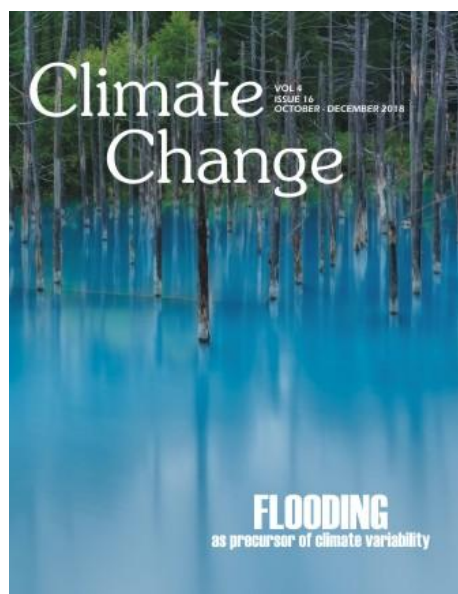


Climate Change

About the Cover



Pakistan is extremely vulnerable to climate induced hazards such as floods, droughts, storms, heat waves and extreme weather events. Flooding is the most devastating natural hazard of Pakistan. Since the inception, the country has faced with multiple flood events costing thousands of lives and billions of losses in infrastructure. The situation has gotten worse since the past decades as the events of floods have increased in the country particularly the enormous floods of 2010 which shook the economy and till now we have not been recovered yet. This paper utilizes primary and secondary sources in gathering the data regarding damages of floods incurred by the inhabitants of district Swat. A total of 86 respondents were interviewed using semi structured household questionnaire. The survey results showed that flooding is the main perceived climate change vulnerability in the area. Damages include human, livelihood and household losses. Most of the respondents believe the incidents of floods have increased since the past two decades. The study area is most vulnerable to the negative impacts of climate change. Climate variability and increasing extreme weathers events are resulting in livelihood insecurities among the local communities. Poor households with low resource base and adaptation capabilities are most vulnerable to the natural disasters. This research recommends that government should prioritize the effected livelihoods of the study area by extending their support to the affected communities. Intensive research is needed to investigate to a full extent the climate change vulnerabilities particularly extreme weather events in the area. Local communities should be equipped with climate change knowledge and extension of climate technologies to offset the vulnerabilities with effective climate adaptation plans. (Ref: Muhammad Suleman Bacha, Mohammad Nafees, Muhammad. Flooding as precursor of climate variability: causes and damages of 2010 flood event in District Swat, Pakistan. *Climate Change*, 2018, 4(16), 642-652).

Climate Change & Disaster

Flooding as precursor of climate variability: causes and damages of 2010 flood event in District Swat, Pakistan

Muhammad Suleman Bacha, Mohammad Nafees, Muhammad

Pakistan is extremely vulnerable to climate induced hazards such as floods, droughts, storms, heat waves and extreme weather events. Flooding is the most devastating natural hazard of Pakistan. Since the inception, the country has faced with multiple flood events costing thousands of lives and billions of losses in infrastructure. The situation has gotten worse since the past decades as the events of floods have increased in the country particularly the enormous floods of 2010 which shook the economy and till now we have not been recovered yet. This paper utilizes primary and secondary sources in gathering the data regarding damages of floods incurred by the inhabitants of district Swat. A total of 86 respondents were interviewed using semi structured household questionnaire. The survey results showed that flooding is the main perceived climate change vulnerability in the area. Damages include human, livelihood and household losses. Most of the respondents believe the incidents of floods have increased since the past two decades. The study area is most vulnerable to the negative impacts of climate change. Climate variability and increasing extreme weathers events are resulting in livelihood insecurities among the local communities. Poor households with low resource base and adaptation capabilities are most vulnerable to the natural disasters. This research recommends that government should prioritize the effected livelihoods of the study area by extending their support to the affected communities. Intensive research is needed to investigate to a full extent the climate change vulnerabilities particularly extreme weather events in the area. Local communities should be equipped with climate change knowledge and extension of climate technologies to offset the vulnerabilities with effective climate adaptation plans.

