Reviving Indian Tribal Knowledge of Ethnomedicinal Plants for a Sustainable Future

Ravindar Meena[a] and Amita Charan[b]

[a]*Assistant Professor in Commerce Department, Janki Devi Memorial College, University of Delhi, India;*

Ravindar Meena is Assistant Professor in the Commerce Department, JDMC, University of Delhi since 2022, He has two chapters in edited books, four patents published in IPR and 5 research papers in National and International Journals. His interest area is Business Administration, Sustainability issues in Business and HRM.

[b]*Professor in Commerce Department, Janki Devi Memorial College, University of Delhi, India;*

Amita Charan is Professor in the Commerce Department, JDMC, University of Delhi since 2022, She has authored three books and 25 research papers in National and International Journals. Her interest area is Sustainability issues in Business and Higher Education.

Abstract: Traditional ethnomedicinal plants have been used in the various stages of human development for therapeutic purposes and survival. Moreover, ancient tribes learned the characteristics of natural habitats more closely as they survived in dense forests for decades. However, as modern synthetic medicine has become more prevalent, knowledge and medicinal use of these plants have gradually declined (Munesh Kumar, 2021). The loss of traditional knowledge is a loss of not only cultural heritage but also valuable resources for therapeutic procedures, longevity and sustainable development. As a result, efforts are being made to revitalize the use of ethnomedicinal plants. This revival entails documenting and preserving traditional knowledge, promoting plant cultivation, procuring the seeds and incorporating these medicinal plants into modern healthcare systems in a less commercial manner. Indian forests are estimated to contain around 5,00,000 of the 10 to 30 million species on earth (Gadgil, 1996). The use of ethnomedicinal plants not only provides affordable and accessible healthcare but also promotes sustainable practices by decreasing reliance on modern pharmaceuticals and conserving natural resources for generations. Construction and extraction activities in the Aravalli range are detrimental for flora and fauna in this zone. This research article attempts to revive the ancient ethnomedicinal knowledge and methods learned by diversified tribal groups for using plants to conserve ancient cultural heritage, encourage sustainable lifestyles, increase longevity, offer accessible healthcare and above all contribute significantly towards the revival and perseverance of Indian tribal knowledge of ethnomedicinal plants of Aravalli range.

Keywords: Ethnomedicinal Plants, Sustainable Lifestyle, Nomadic Communities, Indian Tribal knowledge

Introduction: The Aravalli range extends over the north-western states of India i.e., Rajasthan, Gujarat, Haryana and Delhi. It covers two major hill ranges in Rajasthan: Sambhar Sirohi Range and the Sambhar Khatri Range. ‘'Guru Shikhar' situated on the hill of Mount Abu (Rajasthan) is the highest peak of the Aravalli Mountains. Some of the traces of **Sothi–Siswal culture** are also found in the Aravalli region. The Aravalli Mountain is the remnant of the oldest fold mountains of the world hence many secrets of human civilization are hidden here. The total extension of Aravalli is about 1100 km. These hills are also known as 'Delhi hills' in Delhi and its surrounding areas. In Delhi, the height of the Aravalli hills becomes minimal and from here they merge into the plain due to deforestation, construction, mining and development activities. The Aravalli range covers about 850 km from Palanpur in Gujarat to Delhi via Rajasthan and Haryana (Rathore, 2012) spread over its length. It was formed in the Proterozoic era of the Pre-Cambrian period, which is believed to be 600 to 570 million years ago. It is the oldest mountain range not only in India but in the world and home to many ancient tribes. Henceforth, it is important to investigate the role of Aravalli in retaining the climate and restoring of natural habitat. Moreover, the conservation and preservation of natural climate and flora and fauna in this area is also essential in understanding issues such as; the development of human civilization, livelihood and resource use patterns of tribes, changing ethnic identity, human climate conflicts and social changes in the lifestyle of tribes.

