

Characteristics of climatological, dry and wet summer monsoon in Pakistan by focusing on the upper troposphere

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The summer monsoon sometimes brings severe droughts and intense flooding in many parts of the world including South Asian countries like Pakistan. So, an essential question arises “how can we contribute better to manage the water resources of the region for the societal needs”. By data analysis, the basis of the dynamical processes associated with upper tropospheric conditions during the climatological mean Pakistan Summer Monsoon (PSM) and its extreme events has been developed in the current study. During PSM mature phase, the climatological-mean structure of atmosphere favors convective activity compared to premonsoon phase, by weakening the mid-upper level subsidence together with the increasing of moisture flux in the lower troposphere from Arabian Sea and Bay of Bengal. Specifically, the upper-level convergence and subsidence observed over Pakistan during pre-monsoon phase reallocates to northwest of Pakistan during mature phase. However, PSM extreme dry (wet) events were closely related with the upper tropospheric cyclonic (anticyclonic) anomaly northwest of Pakistan and the associated cold (warm) temperature anomaly. This anomalous state of upper tropospheric cyclonic (anticyclonic) circulation is accompanied with the anomalous upper level convergence (divergence) around Pakistan, which anomalously weakens (strengthens) the climatological mean PSM trough to suppress (enhance) the PSM activities. We found two possibilities i.e. Matsuno-Gill type atmospheric response from the tropics and/or the Rossby wave train along the Asian Jet to trigger, reinforce, and maintain the upper-tropospheric cyclonic (anticyclonic) circulation. However what (i.e. source) triggers the circulation anomaly from the tropics and/or extratropics needs further investigations to reach a definite conclusion.

Biography

Shakil Ahmad has completed his PhD at the age of 37 years from the University of Tokyo and presently working as Project Researcher since October 2011 at the University of Tokyo, Japan. He has published more than 5 papers in the reputed journals and also presented his PhD research in reputed couple of international conferences, like AGU, WCRP, EGU, etc.

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Impact of climate change on sahel savannah ecosystem in Nigeria

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Sahel Savannah occupies the uppermost part of northern Nigeria, and is reported to be highly vulnerable to climate change. This study was conducted to evaluate the impacts of climate change on the Sahel. Methods used include on-site assessment, secondary data mining, questionnaire administration and analysis of climatic records. Sand dunes invasion, reduction of Lake Chad size, drought, increased temperature, soil degradation and dust storms were observable evidences of desertification, accentuated by climate change on Nigerian Sahel Savannah; health problems, human and livestock deaths, crop failure, biodiversity loss, increased poverty and resource use conflicts. This indicates that Sahel, with its biodiversity, human and cultural diversity is highly threatened. Agro-forestry, alternative energy, rainwater harvesting, organic agriculture and establishment of indigenous multipurpose trees as green belt are suggested as adaptative measures. However, the success of these suggested and current government initiatives in the Sahel is hinged on community participation.

Biography

Borokini is an upcoming research scientist working with National Centre for Genetic Resources and Biotechnology (NACGRAB), Ibadan, Nigeria as a Senior Scientific Officer in charge of Botanical Gardens. He completed his MSc. in Botany at the University of Ibadan. Within four years of working, he has written 2 books, published 18 papers in reputable journals, another 6 in press, and made presentations at 16 scientific conferences. He is a registered reviewer for 23 journals. Israel is an ITTO fellow for 2010.

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