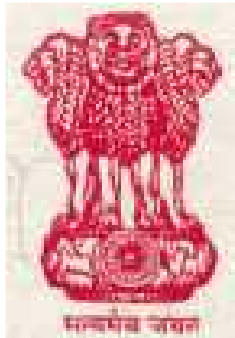


Satoyama like Landscapes in India and their Benefits for Bio-diversity Conservation and Human Well Being

Dr G.V. Subrahmanyam
Adviser

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Government of India
Ministry of Environment and Forests
New Delhi



जहाँ है हरियाली ।
वहाँ है खुशहाली ॥

Environmental Ethic in India

- Ancient philosophy
- Respect for environment
- Tribals and adivasis
- Living in harmony with nature
- Cultural practices and knowledge systems
- Nurture biodiversity
- No accumulation of waste
- Humanbeing – one of the species – ecosystem

Contd...Environmental Ethic in India

- Humanbeing – dominant species – urban environment
- Accumulation of waste- environmental degradation
- Conflict with nature
- Prakruti and Purush – harmony
- No single species encroach over other species
- Indian culture - compassion for animate and inanimate

India

- **Mega-diversity country**
- **2.4% land area, 8.5 of recorded species of the world**
- **3 (NE, A&N, W. Ghats) of the 34 biodiversity hotspot zones on earth.**
- **One of the 17 Like Minded Mega-Diverse Countries (LMMDCs) and led the world from 2004 to 2006.**
- **Ratified the CBD and became party to it in Feb 1994.**
- **Prepared its national Policy and Macro-level Action Strategy on Biodiversity in 1999 and revised through consultative Process the “National Biodiversity Action Plan” in December 2008.**
- **Has National Forest Policy 1988 to ensure environmental stability and Ecological balance.**
- **National Environment Policy 2006 seeks to achieve balance between conservation and development.**

India

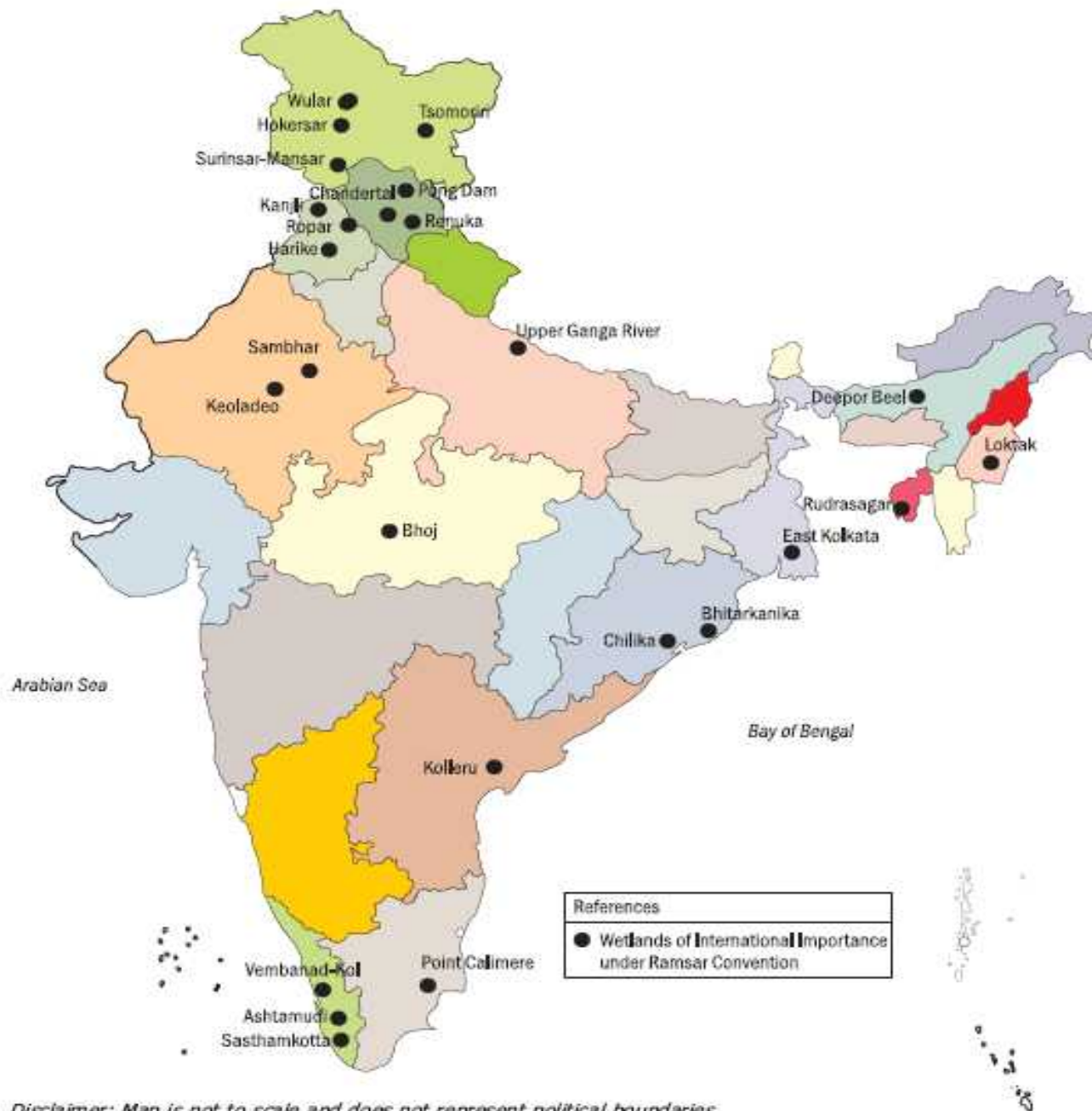
- **Enacted the Biological Diversity Act 2002 and Biodiversity Rules 2004 (one of a very few countries to have a legislative mechanism to protect Biodiversity)**
- **With very wide socio-cultural-economic diversity on one hand, conflicting and unequal stakeholders' demands accelerated efforts towards:**
 - **Effective conservation and management of living resources**
 - **Sustainable use of biodiversity**
 - **Fair and equitable sharing of benefits**