Role of Tribal Communities:

For thousands of years, tribal communities have used ethnomedicinal herbs in traditional ways as part of their culture. By offering an alternative source of medicine that is frequently less damaging to the environment and less expensive than synthetic drugs, ethnomedicinal plants, which are plants that are used for medicinal purposes by natives or indigenous communities, have the potential to contribute to our common sustainable future. These plants have been utilized for several medical applications, including the treatment of ailments and the advancement of overall health. The traditional use of these herbs has decreased in the past, nevertheless, as a result of the development of modern allopathy, naturopathy and herbal medicine. There has been an increase in interest in restoring the usage of ethnomedicinal plants in recent years. This has been sparked by several things, such as worries about the future of modern medicine, growing appreciation for the cultural significance of these plants, and potential financial gains from their use. Reviving the traditional practice of ethnomedicinal plants is becoming more and more important for establishing sustainable healthcare practices. The invention, production, and preservation of ethnomedicinal plants for long-term use is gaining popularity. For instance, botanic gardens and biotechnology can support the development of cultivation and propagation methods as well as the conservation of plant species. For upcoming research and potential creation of novel herbal medicines, it's crucial to create an international database for identifying and procuring medicinal plants. The usage of these herbs and indigenous techniques can encourage a more holistic approach to healing and lessen reliance on expensive and detrimental modern medicine. Additionally, the customary native knowledge related to these practices is a significant component of cultural and intellectual tribal heritage, and its preservation can support knowledge transfer between generations and maintain rich cultural diversity of ancient Indian tribes and nomadic communities.

There are various processes involved in reviving the usage of ethnomedical herbs. Finding the plants that have historically been used as medicines and the communities that have done so is the first step. After these plants have been located, attempts can be undertaken to analyse their efficacy and safety while also capturing the traditional knowledge associated with them. The next stage is to create sustainable methods for growing and gathering these plants. This could entail collaborating with neighbourhood groups to create harvesting methods that are environmentally friendly and don't decrease plant populations. Efforts can also be made to promote the utilisation of these botanicals in contemporary medicine. This could entail working with regulatory organisations to ensure that they are appropriately incorporated into contemporary medical practice, as well as performing research to determine the efficacy and safety of these plants. It may be possible to support sustainable development, protect cultural heritage, and assist local people economically by reviving the use of ethnomedicinal plants. The safe, sustainable, and culturally appropriate use of these plants, however, necessitates cooperation between researchers, local groups, and government. Primarily Bhil, Garssia, Meena, Saharia, Kathodi, Dhanka, Kunbis, Patelias are residing in Aravalli range. Hence, it is important to build healthy community relationships to retain the rich knowledge of these tribal communities. Moreover, the tribal indigenous belief system is significant in the conservation and management of floral and faunal biodiversity (Vibha Singhal, 2021).

Traditional Indigenous Knowledge of Ethnomedicinal Plant :

India is renowned for having a wealth of traditional knowledge when it comes to using ethnomedicinal herbs. The discovery of plants with medicinal characteristics, the creation of various formulations for the treatment of diseases, and the use of these medicines for treating disorders are only a few examples of the diverse topics covered by traditional knowledge of ethnomedicinal plants in Indian cattle gazers, shepherds, nagas and forest dwellers. Their knowledge and therapies are carried forward by Buddhism and Jainism (Salguero, 2017). Boddhisatva means master of five great sciences including medicine (Sanjay Kalra, 2018). Ethnomedicinal plants have been an essential component of traditional medicine in India for ages in monastic medical institutions and healer monks. Several prehistoric Indian writings, Ashoka inscriptions and stone carvings including the mention the use of a few medicinal plants for curing the people and animals. From India, the medicinal knowledge sailed to China, Bangladesh, Mongolia, Japan, Cambodia, Sri Lanka and the rest of the world.

Indian tribal knowledge of ethnomedicinal plants involves the surrounding ecosystem and environment in addition to the plants' medicinal capabilities. The interaction between nature and humans is significant, and it is necessary to keep that relationship in balance, according to traditional Indian thinking. In different indigenous tribes throughout India, there is a wealth of traditional knowledge about ethnomedicinal plants that has been passed down through the decades. There is a plethora of information regarding the qualities and uses of these plants, which are used to cure a variety of illnesses and health problems. This tribal knowledge has been the subject of numerous studies, including ones on the ethnomedicinal plant resources of numerous areas, including Mizoram, Mizoram, Nagaland, Tripura, Sikkim, Andaman, Kerla, and the Western Ghats of Karnataka. These studies have emphasised the significance of fostering sustainable resource use and the preservation of traditional knowledge. In practically every civilization, traditional knowledge of ethnomedicinal plants plays a significant role in the provision of basic healthcare, particularly in remote locations where the constant threat of losing this priceless knowledge as it is passed down orally from one generation to the next exists. Recent years have seen a significant increase in the value of ethnomedical plants, not just in India but also globally. The rehabilitation, conservation and preservation of ethnomedical knowledge about plants as well as the management of these species for the benefit of human society as a whole depend on the exploration, identification, and documentation of the use of ethnobotanic resources. Ayurveda, Herbal, Siddha, Unani, Tibetan, and traditional herbal medicines are just a few of the many popular systems of medicine that have historically used Indian tribal knowledge of ethnomedicinal plants in research and practices. These medical techniques have been used for many centuries and have greatly influenced Indian healthcare procedures. Moreover, in day-to-day life Indians use ethnomedicinal plants such as Ashoka, Sal, Banyan, Neem, Tulsi (Basil), Ashwagandha, Turmeric, Amla (Indian Gooseberry), Ginger, Garlic, Brahmi, Arjuna, Bahera, Alovera, Jatropha and many more. These are only a few of the countless ethnomedicinal plants that are used in Indian traditional knowledge systems. Although these plants have a lengthy history of traditional use, it is always advised to seek the advice of a licenced healthcare professional or Ayurvedic specialist before using them for therapeutic purposes. The Indian government has launched numerous programmes to develop and conserve traditional knowledge of

