

Sustainable Growth Of Domestic Medicinal Herbal Plants Of Raipur Region, C.G., India

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Abstract: Most of the Asian Countries of the world (about 80%) people used Herbal medicines for their Primary Health Care (PHC). Medicinal plant acts and produces similar effects as chemical compounds in conventional drugs. The favourable conditions for natural growth and production of Herbal plant depends largely on Eco-Climate and terrain conditions prevailing in the region. Ayurvedic medicine originated in India more than 3,000 years ago. Leaves to seed of holy basil (Tulsi) is considered a tonic for the body, mind and spirit. The study area is included in J3 C3 Agro climate Ecological Region of India, facing sub-humid Tropical climate with an average annual rain-fall of 13,58 mm. Six domestic, popular and effective medicinal plants, commonly growing in small pots, vessels in houses small gardens have chosen for this study. The plan/base map has been prepared (1:10,000 scale) and data regarding species, morphology, canopy cover, soil types plant growth, uses, price, etc. have been collected and synthesized. It is observed that sandy loam soil are frequently used for the cultivation of domestic flora. Kanhar (black, silty loam) soils are suitable for Tulsi (*Ocimum sanctum*), Rose (*Rosa olameacena*) and Hibiscus (*Hibiscus Rosa Sinensis*) whereas Sandy loam (Dorsa/Matasi) are found favourable for Jasmine. Jasmine sarfaced/ Sada Bahar sp. (*Vincarosea*). The variety of Marigold (*Althecea officianalis*) develops fast rate in Kachhari (Alluvium) soils. The high productivity of Sada Bahar and Marigold is susceptible in Kanhar and Matasi soil respectively. The utility of herbal plants indicates that flowers, leaves, petals, seeds, roots, barks are commonly used for medicinal purposes in the treatment and problems of gastric, cough, cold, skin diseases, etc. Petals of Marigold contains high range of antioxidants, effective to combating the damage causes by pollution of industries. The optimum growth of domestic medicinal plants can be obtained in the Geo-environment of Chhattisgarh with sustainable utilization of herbals for healthcare.

Keywords: Domestic Herbal Plants, Medicinal Uses, Sadabahar, Rose, Tulsi, Marigold, Jasmine, Hibiscus.

I. INTRODUCTION

There are 12 mega diversity countries, commanding 7% of the World's biodiversity. National Medical Plant Board (NMPB) and Central Council for Research in Ayurvedic Science (CCRAS), under Department of AYUSH; Government of India, to conceive the idea of developing a database in which all the available published information on selected medicinal plants, covering every subject area can be accessed at one place. Medicinal plants acts as a richest bio-resource for traditional and folk medicines till date. Around 20,000 medicinal plants have been recorded in India and about 7,000 to 7,500 plants are used for various treatments. According to the World Health Organization, for preparation of variety of

newer herbal drugs, medicinal plants are the best raw materials. About 80% of individuals from developed countries use traditional medicine, which has compounds derived from medicinal plants About 72.90% population of India live in villages and this covers = 98% of total geographical area. India is blessed with an enormous diversity of medicinal and aromatic herbal plants for harnessing good health for all. The present disciplines of medicinal science in India like Ayurveda, Unani, Homeopathy and Allopathy are enriched with the herbal resources of nearly 80% sps.and genetic diversity of the plants in course of time (Yogita, 2016).

People living in villages know about the medicinal value of good number of plants and they are using these plants from long back. Many of the modern medicines are derived from

the plants directly or indirectly. India about 1800 brands of herbal medicines are used by allopathic drugs manufacturing companies. The traditional medicines provide some affordable treatment to low income group but decades the trust on the herbal medicine has increased among higher income group because It does not have any side effects, chemical pollution, cost efficiency and availability.

II. STUDY AREA

The study area is located in the vicinity of Raipur City, C.G Stretched from Kharun river tract in the west to lateritic uplands of Telibandha on the east. Urla industrial belt in the north whereas south peripheries represented by agricultural pediplanes of Sejbahar (Fig. 1). It lies between N latitude 21°10' and 21°20' and E longitude 81°25' and 81° 35' spread over 55.05 sq.km.

