Phytogeographical Distribution of azadirachta indica in Shekhawati Region, Rajasthan

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Abstract - The present paper discusses the potentiality of natural vegetation i.e. Azadirachta indica. The area under investigation i.e. Shekhawati region, popularly known as historical heritage, geographical and cultural zone in Jaipur division of Rajasthan state, India. Besides this zone has unique combination of beautiful ecosystems viz; riverine ecosystem, sandy plain ecosystem, sand dunes ecosystem and stony and rocky ecosystem. In these ecosystem, the sand dunes is the heart of Churu. The Shekhawati zone has a great variety of climates (semi-arid and arid) biotic and edafic conditions, physiography and diversity of natural vegetations which has on a wide range of natural ecosystem.

I INTRODUCTION

Actually, there is no plant species on this planet which may be termed as useless indeed, whether it is another matter that mankind have acquire knowledge of the uses or applications of the particular plant species. One can visualize very well the uncountable uses at the part of applied aspect of plant kingdom which left no activity of daily life of human beings requirements without any sort of their impact of usefulness by quantitative or qualitative point of view. The green cover on the earth surface whatever in the form of vegetation or forest wealth is an essential component as well as part and portion of the surrounding complex of the nature of which man is an important biological elements. Hence, generally the plant species whose uses are known to the human beings in applied sense for the mankind welfare as well as for

domestic animals are termed as useful plant species - at the part of his knowledge.

By thus, one can visualize Multi-purpose Medicinal Plant Species (MPMPS) i.e. Azadirachta indica has their varied applied values in the cure of different kind of diseases for the welfare of human beings which naturally show their importance that MPMPS is really may be termed as "Medicinal Plant Wealth" of Shekhawati Region, Rajasthan.

II INTRODUCTION OF THE RESEARCH AREA

Shekhawati region is located in the north-eastern part of Rajasthan state and the region has geographical extension from 26°26' to 29°20' north latitude and 74° 44' to 76°34' east longitude on the map of Rajasthan.

The area under study covers fully or partly three districts, namely Churu, Jhujhunun and Sikar. Churu district's out of 7, only 3 tehsils fall under Shekhawati region (Churu, Rajgarh and Taranagar) whereas Jhunjhunu district as a whole with its six tehsils (Buhana, Chirawa, Khetri, Jhunjhunu, Nawalgarh and Udaipurwati) in which Buhana tehsil emerged out as a new tehsil on the map of Jhunjhunu district (2001), it was no more existence in the year of 1991 and Sikar district also covered fully with it's six tehsils (Data Ramgarh, Fatehpur, Laxmangarh, Neem ka Thana, Sikar and Shri Madhopur).





The region has 23 Panchayat Samitis in all. Thus, the region under study has 15 tehsils in total with it's total 15343 sq. km. geographical area which makes 5.6% of the state's total. At the part of district-wise contribution by area point of view in Shekhawati region it is observed that part and portion of Churu district contributes 29%, Jhunjhunu district contributes 31% and Sikar by 40%, respectively. Among these tehsils area point of view, the tehsil of Churu is largest one and Buhana smallest, respectively. Districtwise area point of view Sikar stands at first position which is followed by Jhunjhunu and lowest contribution is made by Churu i.e. 1683 sq. km. only.

III REVIEW OF LITERATURE

The area under research work was studied by following botanists and time to time viz; first of all the Sekhawati region was touched from vegetational study point of view by Mulay and Ratnam (1950), Bikaner and pilani neighbourhood areas by joshi (1956 and 1958), vegetation of chirawa by Nair (1956), again Nair and Joshi for Pilani and neighbourhood areas (1957), vegetation of harsh nath in aravalli's hills was studied by Nair and Nathawat (1957), vegetation of Jhunjhunu, Manderella and neighbourhood by Nair (1961), vegetation of ajit sagar dam by Nair and Kanodia (1959); Nair, Kandodia and Thomas (1961) studied the vegetation of Khetri town and neghbourhood areas and vegetation of Lohargal and it's neighbourhood areas of Sikar district by Nair and Malhotra (1961). After the work of Nair and Malhotra (1961), i.e. four decades ago. the area was again left for any sort of further research work in the field of applied Botany.

A significant, very authentic taxonomic work was contributed in the field of botany by Bhandari with the publcation of a book Flora of the Indian desert (1990). From the field of applied phytogeography point of view. Charan gave a valuable contribution with a publication of a book on Plant Geography (1992). Bhattacharjee (2000) gave a very valuable autheontic contribution through the publication of a book on Handbook of Medicinal Plants in which he presented the medicinal plants of Indian Subcontinental back ground with their coloured photographs also and Sharma (2007) gave a very valuable autheontic contribution through the publication of a book on Medical Plant Geography.

