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Prospects and Challenges of Geographical Indications protection for India's Medicinal plants

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Abstract
India's medicinal plants are deeply rooted in traditional healthcare systems like Ayurveda, Siddha, and Unani. It represents an invaluable national heritage. The Geographical Indication (GI) tag has emerged as a crucial mechanism to protect these botanical treasures. It ensures their authenticity, reputation and quality by traditional knowledge. By linking medicinal plants to their geographical origins, GI protection helps combat bio-piracy, enhances market value, and empowers local communities through sustainable commercialization. However, despite the framework provided by the Geographical Indications of Goods Act (1999), significant challenges persist. Issues such as lack of awareness, inadequate infrastructure, and insufficient research hamper the full potential of GI-protected medicinal plants. Government initiatives like the National Medicinal Plants Board (NMPB) and the National AYUSH Mission are steps in the right direction, but stronger enforcement, collaborative research, and technological empowerment of rural producers are needed.

Keywords: Geographical Indication (GI), medicinal plants, biodiversity conservation

Introduction

Medicinal plants have been an integral part of traditional healthcare systems in India. For centuries, forming the foundation of Ayurveda, Siddha, Unani, and other indigenous medical practices. These plants are a rich source of bioactive component that have been used to treat various diseases. India is one of the world's richest repositories of botanical diversity having over 8,000 species of medicinal plants. Contributing significantly to both rural and urban healthcare. However, despite their ecological and economic importance, medicinal plants in India face severe threats due to misuses, environment destruction, climate change, and inadequate conservation policies.

The increasing demand for herbal products in pharmaceutical, nutraceutical, and cosmetic industries has led to unsustainable harvesting practices, pushing several species toward destruction. Additionally, the lack of proper documentation, loss of traditional knowledge, and weak implementation of legal frameworks further worsen the challenges in medicinal plant conservation.

This paper highlights the major challenges in Protecting and Promoting GI-designated Medicinal Plants. It also explores potential conservation strategies by the Governments. By addressing these

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challenges, India can safeguard its medicinal plant heritage while ensuring the sustainability of its traditional medicine systems for future generations.

Geographical Indication Protections for Medicinal Plants

The Geographical Indications of Goods (Registration and Protection) Act, 1999, offers support for protecting medicinal plants under GI act in India. The Act establishes a system which prohibits the use of registered GI product from unauthorized users and ensuring authenticity by the source of origin.

The protection provided by GI benefits medicinal plants in several ways:

Authenticity and Quality Assurance: GI protection promises the authenticity of products. It ensures the specific characteristics and qualities of the products which associated with their geographical origin. This builds trust and confidence of consumers to receive the product to pay relatively high price.

Market Value Enhancement GI protection increases the market value of medicinal plants assuring its unique qualities and source of origin. Consumers are also ready to pay a premium price for authentic and high-quality products. It brings currency to the country.

Promotion of Traditional Knowledge: To use of medicinal plants traditional knowledge play a crucial role. The knowledge is use for cultivation practices to farmers and producers to maintain the quality and standards products. GI helps to conserve traditional knowledge which is associated with the medicinal plants and process of production from the past.

INITIATIVES AND POLICIES FOR UTILIZATION OF GI MEDICINAL PLANTS

The Indian government has implemented several initiatives and policies to promote the ecological utilization of GI-designated medicinal plants. These include:

National Medicinal Plants Board: The National Medicinal Plants Board (NMPB) provides financial assistance, training, and infrastructure support to farmers and producers in promoting the cultivation, preservation, and conservational use of medicinal plants.

Geographical Indications Registry: The Geographical Indications Registry, established under the Geographical Indications of Goods (Registration and Protection) Act, 1999, helps the registration and protection of GIs.

National AYUSH Mission: The objectives of National AYUSH Mission (NAM) is to support the cultivation and utilization of medicinal plants in Ayurveda, Siddha, Unani, and Homeopathy systems of traditional medicine.

COMMERCIAL INITIATIVES

Promotion of Organic Cultivation: To encourage organic farming of medicinal plants, Initiatives have been started to ensuring the production of high-quality and environmentally friendly products.

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Development of Value-Added Products: Initiatives are going on to cultivate value-added products, such as herbal extracts, essential oils, and herbal supplements, from GI-designated medicinal plants.

Economic and Social Benefits of GI Protections for Medicinal Plants

The socio-economic effects in India with the use of GI protection for medicinal plants:

Economic Empowerment, GI protection boosts the market value of medicinal plants. Cultivation of medicinal plant in GI designated area empowers rural communities with the help of higher incomes to the farmers and producers.

Improved Livelihoods: Cultivation and production of GI goods from medicinal plants creates employment prospects. Cultivation of medicinal plants improves the livelihoods of people involved therewith.

Conservation of Biodiversity: GI protection is necessary to preserve genetic resources of medicinal plants and their unique characteristics,. It ensures availability of the valuable resources for future generations.

Promotion of Traditional Knowledge: Traditional knowledge is an integral part of India's traditional medicine. GI Protection on medicinal plants promote India's ancient heritage and practices.

