

Climate Change in the Western Ghat Mountains: Impact and Adaptation

by S P Anandan

Conservation International has declared the Western Ghats Mountains as one of the 34 global biodiversity hotspots in the world. The Western Ghats of southwestern India and the highlands of southwestern Sri Lanka are strikingly similar in their geology, climate and evolutionary history. Together, they form one of the most densely populated of the 34 global biodiversity hotspots. This hotspot is extraordinarily rich in species, especially plants, found nowhere else. However, its forests face tremendous population pressure and have been dramatically impacted by demands for timber and agricultural land.

The Sierra Club is promoting and helping Indian environmental groups develop effective conservation strategies for the hills of the Western Ghats. The United Nations Environmental Programme also considers closed-forest preservation 'critical' in the area and all of India. Today, the challenge of mountain biodiversity entails not only documentation of information but its management, application and communication so that a clear picture will be available on the impact of climate change in the Western Ghats. The quality of research on mountain biodiversity and ecosystems of the Western Ghats depends on the individuals who perform it. So far, no indigenous scientific community has been involved in conserving various hills and mountains of these mountains. Green laws of conservation have never reached indigenous communities. The key to sustainable ecological development of the Western Ghats Mountains is to involve all indigenous communities dwelling in the mountains and hills. In fact, tribal community members can show our conservationists how human beings and the environment can live symbiotically since they have inherited conservation practices from their ancestors who were the guardians of mountains. Our Foundation, the Foundation for Research and Sustainable Development (FRSD) wishes to remind policy makers on the necessity to preserve various isolated hills of the Western Ghats from the impact of climate change.



Central Station, Kurangani Hills (P.S.Bose, GREEN)

Our Foundation and GREEN, an NGO in the Kurangani hills are active in highlighting the impact of climate changes in the Western Ghats Mountain range in the Theni District, Tamilnadu, India. Our focus areas are the Kurangani hills of the Bodinayakkanur block and Suruli hills of the Cumbum valley in the Western Ghats. Researchers say that “The projections of impacts using the outputs of the current climate models and vegetation response models are characterized by high uncertainty. There is therefore a need to improve the reliability of climate projections at a regional level and use dynamic vegetation models.”



Tribal settlements in Kurangani Hills (Mudhuvakkudi, Muttam hamlets) (P.S.Bose, GREEN)

There are 27 forest areas in the Theni district constituting a total area of 79,581.24 (795.81 sq.km) hectares. Nineteen areas fall under the Reserve Forest category with 25,543.75 (255.44 sq.km) hectares, 8 under the Reserve Land category with 54,037.49 (540.37 sq.km.) hectares and there is no Unclassified Forest type in this district. In the district, the total area of forest under green cover classification is 80,686 hectares. Dense forest and sparse forest are 29,281 and 2,243 hectares respectively. There has been no conservation of biological resources in the district. The information from a wild life census in the Theni district is yet to be made available (Government of Tamilnadu – Theni District website).

The forests of the Western Ghats are some of the best representatives of non-equatorial tropical evergreen forests in the world. The Western Ghats have evolved into one of the richest centers of endemism owing to their isolation from other moist areas. The hills of the Western Ghats are embedded in a landscape that has much drier climatic conditions (Ramesh et al. 1997). South of the Kodagu district in Karnataka, the elevation increases. The topography creates several enclaves that have acted as refuges for species over the years as surrounding areas have steadily grown drier. Variation in the degree of endemism in the Western Ghats depends on both the latitudinal length of dry season gradient as well as the temperature/elevation gradient, with a greater number of endemics found in areas with a short dry season and higher altitudes (Ramesh et al. 1997). The tall Western Ghats mountain range intercepts the moisture from the southwest monsoon, so that the eastern slopes and the Deccan Plateau receive relatively little rainfall: from 900 to 1,500 millimeters. The undulating hillsides have very shallow soils. (Ecosystem profile-CEPF)

