DEVELOPMENT OF FOREST ECOZONES OF PUNJAB

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INTRODUCTION

Forest Ecozones represent large areas of the Earth's surface where plants developed in relative isolation over long periods of time and are separated from one another by geologic features, such as oceans, broad deserts or high mountain ranges, that formed barriers to plant migration. Forest Ecozones are characterized by the evolutionary history of the plants they contain. These are divisions of the Earth's surface based on plant life form or the adaptation of plants to climatic, soil and other conditions. A tropical moist broadleaf forest in Central America, for example, may be similar to one in New Guinea in its vegetation type and structure, climate, soils, etc., but these forests are inhabited by plants with very different evolutionary histories.

The Punjab province is mainly a fertile region along the river valleys, while sparse deserts can be found near the border with Rajasthan and the Sulaiman Range. The region contains Thar and Cholistan deserts. The Indus River and its many tributaries traverse Punjab from north to south. The landscape is amongst the most heavily irrigated on earth and canals can be found throughout the province. Weather extremes are notable from the hot and barren south to the cool hills of the north. The foothills of the Himalayas are found in the extreme north as well. Most areas in Punjab experience fairly cool winters. By mid-February the temperature begins to rise; springtime weather continues until mid-April, when the summer heat sets in. The spring monsoon has either skipped over the area or has caused it to rain so hard that floods have resulted. June and July are oppressively hot. Although official estimates rarely place the temperature above 46°C, newspaper sources claim that it reaches 51°C and regularly carry reports about people who have succumbed to the heat. Heat records were broken in Multan in June 1993, when the mercury was reported to have risen to 54°C. In August the oppressive heat is punctuated by the rainy season, referred to as *barsat*, which brings relief in its wake. The hardest part of the summer is then over, but cooler weather does not come until late October.

Forest Ecozones of Punjab

Zones	Annual Rainfall	Mean Annual Temp. Min – Max	Physiography	Soil	Vegetation	
					Technical Name	Common Name
Sub Himalayan Tract	800-1200 mm	0 - 44°C	The natural high hill coniferous forests grow at an elevation of 765 m above sea level. The forest areas are located in Murree and Kahuta	Rich soils in valleys.	- *Pinus roxburghii* - *Pinus wallichiana* - *Cedrus deodara* - *Picea smithiana* - *Abies pindrow* - *Quercus* spp.	Chir Kail Diar/Deodar Kachal/Spruce Partal/Fir Rein/Oak

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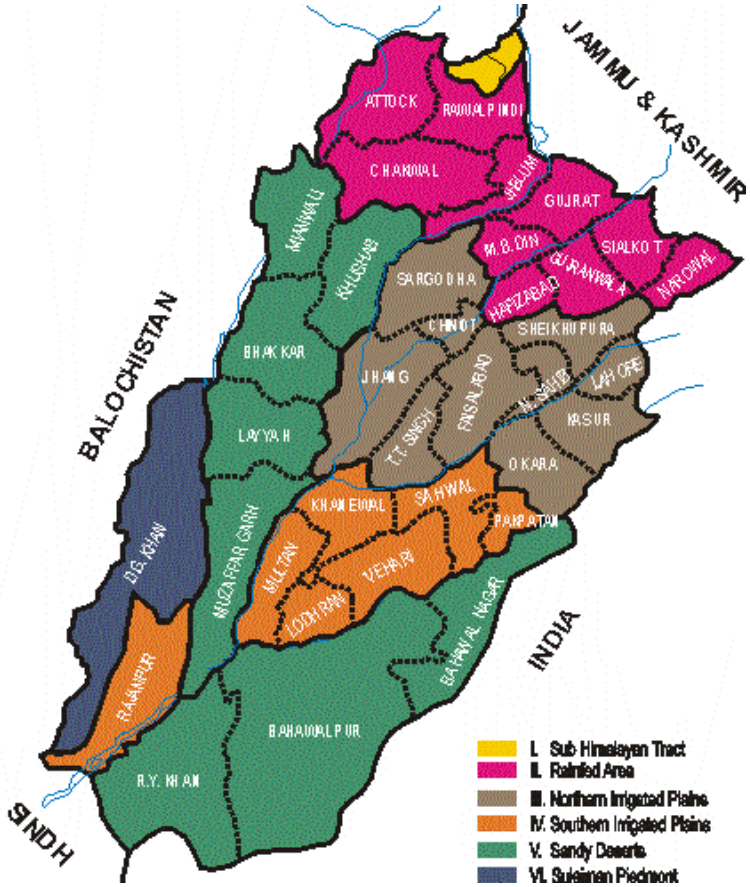
Zones	Annual Rainfall	Mean Annual Temp. Min – Max	Physiography	Soil	Vegetation	
					Technical Name	Common Name
			tehsils of Rawalpindi district.		- *Aesculus indica* - *Robinia pseudoacacia* - *Populus ciliata* - *Populus alba* - *Syzygium cumini* - *Platanus orientalis* - *Acer caesium*	Ban Khor/Horse Chestnut Robinia/Black Locust Palach Poplar Jaman Chinar Trekhan/Maple
Rainfed Area	125-1000 mm	-0.5 - 40°C	Covers the Salt Range, Pothwar Plateau and the Himalayan Piedmont plains. Narrow belt along the foot of the mountains nearly humid, southwestern part semi-arid and hot. The forest areas are located in Attock, Rawalpindi, Chakwal, Jhelum, Gujrat, M.B. Din, Sialkot, Gujranwala, Hafizabad and Narowal districts.	Eastern part dominantly non-calcareous to moderately calcareous silt loams; west southern part mainly calcareous loams.	- *Acacia modesta* - *Olea ferruginea* - *Acacia nilotica* - *Zizyphus mauritiana* - *Melia azedarach* - *Tamarix aphylla* - *Prosopis juliflora* - *Tecoma undulata* -*Parkinsonia aculeata* - *Butea frondosa* - *Phoenix dactylifera* - *Vitex negundu* -*Calligonum polygonaides*	Phulai Kahu Babul/Kikar Ber Bakain Frash Mesquite Lahura Parkinsonia Dhak Khajur Marwan Phog
Northern Irrigated Plains	300-500 mm	6 - 40°C	Areas between Sutlej and Jhelum rivers. This zone has a semi-arid subtropical continental climate. The forest areas are located in Sargodha, Jhang, Chiniot, T.T. Singh, Faisalabad, Shekhupura, N. Sahib, Lahore, Kasur and Okara districts.	Sandy loam - clay loam; southern and central part calcareous silt loams and about 15% saline-sodic; northern part loam and clay loam, mostly non-calcareous, saline sodic.	- *Dalbergia sissoo* - *Morus alba* - *Bombax cieba* - *Salvadora oleoides* - *Tamarix dioca* - *Prosopis cineraria* - *Tecoma undulata* - *Tamarix aphylla* - *Zizyphus mauritiana* - *Acacia nilotica* - *Syzygium cumini* - *Azadirachta indica* - *Cordia dichotoma* - *Acacia catechu* - *Bauhinia purpurea* - *Cassia fistula* - *Populus deltoides* - *Eucalyptus* spp. - *Albizzia lebbek* - *Albizzia procera*	Shisham Toot Simal Van Pilchi Jand Lahura Frash Ber Kikar Jaman Neem Lasura Katha Kachnar Amaltas Poplar Sufeda Kala Sirin Sufed Sirin
Southern Irrigated Plains	16-120 mm	8 - 45°C	Represents lower Indus Plain formed by meandering of Indus river. Climate arid sub-tropical continental with hot summer and mild winter. The forest areas are located in Khanewal, Sahiwal, Multan, Lodhran, Vehari,	Soil is silty and sandy loam associated with the active flood plain, upper areas of the flood plain calcareous loamy and	- *Dalbergia sissoo* - *Morus alba* - *Acacia nilotica* - *Bombax cieba* - *Melia azedarach* - *Populus euphratica* - *Eucalyptus* spp. - *Zizyphus mauritiana* - *Prosopis cineraria* - *Salix* spp.	Shisham Toot Kikar Simal Bakain Bahan Sufeda Ber Jand Willow

