

Effects of Climate Change

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Introduction

Planet earth is the only cosmological entity which is residing at the most habitable zone of our solar system and provides life-support systems to the all living-being residing on it. The systematic studies on earth structure, ingredients, and global phenology are covered under 'Earth Science', which provides the meaningful justification for every incident happened or happening on earth surface. Climate condition played an important role in the origin of life. Optimum weather condition warrants the succession of life on earth. However, in modern civilization, increasing trend of urbanization has put the environment in a vulnerable situation. As a result, changes in climate have been observed in different parts of the world. To cope up with the problematic issues due to climate change it is necessary to research the fact vividly, which not only secures the present environment but also maintains sustainable resources for the future generations. The current issue of The Journal of Earth Science and Climatic Change presents some interesting findings such as- maximum land area is covered by regions of moderate vulnerability; bi-layered structure of the Awataib valley, Sudan; change in perception and attitudes of the locals towards forest management would entail providing environmental education to the people, and consideration of the needs of the local populace; climate change will impact the magnitude and frequency of rainfall intensity, and therefore flooding of the Abaya-Chamo basin; identification of sulphate, and by extrapolation petrol in Loei-Wang Saphung, Thailand.

Environmental vulnerability maps provide the location of fragile sites where the environment, people, or property are at risk due to potentially calamitous changes in the ecosystem that could result in injury, death, or other disasters. Excessive mining, excessive consumption of natural resources, and/or population explosion lead to ecological instability and therefore, need to be addressed urgently. Mukesh investigated the distribution of environmental vulnerability in Astrakhan, Russia [1]. They identified and classified vulnerability sites using Geographical Information System (GIS) and remote sensing techniques. Using ArcGIS 10.3 software, the authors developed a model factoring the following parameters: vegetation, geology, land use/cover, soil, and geomorphology. On the basis of numerical values, vulnerability was slotted into five degrees: extreme, high, moderate, reasonable, and low. The authors identified that maximum land area is covered by regions of moderate vulnerability, and low agricultural cover, harsh weather, and land degradation effect environmental vulnerability.

Gravity survey entails quantification of the differences in the earth's gravitational field over a large area. Gravity surveying is conducted for the purpose of locating and describing subsurface structures. In this issue, using Gravity variation measurements Hussein et al. describe the structural geography of the Awataib valley in the Sudan [2]. Their data present a bi-layered structure, comprised of cretaceous Nubian sandstone and basement complex crystalline rocks. Bouguer anomaly map data revealed that the four fault zones have general trends of NW-SE, SW-NE, and W-E. The Density-Depth models disclosed the presence of small Grabben and Horst structures having a thickness of ~275 m in south-western and north-eastern Awataib valley. The authors hypothesize that these regions are suitable for drilling boreholes for water. High gravity in Awataib valley can be attributed to the Basement Complex that has been faulted and displaced.

Management of a forest not only requires intervention of the authorities but also that of the communities inhabiting the forest. Participatory Forest Management (PFM) is one such system which enables the communities living in the forest to have a say in the entire decision-making process of forest management. Thus, garnering participation of the locals in forest management generally generates positive vibes. In this issue, Tesfaye et al, made an assessment of the attitude and perception of the locals residing in the Chilimo-Gaji Forest in Ethiopia towards Chilimo-Gaji forest and the forest management system (n=265) [3]. The study comprised two dimensions like: local attitude towards the PFM system and local perception of the forest and its resources. Sixty percent of respondents responded positively to conservation though, differences were observed at the level of supportive attitude towards the forest conservation system ($p=0.02$) and towards the PFM ($p=0.01$). Locals highly dependent on the forest for generation of income remained unsupportive. This study suggests that change in perception and attitudes of the locals would require: environmental education and consideration of the needs of the local populace.

Hare river watershed drains into Lake Abaya, which located in the Abaya-Chamo basin of the southern Ethiopian Rift Valley. In this issue, Biniyam and Kemal investigate the impact of climate change on rainfall and flooding the of Hare watershed [4]. The rainfall frequency data revealed that change in climate will impact the magnitude and frequency of rainfall intensity. The study data also predicated an increase in floods, flood frequency analyses can be referred to before constructing any superstructures such as bridges and dams thereby mitigating possible damage caused by floods.

The gypsum evaporite deposit in Loei-Wang Saphung (LWS), Thailand is estimated to be in excess of 35 million tons. In this issue, Nusara et al. document a few characteristics of these deposits such as morphology of gypsum-anhydrite, textures, lithologies etc [5]. Morphological and textural analyses revealed that the evaporite formation at LSW exhibits a spectrum of ten textures of i.e. alabastrine gypsum, crystalloblastic or blocky anhydrite, epigenetic anhydrite, felty epigenetic anhydrite, fine lenticular gypsum, gypsarenite, porphyroblastic gypsum, prismatic anhydrite, satin spar gypsum, and selenite gypsum. Sulphate was identified for the first time in LSW in this study, this finding is important in view of the fact that evaporites like sulphates are indicators of petroleum accumulation. The results suggest that the sulphate deposit at LSW has undergone at least four evolutionary alterations: (1) gypsum precipitation, (2) gypsum-to-anhydrite, (3) anhydrite-to-gypsum, and (4) gypsum re-expose.

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