ethnomedicinal plants in light of its significance. These initiatives seek to preserve traditional knowledge, advance research, and raise public awareness of its significance. A natural and long-lasting method of treating illnesses has been supplied by Indian tribal knowledge of ethnomedicinal plants for ages. It recognises the value of keeping a balance between humans and nature while also including the identification and use of medicinal herbs. The government's initiatives to advance and safeguard this knowledge will guarantee its continuance and practicality for future generations.

Community-Based Approaches to Ethnomedicinal Plant Conservations:

Local communities are actively involved and contributing in the preservation and sustainable use of medicinal plants that have cultural and traditional value as part of community-based methods to ethnomedicinal plant conservation. These methods acknowledge the value of traditional tribal knowledge and the function of regional communities in preserving plant biodiversity for future generations. Different communities are protecting different zones and carrying forward their specific techniques to protect the biodiversity and tribal heritage in their own way.

Research Methodology: It entails undertaking an ethnomedicinal investigation to document traditional medicinal plant uses. This research entail finding and documenting the unique information about plant richness, as well as looking for new resources for herbal medicine preparation. Additionally, the study determines how indigenous populations and traditional ethnomedicinal knowledge contribute to the achievement of sustainable development. The research is based on the ecological and traditional knowledge of indigenous peoples, which has served as the foundation of globally prevalent traditional food cultures and agricultural heritage. The study also involves determining how traditional ecological knowledge and spirituality, which historically connected common cultural practices into landscapes, seascapes, and natural rhythms, relate to agroecological principles. Observation, focus group interviews and personal discussion is used for compiling the data. Overall, 25 tribal groups are contacted and 10 village development officers in Aravalli area are approached to collect the information.

Qualitative Research:

Conducting focus groups and interviews with local residents who have knowledge of and experience with ethnomedicinal plants is one method of qualitative research. Traditional healers, local elders, and people who have used ethnomedicinal herbs for therapeutic purposes could all fall under this category. Through interviews, we were able to gather the past and present uses of ethnomedicinal plants, their cultural value, and the community's understanding and use of these plants. The study would also include statistical and qualitative data analysis to detect patterns and trends in the use of medicinal herbs.

Field Work:

Taking part in fieldwork to collect empirical data on the state of ethnomedicinal plant use in various cultures, including identifying the plants utilised, their preparation techniques, and their

therapeutic characteristics. Five states and more than 20 districts are covered for field survey namely Gujrat, Rajasthan, Madhya Pradesh, Haryana and Delhi.

Data Analysis:

Understanding patterns and trends in the usage of ethnomedicinal plants and their potential for environmentally friendly medical procedures through analysis of the data that has been gathered.

Documentation:

Recording the research's findings in this study can be utilised to enlighten practitioners, stakeholders, and policymakers about the importance of ethnomedicinal plants for environmentally friendly medical procedures.

Dissemination:

To promote awareness of the value of resurrecting cultural traditions of ethnomedicinal plants for a sustainable future, the research findings will be disseminated through academic conferences, workshops, and publications. With the primary research method, we gather information about the scientific and medical qualities of the ethnomedicinal plants being investigated, as well as their potential for sustainable use and conservation. To guarantee that the research is culturally sensitive and pertinent to local contexts, the research methods for this topic should be interdisciplinary and participatory, involving collaboration with traditional healers, community members, and policymakers.

