



## AZADIRACHTA INDICA (NEEM): IT'S ECONOMIC UTILITY AND CHANCES FOR COMMERCIAL PLANNED PLANTATION IN NANDED DISTRICT

Brototi Biswas\*<sup>1</sup> and Kaplay RD<sup>2</sup>

<sup>1</sup>Department of Geography, Indira Gandhi College, CIDCO, Nanded, Maharashtra, India

<sup>2</sup>Director, BCUD, S.R.T.M.University, Nanded, Maharashtra, India

\*Corresponding author e-mail: [brototibiswas@gmail.com](mailto:brototibiswas@gmail.com)

### ABSTRACT

Neem is the most versatile, multifarious tree with immense potential. However in the study area there is no utilization of Neem in medicinal, industrial or agricultural industry, although there is wild growth of Neem tree in the study area. The study finds out the multifarious uses of Neem along with the potential areas for commercial Neem plantation. Exact demarcation of land pertaining to possible sites of Neem commercial cultivation has been done keeping in view the already existence of wild growing Neem in those areas. The study also finds out the possible reasons for known development of Neem based industry in the study area, though this kind of industry is quite developed in India and at the same time money churning.

**Keywords:** Neem, Nimboli, Barren land, Commercial plantation and Favorable geographical conditions.

### INTRODUCTION

The NEEM tree (*Azadirachta indica*) is a tropical evergreen tree native to India. Neem is the most versatile, multifarious tree with immense potential. Indian Neem Tree is the subject matter of numerous scientific studies concerning its utilization in medicine, industry and agriculture<sup>3</sup>. However in the study area there is no utilization of Neem in medicinal, industrial or agricultural industry, although there is wild growth of Neem tree in the study area. Today, rural Indians call this tree their "village pharmacy" because of claims it cures diseases and disorders ranging from teeth cavities and bedbugs to ulcers and malaria. Neem has the ability to withstand salty and non-salty industrial effluent, polluted gas like SO<sub>2</sub>, CO<sub>2</sub> and attract dust and carbon particulates. Hence it has a special use in establishing industrial green belts and avenue plantations<sup>6</sup>. Neem offers a considerable potential for utilization in agriculture, when considered together, the various economic uses of Neem suggest that the utilization of this tree can be a highly attractive

proposition<sup>5</sup>. It possesses maximum useful non-wood products<sup>2</sup>. The tree has its origin in the forests of Karnataka<sup>3</sup>.

### OBJECTIVES

Thus keeping the importance of the topic in mind, present study would like to

1. Find out the uses of Neem tree.
2. Demarcate lands favorable for growth of Neem trees in the study area.
3. Reason for non-utility Neem in the study area in terms of industrial scope.

### STUDY AREA

The area under study is Nanded. The district of Nanded lies at the border of Maharashtra and shares boundaries with Yavatmal District in the North, Parbhani, Latur and Osmanabad Districts in the West, Bidar District of Karnataka in South and Nizamabad and Adilabad Districts of Andhra Pradesh in the East. The district encompasses 16 talukas. With population

of 28, 68,158 (2001 Census), Nanded is among the most backward districts of the state of Maharashtra. It ranks 29<sup>th</sup> in terms of literacy rate (68.5%) in the state of Maharashtra and has a work force participation rate of about 42.8 percent. The population density of this district is 272 persons per sq. km. The study area is bounded by 18°15' to 19°55' North latitude and 77° to 78°25' East longitudes. The total area is 10,332 sq. km (3.41 % of the state). The total barren land is 148912 acres.

## DISCUSSION

### *I. Uses of Neem*

All parts of the tree have been used medicinally for centuries. The medical properties of Neem have been known to Indians since time immemorial. The earliest Sanskrit medical writings refer to the benefits of Neem's fruits, seeds, oil, leaves, roots and bark. Each has been used in the Indian Ayurvedic medicine, and is now being used in pharmaceutical and cosmetics industries. Neem fruits, seeds, oil, leaves, bark and roots used as antiseptics, antimicrobials and treatment of inflammatory diseases. This is mainly due to the chemical constituents which enable Neem to protect itself from a multitude of pests by a substantial number of pesticides ingredients.