Subtropical humid climate is prevailing in the region with 1380 mm average annual rain fall. Temperature variation during winter is 5° to 13°C and in summer 36° to 44° C are common. The maximum elevations occur at Tikrapara uplands i.e. 304.8 meters AMSL and the average height is 298.15 metres AMSL.

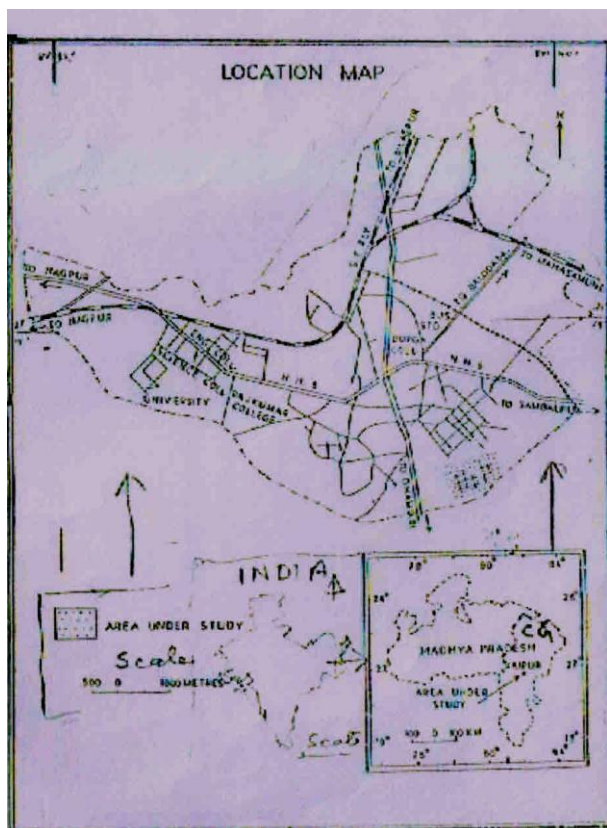


Figure 1: Location of the Area

III. METHODOLOGY

Methodology includes mapping of various geomorphic and soil types using Remote Sensing interpretation of IRS LISS II imagery with limited field checks. The domestic

medicinal herbal plants (DMHP) occurrences and cultivation/growing practices have been classified from collected survey data in four planning units of Raipur Urban Centre (Fig.2). The planning area of Raipur under M.P Nagar Tatha Gram Nivash Adhiniyam 1973 (No. 23 of 1973) includes 6 planning units. The integrated scientific approach of the present study considering four planning units in each direction azimuthally. Data regarding soil types/herbal growth, medicinal uses, etc. collected from house holds, poorly open fallowland garden, public/private recreation centre during Dec. 2017- March 2018.

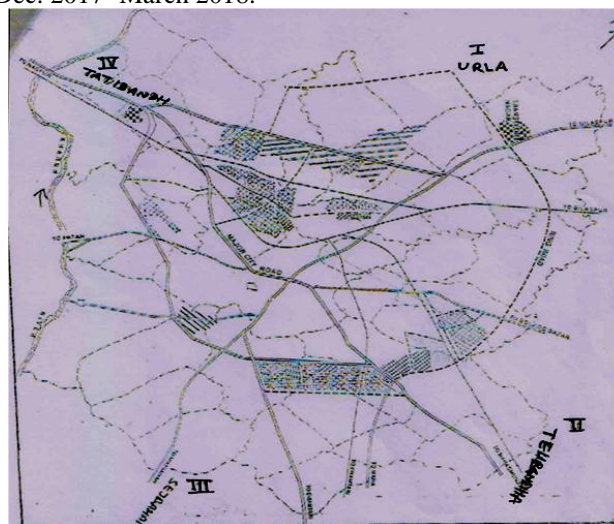


Figure 2: Planning Units (Field Survey)

A. HERBAL PLANTS GROWTH AND SOIL TYPES

The geomorphic conditions and soil types govern the extent and abundance & growth of herbaceous vegetation cultivation (Diwan 2002) The soil texture and compositional properties influences the response of individual variety of DMHP differently. Vinca rosea (Sadabahar) herbal medicinal plant growth during cultivation reaches optimum in well drained Soil & in presence of Sunlight. The Domestic Medicinal Herbal Plants (DMHP) and major soil types for prolific growth is given in Table I & Fig. 3.