Enhancement of Brand Reputation: Practice of traditional medicine system follows in India from the ancient past. GI protection on Indian medicinal plants enhances the reputation in the global market.

GI not only gives protection to the Indian medicinal plants but also provide safe guard to the countries natural resources which supporting to the nations wellbeing and conserve of its ancient old cultural heritage.

CHALLENGES IN PROTECTING AND PROMOTING GI-DESIGNATED MEDICINAL PLANTS

Although to protecting and promoting registered GI-medicinal plants, India Government made legal frame work that brings potential benefits in the system. But there are several challenges present beyond the legal protection:

Lack of Awareness: There is a lack of awareness among producers, consumers, and even government officials about the significance and benefits of GIs. This hampers the effective implementation and enforcement of GI protection measures.

Limited Infrastructure: The lack of adequate infrastructure, including storage facilities, processing units, and marketing channels, poses a significant challenge to the effective promotion and distribution of GI-designated medicinal plants.

Competition from Counterfeit Products: The demand of medicinal plants increasing rapidly. It has led to the spread of imitation products in the market. These products are often of inferior quality and challenge the reputation of authentic GI-designated products.

Need more Research and Development: Need more research and development efforts to the further exploration of the medicinal properties of GI-designated plants and the development of value-added products.

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Lack of Collaboration: Collaboration between producers, government agencies, and research institutions is essential for the effective protection and promotion of GI-designated medicinal plants. However, coordination and communication gaps often hamper progress.

Lack of information and technological know-how: The lack of communication and information flow within the producers of the rural communities and marginalized people associated with creation of GI goods, also having gap of technological and commercial orientation is facing challenges in competitive market.

ROLE OF GOVERNMENT AND REGULATORY BODIES

To promoting and protecting GI medicinal plants properly, the government and regulatory bodies initiatives is needed as follows:

To effectively facilitating the registration process for GI tags develop awareness within the producers.

- Raising awareness to the users of the GI-designated product.
- Enforcing strict quality control measures to resist imitating the GI products
- Supporting research and development to enhance the farming and processing of GI medicinal plants
- By the arrangement of workshop, seminar, advertisement on GI related topics, bring consciousness among the government officials, producers and consumers.
- Involvement of Public libraries, Special libraries and knowledge centers to bring awareness about GI products with in the consumers.
- Using resources of libraries and knowledge centers educate GI goods producers and root level workers about the development of new technologies, market policy, effects of change in environment and climate, promotion of goods etc.

Addressing these challenges requires some positive Government initiatives. To increase awareness to various aspects of GIs campaigns, infrastructure development, strict enforcement of GI regulations is important. Raising collaboration among stakeholders, Government can significantly contribute to the success of GI medicinal plants in India.

Classification of Products with GI Tags

The four primary categories of GI items have been divided: agriculture, manufacturing, handicrafts, and foodstuff. The table below lists 30 GI agricultural items from India that have a variety of therapeutic values and medicinal uses.

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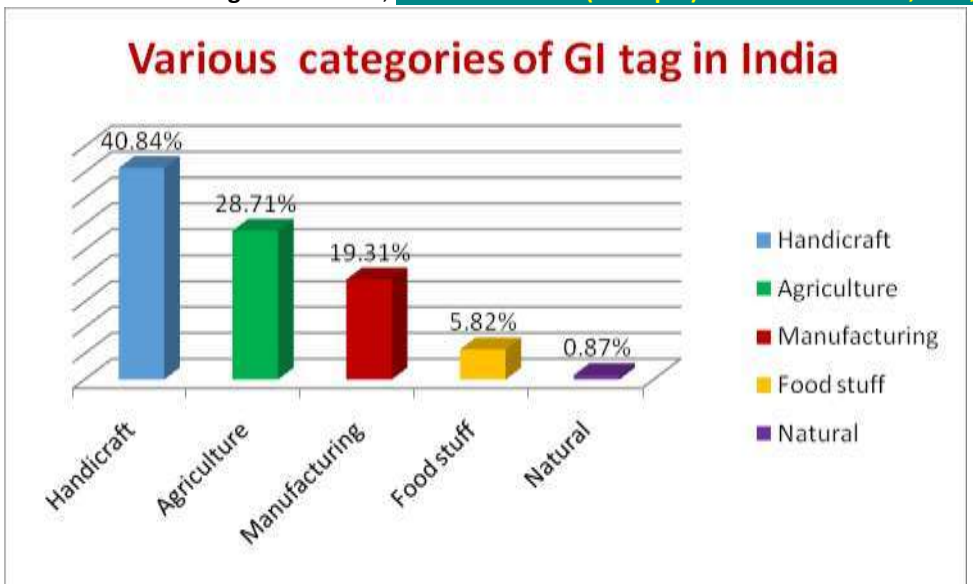

Figure 1: Various categories of GI tags in India

Figure 1showing the handcraft goods that obtained the greatest (40.84%) of the overall GI tag. The highest percentage of 28.71.44% went to agricultural commodities, followed by manufactured (19.31%), foodstuffsgoods (5.82%), and natural goods (0.87%).