### **Advantages of various Neem parts**<sup>5,8,10</sup>

Some of the most important documented uses of various parts of the Neem tree are;

1. **Neem oil:** useful for pest control, cosmetics, medicines, etc.
2. **Neem seed cake :** Natural fertilizer and insecticide
3. **Neem leaves:** useful for chickenpox, increase immunity of the body, reduce fever caused by malaria, treating various foot fungi, useful against termites, used in curing neuromuscular pains. In the study area leaves are used for storage of grains.
4. **Neem bark and roots:** control fleas and ticks on pets, fights against skin infections such as acne, psoriasis, scabies, eczema, etc, treats diabetes, AIDS, cancer, heart disease, herpes, allergies, ulcers, hepatitis and several other diseases.
5. **Health and Personal Care products:** Neem personal care products derived from seed, oil and leaf include;

- a. Skin care -including Eczema cream, antiseptic cream, and nail care
- b. Hair care - Shampoo, and hair oils
- c. Oral hygiene - Toothpaste and Neem twigs
- d. Therapeutic - Loose Neem leaves – tea, Vegetarian capsules, Powders
- e. Household products – soaps, Insect repellent [spray and lotion], and candles

### **6. Fuel and Firewood**

7. **Timber** - because the wood is termite resistant

8. **Organic manure:** Farmers in India use Neem cake (the residue left after extracting oil from the seeds) as an organic manure and soil amendment. It is believed to enhance the efficiency of nitrogen fertilizers by reducing the rate of nitrification and inhibiting soil pests including nematodes. The tree apart from having multi-economic uses is highly suited for environmental uplifting, has medicinal properties and also has good agro-potentiality<sup>10</sup>.

### *II. Demarcate lands favorable for growth of Neem trees in the study are.*

Since the tree has multi-economic and environmental use it is pertinent that the district which has a plethora of wild growing Neem be developed as commercial Neem plantation site. Throughout the study area sampling of Neem trees were done. The tree was found in plenty in various locations, including the barren lands. The tree was even found in the areas of not so suitable geographical conditions (agriculturally) in terms of soil depth (less than 3 ft), stony waste and low ground water. Wild growth of Neem was located in the elevated topography of the district, as well as plateau topography and plain land topography. The geographical requirement of Neem along with the Geographical condition of the study area is discussed in Table 1.

From the above table it can be concluded that the study area has favorable geographical conditions for the growth of Neem. Neem tree is being grown on a commercial basis in USA, Australia for use in various industries like agriculture and cosmetic etc<sup>10</sup>. The scope for commercial exploitation of Neem reserves for the rural masses but even for the national exchequer as well<sup>4</sup>. No artificial commercial plantation or cultivation in terms of medicinal gardening exclusively for Neem has been still done in

India, although the uses of this plant including the commercial profit are not a hidden fact. For the present study only the barren lands of the study area has been taken into account.

#### **Potentiality of Neem commercial plantation in barren land**

As far as developmental potentiality of Neem commercial plantation in barren land is concerned in the study area, Government Ayurvedic Medical College of Nanded in 1997 undertook a 100 acre barren (waste) land in Barad village of Bhokar taluka (Plate 1). The area encompasses a small hillock. The area is located at N 19° 13' and E 77° 29' at an altitude of 400 mts. The general soil depth is < 0.5 mts-1.5 mts. Here Neem is one of the cultivated/planted species of a total number of 104 species. The total number of Neem trees here are 40. However, owing to administrative ignorance the utilization is not done profitably.

#### **Reasons for choosing Barren land in the study area as potential Neem plantation site:**

1. It is a debatable issue as to why people in the study area will prefer to cultivate *Neem* instead of *cultivable crops* which will give them quick returns. *Neem* can grow barren lands. Thus only the barren lands have been taken into consideration. *Neem* is often used for afforestation in the arid lands, ravines and for soil erosion control<sup>9</sup>.
2. Only the non-agricultural lands were preferred to see / explore their potentiality as booming economic units. Usage of the barren lands will turn them into economically and environmentally productive units.
3. There is a need for concerted efforts to sensitize and motivate the farming community to adopt *Neem* planting on used lands...The farmers in particular and the public in general need to be educated on the economical and ecological significance of *Neem* and *Neem* –based products<sup>4</sup>.
4. *Neem* helps to improve fertility of the soil and rehabilitate degraded land. *Neem* reclaims the degraded land by reducing the leaching loss of Nitrogen and by improving the general health of the soil...*Neem* rejuvenates unused lands and improves productivity of even soils unsuitable for farming. *Neem* prevents soil erosion in semi-arid climates<sup>4</sup>. Thus through *Neem*

plantation the pedagogical condition of the barren soil can be rectified.

5. The potentiality of barren lands as potential *Neem* commercial sites and *Neem* plantation growth centers have already been proved by the fact that wild and wide growth of *Neem* has been sampled in the barren lands of the study area.

Since 100% of the barren land cannot be utilized for reasons like stony waste, shallow soil depth, other afforestation programmes etc, only 50% of the total barren lands in each taluka has been considered. The total barren land which can be utilized for *Neem* plantation for the study area thus stands at 29782.4 hectare of the total 29782.4 hectare exact demarcation of around 15,000 hectare of barren land for *Neem* commercial plantation was done.

