Rimal**

Tribhuvan University, Nepal

Nepal is among the most vulnerable countries with regard to climate change. The study includes climate change phenomenon, its effect on crop production, perception of local respondents and measures of the adaptation. Bhimdattnagar Municipality of Kanchanpur district in Far-Western Nepal was selected for the study because it is directly linked to the reserve and also lies in the vicinity of Mahakali River. It is a more productive area and people living in the area are mainly dependent on agriculture and livestock to fulfill the basic need. This study showed that current illiteracy rate of respondents was only 42.42% and 81.10% respondents engaged in agriculture. The major crops grown in the area were maize, wheat and paddy. Paddy production was found fluctuated with erratic rainfall pattern, but according to 65.20% of respondents, maize yield has decreased over the last 5 years. 71% households were dependent on agriculture products as a source of fodder because the entry of local people inside the park was restricted to collect fodder. Majority of the respondents (60%) accepted that temperature was the most rapidly changing climatic factor followed by 23% respondents with rainfall due to climate change. Hydrometeorological data (from year 1980-2011) were analyzed by using XLSTAT software and tested by Man-Kendall test. The maximum temperature in Kanchanpur district was found annually decreasing by 0.0159 °C but minimum temperature was annually increased by 0.0519 °C, statistically annual mean rainfall trend of Kanchanpur district was decreased by 2.1489 mm and monsoon rainfall was decreased by 6.414 mm.

chaulagaindeepu11@gmail.com

8TH WORLD CLIMATE CONGRESS

May 10-11, 2019 Bangkok, Thailand

Impacts of climate change on salinity intrusion in south central coast of Bangladesh

M G Mostafa and M Ferog Serder

University of Rajshahi, Bangladesh

The water quality in the coastal region was affected by various climatic parameters, i.e. temperature, humidity, precipitation and as well as anthropogenic reasons. The study was conducted to investigate the impacts of climate change on water quality at south central coastal region (Kalapara Upazila in Patuakhali District) of Bangladesh. The study has collected some meteorological data of Kalapara station from 1975 to 2015. The water samples were collected from the different locations in the coastal areas including open sea, channels, rivers, ponds and tube wells in the study area. The analysis results were compared with some published reports on water quality in the coastal areas and interpreted accordingly. Major physicochemical parameters of the samples were analyzed in the laboratory using various standard methods of analysis as well as the Arithmetic Quality Index was used to assess the existing water quality of the study area. The metrological data analysis results illustrate that an average of 0.6 °C temperature has increased over the last 40 years and the projected average temperature will increase up to 1.2 °C by the year 2050. The analysis results also show the increasing trend in humidity and precipitation in the area. The water samples analysis results illustrated that most of the tubewell and surface water are unsuitable for drinking, domestic or agricultural purposes due to saline water intrusion in the area. The water quality comparison results indicated that the salinity intrusion is threatening the ecosystem of coastal areas of Bangladesh. Further studies on this issue are needed for the sustainability of water resource and the environment as well.

Mostafa_ies@yahoo.com

8TH WORLD CLIMATE CONGRESS

May 10-11, 2019 Bangkok, Thailand

Dynamical approach to identify the track evolution of cyclones over Bay of Bengal**Indrani Ganguly, Jayanti Pal and Sutapa Chaudhuri**
University of Calcutta, India

An investigation has been carried out in this research to identify the track evolution process of tropical cyclones occurred over Bay of Bengal (BOB) through dynamic point of view. Three cyclonic systems of the same category occurred over Bay of Bengal has been considered for this study. The cyclonic systems, Kayant, Nada and Maarutha are those systems that have attained their maximum strength and categorize as Cyclonic System (CS). The Kayant has unique track features that develop over BOB and move east-northeast ward and subsequently turned westward and dissipated over the ocean. Kayant thus, had no land fall. The cyclonic system Nada is another system developed as CS over BOB with westward track. Nada developed over BOB and had landfall at southeast coast of India. The third cyclonic system under investigation is Maarutha, which had an eastward track and made a land fall over Myanmar. It is observed that the cloud cluster initially developed under surface westerly current for Maarutha. The analysis depicts that the cloud clusters have been developing under different surface currents. A tilt in vertical profile of vorticity has been observed with the track of Kayant and Nada while for Maarutha, tilt of vorticity was not with the track of cyclone. The divergence field in upper level has been found for the systems Nada and Maarutha however, while for Kayant, the divergence field in upper level was not observed. The result shows that the evolution of track for each system was quite different however, they were declared to belong in the same category. The surface current at initial stage, vertical profile of vorticity and upper level divergence might aid in providing an insight about the structure of the track of cyclones over BOB.

indraniganguly1520@gmail.com

8TH WORLD CLIMATE CONGRESS

May 10-11, 2019 Bangkok, Thailand

Assessing the vulnerability of Egyptian agriculture to climate change**M K Hassanein**

Agricultural Research Center, Egypt

Egypt is one of the most vulnerable countries to the potential impacts and risks of climate change. Climate change may play an even more prominent role in the coming decades. Poor farmers are especially vulnerable to these impacts of climate change because of their geographic exposure, low incomes and greater reliance on agriculture as well as their limited capacity to seek alternative livelihoods. The vulnerability and impacts may arise from the anticipated climate change are diverse. However, we will concentrate on the most important ones as follows: (1) Crop productivity: Reduction in the productivity of major crops in Egypt from 1.53 to 47% by 2050; (2) Crop-water requirements: Crop-water stress and crop water requirements of the important strategic crops in Egypt are expected to increase by a range of 6% to 16% by 2100; and (3) Sea level rise and soil degradation: The inundation and salinization of the most fertile arable land in the Nile delta as a result of sea level rise and salt water intrusion; the effects of extreme weather events on agriculture, looking at examples from the recent past and to future projections. Extreme weather events include spells of very high temperature, torrential rains and droughts. Extreme weather events, which occur in every agricultural region, cause severe crop reduction of wheat production by 12% in year 2010, recent climate trends and extreme weather events may be directly and indirectly contributing to the increased pest damage. Adaptation is a key factor that will shape the future severity of climate change impacts on food production.

dr_mosaadkotb2003@yahoo.com

8TH WORLD CLIMATE CONGRESS

May 10-11, 2019 Bangkok, Thailand

Safe water technologies to tackle climate change in Bangladesh**Shah Riazur Rahman**
BRAC, Bangladesh

Bangladesh has made remarkable progress in providing basic water and sanitation services to people. It is now estimated that 87% of people in Bangladesh have access to improved drinking water source and 61% people in Bangladesh have access to improved sanitation. Bangladesh is the most vulnerable to climate change and people in coastal belt struggle round the year to obtain safe water. Considering climate change impact especially in coastal belt, BRAC WASH program provided climate resilient water technologies through private entrepreneurs in eight sub-districts. We developed 86 water entrepreneurs by installing reverse osmosis water filtration techniques and thus we reached approximately 11,000 people within two years. We also ensured that some water quality parameters tested (named as pH, arsenic, iron, manganese, chloride, total hardness, fecal coliform) from filtered water before serving to the people. The test result showed no harmful material obtained from water technologies. The diversification in water technologies is important to maximize the efficiency of filter chamber and to reduce waste water which ultimately will increase profitability of water business. Also we facilitated awareness raising program about climate change impact and disaster risk reduction and WASH. The positive side of water technologies is that people now become more aware to purchase pure water instead of free services and thus saline intrusion in the coastal belt has less impact in their livelihood. Both the technological solution and behavioral change program might bring healthy community in Bangladesh who is most vulnerable to climate change in terms of sustainability.

lovelu216@gmail.com