AN ANALYTICAL STUDY OF FOREST FLORA: SPECIAL REFRENCE TO AURANGABAD DISTRICT (M.S)

UPENDRA ABHIMANYU PATHADE

Assistant Professor and Head

Department of Geography

G.M.D ARTS, B.W. COMMERCE AND SCIENCE COLLEGE SINNAR DIST. NASHIK (M.S) India

Abstract: The term 'flora' refers to plants of a particular region or period listed by species and considered as a group in a specific region. Natural vegetation most fundamentally dealt with a plant community that has been left undisturbed over a long time, so as to allow its individual species to adjust themselves to the climatic and soil conditions of the area. India has a wide variety of flora and fauna which are diversified in nature and which depend upon the geography of the region. Climate and geology of the region are important element of the physical environment. The differences in plants communities may be largely due to climatic differences, but these climatic differences are in turn due to topographic causes. In nature plants usually groups, not as isolated individuals. There groups may consist of plants of a single species constituting a population, but more often the groups a comprise individuals of several species, constituting a community. The flora of a region represents the sum total of different types and kinds of plants. The vegetation represents the total effect produced by abundance or scarcity of plants. In an area need not be estimated but this is necessary in vegetation analysis. Present study carried out in a two parts i.e. the first part analyses the configuration of the ground. The Second part concentrates on descriptive catalogue of the plants of an Aurangabad district region and general description and conditions of the forest.

Keywords: **Flora, Natural vegetation, Plant community, living organisms, scarcity of plants, Climate, Geology, plant species, physical environment, plant species.**

I. INTRODUCTION:

India's flora can be broadly grouped under 'tropical monsoonal' category but due to complex physiographic, climatic and pedological conditions it is divided into 174 natural orders and over 30,000 plant species. Perhaps, 'flora' refers to plants of a particular region or period listed by species and considered as a group in a region. The term forest is generally used to denote a large tract of land covered by trees and shrubs. The word used in a more precise sense by plant ecologist, foresters and geographers who suggest various measures to delineate, classify, protect, conserve and develop forest for sustainable economic development without causing damage to ecosystem. Similarly, natural vegetation refers to a plant community that has been left undisturbed over a long time, so as to allow its individuals species to adjust themselves to the climatic and soil conditions of the area. India has various species ranging from thorny bushes to evergreen forest belonging to dominant plant families like *Orchidaceae, Gramineae, Euphorbiaceae, Aeanthaceae, Compositeae, Cyperaceae, Labiatae and Urticaceae*. The total geographical area of the division is 1782500 ha. The Forest area of Aurangabad District is 77582.50 ha.

The Indian floras are heterogeneous and can be grouped under a number of floristic regions. The concept of 'flora' highlighting the regional characteristics of the country's natural vegetation goes to Hooker and Thomson in 1855. Later on C.B. Clarke (1898) divided this part of Asia into 6 floristic regions as per the morphological approaches. In 1937 C.C. Calder identified 6 floristic regions in the country. This research area is under the 'Malabar Region' out of 6 floristic regions of the India. Generally, the Malabar region stretches all along the western coast from Gulf of Cambay to Cape Camorin. The study area's vegetation type ranges from moist tropical evergreen to broad leaf mixed and monsoon deciduous type. The Nilgiri hills show temperate forest. This particular region contains several species of plants with Malay origin.

II. HYPOTHESIS

Hypotheses in fact, are the basis of any research. These are facts and realities which exist in the regional view. Hypothesis is the pre-supposition on which entire research is based; hence it carried out of a particular problem. No study can be carried out without forming certain hypothesis. The following are certain hypotheses, which have been formulated for present study. i.e. -

1. Forest plays vital role to keep the environmental balance and provides wood for making form implements but Study the demographic phenomenon, structural change in society and urbanization as a behavioral process defined the absolute and relative growth of towns and cities.

2. Tourism is the effective feature of generalized an economical activity and employment.

3. The problem of rural and urban settlement has increasingly been probed by anthropologist, sociologists, ethnographers,

economists and geographer. They, however, examine these issues with different objectives and methodologies.

4. Aurangabad city more urbanized because of historical, socio – cultural and resource factors.

III. OBJECTIVES

This research paper avails to concentrate on following objectives -

i) Configuration of the ground i.e. research area
ii) Geology and Vegetation and its Correlation
iii) General description and conditions of the forests
iv) Plants conservation strategies

IV. METHODOLOGY

The data and information have been collected from different source such as published and unpublished work. Secondary data reviews of for different period. In order to asses educational performance to effective planning and designing for decision makers were collected and processed to summarize succeeding pages.

