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RESEARCH ARTICLE

AN EXPANDING RANGE OF NON-FORESTED LAND IN PUNJAB AND ITS REPERCUSSIONS

***Kirandeep Dhami**

Guru Nanak Dev University, Amritsar, Punjab

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ABSTRACT

Forests ecosystem is the baseline of any healthy terrestrial ecosystem on earth on which the survival of different species including human beings depend. Despite the fact that forests are critical for a healthy ecosystem, forests are being allowed to disappear from the surface of earth without appropriate concern and consideration. While the world lost 129 million hectares of forests between 1990 and 2015, the Indian state of Punjab lost 9 lakh trees between 2011 and 2017 on its 50362 sqKms of geographical area. Due to this huge deforestation for various developmental projects, the state is left with very small forest cover on its land that hardly makes 3.65% of its geographical area. As the tree cutting continues in the state, this percentage is approaching even a smaller value with each passing day. With this small canopy cover and a population of 28 million to support, the state has already started observing some of the serious consequences tree cutting brings; be it unhealthy air, water scarcity, depleting water table, global warming and/or unpredictable weather patterns. This article reviews the alarming bells that the deforestation has begun to ring for the imbalance in nature that reduced forest cover has started to generate in the state of Punjab.

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INTRODUCTION

Aforest is a complex ecosystemthat is predominantly composed of a variety of plant species of herbs, shrubs, trees,climbers and grasses. Technically, a forest is defined as a region that has a dense tree cover of more than 10% of its geographical area (Food and Agricultural Organization). Forests can be evergreen (trees remain green throughout the year) or deciduous (trees shed their leaves in particular season of the year). Depending upon geographical location, ecology or canopy cover, forests aredescribed as tropical, temperate, montane or alpine and dense or open forests (Table 1 and 2). Forests are important to keep a balance of ecology while contributing to the economy (Champion, 1968). The contribution of forests in maintaining a balance of natureis huge. Forests are important component of earth that make the planet earth habitable for various species while providing economic and aesthetic benefits to human society.Forestsare "lungs of the earth" that regulate the composition of air in the atmosphere by consuming carbon dioxide and producing oxygen. Every acre of forest canproducealmost 6 tons of oxygen every year. Not only they produce oxygen that is necessary for survival for many species, forests also absorbcarbon dioxide, one of major greenhouse gases, through the process of photosynthesis. Therefore, they can efficiently moderate the greenhouse effect by regulating the concentration of carbon dioxide.

Another important factor that makes the forests vital for a healthy terrestrial ecosystem, is that they are home to diverse species of plants and animals. Trees provide habitat to several organisms, nesting ground to all bird species and a niche to wildlife. Besides, forests bring various economic and medical benefits to human kind. Forests are a source of a variety of items including timber, bamboo, cane, fodder, paper and wood. Several medications that are in use for various diseases prevalent in the world are coming from different plant species found in the forests. Forests also act as hydrologic flow modulators by preventing soil erosion and runoff. Overall, forests maintain the ecological balance and micro-climate of the area by providing a shelter to a variety of species, cleaning the air and maintaining the temperature of the region. Despite various economic or ecological benefits that forests bring, the earth is losing its forest cover at an alarming rate owing to pressures of increasing populations, urbanization and development (Cajander, 1949). Though forests covered one half of the earth's surface at one point of time, today, forests cover only one third of the earth's surface. This decline in forest cover has appeared for various reasons; population explosion, agriculture, infrastructure development, mining and oil explorations. Rise in population is considered to be one of the major causes of deforestation that indirectly demand cutting of trees and use of land and wood for other purposes like agriculture, logging and firewood demand.

Table 1. Classification of Forests depending upon the canopy cover

S.No	Forest Type	Description
1.	Very Dense Forests	All lands with tree canopy density of 70% or above
2.	Moderately Dense Forests	All lands with tree canopy density between 40% and 70%
3.	Open Forests	All lands with tree canopy density between 10%-40%
4.	Scrub	Degraded forest lands with canopy density less than 10%
5.	Non-Forest	Area not included in any of the above classes

Table 2. A Basic Classification of Forests (depending mainly upon their distance from the equator, altitude and climate)