Literature Review: A literature review is an exploration and evaluation of the existing literature on a given subject or selected research area. While conducting this study, a review of the literature helps in finding the gaps in the earlier studies on the concerned subject area in other regions and identifying new avenues for study in the same subject area. An extensive review of the proposed area has been done.

According to the research paper topic “Biotechnological Approaches to Medicinal Plants of Aravalli Hills: Conservation and Scientific Validation of Biological Activities” (Shaily Goyal, 2014) Aravalli hills are a hot spot of subtropical plant biodiversity. The tribal people of the region partially or fully depend upon herbal drugs for primary healthcare. Overexploitation of these plants has made several of them endangered species. This paper aimed to document the biotechnological approaches being used to conserve ethnomedicinal plants of Aravalli Hills, the bioactive molecules present in them and their traditional uses and the modern scientific validation/assay of biological activities. Plants of Aravalli hills are showing various promising biological activities and bioactive molecules. Though various biotechnological methods are attempted for enhanced production of these bioactive molecules and for their micropropagation, yet the approaches are insufficient at the mass scale level as some of the endangered species may have unusual growth requirements and thus may require modified procedures for in vitro culture.
According to a Deccan Herald report by Ashish Tripathi, The Supreme Court expressed shock that 31 hills had "vanished" in the Aravalli area of Rajasthan due to illegal mining in the

115.34-hectare area (Asish Tripathi, 2018). Rajasthan was earning a royalty of around Rs 5,000 crore from mining activities in Aravalli, it cannot endanger lakhs of people in Delhi as the disappearance of the hills could be one of the reasons for the rising pollution level in the national capital. It also referred to a report of the Central Empowered Committee (CEC), which said that out of 128 samples taken by the Forest Survey of India (FSI), as many as 31 hills or hillocks have vanished. "31 hills or hillocks have disappeared. A report by CEC in 2018 says that 25% of Aravalli Hills have already disappeared from Rajasthan due to illegal mining since 1967 (Mazoomdaar, 2023).

According to the research paper topic, "Review on Traditional Medicinal Plants in Aravalli District" (Chaudhari, 2019) Aravalli hill ranges are endowed with vast natural resources and abundant medicinal plant resources. Tribes and other communities of people who inhabit these regions depend on natural resources for their food, shelter, and for treating various diseases.

According to the research paper topic "Medicinal Plant Diversity in Aravallis" (Sharma, 2019) Aravallis ranges are one of the very important features of the western part of India which runs from Gujarat to Delhi. It traverses four states viz., Gujarat, Rajasthan, Haryana and Delhi. The maximum part of Aravallis is confined to Rajasthan. As many as 13 wildlife sanctuaries are confined to Aravallis; 10 in Rajasthan, 2 in Gujarat and 1 in Delhi. As many as 3 protected areas are confined to the confluence of Aravallis and Vindhyas, all are in Rajasthan. Forest Department, Rajasthan and Foundation for Revitalization of Local Health Traditions, Bangalore jointly listed 39 species in the "red list of medicinal plants" from Rajasthan state. Most of these listed medicinal plants are present in 16 protected areas. Out of these 16 protected areas, 6 are rich in medicinal plants. Phulwari, Sitamata, Kumbhalgarh, Mt. Abu. Balaram Ambaji and Jassore sanctuaries have 22, 18, 14, 12, 11 and 10 species respectively. The study reveals that the southern part of Aravallis is richer than the northern and central Aravallis. The "nals" of the southern part of Aravallis are especially rich in medicinal plant diversity.

In one more study on "Importance of Plants in Subsistence of Bhil Tribe" found that ethnobotanical knowledge of herbs and plants among original Bhils is very sound (Archna Sahare, 2021). Although in the past the use of few medicinal plant resources has been practiced since the Indus Valley and Sumerian civilisation such as mustard, sesame, spikenard etc. Traditional medicine practices plays a predominant role in the evolution of human culture because medicinal plants have been used in the treatment of numerous diseases including epidemics.

According to the research paper topic "General Information about the Medicinal Plants in the Aravalli Ranges, its Conservation in the Form of Aravalli Biodiversity Park, India" by Dr. Anita (2021) their volunteer group working for the betterment of Aravalli – the oldest mountain range of India. The motive is to make it green, home to wildlife and an entity of prosperity for humans. The issue of legal protection, or a lack thereof, for the Aravalli hills of south Haryana, came to the fore in 2019, spurred by legislative amendments to the colonial-era Punjab Land Preservation Act (1900). Approved by the Haryana cabinet in February, the amendments would have removed 60,000 acres of Aravalli land in the National Capital Region (NCR) from the legal definition of 'forest', opening them up to real estate and commercial interests.

