GE 2211 Environmental Science and Engineering

Unit – II

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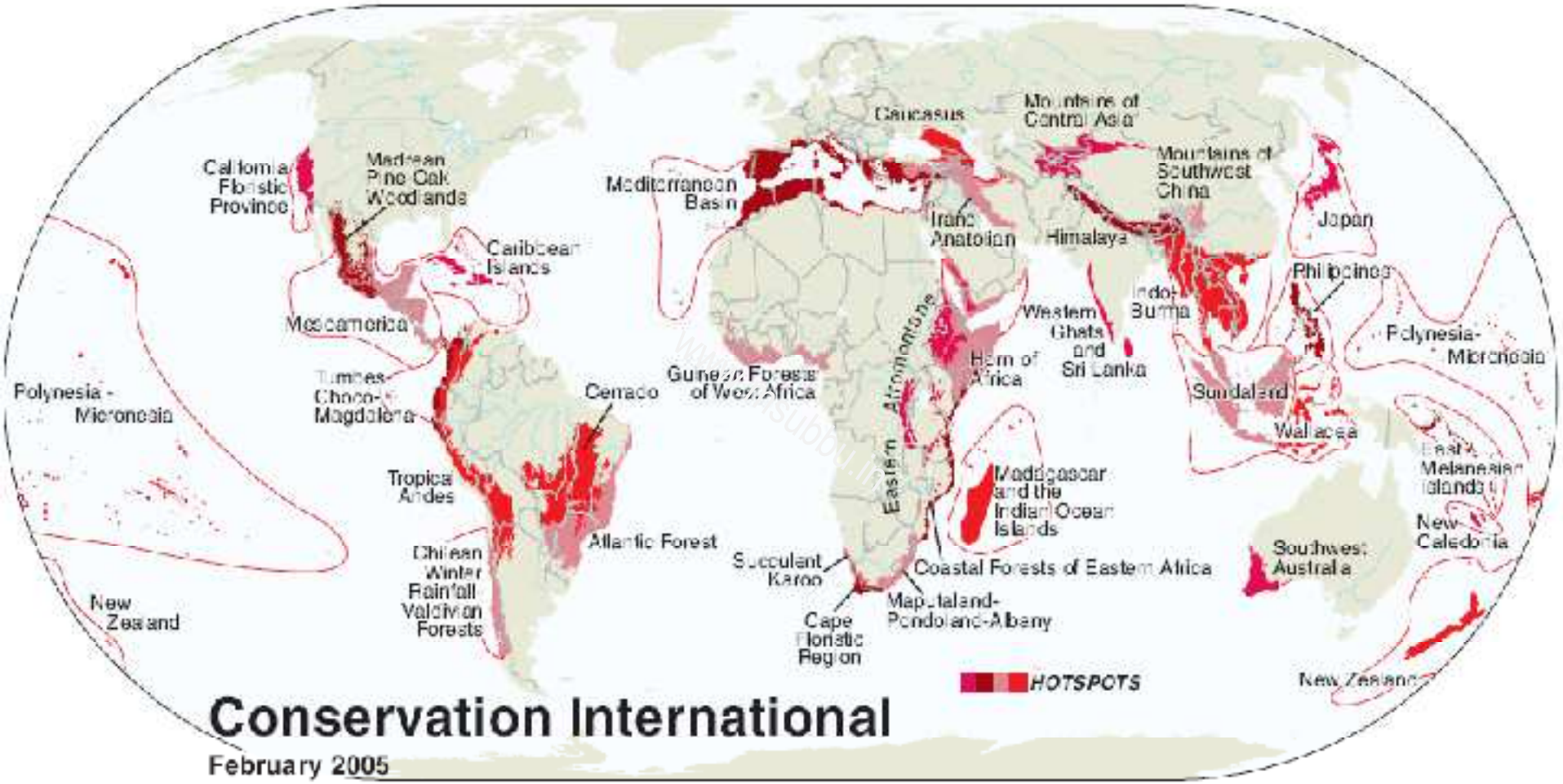
Biodiversity-Hotspots

M. Subramanian

Assistant Professor
Department of Chemical Engineering
Sri Sivasubramaniya Nadar College of Engineering
Kalavakkam – 603 110, Kanchipuram (Dist)
Tamil Nadu, India
msubbu.in[AT]gmail.com

Biodiversity - Hotspot

- The richest and most threatened reservoirs of plant and animal life on the Earth
- British ecologist Norman Myers defined the biodiversity hotspot concept in 1988 to address the dilemma that conservationists face: *what areas are the most immediately important for conserving biodiversity*?
- The biodiversity hotspots hold especially high numbers of endemic species, yet their combined area of remaining habitat covers only 2.3 percent of the Earth's land surface.
- Each hotspot faces extreme threats and has already lost at least 70 percent of its original natural vegetation. Over 50 percent of the world's plant species and 42 percent of all terrestrial vertebrate species are endemic to the 34 biodiversity hotspots.