S.No	Forest Type	Description
1	Tropical Forest	Close to equator, in hot and humid environment, dense and lush green vegetation stores vital biodiversity of the world
2	Sub-tropical Forests	Close to the south and north of the Tropical Forests where trees are adapted to resist the summer drought
3	Mediterranean Forests	Found to the south of the temperate regions around the coasts of the Mediterranean, California, Chile and Western Australia where growing season is short. Most of trees are evergreen, but mixed hardwood and softwood.
4	Temperate Forests	A mix of deciduous and coniferous evergreen trees, found in eastern North America, north-eastern Asia, and western and eastern Europe in places with well-defined seasons, a distinct winter and sufficient rainfall.
5	Coniferous Forests	Found in the cold, windy regions around the poles. Conifers are evergreen and structurally adapted to withstand the long drought-like conditions of the long winters
6	Montane Forests	Montane woodlands and grasslands are found in high-elevation tropical, subtropical and temperate zones. These forests receive most of their precipitation from the mist or fog that comes up from the lowlands and as such are also known as cloud Forests. Plants are well adapted to withstanding the cold, wet conditions and intense sunlight. Trees are mainly Conifers.

Table 3. Punjab Forests (Champion and Seth Classification)

S.No	Forest Type	Vegetation
1.	Northern Dry Deciduous Mixed	*Acacia catechu, A. nilotica, A. leucophloea and Anogeissuslatifolia, Carissa opaca, Greviaoptiva, Adatodavasica*, etc.
2.	Dry Deciduous Scrub Forests	Found in Kandi tract with predominant species like *Acacia catechu*, *Dalbergia sissoo, Bombax ceiba, Emblica officinalis, Lannea grandis, Toona ciliata, Cassia fistula*, etc.
3.	Khair, Sissoo , Bela and Mand	Khair, Sissoo, Mangoes, Eucalypus
4.	ShivalikChir Pine Forests	*Pinusroxburghii, Terminalia alata, Terminalia bellerica, Terminalia chebula, Anogeisus latifolia, Emblica officinalis, Cassia fistula*, etc.
5.	Dry Deciduous Bamboo Forests	Found in Dasua Forest Division only. The main species found in these forests is *Dendrocalamusstrictus*. The other associates are *Lanneagrandis, Diospyrosmontana, Buteamonosperma, Holopteliaintegrifolia and Cassia fistula*.

Almost 80% of deforestation is attributed to agriculture according to the UNFCCC (United Nations Framework Convention on Climate Change) report. Logging, firewood and other purposes roughly take remaining 20%. All these human activities which are considered to be the causes of deforestation invariably rise with the rise in population. In India, total forest coveraccounts only for 24.39 % of thetotal geographical area of the country against a minimum requirement of atleast 33% of total geographical area as per the National Forest Policy (3). Among all the twenty nine states in the country, the state of Arunachal Pradesh has highest percentage of forest cover on its land in the country while Punjab is left with a very small forest cover that makes hardly 3.65% of total geographical area of the state (State of Forest Report, 2017). This article reviews the state of forest cover in small northwestern state of Punjab in India and the ecological dangers that the state is currently facing for the massive destruction of forests that has occurred in the state in the past ten years.

Punjab & its Forests

Punjab, anorthwestern state of India (31.1471° N, 75.3412° E) that forms a part of Indo-Gangetic alluvial plain, is composed of sediments of Shiwalik hills and Himalayas which are brought down and laid by the rivers of Indus system.The state experiences mainly three different seasons annually [Winter Season (November to March), Summer season (April to June) and Monsoon season (July to September)] during which the temperature observes a large variation between 45 degree centigrade to below zero degree centigrade.

The average rainfall in the state is about 480-960 mm every year. Historically, the state of Punjab has been viewed as a combination of three different regions, Majha (Amritsar, Gurdaspur, Tarn Taran, and Pathankot), Doaba (Jalandhar, Kapurthala, Nawashahr and Hoshiarpur) and Malwa (Ludhiana, Patiala, Sangrur etc.) that were divided by rivers.

The major categories of forest that are found in Punjab include mainly dry deciduous forests found in all three Majha, Malwa and Doaba regions. The dry deciduous forests are those forests that are found under moderate cool climates with moderate rainfall. The broad leaves of trees areshed in particular season so that the tree can conserve the loss of moisture through transpiration. Bir forests are found in Patiala and Sangrur districts whereasMandforests are found in Tarn Taran, Kapurthala and Rup Nagar districts. Shivalik forest that constitute more than 70% of total forest area of the state is found in Hoshiarpur, Gurdaspur and Pathankot,andRopar districts of Punjab (Table 3). Punjab is that one of the important states of the India that has minimum forest cover in India. Based on the satellite data, the total forest cover in the state has contracted merely to 1837 SqKms which makes 3.65% of the total geographical area of the state (50362 sqKms). Only two districts in the state, Patiala and Amritsar, have been recorded to have very dense forests that cover an area of 8 SqKms.Hardly 806 SqKms area of the state comes under moderately dense forest and 1023 SqKms under open forest (State of Forest Report, 2017) (Table 4). The data is clearly evident of very small tree cover that has left over the state of Punjab and the scientific community is worried over its repercussion in the coming years.