Observations and Findings: In this section, data is summarised and presented with the help of graphs and tables. Tribel communities are actively engaged in the protection and conservation of medicinal plants in Aravalli range. Construction and development activities are still reported in these areas and both are harming the cultivation and protection of medicinal plans in this area.

Ethnomedicinal Plants in Different Regions and Communities in Various States: Numerous ethnomedicinal plants are being used by various tribal communities in India but have not undergone enough in-depth research or are not well-known for connecting the link between commercial activities, construction and conservation of ethnomedicinal plants in Aravalli. Here are a few illustrations presented below:

Table 1 presents an overview of common medicinal plants used in India. Table 2 presents a zone-wise summary of medicinal plants used in India. Table 3 is statistical inferences related to medicinal plants and Table 4 presents an overview of medicinal plants used by tribal communities in the Aravalli range.

The Bar Graph 1 represents the ethnomedicinal plants used in India the Bar Graph 2 showing the following statistics:

1. Estimated number of medicinal plant species in India - Bar ranging from 7,500 to 10,000
2. Estimated number of medicinal plant formulations used in traditional medicine systems - Bar at 9,500
3. Estimated number of medicinal plant species used by indigenous communities - Bar ranging from 6,000 to 7,000
4. Share of modern pharmaceutical drugs with plant-based origins - Bar at 25%
5. India's share in global herbal medicine market (2027 projection) - Bar at $18.1 billion
6. Share of medicinal plant raw material sourced from wild harvesting - Bar at 90%
7. Number of threatened medicinal plant species - Bar at 1,500
8. Estimated land required for medicinal plant cultivation - Bar at 4 million hectares
9. Share of total medicinal plants under cultivation currently - Bar at 10%

Graph 3 presents the following findings:

- A total of 31 ethnomedicinal plants were listed across the 6 regions

- The dominant plant families across regions were Fabaceae, Asteraceae and Lamiaceae
- The Himalayan region had distinct dominant families like Valerianaceae and Berberidaceae
- Most regions had 5-6 commonly used medicinal plants illustratively listed

Graph 4 displays the percentage of various ethnomedicinal plants used by tribal communities. Whereas the map portray the availability of ethnomedicinal plants in different Indian states .

Conclusion: The Aravalli Hills, one of the oldest mountain ranges in India, is home to a diverse range of medicinal plants. This list of ethnomedicinal plants is not exhaustive, and there are many more medicinal plants found in the Aravalli Hills which are used by different tribal communities. The local communities have been using these plants for centuries to treat various ailments and diseases. It is important to conserve and sustainably manage these valuable resources for the benefit of future generations without destruction and maltreatment. The Aravalli Hills are home to a large diversity of medicinal plants, including tree, herb, and shrub species. These plants belong to different families, with Fabaceae, Moraceae, and Asteraceae being the most represented. The local people of Aravalli in different districts use these plants for various medicinal purposes, such as treating cold, cough, stomach-ache, fever, diarrhea, diabetes, jaundice, dysentery, back-ache, and ulcers. The traditional system of medicine is widely used in Rajasthan, with tribals being the real custodians of this knowledge. In summary, the Aravalli Hills are a rich source of medicinal plants, with various species being used by local communities for their medicinal needs. These plants play a crucial role in traditional medicine and are an essential part of the region's biodiversity.

Bibliography

Archna Sahare, V. K. (2021). Importance of Plants in Subsistence of Bhil Tribe. *Journal of Applied Ecology and Environmental Sciences*.

Asish Tripathi. (2018). *Deccan Herald*. Retrieved from www.deccanherald.com: https://www.deccanherald.com/india/sc-shock-over-vanished-699447.html

Chaudhari, A. S. (2019). Review On Traditional Medicinal Plants In Aravalli District. *Think India*.

Gadgil, M. (1996). Documenting diversity; an experiment. *Current Science*, 36-44.

Grimes, P., et al. (2021). *Mapping of Disability-Inclusive Education Practices in South Asia.* United Nations Children's Fund Regional .