Recorded plant species

Taxonomic group	Number of species		% of world flora
	World	India	
Angiosperms	250000	17500	7.0
Gymnosperms	650	48	7.4
Pteridophytes	10000	1200	12.0
Bryophytes	14500	2850	19.7
Lichens	13500	2075	15.0
Fungi	70000	14500	20.7
Algae	40000	6500	16.30
Virus/Bacteria	8050	850	10.6
Total	406700	45523	11.80

Source: India's Third National Report to CBD, 2006

Identified Ramsar Sites in India



Comparable with the regional forests for various ecological attributes

Gene-pool gardens for in-situ conservation

Store-houses of rare and endangered plants



Refugia of resource population under extermination

Services for the maintenance of ecosystem health of all interacting landscape units

Centres of traditional socio-cultural and eco-folklore

Sacred groves of india

- patches of forests or natural vegetation –
- dedicated to **local folk deities** (Example – *Ayyanar* and *Amman*) or **tree spirits** (*Vanadevatais*).
- **protected by local communities** because of their religious beliefs and traditional rituals.
- **Types of Sacred groves**
 - a) Traditional** – It is the place where the village deity resides, who is represented by an elementary symbol
 - b) Temple** – Here a grove is created around a temple and conserved.
 - c) Groves around the burial or cremation grounds.**

Ecological significance

- **Conservation of Biodiversity** – The sacred groves are important repositories of floral and faunal diversity that have been conserved by local communities in a sustainable manner. They are often the last refuge of endemic species in the geographical region.
- **Recharge of aquifers** – The groves are often associated with ponds, streams or springs, which help meet the water requirements of the local people. The vegetative cover also helps in the recharging the aquifers.
- **Soil conservation** - The vegetation cover of the sacred groves improves the soil stability of the area and also prevents soil erosion.

Distribution of sacred groves in india

- In India, the sacred groves are found all over the country and abundantly along the western ghats in the states of Kerala and Karnataka. Although, there has been no comprehensive study on the sacred groves of the entire country, approximately **19,000** sacred groves have been documented so far.

State	Local term for Sacred Groves	No. of documented sacred groves
Andhra Pradesh	-	750
<u>Arunachal Pradesh</u>	<i>Gumpa</i> Forests (Sacred Groves attached to Buddhist monastries)	65
Assam	<i>Than, Madaico</i>	40
Chhattisgarh	Sarna, Devlas, Mandar, Budhadev	600
Gujarat	-	29
Haryana	-	248
Himachal Pradesh	<i>Deo Bhumi</i>	5,000
<u>Jharkhand</u>	<i>Sarana</i>	21
<u>Karnataka</u>	<i>Devara Kadu</i>	1,424
<u>Kerala</u>	<i>Kavus</i>	2000
Madhya Pradesh	<i>Devkot, Matikot, Devsthali, Budhadev</i>	21
<u>Maharashtra</u>	<i>Devrais</i>	1,600
<u>Manipur</u>	<i>Gamkhap, Mauhak</i> (sacred bamboo reserves)	365
<u>Meghalaya</u>	<i>Law Lyngdhoh</i>	83
Orissa	<i>Jahera, Thakuramma</i>	322
<u>Pondicherry</u>	<i>Kovil Kadu</i>	108
<u>Rajasthan</u>	<i>Orans, Kenkris, Jogmaya</i>	9
Sikkim	<i>Gumpa</i> Forests	56
<u>Tamilnadu</u>	<i>Kovil Kadu</i>	503
<u>Uttaranchal</u>	<i>Deo Bhumi, Bugyal</i> (sacred alpine meadows)	18
<u>West Bengal</u>	<i>Garamthan, Harithan, Jahera, Sabitrithan, Santalburithan</i>	670