IV OBJECTIVES

As the nature of the research work, it becomes the prime most duty of a phytogeographer to trace out to identify the plants and than their geographic interpretation from their origin point of view, their cartographic presentation from spatial distribution point of view and lastly also to prepare their layout planning map for on going plantation programme at least for the applied plant species for the area under study.

V HYPOTHESIS

Naturally, the present study will cover the present position of phytogeographic pattern of spatial distribution of applied plant species, so a phytogeographer can propose their allocation of sites of coinciding habitats from their conservation point of view for the welfare of future generation of the area under study.

we can conserve those plant species which have their appled values for the welfare of human beings inhabiting in that particular area or the area under study. for this purpose, a phytogeographer has to give an account of the layout maps of that area under study which covers the allocation of the sites with favourable habitats according the nature of the existing applied plant species for the area under investigation.

VI METHODOLOGY

The present study has been substantiated by extensive field work. The essential data have been collected from a wide range of sources. The remote sensing available data have been used. Survey of India topo-sheets for the entire region and a bioclimatic map, have been used as base maps. Additionally, data from reports, maps, pamphlets, research papers, books, monographs, soil survey data, forest survey data from published and unpublished materials have been collected from different agencies. After examining the remote sensing and other data related to physical (climate, soil, land forms and water) biological (flora and fauna) and social (population dynamics, economic activities land use and productivity) indicators, a few survey sites were located. The sites were visited during field survey.

To illustrate the frequency of distribution of particular plant species the prescribed method of Raunkier's will be exercised to show whether the particular plant species is rare, frequent, common or abundant for the area under investigation. The nature of habitats and the ecoclimatic conditions will be dealt as a part and portion of the study to support the phyto-climatic account of the research problem for the area under study.

From phytogeographic study point of view, a cartographic interpretation of the multi-purpose plant species will be dealt at two levels i.e. at macro-level and at microlevel, basically it may be dealt phytogeographic sense.

VII OBSERVATIONS

BOTANICAL NAME : *Azadirachta indica* **LOCAL NAME :** Neem, Margosa, Nimba (**Photoplate**).

(A) VEGETATIONAL CHARACTERISTICS :

Azadirachta indica is generally found as a full sized tree, and it belongs to the family - *Meliaceae*. It belongs to the vegetational group of 'Tree,' from life-form point of view if falls in the life- form group of 'Meso-phanerophyte', and from leaf-class point of view it falls under the leaf-class of 'Microphylls', it is deciduous nature of tree species. From xerophytic categorization point of view it's leaves are with waxy coated (neem oil) surface and has more sunkum stomata.

Leaves - Imparipinnate 20-37 cm. In length. Leaf-lets are apposite or alternate, obliquely falcate lanceolate, serrate, dark green to greenish yellow in colour and bitter in test. Flowers -White scented 5 mm. Long pentamerous, stominal tube dentate anthers inserted inside. Fruit's -Drupe 1.2 to 1.8 cm. Long, oblong, 1-Seeded smooth greenish yellow in colour. Intensely bitter in taste. Bark - Rough greyish to brownish in colour channelled in shape about 10 mm. In thickness - with scally to fissured surface. Internally yellowish in colour caminated and fibrous.

(B) ECO-CLIMATIC CONDITIONS AND HABITAT:

It has 'poly-climax' distribution in nature, or in other words to say - the may be observed in more than one habitat i.e. sandy plains habitat, gravel formations, stony and rocky habitat and also on riverine habitat. It has no occurrence over the tops of sand dunes as well as on hills top surface. It has wide range of rainfall distribution i.e. from 25 cm. to 150 cm. (total of average annual). Similarly it has occurrence in wide range of temperatures' i.e. 10°C (average mean monthly minimum temperature) and 50°C (average mean monthly maximum temperature). As soil type is concerned - it shows common occurrence on sandy plains, gravel formations, and stony and rocky, soil, also an marginal areas of riverine habitat soil formation. Thus, the tree bears arid, semi-arid, sub-humid and humid climate - as observed for the area under study. In nature, mostly it is observed with it's occurrence from plantation point of view more rather than it's natural growth distribution in phytogeographic pattern. Thus, it's tolerance limit of ecoclimatic conditions is broad weather it may be soil type, rainfall amount, temperature variations, relative humidity and heat waves or cold waves.