California Floristic Province
Mediterran Pine Oak Woodlands
Caribbean Islands
Mesoamerica
Tumbes-Chocó-Magdalena
Tropical Andes
Cerrado
Atlantic Forest
Chilean Winter Rainfall Valdivian Forests
Polynesia - Micronesia
New Zealand
Mediterranean Basin
Caucasus
Irano Anatolian
Guinean Forests of West Africa
Horn of Africa
Eastern Afromontane
Succulent Karoo
Cape Floristic Region
Maputaland-Pondoland-Albany
Coastal Forests of Eastern Africa
Madagascar and the Indian Ocean Islands
Mountains of Central Asia
Himalaya
Mountains of Southwest China
Western Ghats and Sri Lanka
Indo-Burma
Sundaland
Wallacea
Japan
Philippines
Polynesia-Micronesia
New Caledonia
Southwest Australia
New Zealand
HOTSPOTS
Conservation International
February 2005

North and Central America

1. California Floristic Province
2. Caribbean Islands
3. Madrean Pine-Oak Woodlands
4. Mesoamerica

South America

5. Atlantic Forest
6. Cerrado
7. Chilean Winter Rainfall-Valdivian Forests
8. Tumbes-Chocó-Magdalena
9. Tropical Andes

Europe and Central Asi

10. Caucasus
11. Irano-Anatolian
12. Mediterranean Basin
13. Mountains of Central Asia

Africa

14. Cape Floristic Region
15. Coastal Forests of Eastern Africa
16. Eastern Afromontane
17. Guinean Forests of West Africa
18. Horn of Africa
19. Madagascar and the Indian Ocean Islands
20. Maputaland-Pondoland-Albany
21. Succulent Karoo

Asia-Pacific

22. East Melanesian Islands
23. Himalaya
24. Indo-Burma
25. Japan
26. Mountains of Southwest China
27. New Caledonia
28. New Zealand
29. Philippines
30. Polynesia-Micronesia
31. Southwest Australia
32. Sundaland
33. Wallacea
34. Western Ghats and Sri Lanka

Hotspot	Population	People/km^2
Atlantic Forest	106,800,000	87
California Floristic Province	35,600,000	121
Cape Floristic Region	4,000,000	51
Caribbean Islands	35,600,000	155
Caucasus	36,100,000	68
Cerrado	26,800,000	13
Chilean Winter Rainfall - Valdivian Forests	14,700,000	37
Coastal Forests of Eastern Africa	15,000,000	52
East Melanesian Islands	1,300,000	13
Eastern Afromontane	96,900,000	95
Guinean Forests of West Africa	84,700,000	137
Himalaya	91,300,000	123
Horn of Africa	38,100,000	23
Indo - Burma	316,900,000	134
Irano - Anatolian	52,000,000	58
Japan	125,400,000	336

