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Climate change impact on mountain biodiversity: A special reference to Gilgit-Baltistan of Pakistan

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The present study is an attempt to identify the current knowledge of impacts of climate change on mountain biodiversity, a special reference to the Gilgit-Baltistan (GB), the home of world's three largest mountain ranges i.e., Himalaya, Karakoram and Hindu Kush range with the help of literature review. Mountains of Gilgit-Baltistan have most fragile ecosystem and are home to a great variety of wild fauna and flora, with many endangered species like the iconic Snow leopard (*Uncia uncia*) that lives with snow line, Astore Markhor (*Capra falconeri falconeri*), Marco Polo Sheep (*Ovis amon poli*), Himalayan griffin vulture (*Gyps himalayensis*) and various aromatic and economic value high altitude herbs. An inevitable conclusion from reviewed literature is that, the climate change is impacting the globe but its impacts are more drastic and extreme in the fragile mountain ecosystems like Gilgit-Baltistan (GB) resulting in biodiversity loss. Scientists warn that climate change impacts are three to four times greater in high altitude ecosystems like GB resulting in heavy floods due to melting of snow and glaciers leading to the loss of human lives, economy and infrastructure. It is also warned that the impact of climate change is expected to increase in future. Studies show that most of the species are moving towards higher elevations, especially the small mammals that are considered niche specialist, therefore considered as bio-indicators. As Gilgit-Baltistan has a fragile mountainous ecosystem, so every fraction of change in climate alters the ecosystem services very badly. People of Gilgit-Baltistan are totally dependent on natural resources, so there is great need of policy implementation for better management of natural resources and livelihood support in the changing climate. There is a need of actions to mitigate and adapt to the impacts of changing climate. The Government organizations, NGOs and the research agencies must fill the knowledge gap, so that it will help them for policy making, which will be based on scientific findings and research.

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Biodiversity restoration through conservation of *Xanthoxylum rhetsa*, *Cassia fistula* L., Pterocarpus santalinus and Santalum album: Trees under high exploitation in tropical India

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Sustained biodiversity could be achieved by species conservation at all levels. Hence a research work is carried out on Provenance variation studies on fruit, seed and seedling, traits of *Xanthoxylum rhetsa* - a tree under high exploitation in Central Western Ghats. The fruit length, fruit width, fruit test weight were 6.09 mm, 4.19 mm and 21.29 g respectively in Sirsi seed source which was found highest. *Cassia fistula* is an important tree with lot of medicinal properties commonly called as 'Amaltas'. Recently this species is gaining more popularity for its medicinal value. The pods and seeds are economically important parts having medicinal properties. *Pterocarpus santalinus* (*Red sander* or *Rakta chandana*) is a large deciduous, endemic and endangered multipurpose tree species. It is renowned for its highly prized characteristic timber of exquisite colour, beauty and superlative technical qualities. Red sanders, pods should be treated with 40 percent HCI for 24 hours to improve germination and 33 g of poultry manure should be applied to improve the initial growth and development of seedlings. These techniques are found to boost the production of quality planting stock of Red sanders. Tree crop interaction, carbon sequestration, shelterbelts, and their role in dry land ecosystem are determined.

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