The spatial variation of soils in the study area has been demarcated, using Remote sensing visual interpretation. It is found that alluvium 7.35%, laterite 8.77%, matasi Dorsa 28.17% areal coverage with highly distributed Kanhar soil 55.70%. It is suitable for Tulsi, Rose, Hibiscus varieties growth.

S.No.	Soil Types	Physical Properties/Texture	Dominant, Domestic Medicinal Herbal Plants
1.	Bhata (Laterite)	Red Coloured lateritic soil, coarse grained morooms, high filterations.	Grass wild, latjira, etc.
2.	Kanhar (Silty loam)	Black colour, dark, sticky, heavy, permeability low	Tulsi, Rose, Hibiscus
3.	(Matasi) (Sandy Loam)	Sandy loam soil, permeability medium	Jasmine, Sadabahar
4.	Alluvium (Sandy)	Sandy soil, Kachhari Soil, high permeability	Merigold.

Table 1: Soil Types and DMHP of the study area, Raipur, C.G.

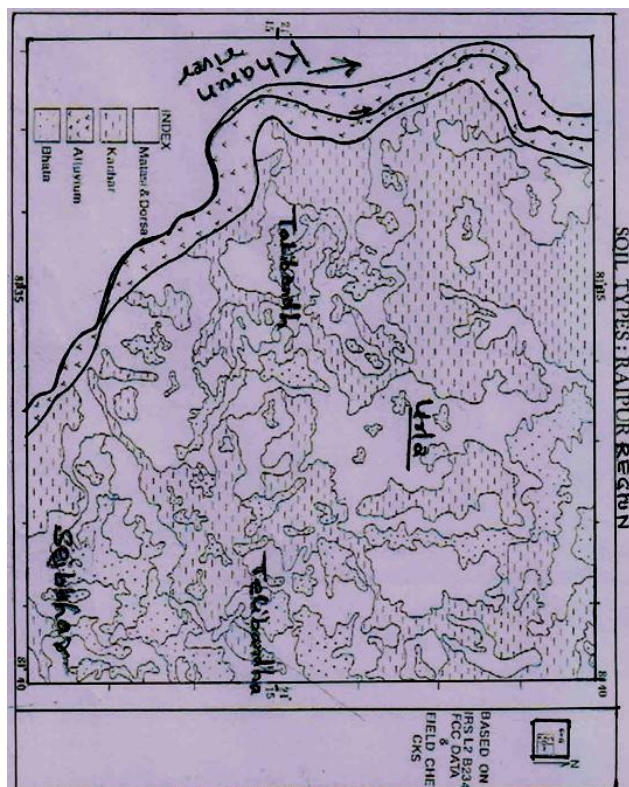


Figure 1: SOIL CATEGORY: RAIPUR

B. OCCURRENCE AND DISTRIBUTION OF DMHP: IN THE PLANNING UNIT AREA OF

Raipur City, C.G a survey of the occurrences and distribution of Domestic Medicinal Herbal Plants (DMHP) has been carried out. The cultivation practices and domestic growth of plants in gardens/pots in households, open graze lands, horticulture/recreation centres it is observed that Tulsi is most popular among the house and traditional growing herbal plants (24%), successively receives attention to Rose (16%), Marigold (13%) where as Jasmine is found very low (2%), Due to low maintenance and naturally occurring Sadabahar (12%) and Hibiscus variety also growing where plentiful space and sowing areas are available.