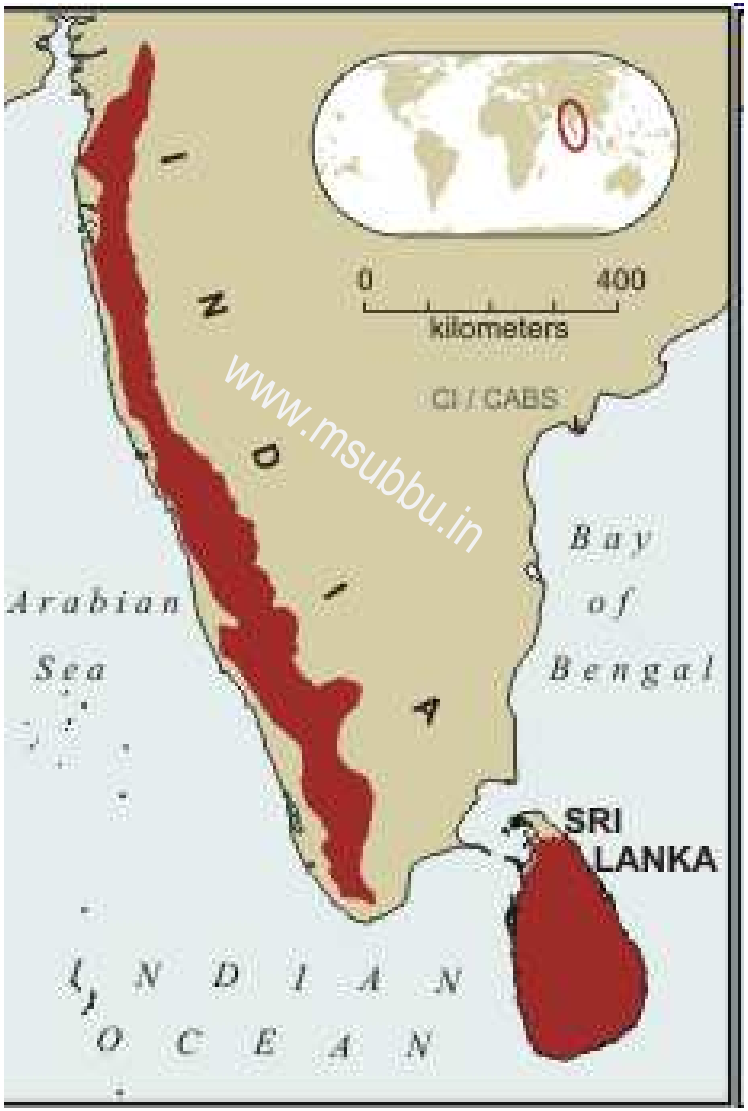
Hotspot	Population	People/km ^{2}
Madagascar and the Indian Ocean Islands	19,200,000	32
Madrean Pine - Oak Woodlands	14,700,000	32
Maputaland - Pondoland - Albany	19,300,000	70
Mediterranean Basin	232,200,000	111
Mesoamerica	81,400,000	72
Mountains of Central Asia	36,000,000	42
Mountains of Southwest China	8,500,000	32
New Caledonia	200,000	11
New Zealand	3,800,000	14
Philippines	81,000,000	273
Polynesia - Micronesia	2,800,000	59
Southwest Australia	1,700,000	5
Succulent Karoo	400,000	4
Sundaland	229,400,000	153
Tropical Andes	56,700,000	37
Tumbes - Choc	13,900,000	51
Wallacea	27,500,000	81
Western Ghats and Sri Lanka	49,400,000	261

Human population in the hotspots

- Recent studies have shown that the hotspots have a higher population density than expected when compared to the global average.

- Coastal Asian hotspots with major cities are suffering the worst from overpopulation in hotpots with the Philippines, Japan, and Western Ghats and Sri Lanka all having over 250 people per km², in comparison to the global average of 42 people per km².

Western Ghats



Western Ghats

- The Western Ghats of southwestern India and the highlands of southwestern Sri Lanka, separated by 400 kilometers, are strikingly similar in their geology, climate and evolutionary history.

- The Western Ghats, known locally as the Sahyadri Hills, are formed by the Malabar Plains and the chain of mountains running parallel to India's western coast, about 30 to 50 kilometers inland.

- They cover an area of about 160,000 km² and stretch for 1,600 kilometers from the country's southern tip to Gujarat in the north, interrupted only by the 30 kilometers Palghat Gap

Western Ghats (contd.)

- The Western Ghats mediates the rainfall regime of peninsular India by intercepting the southwestern monsoon winds.
- The western slopes of the mountains experience heavy annual rainfall (with 80 percent of it falling during the southwest monsoon from June to September), while the eastern slopes are drier; rainfall also decreases from south to north
- Dozens of rivers originate in these mountains, including the peninsula's three major eastward-flowing rivers. Thus, they are important sources of drinking water, irrigation, and power.
- The wide variation of rainfall patterns in the Western Ghats, coupled with the region's complex geography, produces a great variety of vegetation types.

Western Ghats (contd.)

- The forests of the Western Ghats have been selectively logged and highly fragmented throughout their entire range.

- Forests have been converted to agricultural land for monoculture plantations of tea, coffee, rubber, oil palm, teak, eucalyptus, and wattle, and are also cleared for building reservoirs, roads, and railways.

Himalaya


Portrayals of political boundaries are for reference only and are NOT in support of ANY position
PAKI-STAN
C H I N A
BHUTAN
I N D I A
NEPAL
0 500
kilometers
BANGLADESH
MYANMAR
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Himalaya

- Stretching in an arc over 3,000 kilometers of northern Pakistan, Nepal, Bhutan and the northwestern and northeastern states of India, the Himalaya hotspot includes all of the world's mountain peaks higher than 8,000 meters.
- The Himalaya Hotspot is home to the world's highest mountains, including Mt. Everest.
- The mountains rise abruptly, resulting in a diversity of ecosystems that range from alluvial grasslands and subtropical broadleaf forests to alpine meadows above the tree line.
- The hotspot is home to important populations of numerous large birds and mammals, including vultures, tigers, elephants, rhinos and wild water buffalo.