Climate Change, 2018, 4(16), 642-652

Climate Change & Sustainability

Crop residues management in agro-environmental sustainability

Jay Shankar Singh

The advance tools and technologies in agriculture sector of have played a significant role in enhancement of crop yields and food security to most of the countries. However, long term sustainability of current agricultural system is at risk because of soil health deterioration, over use of natural resources and erratic climate patterns due to global warming. In recent years, high crop yields due to improved tools and technologies have resulted in huge quantities of crop residues (CRs) production annually. Burning of CRs is now a common practice at filed conditions causing soil health deterioration, air pollution, loss of agriculturally important soil microbial biomass diversity, etc. Residue incorporation results more microbial activity than residue removal or burning. Paddy CRs decomposition in anaerobic flooded soil conditions substantially increases green house gases emissions particularly methane. Therefore, appropriate sustainable management of huge amount of crop residues produced every year is need of the hour and assumes a great significance to the major agricultural producing countries. Appropriate management planning and environmental education would reduce the CRs burning practices and the related environmental, social and economical loss. In this communication, current concerns and possible options related to efficient management of CRs has been discussed. At present most of the developing countries including India, has challenging tasks to ensure food and environmental security. Hence the CRs, either partly or entirely can be used for agriculture conservation to country's food security, agriculture and environmental sustainability.

Climate Change, 2018, 4(16), 653-660

Climate Change & Food Security

Measuring the productivity of food-grain crops in different climate change scenarios in India: An evidence from time series investigation

Ajay Kumar Singh, Pritee Sharma

This study assess the impact of climate change on productivity of food-grain crops in India. It used Cobb-Douglas production function model to investigate the climate change impact on food-grain productivity in India using time series, 1980-2010. In this study, food-grain production/hectare land is used as a dependent variable that is regressed with different socio-economic and climatic variables. Thereupon, it estimates the expected productivity of food-grain crops in different climate change scenarios. Empirical result based on Newey-West Standard Errors model shows that increase in maximum and minimum temperature, and change in rainfall pattern have a negative and significant impact on productivity of rice, arhar, bajra, jowar, wheat, ragi, gram and barley crops. Estimates also indicates that productivity of aforesaid crops are likely to be declined significantly by 2025, 2040, 2050, 2075 and 2100 in different climate change scenarios in India. Thus, it would be very serious concern for Indian farmers and policy makers to mitigate the negative consequences of climate change in food-grain crop farming and to meet food security in India. It provides several viable policy proposals to mitigate the negative impact of climate change in food-grain crops farming and to achieve sustainable food security in India in near future.

Climate Change, 2018, 4(16), 661-673

Climate Change & Policy/Law

COP21 policies and abrupt climate change: Political Economy of Hawking's Irreversibility

Jan-Erik Lane

Climate and earth scientists have convinced a large majority of people that climate change occurs today. And the new theory of abrupt climate change entails that huge feedback loops will change the Earth already within the next one or two decades. Yet, this information is only half the story, as the pragmatical side is also part of climate change: will the COP21 promise of global decarbonisation be fulfilled? It requires global coordination by states or government, which is very hard to achieve. The COP process by the UNFCCC and the IPCC never speaks about it. The aim of this paper is to emphasize that global decarbonisation can only be accomplished by global state coordination, which reduces the probability of COP21 success considerably.

Climate Change, 2018, 4(16), 674-683

Climate Change & Ecosystem

A one hundred-year study of the upper limit of tree growth (*Terminus aboreus*) in the Swedish Scandes illustrated and updated change in an historical perspective

