



## **TOWARDS INTEGRATED MANAGEMENT OF WESTERN GHATS**

**M D Subash Chandran** and T.V. Ramachandra

Energy & Wetlands Research Group, Centre for Ecological Sciences, Indian Institute of Science, Bangalore 560 012, Email: [mds@ces.iisc.ernet.in](mailto:mds@ces.iisc.ernet.in); [cestvr@ces.iisc.ernet.in](mailto:cestvr@ces.iisc.ernet.in)

URL: <http://ces.iisc.ernet.in/energy>; <http://ces.iisc.ernet.in/biodiversity>

Western Ghats, a practically unbroken chain of mountains except for the Palghat Gap and running parallel to the Arabian Sea all along the India peninsula, is a global centre for exceptionally high biodiversity and endemism. The influence of the Western Ghats and its characteristic montane forest ecosystems on the Indian monsoon weather patterns that mediate the warm tropical climate of the region, has been considered one of the best examples of the tropical monsoon, and a notable reason for conferring World Heritage Centre status for the mountains.

The rivers from the Western Ghats, both towards the Arabian Sea and the Bay of Bengal, have sustained through ages human lives and cultures beyond its geographical and geological limits which are rather imprecise. The tropical estuaries of these rivers, with their mangrove swamps and marshes, in their pristine forms would have been among the most biodiverse and productive ecosystems of the planet. Whereas the Deccan volcanism, about 65 million years ago, that marked the end of the Cretaceous and beginning of the Tertiary in the Indian subcontinent, created massive destruction of flora and fauna especially in the northern portions, the southern region remaining relatively less harmed and where primeval forests probably persisted in riparian regions, paving way for natural regeneration and re-vegetation of Western Ghats with native species.

The northern Western Ghats under flood basalt regime, despite the passage of over 60 million

since volcanism, seems to have not regained the lost rain forests as could be deciphered from the absence in Maharashtra of Myrsitica swamps and Dipterocarps, Gondwanan lineage elements which occur in increasing frequencies, along with endemic amphibians and endangered primates like Lion Tailed Macaques, in the primeval forest relics southwards of 15°N latitude. The decline of rainforests that covered most of India, in the geological ages past could be also attributed to the setting in of aridity and pronounced monsoonal climate with more number of dry months towards north due to northward drift of the subcontinent towards Eurasia and the rise of the Himalayas.

Major human impacts on primeval forests began with the introduction of slash and burn cultivation in the pre-historical times, beginning around three millennia back lasting till late 19<sup>th</sup> to early 20<sup>th</sup> centuries. However, the traditional practice of setting aside large blocks of forests, as dedicated to gods of villages, helped in a big way the cause of conservation of primeval elements enmeshed in secondary forests, helping the recovery of the latter during the long fallow periods of shifting cultivation, especially in the pre-colonial South Indian Western Ghats. These sacred groves, as their numerous remains, some relatively in-tact, indicate that they functioned as important hydrological systems, being associated with perennial streams, springs and tanks. The groves enhanced habitat heterogeneity and supplied various non-wood produce for subsistence and trade, especially spices like pepper, cardamom and cinnamon.



**LAKE 2014: Conference on Conservation and Sustainable Management of Wetland Ecosystems in Western Ghats**

Date: 13<sup>th</sup> -15<sup>th</sup> November 2014

Symposium Web: <http://ces.iisc.ernet.in/energy>

Beginning in the colonial period, over two centuries ago, the ecosystems of the Western Ghats have undergone wholesale deterioration and destruction, due to piecemeal, resource-extraction centred management regimes, which continued even after the British era, well into mid-1980's, from when there has been greater emphasis on conservation.

That the implications of piecemeal management by humans can have far reaching impacts can be deciphered from some of the recent breakthrough studies:

1. That forest transformation by humans, from endemic tree rich evergreen forests to deciduous ones and monocultural plantations can eliminate Western Ghats endemic fishes from the streams in such forests.
2. That construction of hydroelectric projects especially in west-flowing rivers can create a collapse of estuarine ecosystems due to lowered salinity, caused by year-long release of fresh water releases after power production, adversely affecting entry into the estuary of stenohaline marine fishes for feeding and breeding, as is evident from Sharavathi estuary of Uttara Kannada. Estuarine impoverishment in turn can affect marine biodiversity and productivity.
3. Even shrinkage and shifts in habitats of edible estuarine clams have happened in

Kali estuary of Uttara Kannada following hydroelectric projects upstream in the river. Most edible clams have almost gone extinct in Sharavathi due to lowered salinity.

4. That continued protection of sacred groves, in watershed areas can substantially benefit the economy and ease of life for rural human communities downstream, through perennial water supply unlike in adjoining landscapes where sacred groves are lost or non-existent, has been illustrated by Uttara Kannada studies. Sacred grove degradation and destruction have been rampantly happening due to gradual transformations in earlier nature-centric cultures of the region towards overwhelming ritualization and dogmas in religion with unexpected adverse consequences on hydrology and endemism in flora and fauna.

The paper calls for strengthening hydrology centric landscape management in the Western Ghats and its peripheral areas for conservation of threatened primeval vegetation and endemic biodiversity, for restoration of primeval biodiversity from lost areas, and for betterment of human lives. A fresh approach towards clustering of gram panchayats towards decentralized development considering the status of local natural resources and human resources has been called for.

**Keywords:** Western Ghats; integrated ecosystem management; forest history; sacred groves, hydrology