Mazoomdaar, J. (2023). *Indian Express*. Retrieved from Indianexpress.com: https://indianexpress.com/article/india/central-empowered-committee-sc-hands-over-its-green-watchdog-committee-to-environment-ministry-8929659/

MoE. (2023). *Department of School Education and Literacy* . Retrieved from dsel-education: https://dsel.education.gov.in/inclusive-education

Munesh Kumar, S. R.-P. (2021). Implementation of the Use of Ethnomedicinal Plants for Curing Diseases in the Indian Himalayas and Its Role in Sustainability of Livelihoods and

Socioeconomic Development. *Int. J. Environ. Res. Public Health*. doi:https://doi.org/10.3390%2Fijerph18041509

Rathore, N. S. (2012). *CLIMATE CHANGE DUE TO HUMAN INTERFERANCE IN SOUTH ARAVALI HILL MOUNTAIN AREA OF INDIA*. Retrieved from https://a-a-r-s.org/proceeding/ACRS2016/ACRS%202016%20Oral%20Papers/TS33/Ab%200368.pdf

Salguero, C. P. (2017). *Buddhism and Medicine.* Columbia University Press.

Sanjay Kalra, G. P. (2018). Sanjay Kalra, Gagan Priya,1 Emmy Grewal,2 Than Than Aye,3 B.K. Waraich,4 Tint SweLatt,5 Touch Khun,6 Menh Phanvarine,7 Sun Sutta,8 Uditha Kaush,9 Manilka,10 Sundeep Ruder,11 and Bharti Kalra12. *Indian J Endocrinol Metabolism*. doi:https://doi.org/10.4103%2Fijem.IJEM_286_17

Shaily Goyal, J. A. (2014). Biotechnological Approaches to Medicinal Plants of Aravalli Hills: Conservation and Scientific Validation of Biological Activities. In *Biotechnology and Biodiversity* (pp. 203-245). Springer. doi:https://doi.org/10.1007%2F978-3-319-09381-9_11

Sharma, S. K. (2019). Medicinal plant diversity in Aravallis. *International Society for Phytocosmetic Sciences*.

UNICEF Fact Sheet. (2022). *Children with Disabilities.* UNICEF.

Vibha Singhal, J. G. (2021). Role of religious beliefs of tribal communities from Jharkhand (India) in biodiversity conservation. *Journal of Environmental Planning and Management*.

Table 1: Medicinal Plants in India

Medicinal plant	State	Usage of Medicinal Plant
Meda vempalli (Leea indica)	Andhra Pradesh	tribal communities use it to treat colds, coughs, and fevers.
Zanthoxylum armatum	Arunachal Pradesh	used to treat fever and gastrointestinal issues.
Houttuynia cordata	Assam	used to treat skin conditions and respiratory issues.
Madhuca longifolia	Bihar	used as a treatment for cough and fever.
Sterculia villosa	Chhattisgarh	used to cure rheumatism and skin conditions.
Phyllanthus tenellus	Goa	used to cure rheumatism and skin conditions.
Capparis decidua	Gujarat	used for the treatment of colds, coughs, and fever.
Ziziphus nummularia	Haryana	used to treat coughs and skin conditions.
Acorus calamus	Jharkhand	utilised to treat stomach issues as well as respiratory issues.

Adhatoda beddomei	Karnataka	used to treat fever and respiratory conditions.
Erythrina indica	Kerala	used to treat skin conditions and arthritis.
Embelia ribes	Madhya Pradesh	used to treat fever and gastrointestinal issues.
Tridax procumbens	Maharashtra	used to heal wounds and treat skin conditions.
Smilax ovalifolia	Manipur	used to treat rheumatism and skin conditions.
Curculigo orchioides	Meghalaya	used to cure tiredness and erectile dysfunction.
Ficus auriculata	Mizoram	used to heal wounds and treat skin conditions.
Anaphalis neelgerriana	Nagaland	used to treat fever and respiratory conditions.
Entada scandens	Odisha	It is used to treat skin disorders and rheumatism.
Acacia leucophloea	Punjab	It is used to treat fever and diarrhoea.
Suaeda maritima	Rajasthan	It is used to treat skin problems and to heal wounds.
Aconitum violaceum	Sikkim	used to treat rheumatism and arthritis.
Blepharis maderaspatensis	Tamil Nadu	used for treating skin diseases and wound healing.
Operculina turpethum	Telangana	used for treating respiratory disorders and fever.
Cissus quadrangularis	Tripura	used for treating bone fractures and wound healing.
Boerhavia diffusa	Uttar Pradesh	used for treating gastrointestinal disorders and fever
Eupatorium adenophorum	Uttarakhand	used for treating respiratory disorders and fever.
Abroma augusta	West Bengal	used for treating menstrual disorders and digestive problems.
Zanthoxylum rhetsa	Andaman and Nicobar Islands	used for treating skin diseases and rheumatism.
Source: Self Complied		