C. MEDICINAL PROPERTIES & THERAPAETIC USE OF DMHP

The utility of herbal plants indicates that flowers, leaves, petals, seeds, roots, barks are commonly used for medicinal purpose in the treatment and problems of gastric, cough, cold, skin diseases etc. Petals of merigold contains high range of antioxidants effective to combating the damage causes by pollution of industries.

a. TULSI

Tulsi is the Sanskrit word. It is an aromatic plant in the family Larniaceae. There are three varieties of Tulsi - (i) Rama Tulsi (*Ocimum sanctum*) (ii) Vonsa Tulsi (*Ocimum*

gratissimum) (iii) Krishna Tulsi (*Ocimum sanctum*). Hindus worship Tulsi as goddess. She is regarded as a great worshipper of Lord "Vishnu". It's scientific name is *Ocimum Sanctum* which is undoubtedly the best medicinal herb that is discovered and used by our ancestors. In India holy Basil, the "Queen of herbs" is the most sacred in all the herbs present, It is very common in the Indian houses. Tulsi is used in India for more than 5,000 years and is acclaimed for its healing properties of the mind, body and sprit.

The holy basil is also know as Tulsi, include oralcase, relief from respiratory disorders, as well as treatment of fever, as thema, lung disorders, heart diseases as stress. Tulsi works significantly on the skin. It's leaves can be eaten directly or apply the paste on the effected areas. Eating raw fresh leaves purifies the blood from toxins and prevents appearance of acne and pimples. Tulsi leaves is boiled in water and that can be used on the acme affected areas. Tulsi helps to improve the blood circulation and keeps your scalp cool reducing itchiness and dandruff. This accelerate the hair growth. Leaves, seeds & dried roots are used. Tulsi contains vitamin A (17.5%), C is 30%, K is 34.5% along with zinc, iron and chlorophyll. Tulsi or basil leaves can cure cough, cold, earache, inflammation, malaria, heart diseases, diabetes, asthma, bronchitis, and loss of appetite. The plant is the most widely used herbal expectorant in the world. According to the Organic India Website, Tulsi tea strengthens digestion and a healthy metabolism that may promote weight loss. Tulsi plays an important role in the purification of the atmosphere. It is an adaptogenic, balancing different processes in the body and enabling the body to adapt to stress. This is known in Ayurveda as an "elixir of life". Tulsi has been found to protect organs and tissues against chemical stress from industrial pollutants and heavy metals and physical exertion, ischemia, physical restraint and exposure to cold and excessive notes

In medicinal uses traditional system of medicine, different parts of *Ocimum* have been recommended for the treatment of bronchitis, bronchial asthma, malaria, diarrhoea, dysentery, skin diseases, asthritis, chronic fever and insect bite etc. Tulsi leaves utilises as a never tonic and additionally it sharpen memory power the leave of basil square measure specific for several fevers. A decoction of the leaves, with honey and ginger is a good remedy for respiratory disease, asthma, influenza, cough and cold etc.

b. ROSE (*ROSA & RUGOSA*)

This is a species of rose native to Eastern Asia, in northeastern China, Japan, Korea and south eastern Siberia, Where it grows on the coast, often on sand dunes. It is classified in two- Pink Grootendorst x *Rosa Rugosa*-Gruppen. The Rugged *Rugosa* American Rose and *Rose Rugosa* "Rubra" (Ru) is red Japanese rose. *Rugosa* rose in notable for it's rough (rugose) and leathery leaves, which conserve water well in its dry habits. *Rosa Rugosa* is a flower of deciduous nature. It grows up to 2 m in tropical climate and best used for weak eye sight and depression. It's taste is sweet & bitter. *Rosa rugosa* is a hardy, vigorous rose for harsh climates.