Only those barren lands where wild growth of *Neem* was spotted were selected. The soil depth of these lands in general varied from less than 1ft- 3fts. Some of the sites had non-perennial streams. Some of the sites were dry. Some of the sites belong to hilly terrain, some plateau while some flat terrain.

Of the various selected sites, some of the sampled sites fit for *Neem* plantation are shown through GIS maps, snapshots, satellite images and Google maps in Plate 2-4. Thus as far as objective is concerned *Neem* plantation site could be demarcated for commercial *Neem* plantation. The sampled areas already have wild *Neem* growth and have geographical conditions suiting *Neem* growth

#### **III. Find out the possible reasons for non development of *Neem* based industry in the district.**

At present there is a high demand of herbal cosmetic industry throughout the world and more importantly *Neem* based cosmetic industry has a huge demand. Various types of soaps and shampoos are prepared from *Neem*. *Soap production from *Neem* seed oil is widespread in India and Africa*<sup>1</sup>. Apart from usage in cosmetics, *Neem* has high demand in pesticide and fertilizer industry. Over the last 20 years the global price of *Neem* seed has gone up from Rs300/ ton to current levels of Rs3000-4000/ ton. At present Indian growers and suppliers dominate the *Neem* market<sup>5</sup>. There is a huge market of *Neem* world-wide. The district can easily tap this potential.

For the development of any industry 3 factors are important – (1) **Raw material**, (2) **Labour**, (3) **Market**. The fact that the growth potentiality of *Neem* is good has already been proved. Thus when the growth potentiality is good then raw material is not a problem. The study area has 90% workforce in

primary sector, thus labour is not a problem. The southern states, being the neighboring states and Mumbai (door for export through airway and waterway) not being far away, market is not a problem. The basic requirements being fulfilled Neem industrialization have good potentiality for the study area. The direct income from 29782 hectare of barren land transformed to Neem plantation is above Rs 35 crore/annum from the 6<sup>th</sup> year onwards<sup>10</sup>. This increases with every passing year. This income is just through the sale of Neem oil, cake and leaves. The downstream industries involve cosmetics, fertilizer, pesticide industry etc.

The state, NGO's, co-operatives and the N.S.S volunteers of educational institutions can do a lot in carrying the message across the targeted farm and non-farm population. The state sponsored massive Neem tree planting programme involving the departments of agriculture and forest and also the willing participation of farming community will significantly change the country's landscape greener and the economy richer<sup>4</sup>.

India is the land of Neem tree. The medicinal, economical aspect of Neem tree has been known to the India society for ages. The fact that India dominates the world market in Neem based products and Neem raw materials are proof to the dominant role of India in the world market. The study area already has wild growth of Neem. The market availability, raw material potentiality and labour factor have already been discussed. Thus the study area has all the possibilities to develop itself as a major supplier to the world market. There can be only one reason for non-development of Neem industry in the study area even after all the positive boosting factors. The administrative ignorance and the ignorance of the elite group both in respect to intellectual class and the entrepreneurial class of farmers are main reasons for non development of this resource in the study area.

## CONCLUSION

Neem is the most versatile, multifarious tree with immense potential. Indian Neem Tree (*Azadirachta indica*) is the subject matter of numerous scientific studies concerning its utilization in medicine, industry and agriculture. The present study tries to find out the various multifarious uses of Neem, along with demarcation of sites for planned commercial Neem plantation for the economic upliftment of the study area. Only barren lands have been chosen for the planned Neem plantation. Only those lands have been chosen where there is already wild and wide growth of Neem. The study also tries to find out the

possible reasons for non-development and non-utility of Neem in the study area in terms of industrial scope.

## ACKNOWLEDGEMENT

The work is the result of MINOR RESEARCH PROJECT sanctioned by the UGC (WRO, Pune) "Potentiality of Neem growth and the scope of its industrial development in Nanded district". The author is indebted to UGC (WRO, Pune) for providing sanctioning the project and providing the financial and the other requirements.

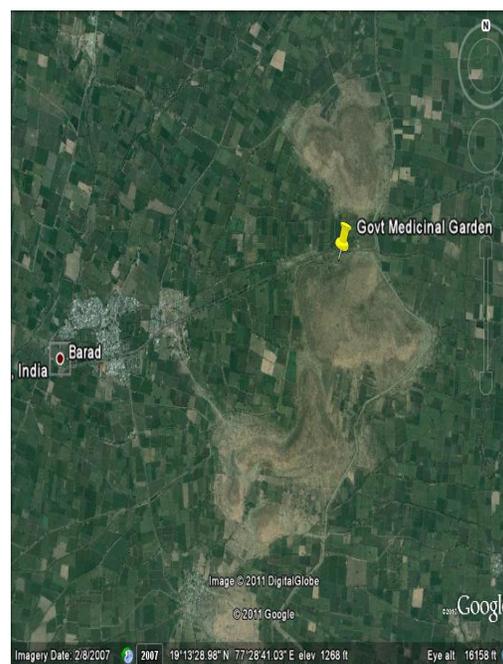


Plate 1: Aerial Photograph of existing Medicinal garden.