Leif Kullman, Lisa Oberg

Positional treeline change since the early 20th century and up to 2017 was assessed along three elevational transects on Mt. Getryggen in the southern Swedish Scandes. Baseline data, representing the year 1915, were compared with later intermittent records up to 2017. Concerned species were *Betula pubescens* ssp. *czerepanowii*, *Picea abies*, *Pinus sylvestris* and *Alnus incana*. These species responded with different degrees of continuous upshift and substantial inter-site variability. *Betula* displayed the largest advance, by 215 m. This maximum magnitude of change compares with data from widely different parts of the Swedish Scandes. This common performance indicates that regionally recorded summer warming by 1.5 °C is the ultimate cause. In a long-term historical perspective, most congenial conditions for birch and pine growth at high elevations prevailed around 10500 – 9400 cal. yr BP, when the local treelines reached 1355 and 1250 m a.s.l., respectively. The former elevation coincides with the upper limit of *Vaccinium myrtillus* and the low-alpine belt. With the exception for *Pinus*, recent treeline upshifts were accomplished predominantly by phenotypic responses of millennial-old krummholz specimens. Only occasionally, has treeline advance by *Betula* and *Picea* originated from seed regeneration during the past century. These circumstances may set the limit for further advance where and when the pool of high-altitude old-established krummholz specimens becomes depleted as existing krummholz individuals have already transformed to tree mode.

Climate Change, 2018, 4(16), 684-714

Climate Change & Pollution

The status of air pollution attributable to automobile emissions in Mysuru: Implications for urban transport planning

Venkataramana GV, Azis Kemal Fauzie, Naveen S

This paper explains the interlinking impacts of population growth, urban land use, automobile transportation, and atmospheric air pollution in Mysuru, a fast growing city in south India. High growth in urbanization and industrialization has affected on tremendous change in land use pattern and increase in motor vehicle use that, in turn, threatens urban air quality and health status. Number of registered vehicles in Mysuru rises gradually at a rate of 20% per year. Highest proportion was found in the number of two-wheelers accounting for 81% of total vehicle population. However, air quality status of the city was found within the national standards, especially for SO₂ and NO₂, while PM sometimes approached the limit. An updated estimation of automobile emission has been prepared according to the recent number of registered vehicles in the district from 2010 to 2015. Mysuru daily contributes about 2 Gg gas and particulate pollutants consisting of 1.98 Gg CO₂, 37.3 Mg CO, 20.6 Mg NO_x, 14.5 Mg HC, and 3.2 Mg PM, or total about 0.08% to the Indian road transport emissions in 2015.

Climate Change, 2018, 4(16), 715-722

Climate Change & Policy/Law

Brexit as critical juncture: factors for UK's environmental policy amendment?

Cletus Famous Nwankwo

The United Kingdom (UK)'s political divorce of the European Union (EU), or 'Brexit' will have some implications for many policy areas because of the complex institutional web of the EU not least the fact that the EU's environmental policy is integrated into the UK's policy. Thus, disentangling and reconfiguring the UK's environmental policy seems necessary to circumvent environmental regulatory gaps. Scholars argue Brexit will provide the UK with the opportunity to amend its environmental policy not only to fill loopholes but also ensure that environmental protection is guaranteed. This paper highlights the factors that could influence the UK's environmental policy amendment because of Brexit. Gaps in the European Union Withdrawal Bill, trade deals, economic outlook and other circumstances are pivotal.

Climate Change, 2018, 4(16), 723-727

Climate Change & Atmospheric Science

Temporal analysis of drought in Mwingi sub-county of Kitui County in Kenya using the standardized precipitation index (SPI)

Cassim JZ, Juma GS

This study attempts to temporally characterize drought using Standardized Precipitation Index (SPI) over Mwingi Sub-County of Kenya. Rainfall data spanning 1961-2011 over the area of study was used to determine SPI values using quantitative techniques in R programming. The SPI values were temporally characterized using series graphs and trend analysis carried out. In order to enhance understanding of vegetative characteristics over the area of study, Vegetation Cover Index data was used to generate 3 month VCI spatial characteristics. Results of this study revealed that Mwingi region has been experiencing increasing mild to moderate drought events with occasional severe cases being reported since 1961. No extreme drought event was recorded during this period. The study noted that the drought events were increasingly varying in intensity during the period of study. The study recommends correlation analysis between all climate variables and SPI values to give direction on how they relate to each other over time. However, no extreme drought event was recorded during this period. The study recommends correlation analysis between the SPI values and all climate variables over the area of study.

Climate Change, 2018, 4(16), 728-733