V. SIGNIFICANCE OF STUDY

This research is significant for the following reasons: As per my opinion this research allow to International and National status:-

a) This research study will help the researcher to understand the configuration of the ground.

b) Plants are grouped into floras based on region (floristic regions), period, and special environment, or climate this

gathered information to describe the prevention   program for decision makers.

c) The present study revealed that the majority of floristic information which is helpful for botanist, geologist and plane   makers for the purpose of society.

PART-1

1. STUDY AREA

1.1 Location of study area:

Aurangabad District is located mainly in Godavari Basin and its some part towards North West of Tapi River Basin. This District general down level is towards south and east and North West part comes in Purna. Godavari river basin. The Aurangabad district lies between North Longitude (Degree is 19 and 20 East Longitude is 74 to 76.)
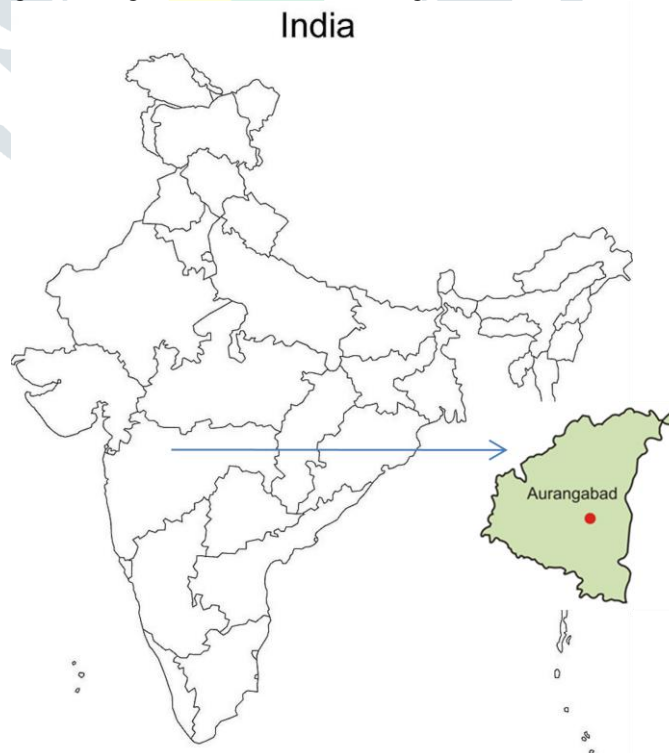

Figure 1: Location map of study area

The district may be broadly divided into the following geographical regions:
- (i) The Shivna-Godavari basin
- (ii) The Northern Piedmont slopes
- (iii) The Ajanta Plateau

The first region forming the basins of the Shivna and the Godavari rivers comprises the relatively low-lying areas to the west and south of the Ajanta plateau. This may be divided into sub-regions, the one comprising the Shivna basin and the upper part of the Godavari valley in the district made up of the western and southern parts of Kannad tehsil, a small part of Khultabad lying to the west of Ellora scarp and the whole of Vaijapur and Gangapur tehsils, and the other comprising the rest of the Godavari valley region south of the Ajanta plateau made up of the whole of Paithan tehsil, and a small adjoining southwestern portion of Aurangabad tehsil and the southern two-thirds of Ambad tehsil.'

1.2. Geology

1.2.1. Rock

The entire Aurangabad Forest Division is uniformly under laid by the Deccan Lava flows, in the form of horizontally bedded sheets. The area is covered with Deccan lava flows with exposures of massive and columnar-jointed basalt, which is believed to be erupted during Cretaceous-Eocene period over the Precambrian basement rocks.

1.2.2 Soil

Soil constitutes the basis of all artificial and natural regeneration practices. The capacity of soil to retain moisture depends upon its texture and structure. The rainfall is the main source of soil moisture.

Table.1: Formation of Soils

Sr. No.	Type of Soil	Depth in Cms.	Available Soil moisture mm. (at saturation)
I	Very shallow soils	Up to 10	16
Ii	Shallow soil	Between 10 to 22.5	37
iii	Medium deep soils	Between 22.5 to 60	65 to 67
iv	Deep Soils	Above 60	140

1.2.3 Climate Physiology

    i.   *i) Season-* The climate of the districts is characterized by a hot summer and general dryness through the year expect   during the southwest season.

ii) Temperature- The cold weather commences by about the end of November when temperatures begin to fall rapidly. The mean daily

    maximum temperatures at $28.7^0 C$ and the mean daily minimum at $13^0 C$.

iii) Rainfall- The rainfall is from southwest monsoon. The average annual rainfall in Aurangabad district is 725.8 mm (28.57''). Wind is

    generally light to moderate with increase in speed during the latter half of the hot season and in the monsoon season. Relative

    humidity in the region is maximum i.e. 89.05% in August and lowest is 33.86% in March. Drought is of common occurrence

    in this region. The Gangapur and Vaijapur tehsils always face scarcity conditions as the rainfall in these two tehsils is not

    dependable.

