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Partial duration analyses for prospective global agro-hydrology and flood management

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In the present study a new concept of analyses of partial duration series was carried out on isolations and their trend of decays patternized to predict annual total and sequential distribution of the daily rainfall events. From the long term rainfall plot with year these cycles were isolated and a decay coefficient determined for exponential decay functions of hydrologic process viz decay of flood peak, antecedent moisture and yearly rainfall amounts that operate in a relation, Pn= P0 Kt with Pn being rainfall for the year under prediction, mm; P0 initial rainfall, mm and t the number of year after the initial year of the maximum rainfall in the partial duration series. The unified and optimized value K was 0.92. Once the yearly rainfall total is determined, the sequential initial observations help identify the sequential distribution of rainfall events in the entire rainy season. Further, conjunctive use of this new technology with an advanced agricultural technology (alive, smart and enthusiastic) racy nature innovated by the author enabled to simulate rainfall situation by application of sprinkler irrigation for water management in pattern of rainfall events to accomplish green water supplementation to crops. Thus, utility of this partial duration series is enhanced in managing extreme drought condition for successful harvest. New cropping pattern is devised to escape devastating effects of floods ravages in the river riparian areas. Thus, the partial duration series analyses and racy nature technology enable prospective management of global hydrology for bringing sustainable food production, creating biodiversity and reducing agony of flood zones of riparian areas adversely affected by global warming and climate change.

Biography

R C Yadav completed his PhD from Indian Institute of Technology Bombay in Water Resources Engineering after 27 years of professional experience post MTech from Indian Institute of Technology Kharagpur. He worked as Principal Scientist and Head of Soil and Water Conservation Research Centre, Agra, Uttar Pradesh, India. In the later years he undertook assignments as Professor in various Indian and Foreign Universities. He has acquired expertise in water and environment interaction maneuver for managing water resources, food, nutrition and environment conservation. He acquired academic excellence in innovative researches and received several awards including famous Thomas Edison 2014 Award for knowledge distribution among the young research scholars in Civil Engineering.

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Watershed biophysical features and climate change impact on water budget

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During the last decades, unbalanced water budget became a critical concern in the Southwestern United States. An evidence of the problem is the groundwater depletion frequently reported in the region. Unfortunately, the situation is not favored by climate change as drought occurrence became more frequent particularly during the last two decades. To help, we contributed to the knowledge aiming to sustain wise water management strategies at the watershed scale, by addressing the effects of topography on precipitation variability. In addition we examined vegetation dynamics with respect to the aridity gradient in the Southwestern United States. We targeted perennial and annual vegetation covers for their Normal Differential Vegetation Index series. At different levels we employed Entropy theory to analyze precipitation variability and vegetation dynamics in time and space. The results revealed complex trends in relation with the climate typesand the watershed biophysical features. The implication on future water budget was analyzed with respect of the critical role of vegetation and topography. We concluded on potential changes in the future terrestrial hydrological processes particularly in arid regions. Analyses based on futureclimate scenarios are ongoing and emphasized on the North American Regional Climate Change Assessment Program'smodels simulations. In sum, our research efforts contributed to a better understanding of the future of water resources under climate change which is relevant for water managers' decision making processes.

Biography

Dagbegnon Clement Sohoulande Djebou is Research Assistant at the Agri Life's Conflict and Development Center. He is a PhD candidate in water management at the Department of Biological and Agricultural Engineering at Texas A&M University. He obtained two Master degrees in agronomics (2005) and later in water management (2007) from the International Institute for Water and Environmental Engineering of Ouagadougou, and the Federal Polytechnic School of Lausanne, Switzerland. In the past, he served in West Africa. He joined Texas A&M since 2010 and his research interests include water management, climate change, land-atmosphere interactions and vegetation dynamics. He published in the journal of Hydrology.

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