The angiosperm diversity of India includes 17,672 species. With 5,640 species, Tamil Nadu ranks first among all the states in the country. This includes 533 endemic species, 230 red-listed species, 1,559 species of medicinal plants and 260 species of wild relatives of cultivated plants. The gymnosperm diversity of the country is 64 species of which Tamil Nadu has 4 species of indigenous gymnosperms and about 60 introduced species. The pteridophytes diversity of India includes 1,022 species of which Tamil Nadu has about 184 species. Tamil Nadu wild plant diversity also includes vast number of bryophytes, lichens, fungi, algae and bacteria. The faunal diversity of Tamil Nadu includes 165 species of fresh water fish, 76 species of amphibians, 177 species of reptiles, 454 species of birds and 187 species of mammals. According to the CAMP reports, the red-listed species include 126 species of fish, 56 species of amphibians, 77 species of reptiles, 32 species of birds and 40 species of mammals. The endemic fauna includes 36 species of amphibians, 63 species of reptiles, 17 species of birds and 24 species of mammals. Schedule I animals include 22 species of mammals, 42 species of birds and 9 species of reptiles. Schedule II animals include 13 species of mammals. Schedule III animals include 5 species of mammals. Schedule IV animals include 5 species of mammals, 367 species of birds, 109 species of reptiles and 23 species of amphibians. Schedule V animals include 13 species of mammals and 1 species of birds. (Tamilnadu Forest Department)



Beautiful birds of Western Ghats- rare and threatened (Photos: S.P.Anandan)

The Suruli Hills and Kurangani Hills of the Theni District are popular for resounding cascades, water falls, silver-lined clouds, sacred groves and temples of antiquity and above all, wonderful floral and faunal diversity. The Kurangani hills lying beneath the Munnar hills in Kerala are popular for cardamom, coffee and tea estates. So far, no conservation efforts have been taken to regenerate the hilly terrain. GREEN, Chinnamanur, a non-governmental organization has been implementing an important project titled “ Endogenous Spices Tourism Development” supported by the Ministry of Tourism, Government of India and the UNDP. GREEN is working to attract tourists to this ecologically important hilly terrain. The region is home for rare flora and fauna. Tribal community members like Mudhuvas and Pulayars are native to this mountain region and have been dwelling in isolated hamlets under miserable conditions. The

region was once under the control of Tata Tea Estates. Three hundred houses were built for the tea estate workers. The estate workers are still found in the region largely unemployed. Initiatives are yet to be taken for adapting to changes in the mountain environment caused by climate change or adaptive strategies to cope with impacts of climate change in this region.

'Kurangani' literally means "a procession of monkeys" as there were thousands of monkeys in Kurangani in the Theni District. Today, we cannot spot even a single monkey in Kurangani because of the changes in climate, human pressure and habitat destruction for commercial gains. Kolukkumalai tea is very famous since the tea estate is near Top Station near Munnar and the tea is popular for its natural taste. Cardamom and Kolukkumalai tea are exported for the wonderful aroma since they are still grown in Kurangani, in the Bodi Mettu region. Yet the aroma and flavor of the spices available today in Kurangani are not the same as they were fifty years ago. This is mainly because of the ecological disturbance in the region and that no conservation measures have been taken to restore the glory of Kurangani hills. We shall restore the lost glory through our newly formed "Sustainable Mountain Development Forum", a network of civil society members opposing environmentally destructive practices in the Western Ghats.



Pancratium zeylanicum and Smilax zeylanica: unique flora endemic to Kurangani Hills, Western Ghats (S.P.Anandan)

References

Critical Ecosystem Partnership Fund (CEPF) (www.cepf.net) (Ecosystem Profile-Western Ghats)

Government of Tamilnadu (www.tn.gov.in) (Department of Forests)

Sierra Club, USA (www.sierraclub.org) (International Committee)

GREEN, Chinnamanur, Theni District, Tamilnadu, India (www.green.org.in)

S.P.Anandan.M.A, (frsdmdu@yahoo.co.in) is the Director of the Foundation for Research and Sustainable Development (FRSD) and can be contacted at Rh 239, Ellis Nagar, Madurai 625010, Tamilnadu, India.

Foundation for Research and Sustainable Development (FRSD) is an NGO and has been engaged primarily in preservation of nature and natural resources in the Western Ghats range of mountains in Tamil Nadu. We have been addressing the threats to biological diversity in Western Ghats chain of mountains and the hills connected to the mountainous terrain in southern Tamilnadu, India. Members can read our featured article in Mountain Forum Bulletin January 2007 issue under Members Initiative to know about our work in Western Ghats mountains in Tamilnadu, India.