Plate 2: Sampled site through snap shots

(Bhokar taluka)

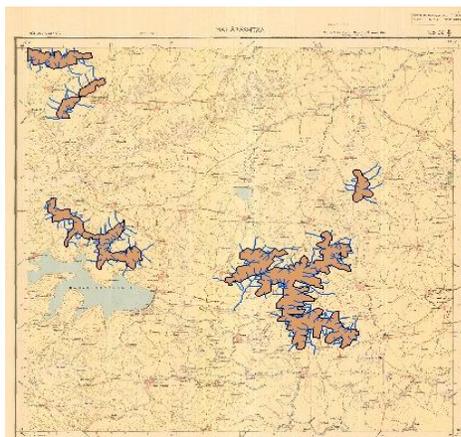


Plate 3: Sampled site through GIS mapping [E 77°15', 18°45' N to E 77°30', 18°45' N and E 77°30', 19° N to E 77°15', 19° N ]

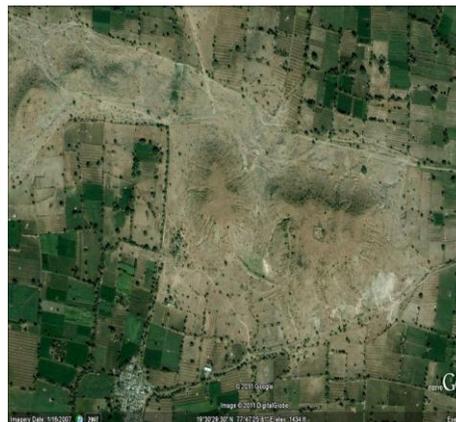


Plate 4: 19° 30' 2'' N and 77° 47' 2'' E near Dhanki village of Himayatnagar taluka.

**Table 1:** Geographical requirement of Neem vis-à-vis geographical attributes of the study area.

Geographical Attributes of the study area	Geographical Requirements	Area Available
<b>Temp</b> -9 °C- 40 °C <b>Rainfall</b> - 780 mm-1250 mm <b>Soil</b> – Black soil, loamy soil with pH around 7 with barren soil depth ranging from 1 ft- 4 ft.	<b>Temp</b> -4 °C- 45 °C <b>Rainfall</b> - 450 mm-1300 mm <b>Soil</b> – variety of soils with pH 4-9 except sandy and permafrost with shallow soil depth from 20 cms and above.	Located all throughout Barren lands, hilly tract, and waste land.

Source: **Panda 2010, NIIR 2010, field survey**

## REFERENCE

- Forster. P, (2000), "Status report on global Neem usage" Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH, Germany, II<sup>nd</sup> edition, pg 7.
- Girish K and Shankara B. S, "Neem – A Green Treasure", Electronic Journal of Biology, 2008, Vol. 4(3): pg102-111.
- Koul. O and Wahab. S, "Neem: Today and in the New Millennium", Springer Science, 2004, New York, pg 1, 8.
- Kundu P.S, Bandyopadhyay A. Sundaram K V, "Sustainable Agriculture", Northern Book Centre, 2005, Delhi, pg-225,226, 232, 234
- Nzioka T, "Conservation and commercialization of the multi-purpose Neem tree", paper presented in Interanational conference of "Marketing Strategies and Human Capacity Strengthening to Realize the Economic Potential of Underutilized Species" held at the University of Macerata, Italy, 2004.
- NIIR, "Neem and Allied Products", Asia Pacific Business Press, 2010, Delhi, pg 32-35.
- Panda H, "Medicinal Plants Cultivation and their Uses", Asia Pacific Business Press, 2010, Delhi, pg 201-213.
- Panhwar F, (2005)., "The Neem Tree, a Natural Pesticide practice in Pakistan", Digitalverlag GmbH, Germany, pp- 1-14.
- Singh K.K Phogat S Tomar A, "Neem: a Treatise", IK International Publishers, 2009, Delhi, pg 22,117.
- Shinde G N., Biswas B, "An environ-economic backbone in the economic resurgence of barren and semi-arid regions: Azadirachta Indica". J. Nat. Prod. Plant Resource, 2011; 1 (2): 8-13.