Medicinal uses: It is a prolific producers for food and medicinal uses Rose in an excellent medicine for diarrhoea, bladder infections. It is rich in vitamin C. *Rosa Rugosa* is most

effective in the case of eye diseases, depressions & indigestion and highly effective for the infection cases. This flower, acts as Antiarthritic, Antidiarrhea, Anti depression Astringent, Aromatic, Diuretic, Carminative and tonic. Flower petals and flower buds are used.

c. *HIBISCUS*

Hibiscus is a genus of mallow family, Malvaceae. This genus is quite large, comprising several hundreds species that are native to warm-temperature, subtropical and tropical region throughout the world. The genetic name is derived from the Greek Word (hibiskos), which was the name Bdanus Dioscorides gave to *Althaea officinalis*.

Hibiscus plants are known for their large, colourful flowers that make a decorative addition to a home or garden. The hibiscus plant is native to parts of North Africa and South east Asia. Major producers of hibiscus today are Mexico, Jamaica, Thailand and China. Hibiscus flowers occur in many colours such as red, yellow, white, violet, brown etc. The red colour is very common.

Medicinal Uses: It is important for it's medicinal uses. Hibiscus can help relieve upset stomach, high blood pressure, cancer, bacterial infection, weight loss and fevers. This has been used by different cultures as a remedy for several conditions. To make body temperature low, treat heart, nerve diseases, Egyptian were using hibiscus tea. Flowers and leaves can be made into teas and liquid extracts that are used to treat a variety of condition. Hibiscus tea is good for type-2 diabetes and it also lowers the blood pressure of people having type-2 diabetes, It has also been used in the treatment a cancers.

d. *MARIGOLD*

Marigold is one of the most popular flowers for garden decoration. A particular species of marigold flower, *Calendula officianalis* (commonly called *Calendula* or "pot marigold") is in the plant family known as Asteraceae or Compositae. This is usually blooming during the warmer months of the year. *Calendula marigolds* contain good number of active useful constituents, which includes various antioxidants and volatile oils. These are responsible for the flower's bright colour and strong smell; ability to repel certain fungi, pests and insects; and also it's capability of improving blood flow and controlling inflammation. Research shows that *calendula's* contain dozens of active chemicals which make it a natural cytotoxic, hepatoprotective and spasmogenic herb that has been demonstrated in both animal and human experiments. Extract of flower shows lower c-reactive protein and cytokine levels and protect cells from being damaged by free radicals. *Calendula marigold* also helps to fight with the growth of bacteria in wounds and might even be able to reduce symptoms. It reduces eye inflammation and conjunctivitis. it has natural antiseptic properties. *Calendula* is used for irritated skin to reduce itchi- ness, redness, sensitivity, dryness and swelling. It promotes the growth of healthy new tissue, increase blood flow to the affected area, boost collagen production. It contains many active constituents, including various antioxidants and volatile oils.

e. *SADA BAHAR (VINCA PLANT)*

It is a genus of flowering plants belongs to the family of Apocynaceae. This is native to EUrope, north west Africa and south west Asia. It's english name 'Periwinkle' which is shared with the related genus 'catharanthus'. It's scientific name is *vinca*. There are over 12 species of *vinca* of different genuses and hardiness zones. Periwinkle of greater and lesser size grows in full Sun but some shades are better for them. *Vinca* major prefers to grow in partial shade but they can even tolerate deep shade also. *Vincas* are quite drought tolerant in nature.

Medicinal uses: Vincristine is the chemotherapy agent, which is extracted from *Vinca rosea* (current name *catharanthus roseus*). This is used for the treatment of some leukemias, lymphomas and child hood cancers. This is also used for several other types of cancer and some non-cancerous conditions. In addition, the nootropic agent Vincamine is derived from *Vinca minor*.

f. *JASMINE*

It is known as the king of flowers, also called on "Mistress of the Night". In hindi it is commonly known as "Chamelee". *Jasmine* is a genus of shrubs and in the olive family It has 200 species and found in tropical and warm temperature regions. In India it is known by different names e.g. in Marathi *Kunda*, in Sanskrit. *Magha Mallika* or *Kundah*, in Hindi - *Kundphul*. It's scientific name is *Jasminum*. This grows in sunny areas, on a fertile, well drained soil. Most of the types of *Jasmine* develops in white colour, waxy nature (occasionally yellow or pinkish) that are belt shaped. Flowers are usually gathered in clusters. *Jasmine* produces fragrant flower during the spring and summer.