(C) PHYTO-CHEMICALS OF APPLIED PARTS AND PORTION :

The different part of Neem tree contain different constituents. Among them the active ingredients are azadirachtin, salannin and meliantriol. The neem leaves contain nimbosterol and quercertin. The seeds contain azadirachtin, salannin meliantrol and meliacin. The trunk bark contains nimbin, nimbinin, nimbidin, nimbosterol and a bitter principle called margosine. Neem oil is expressed from seeds and it contains chiefly glycosides of oleic (50%) and stearic (20%) acids.

Many workers made their research studies on the particular tree species. DMRC, Jodhpur has a Research Project at the name of Neem's medicinal as well as economic uses. Sinha et al. In 1984 also published his research work on Neem Oil as a vaginal contraceptive properties¹.

(D) MEDICINAL APPLIED ASPECT:

The tree as a whole by it's each and every part and portion (except it's roots) is medicinally useful. From medicinal applied aspect point of view, it is used for blood purification, in skin diseases, in fever, it's twigs are best known from centuries back for the cure in toothache, in the cure of piles, and it is a strong antiallergic. It is used as a better natural determinant to protect costly garments from various types of insects.

At the name of parts and portion of the Neem tree's medicinal uses for the cure of diseases, the neem fruit's and leaves are used mainly as anti septics and insectisides. Neem oil, nimbin and nimbidin are active against various fungi. The anti-insect principles have been commercialised in the form of vapaside and margosides. The drug is also attributed antifertility and anti-viral properties, and is being screened for efficacy in treatment of AIDS.

The statistics of commercial evaluation of folklore of *Neem* trees covers the importance (as an antiseptic whole life worship)., Production - seed oil 10 kg./ tree/ year which has evaluation of Rs. 20/- kg., barkgum 2 kg./ tree/ tree year which has evaluation of Rs. 20/- per kg., leaf condiment 10 kg./ tree/ year which has evaluation of Rs. 10/- kg., and flower Essence - 1 kg./tree/year which has evaluation worth of Rs. 2000/- kg.

(E) PHYTO-GEOGRAPHICAL DISTRIBUTION : A. At Global Level :

Although, Neem tree is native to the Indian sub-continent, but it is planted and now very much naturalised in tropical and sub-tropical countries.

B. At Regional Level :

Just a glance, if we go through the reading of **Figure** of Shekhawati region, than one can observe very well the phytogeographic pattern of it's distribution in four categories of spatial distribution. Churu district (with it's three tehsils) more or less as a whole (except frequent at Churu tehsil it self shows it's rare distribution, the tree shows it's frequent occurrence over most of the part of Jhunjhunu district (63 percent) and Sikar district (about 80 percent). In Jhunjhunu district, near Baggar locality it is found in pure association for a limited area. The tree shows rare or no occurrence over the slopes and tops of the hilly patches of Shekhawati region. Similarly, it is most observed on the top of sand dunes habitat. In brief, the tree has more area of Shekhawati region under frequent pattern of phytogeographic distribution.

Among human settlements, the tree is commonly planted by the people within the areas of village, town or city. It has also frequent occurrence on the marginal area of both sides of riverine habitat.

VIII RESULTS

Being a phyto-geographer, the best efforts has been made in this research paper to conserve and analyse of decreasement of natural vegetation and associated factors in Shekhawati region, Rajasthan. Further in this aspect, one can visualise very well the results of any sort of contribution of the efforts made by Department of Forest and public awareness in this aspect, in enhancement of the land under green coverage through implementation of successful aforestation and plantation programmes.

Natural vegetation i.e. Azadirachta indica degradation is taking place in shekhawati region through irregular rainfall, public interfere, wind erosion, water erosion, high temperature, storms and soil erosion. These processes have been accelerated by increasing technologenic and human activities it has resulted in the degradation of Azadirachta indica of the region due to in irregular rainfall and wind erosion and high temperature are more serious and widespread. Overgrazing and indiscriminate felling of under shrubs resuted in the degradation of vegetation cover and decrease in biomass production. In case these problems continue uncontrolled, large acreage of forest area will be affected in future.

The results suggest to take up immediate steps to adopt the improved forest management technologies with people's participation to lack of effects of decreasement of natural vegetation in the region but it is not possible to conserve completely. Further the results of the study could be fruitfully utilized by the planners bio-scientists, botanists, phytogeoraphers, naturalists and policy makers to evolve suitable forest managment technologies and strategies commensurate to the bio-conditions of the region.

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