Table 2: Medicinal Plants in Different Zones of India

Region	Number of Ethnomedicinal Plants Listed	Dominant Plant Families
North India	6	Asteraceae, Fabaceae, Lamiaceae
South India	5	Fabaceae, Menispermaceae, Asclepiadaceae
East India	5	Asteraceae, Rubiaceae, Meliaceae
West India	5	Asparagaceae, Fabaceae, Lamiaceae
Central India	5	Fabaceae, Lythraceae, Asteraceae
Himalayan Region	5	Valerianaceae, Rubiaceae, Berberidaceae
Source: Self Compiled		

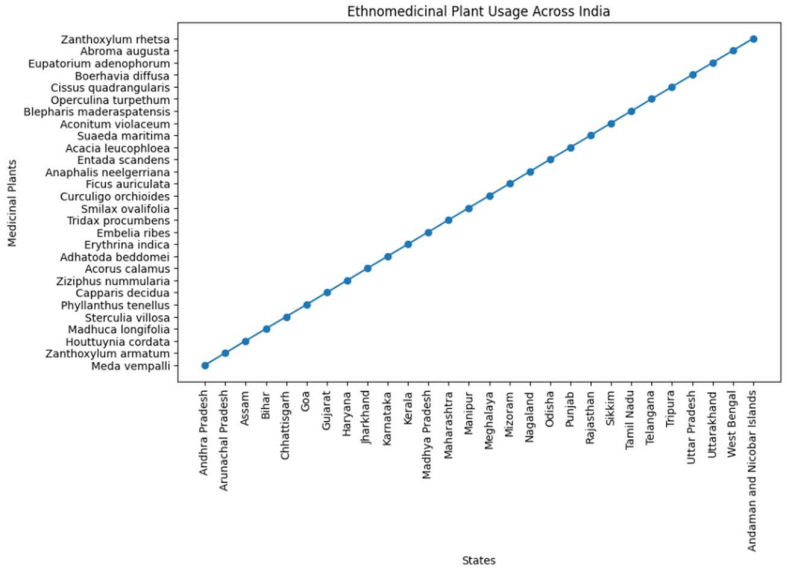
Table 3: Statistical data on Ethnomedicinal Plant in India:

Parameter	Statistics
Estimated number of medicinal plant species in India	7,500 – 10,000
Estimated number of medicinal plant formulations used in traditional medicine system	Over 9,500
Estimated number of medicinal plant species used by indigenous communities	6,000 – 7,000
Share of modern pharmaceutical drugs with plant-based origins	Above 25%
India's share in global herbal medicine market (2027 projection)	$ 18.1 billion
Share of medicinal plant raw medicinal plant raw material sourced from would harvesting	Over 90%
Number of threatened medicinal plant species	Around 1,500
Estimated land required for medicinal plant cultivation	4 million hectares
Share of total medicinal plants under cultivation currently	About 10
Source: Self Compiled	

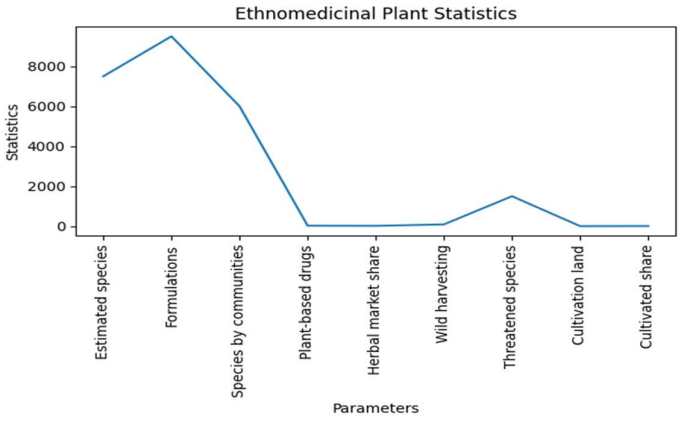
Table 4: Some of the medicinal plants found in the Aravalli Hills include:

Plant	Medicinal Use by Tribal Communities
Aloe vera (Aloe barbadensis)	Bhil Tribe
Indian gooseberry (Phyllanthus emblica) Neem (Azadirachta indica)	Meena Tribe
Holy basil (Ocimum sanctum)	Bhil Tribe
Turmeric (Curcuma longa)	Bhil Tribe
Indian madder (Rubia cordifolia)	Garasia Tribe
Indian sarsaparilla (Hemidesmus indicus)	Bhil Tribe
Indian tinospora (Tinospora cordifolia)	Garasia Tribe
Bael (Aegle marmelos)	Bhil Tribe
Indian laburnum (Cassia fistula)	Meena Tribe
Indian trumpet flower (Tecoma stans)	Meena Tribe
Indian aloe (Aloe vera)	Bhil Tribe
Indian licorice (Glycyrrhiza glabra)	Sharia Tribe
Indian nightshade (Solanum nigrum)	Sharia Tribe

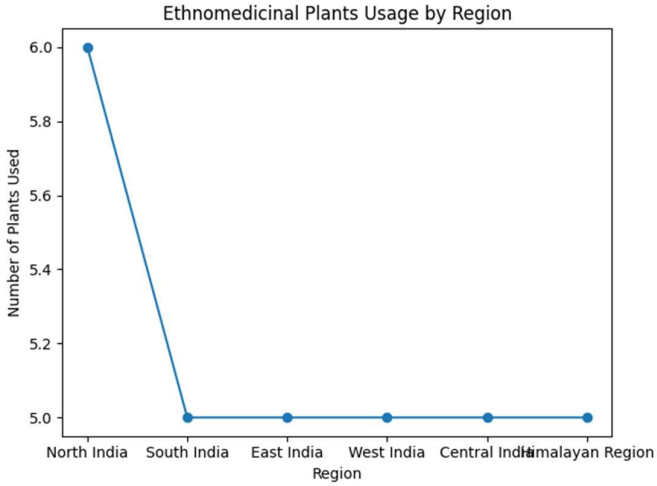
Indian pennywort (Centella asiatica)	Meena Tribe
Indian plum (Ziziphus mauritiana)	Garasia Tribe
Indian privet (Vitex negundo)	Saharia Tribe
Indian sorrel (Oxalis corniculata)	Kathodi Tribe
Indian wild cherry (Prunus cerasoides)	Kathodi Tribe
Kalmegh (Andrographis paniculata)	Kathodi Tribe
Source : Self Compiled	



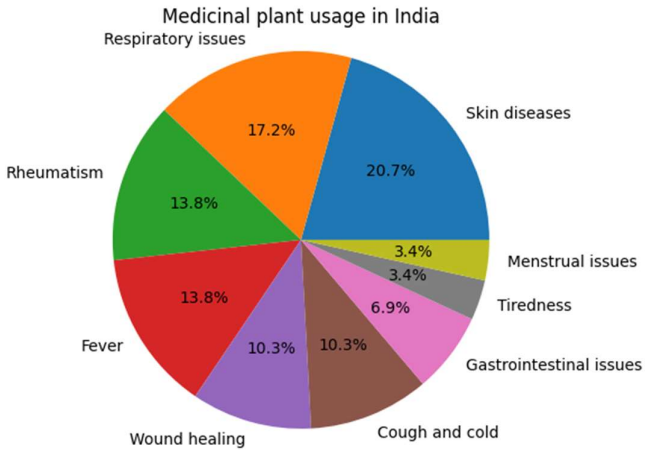
Graph 1: Ethnomedicinal Plant Usage Across India



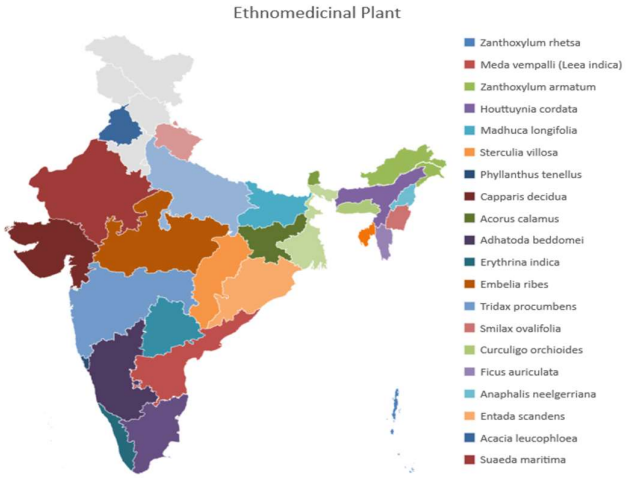
Graph 2: Ethnomedicinal Plant Statistics



Graph 3: Ethnomedicinal Plants usage by region



Graph 4: Percentage Ethnomedicinal Plants usage



Map: Ethnomedicinal Plant in Different States