Zones	Annual Rainfall	Mean Annual Temp. Min – Max	Physiography	Soil	Vegetation	
					Technical Name	Common Name
			Pakpatan, and Rajanpur districts.	clayey.		
Sandy Deserts	**A.** 150-200 mm **B.**150-350 mm	7 - 45°C 5 - 40°C	**A.** Sandy desert with xerophytic vegetation; central part occupied by salt lakes. **B.** Area covered with various forms of sand ridges, sand dunes and sand sheets with profuse short trees and vegetation. The forest areas are located in Mianwali, Khushab, Bhakkar, Layyah, Muzaffar Garh, R.Y. Khan, Bahawalpur and Bahawalnagar districts.	**A.** Sandy soils and moving sand dunes, undulating sand ridges 20-25 m high and 1-3 m long; western part has strips of clayey soils. **B.** Stable sand ridges with loamy soil in between sand dunes. Moderately to strongly calcareous, locally saline-sodic.	- *Calligonum polygonaides* - *Capparis aphylla* - *Prosopis cineraria* - *Salvadora oleoides* - *Tamarix aphylla* - *Tecoma undulata* - *Zizyphus mauritiana* - *Prosopis juliflora*	Phog Karir Jand Van Frash Lahura Ber Mesquite
Suleiman Piedmont	125-250 mm	5.7 - 48°C	Comprises Piedmont plains of the Suleiman range and alluvial fans built by streams. This zone has arid and hot subtropical continental climate. The forest areas are located in D.G. Khan district.	Soils loam in gently sloping areas but clayey further away. Strongly calcareous with narrow strips of salinity, sodicity at the junction of piedmont plain and river flood plain.	- *Acacia modesta* - *Olea ferruginea* - *Prosopis juliflora* - *Prosopis cineraria* - *Tecoma undulata* - *Leucaena leucocephala* - *Salvadora persica*	Phulai Kahu Mesquite Jand Lahura Ipil Ipil Pilu



Forest Ecozones of Punjab

CONCLUSIONS

Food scarcity remains a persistent problem for a large proportion of world population. It has immediate consequence on soil in terms of determining survival strategies of tree growers in view of declining productivity, loss of surface soil mass and soil degradation.

RECOMMENDATIONS

Global environmental problem such as land degradation, desertification, loss of biological diversities and climate change would overcast overall objective of soil in the current 21st century. Soil is the most essential resource for sustained quality of human life and related activities. Therefore, it is strongly recommended that soil resource and forest-ecology based forestry development should be the strategy for exploiting renewable resources.

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REFERENCES

Winrock International Technical Assistance Team, 1992. Forestry Planning & Development Project, Government of Pakistan – USAID. Suitable tree species for different Agro-ecological regions and civil divisions of Pakistan. Technical Note No. 11.

Sheikh, M. I., 1993. Trees of Pakistan.

Pakistan Agricultural Research Council, Ministry for Food & Agriculture, Islamabad. 1996. National Master Agricultural Research Plan (1996-2005).

Pakistan Meteorology Department. Personal Communications.

Muhammad, D. D., 1998. Grassland and pasture crops country pasture/forage resource profiles. FAO.