Table 4. Forest Cover in different districts of Punjab

S.No	Districts	Geographical Area	Very Dense Forests	Mod. Dense Forests	Open Forests	Total	Percentage Of Geographical Area
1.	Amritsar	2683	1	12	14	27	1.01
2.	Barnala	2414		1	7	8	0.33
3.	Bathinda	3353		19	37	56	1.67
4.	Faridkot	1458		4	17	21	1.44
5.	Fatehgarh Sahib	1180		4	0	4	0.34
6.	Firozpur	5305		6	28	34	0.64
7.	Gurdaspur	2242		105	108	213	9.50
8.	Hoshiarpur	3551		371	354	725	20.42
9.	Jalandhar	3386		2	9	11	0.32
10.	Kapurthala	2624		2	8	10	0.38
11.	Ludhiana	1633		26	29	55	3.37
12.	Mansa	3578		1	9	10	0.28
13.	Moga	2198		0	9	9	0.41
14.	Muktsar	2593		6	12	18	0.69
15.	Patiala	3325	7	29	39	75	2.26
16.	RupNagar	1356		106	154	260	19.17
17.	SahibzadaAjit Singh Nagar	1094		75	67	142	12.98
18.	Sangrur	3625		6	17	23	0.63
19.	ShahidBhagat Singh Nagar	1482		26	92	118	2.96
20.	Tarn Taran	1282		5	13	18	1.40
	Total	50,362 sq km	8 sq km	806 sqkm	1023 sqkm	1837sqkm	3.65%

Table 5. Year-wise deforestation in the state of Punjab

Year	Tree Felled
2011-2012	75,000
2012-2013	1.92 Lakh
2013-2014	2.4 Lakh
2014-2015	2.12 Lakh
2015-2016	1.89 Lakh
	Total =9 Lakh

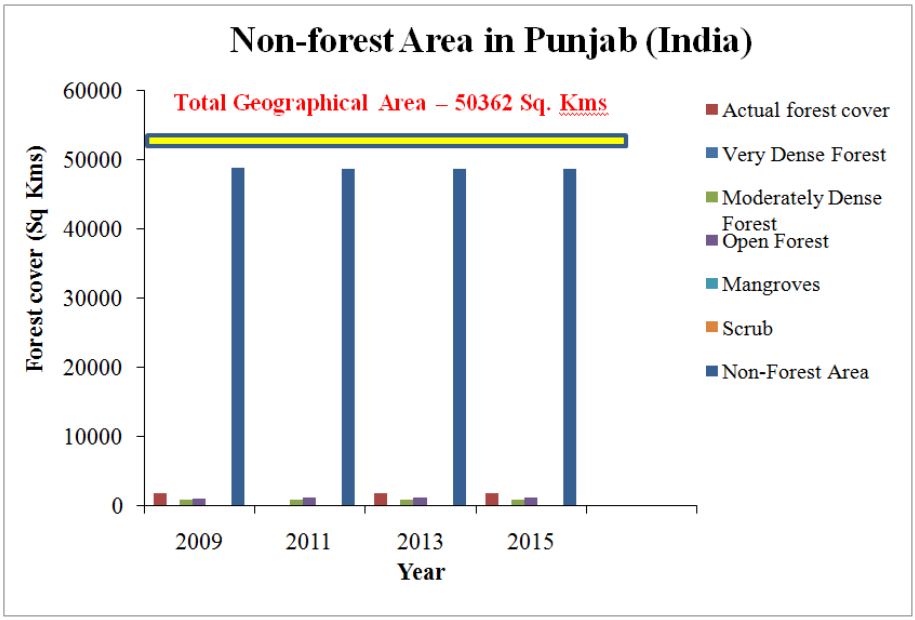

Figure 1. A comparison of Non-forested (Blue Bars) and forested land (all other colors) in the state over a span of seven years since 2009. The closeness between the tip of the blue bars and yellow horizontal bar that shows the overall geographical area of the state is indicative of a very small forest cover remaining in the state

Deforestation and Devastation in Punjab

The scenario of deforestation in Punjab is alarming and existence of forests in in danger today. How the green Punjab has turned into a deforested piece of land is not something that happened in a short span of one or two years. There has been a consistent effort to transform this agricultural state into an urbanized world irrespective of the damage it brings to the environment.