**Sacred groves:
Centres for Culture and eco-folklore
acts as counselor and advisors for the villagers**










Sacred groves in India

Have survived under a variety of ecological situations

Dearali	Darjeeling hills	
Lakyntang	Khasia and Jaintia Hills in Meghalaya	
Jankor Dudh	Central India	
Jaher	Santal tribal region	
Sarnas	Bihar and Madhya Pradesh	
Oran	Rajasthan	
Deorais or Deoranis	Maharashtra	
Devarakadu	Karnataka	
Kovilkadu or Kavu	Tamil Nadu	
Sarpa Kavu or Kavu	Kerala	



Hariyali in Garhwal Himalaya



Sacred groves in Travancore – *Ficus religiosa*, *Strychnos colubrina*



Ficus religiosa - Canopy

Mawphlong, Near Shillong, Meghalaya



THREATS TO THE SACRED GROVES

- The threats vary from one region to the other and even from one grove to the other. But the common threats identified are:
- **Disappearance of the traditional belief systems**, which were fundamental to the concept of sacred groves. These systems and their rituals are now considered mere superstition.
- Sacred groves in many parts of our country have been destroyed due to **rapid urbanization** and **developmental interventions** such as roads, railways tracks, dams including commercial forestry. Encroachment has led to the shrinkage of some of the largest groves in the country.
- Many groves are suffering due to '**Sanskritisation**' or the transformation of the primitive forms of nature worship into formal temple worship.
- **Invasion by exotic weeds** such as *Eupatorium odoratum*, *Lantana camara* and *Prosopis juliflora* is a serious threat to some groves.
- Pressures due to **increasing livestock** and **fuelwood collection**
- **Pollution**
- **Impact of Climate Change**

Threats to Biodiversity

- **In spite of richness of biodiversity, we have problems of:**
 - **Habitat fragmentation,**
 - **Over-exploitation of natural resources,**
 - **Desertification,**
 - **Unplanned change in land-use,**
 - **Pollution**
 - **Impact of Climate Change**
 - **Invasion of exotic species that overpower natives – through natural & anthropogenic induced actions**

- Many of the Introduced plants that include agricultural crops and trees like **Eucalypts** and **Poplars** are useful.



- However, some of the introductions in India e.g. *Lantana camara*, *Ageratum conyzoides*, *Prosopis juliflora*, *Eichhornia crassipes*, *Mikania micrantha* later became **invasive & weedy**.



- While others e.g. *Parthenium hysterophorus*, *Eupatorium odoratum* invaded **accidentally**.



Community based biodiversity conservation of Sacred groves

Bishnois in the State of Rajasthan

- They do not cut trees for fuel and timber, they remove only the dead trunks and twigs. Spotted deer, black buck and blue bull can be seen foraging fearlessly in their fields.

North – East India

- Conservation and protection of a patch of forest near the villages through religious and cultural beliefs is an old practice with tribal communities in north – eastern hill region of India. Villagers in Nagaland have taken up conservation initiatives by banning hunting

Water harvesting structure by Self Help Groups (SHGs)



Soil moisture conservation measures

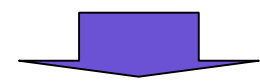




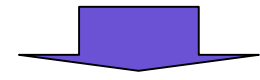
A Tribute to Indian Women for conservation



Forest regeneration



Non-timber forest produce (NTFP)



Benefits/incentives



Left and above: *Forest produce is a vital component of rural economy.*

Urban landscapes

- Silent biodiversity hot spots
- Landscape ecology
- Integration of habitat fragmentation
- Article 8(e) of the CBD explicitly states the need to “promote environmentally sound and sustainable development in areas adjacent to protected areas with a view to furthering protection of these areas”. E.g. Guindy National Park (GNP) despite its small size (around 250 ha.) is often known as the “lungs” of Chennai in South India

- a) Remnant natural habitat preserved inside IIT-M
- b) Endangered Blackbuck continue to survive within Chennai



Environmentally Sensitive areas

- Areas with identified environmental resources having incomparable values which require special attention for their conservation. E.g. Matheran, Mount Abu, Mahabaleshwar, Pachmarhi, Doon Valley etc.
- Area around the PA viz national parks and sancturies
- MoEF notifies ES area for protection and conservation under the Environment (Protection) Act, 1986

Mt. Abu (Rajasthan, ES areas)