Medicinal uses: *Jasmine* is frequently used in making tea, syrup and essential oils. Beautiful, fragrant flowers and ornamental leaves of *Jasmine* are mainly used in decoration. *Jasmine* flower is a rich source of volatile oil, indol. Ethanolic and aqueous extracts of *Jasminum augustifolium* linn, plant exhibits antitumor potentials flowers, roots and leaves of *Jasmine* plants are used for preparation of herbal medicines for treating and preventing constipation and flatulence (). Plants continue to play on integral role in both orthodox and traditional medicines for preventing and treating various diseases and ailments.

Plan ning	Locality	DMHP Species/variety						
		Tulsi	Rose	Meri- gold	Hibis- cus	Jasmi- ne	Sada bahar	Others
I	(North)-Urla, Ranwabhata	5	4	3	1	4	2	6
II	(East)- Telibandha, Avanti Nagar	6	2	2	1	3	4	7
III	(South)- Sejbahar, Tikrapara (West)-	6	3	2	-	3	3	8
IV	Kharun River Front Tatibandh	7	5	3	-	2	4	4
Total Occurrence in %		24	14	10	2	12	13	25

Table 2: Occurrences & Distribution of DMHP in Raipur Region, C G.

S.No.	DMHP Medicinal Herbal Plant Variety	Useful Parts	Medicinal Properties/ Therapeutic Use	Specific Characteristics
1	Tulsi (Ocimum Sanctum)	Leaves Root Seed	1. Anti Inflamm-Motory 2. Anti Allergic 3. Anti Oxidants	Skin disease Cough, Cold Allergy Stomach Problem
2	Rose (Rosea Rugosa)	Leaves Retal Root Seed	1. Astrigents 2. Flavour to other medicines 3. Conations vitamins & Nutrients	Fever Pain muscular Stomach Trouble
3	Hibiscus (Hibiscus rose Sinesis)	Leaves Flowers Root	1. Anti inflammatory 2. Anti snar radiation 3. Polyphenol inleaves 4. Vitamin C & Minents	Cough Hair loss Conditioner Tea
4	Merigold (Calendula)	Petals Seeds leaves	1. Antioxidants 2. Anti Inflammatory 3. Lycopene Present	Bioflaronoids Allergy Skin disease Eczyma minor burns, eye treatment
5	Sada Bahar (Vinca Rosea) Periwinkle	Flowers	1. Anti -Methanolic 2. Anti - Contaract	Muscle Pain Skin disease vision treatment
6	Jasmine (jasmine Sambac)	Flowers Root- Stem	1. Anti - inflammatory 2. Fragrance oil	Skin disease Cooling, headache

Table 3: Utilization of DMHP

IV. DISCUSSION & CONCLUSION

Fast and uncontrolled environmental degradation have become a havoc for the life on the Earth. The existing and

dominating allopathic medicines with their side effects, are fighting to provide healthy life to the human beings. Although several initiation have been taken to develop this ancient dying science for serving the healthy life but still more to be done. Research on herbal medicinal plants have been taken very seriously. Chhattisgarh State is a store of herbal medicinal plants. The high productivity of Tulsi, Rose & Hibiscus, Sadabahar & Jasmine and Merigold is suceptible in Kanhar and matasi & alluvium/soil respectively. The utility of root, leave, seeds are effective to combating damage causes by pollution and treatment of cough, cold, skin disease. According to recent report of WHO, human body will become immune against all the antibiotics upto 2020. In this situation only herbal based drugs will be the alternative avenues for curing different diseases. Definitely herbal medicine will be of immense use in future and it will be proved to be paramount.

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