A total of 9 Lakh trees have been axed in the state during last eight years since 2011 (Table 5, figure 1) to carry out various developmental projects; build roads, homes and industries. The growing population in the state has changed its land cover usage in the state from a forested farmland to concrete floors only. Irrespective of all the developmental activities or population pressures, the biggest reason thathas apparently lead to such a grim situation in the stateis apparently a general lack of concern and interest in the society towards trees,

absence of any compassion towards vegetation and lack of appreciation for forests. The devastation of deforestation is expected to be huge in the coming years not only for future generations but in general for the whole society. The most dramatic impact this massive deforestation is expected to bring to the state of Punjab is climate change, loss of habitat for species, species extinction and depleting water tables. The state has already entered into that phase where preliminary effects can be seen. The climate data indicates that the maximum and minimum temperatures have increased as compared to the baseline of 1971-2000 in the state. The data and projections clearlyindicate a rise in minimum temperatures and a projected increase in temperature in the short term between 2021 and 2050(5,6). This increase in overall temperatures in the state can be attributed to the tree cutting, urbanization and carbon dioxide levels. The concrete floors of urbanized world preserve heat very well causing warmth inthe air and rise in temperatures while trees help in maintaining cool in the atmosphere by blocking sunrays and providing shade. With small forest cover and higher levels of of carbon dioxide in the atmosphere, an increased speed and severity of global warming is no surprise. Since trees help perpetuate the water cycle by returning water vapor to the atmosphere, forest lands can quickly become barren deserts when canopy cover is reduced to fill these roles.

The observations that have been made since huge massive destruction has taken place in the state, are pointing fingers in this direction of dryness appearing in the state. The comparison of reports between 2015 and 2016 clearly showed that water levels in 65% of the wells declined in the 67% of area of Punjab. The studies conducted by Central Ground Water Board (CGWB) in 2017 showed a decline in water in 89 per cent of the observation wells. The report also revealed that water table fell by 2-4 meters in 26 % area of state and upto 2 meters in 60% of the state. Another dramatic impact the state is expected to observe for the lack of tree cover on its grounds is the loss of species. Eighty percent of Earth's land animals and plants live in forests, and depend on vegetation cover for survival. Several are unable to survive when their habitat is destroyed. Some of such consequences the state of Punjab is already observing. Northern Goshawk, "Baaz", the state bird that is known as a symbol of strength and tenacity, is no longer seen in any zoo, aviary or sanctuary of the state. There has been no recent sighting of this migratory bird. Similarly, House sparrows that were used to be common in the houses of Punjab almost twenty years ago, have vanished. They are no longer commonly seen in the state.

Conclusion

The massive destruction of forest cover is Punjab is ringing bells of danger of heat, warmth, drought, water scarcity and loss of species in the coming years in the state. The situation is grim in Punjab with the state having the least amount of forest cover in the country. Any increase in the population in the state is expected to further increase pressure on the remaining small forest cover in the state. In such a scenario, massive afforestation is the only solution to balance a huge deforestation in the state. Considering the depth of this alarming situation, it becomes the responsibility of every resident of the state to begin understand the value of this natural treasure and take necessary steps towards protection of remaining forests and plantation of new trees in the state. If every citizen of a populated state can take the responsibility of growing only a single tree, the state can get rewarded with atleast28 million trees in a few years putting a hold on the rising issues of global warming, drought, water scarcity and species extinction.

REFERENCES

Cajander, A. L. 1949. Forest types and their significance. Acta Forestalia Fennica, 56- 71 pp.

Champion, H.G. and Seth, S. K. 1968. A Revised Survey of the Forest Types of India (Deli:Government of India Press), 600 pp

Jerath, Neelima; Ladhar, Satnam Singh; Kaur, Simrandeep; Sharma, Vidushi; Saile, Peter; Tripathi, Priya; Bhattacharya, Sumana and Parwana, H.K. 2014. Punjab State Action Plan on Climate Change.Punjab State Council for Science and Technology and GIZ (Deutsche Gesellschaft for Internationale Zusarnmenarbeit GmbH -German International Cooperation, India), pp 329.

National Forest Policy, 2018. Ministry of Environment, Forests and Climate Change. Government of India.

State of Forest Report 2017. Forest Survey of India, Ministry of Environment and Forest, India.

van Oldenborgh, G J., Philip, S., Kew, S., van Weele, M., Uhe, P., Otto, F., Singh, R., Pai, I., Cullen, H. and Achuta Rao, K. 2018. Extreme heat in India and anthropogenic climate change. Nat. *Hazards Earth Syst. Sci.,* (18) 365–81

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