PART-II

I. Geology & Vegetation and its Correlation -

The prevailing soil type of Aurangabad and Jalna districts is black cotton soil framed by the weathering of volcanic parent. Black cotton soil is found extensively in the districts. The dark color is due to the formation of clay organic matter complex. The characteristic of soil area higher water retention capacity. The soil shows great variability in their depths as well as characteristic and therefore is generally grouped as shallow, medium and deep black soil. The black cotton soil predominantly supports the following vegetations –

Teak (*Tectona grandis*), Dhawada (*Anogeissus latifolia*), Salai (*Boswellia serrata*), Moi (*Lannea coromandelica*), Kalamb (*Mitragyana parvifalia*), Shisham (*Dalbergia latifolia*), Beheda (*Terminalia bellarica*), Moha (*Madhuca indica*), Chinch (*Tamarindus indica*), Semal (*Bombax Malbaricum*), Bondara (*Lagerstroemia parviflora*), Khair (*Acacia catechu*), Tiwas (*Ougenia oojinennsis*), Bor (*Zizyphus mauritiana*), Avala (*Phyllanths Emblica*), Kusali (*Andropogon contortus*), Sheda (*Ischaemum laxum*), Marvel (*Dichanthium annulatum*), Padri (*Dalbergia paniclata*) etc.

II. General description and conditions of the forests -

In conformity to the locality factors, the forests of Aurangabad Forest Division are entirely dry deciduous and belong to the formation 'Dry Tropical Forests' and fall under the sub group " 5A Southern Tropical Dry Deciduous Forests." Within the broad type, local variations are met with due to variation in edaphic, topographical and climatologically conditions. The forests in this division are primarily mixed forests having a number of species, chief among which is teak. The percentage of teak varies from place to place and in some favorable areas it constitutes as high as 80% of the crop. For the purpose of description, forests having 20% or more teak in the over wood are called teak forest and the rest forest as mixed forest.

The forests of the tract belong to group 5 (Tropical Dry Deciduous Forests) and Sub-Group 5A (Southern Tropical Dry Deciduous Forests).The following are the sub-divisions of the Dry teak bearing forest (C1) climax type found in Aurangabad Forest Division: -

    (i)   *5A/C1a-Very Dry Teak Forest*
    (ii)   *5A/C1b-Dry Teak Forest*

➤ Another type of climax forest found in Aurangabad Forest Division is the Southern dry mixed deciduous forest (C3):-
    (iii)   *5A/C3- Southern Dry Mixed Deciduous Forest*

➤ The degradation stages of the dry deciduous forest are:
    (i)   *DS1- Dry Deciduous Scrubs*
    (ii)   *DS4-Dry Grassland*

➤ Edaphic climax types/variations of dry deciduous forests are as under:
    (i)   *E2- Boswellia (Salai) Forest*
    (ii)   *E4- Hardwickia (Anjan) Forest*

➤ Local edaphic variation of dry deciduous forests is as below:

(i) Chandan Forest

The second storey in many places is either missing or inconspicuous. Bamboo is absent. The undergrowth is sparse and comprises of species like Ghaneri, Karwand, Amti, Henkal etc.

➤ Climbers are generally absent. Natural regeneration of many species is inadequate but Dhawda and Teak coppice well and Tendu, Charoli, Khair, Ain, Palas, regenerate naturally. The floristics is, as under:-

I- Top canopy- Dhawda, Salai, Moi, Teak, Ain, Bondara, Palas, Tendu, Pipri, Apta, Chichora, Bel, Kadai, Char, Anjan, Bahawa.

II- Second storey-Lokhandi, Khair, Chandan, Bhutakesh, Hiwar, Karanj, Awala.

III-Shrubs-Henkal, Raimoni, Henkal, Binata, Bahawa.

IV-Grasses- Gondala, Kusli, Pavnya, Marvel, Sheda.

V-Climbers-Chillar.

III. Important Medicinal plants in the area:

The important medicinal plant occurs in Aurangabad forest area are, Neem, Bel, Semal, Salai, Bahawa, Chinch, Gulvel, Sitaphal etc.

IV. Forest Produce:-

a. Timber: Local villagers consume a major portion of the forest produce of this division. There is great demand for teak timber for building construction and furniture making. Khair, Ain, Anjan, and Dhawda also work as substitutes for teak timber.

b. Firewood- Dhawada, Khair, Neem, Babul and Glyricidia are the main firewood species.

c. Grass- There is local demand for fodder grasses. The grass species mostly consist **of** Kusali, Kali, Kusal, Sheda, Pawanya, and Marvel etc.

d. Tendu : Collection of tendu leaves is an important source of employment and revenue generation for the villagers.

e. Fruits: Sitaphal, Beheda and Bhilawa fruits are auctioned annually in Aurangabad Forest Division.

f. Gum: Kadai, Dhawda, Khair, Salai, Neem and Moi are the important tree species which yield gum.

V. Aforestration Strategies:

All degraded minor forest areas and pasture areas are included in this working circle. These areas are considered suitable for rehabilitation by undertaking soil and moisture conservation and afforestation works in two phases (I) **"RESTORATIVE PHASE"** and (II) **"PRODUCTIVE PHASE"** These areas are generally situated on gentle to moderate slopes. Soil and moisture conservation works carried out throughout the area and plantations are done in suitable areas.

VI. Nature of Treatment / Prevention

A. Type 'A'-PROTECTION AREAS: - The following types of treatment will be carried out in these areas-

    (i) All these areas are either on steep slopes or are highly eroded and therefore no tree will be felled in this category.

    (ii) These will include nala banks and rivers with 20 meters wide strip on either side. –If the stocking is inadequate then species like Bamboo, Jamun, Arjun will be planted along the nala banks at a spacing of 6m x 6m. in pits of 0.45m x 0.45m   x 0.45m.

B. Type 'B'- UNDERSTOCKED AREAS/BLANKS:- These will include areas having density less than 0.4 with rooted stock.

    I. Planting of suitable species should be done in patches having open area more than 2 ha. and above.

    II. Soil and Moisture conservation works like CCT , WATS, nala bunding, will be taken up as per watershed guidelines.

C. Type 'C'- OLD PLANTATIONS: - These will include areas, which had been afforested in the past. If the plantation is successful, subsidiary silvicultural operations should be carried out

D. Type 'D'- STOCED AREAS:- These will include areas with density up to 0.4 having young to middle-aged crop.

   i. All climbers will be cut.

   ii. Coppice shoots on each stump will be reduced to two shoot.

   iii. Damaged and malformed saplings and coppice shoots will be cut back.

CONCLUSION

The Geography discipline can be regarded as a science concerned with the rational development and testing of theories that explain and predict the spatial distribution and location of various characteristics on the surface of the earth. From a technical and cultural point of view it may be considered 'flora' is a major structural and functional unit of ecology. The Aurangabad districts floristic plants communities each have special features which differentiate them are from another. Human activities may also have played a part in bringing about the change in the dominant species. To increase the production of small timber, firewood, grasses, fodder and minor forest produce so as to meet the local demand to the maximum possible extent. The area will be developed for fodder production as per the standard models with guidance from subject specialist, for species of grasses & trees.

REFRENCES

[1] Billings, W.B. 1965.Plants and the Ecosystems. Wordswarth publication Company Ltd, Belmont, 4(1): 401- 423.

[2] D.N. Wadia. 2006. Geology of India. McGrawHill Publication,(4) : 331-349.

[3] Edward J. Romany. 1998. Concept of Ecology, Prentice Hall of India, and New Delhi'4(2): 19-30.

[4] Kulkarni P.S. 1975.Study of Deccan Trap basalt flows in Aurangabad District, Jyoti Prakashan, and Aurangabad: 156-198.

[5] Puri G.S. 1960. Indian forest ecology, Oxford Book Com, New Delhi,4(3): 12-14.

[6] R.Mishra. 2003.Ecology and Environment, Rastogi publication, New Delhi: 315-353.

[7] Ranikier C. 1934. The Life of forms of plants and statistical plant geography, Clarinda press, Oxford Uni. London: 5-17.

[8] R.C. Chandana. 2005. Our Atmosphere, Kalyani publisher, New Delhi: 35-62.

[9] Robinson. 1978. Physical Elements of Geography, McGrawHill Campus, New York: 17-28.

[10]S. Satish. 2015. Application of Geographical Information Systems GIS in forest management, Journal of Geography of Natural Disaster, South Africa (Review Article), 10-24.

[11] Mulay J.G. 2011. Geology of Aurangabad District, Natural Science Journal, (XVI): 11-19

[12] Prosper, C.L.1964.Comparative Animal Physiology, Sandars Co, Philadephia: 966- 974

[13] Puri G.S. 1960. Indian Forest Ecology, Oxford Book Com. New Delhi, 2 (1): 17- 22.

[14] Transean E.N. 1926.The accumulation energy by forest, Ohio, Jour.sci, 3(1): 26-36.

[15] West, W.D.1959.The source of the Deccan Trap flows, Geol.Soc.India, (1): 44-52.