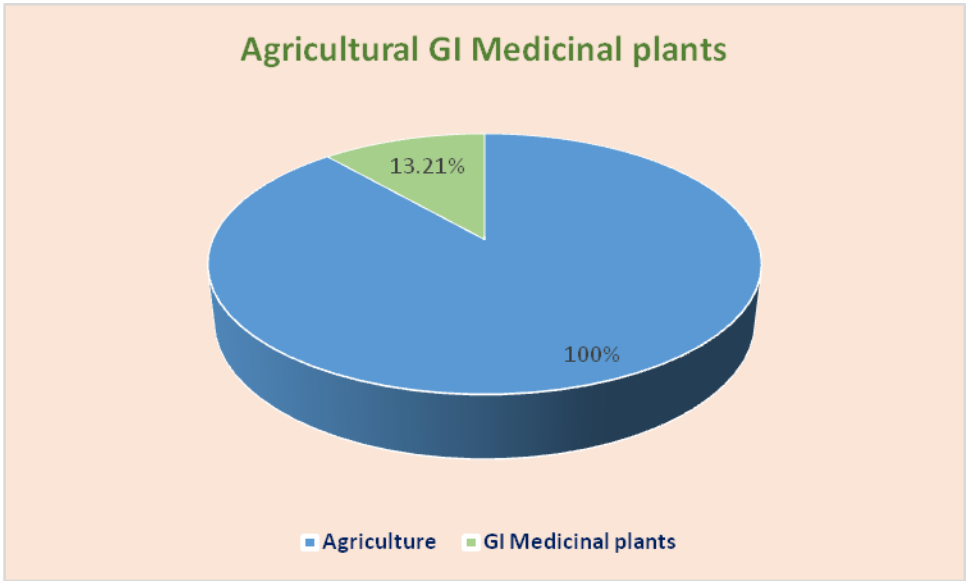

Figure 2: Medicinal plants properties in Agricultural GI

The figure 2: illustrates 13.21 % of GI-tagged agricultural items have strong medicinal potential. The 13.21% of therapeutic qualities of agricultural GI represented that very small number of

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therapeutic properties yet been discovered from a big number of Agricultural GI products (36.44%). It estimate a vast scope for GI Agricultural products in future research that will be significant for the future development of this article.

Overview of Medicinal Plants with GI Tags in India

India renowned for its rich biodiversity. Medicinal plants with GI tags are often cultivated in specific regions of India. This source origin offers unique soil composition, climate, and traditional knowledge contribute to their therapeutic properties. Several horticultural crops, spices, and medicinal and aromatic plants have been awarded GI tags. Some examples include with theirsource of origin:

Sl. No.	Date of Registration	Date of Filing	Medicinal plant	State
1	27.10. 2003	1 & 2	Darjeeling Tea	West Bengal
2	25.11. 2004	17	Navara Rice	Keral
3	11.02.2005	25	Kangra Tea	Himachal Prades
4	31.03.2005	33	Coorg Orange	Karnataka
5	31.03. 2005	34	Mysore Betel leaf	Karnatak
6	18.04.2005	36	Palakkadan Matta Rice	Kerala
7	13.02. 2006 20.07. 2006	49 & 56	Malabar Pepper	Kerala, Karnataka &Tamilnadu
8	14.09. 2006	72	Alleppey Green Cardamom	Kerala &Tamilnadu
9	05.04. 2007	85	Monsooned Malabar Arabica Coffee	Karnataka & Kerala
10	29.01. 2007	81	Pokkali Rice	Keral
11	12.10. 2007	114	Monsooned Malabar Robusta Coffee	India (Karnataka & Kerala)

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12	24.12. 2010	229	Ganjam Kewda Flower	Odisha
13	04.01.2011	231	Erode Manjal (Erode Turmeric)	Tamil Nadu
15	05.02.2013	401	MahobaDesawari Pan	(Uttar Pradesh and Madhya Pradesh)
16	17.07. 2013	432	Himachali Kala Zeera	Himachal Pradesh
17	29.08.2013	435	Assam KarbiAnglong Ginger	Assam
18	26.03.2014	471	Waigaon Turmeric	Maharashtra
19	26.08.2014	496	Sangli Turmeric	Maharashtra
20	27.01.2015	520	UttarakhandTejpata	Uttarakhand
21	20.06.2016	554	Magahi Paan	Magahi Paan
22		604	Coorg Arabica Coffee	Agricultural
23	11.01.2018	610	KandhamalHaladi	Odish
24	28.11.2018	629 & 630	Mizo Ginger	Mizoram
25	03.12.2018	635	Kashmir Saffron	Jammu & Kashmir
26	20.12.2018	641	Tirur Betel Leaf (Tirur Vettila)	Kerala
27	16.01.2020	685	Alibag White Onion	Maharashtra
28	15.02.2021	741	Lakadong Turmeric	High

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29	20.10.2021	785	VasmatHaldi (Turmeric)	Maharashtra
30	11.01.2022	813	RatlamRiyawan Lahsun (Garlic)	Madhya Pradesh

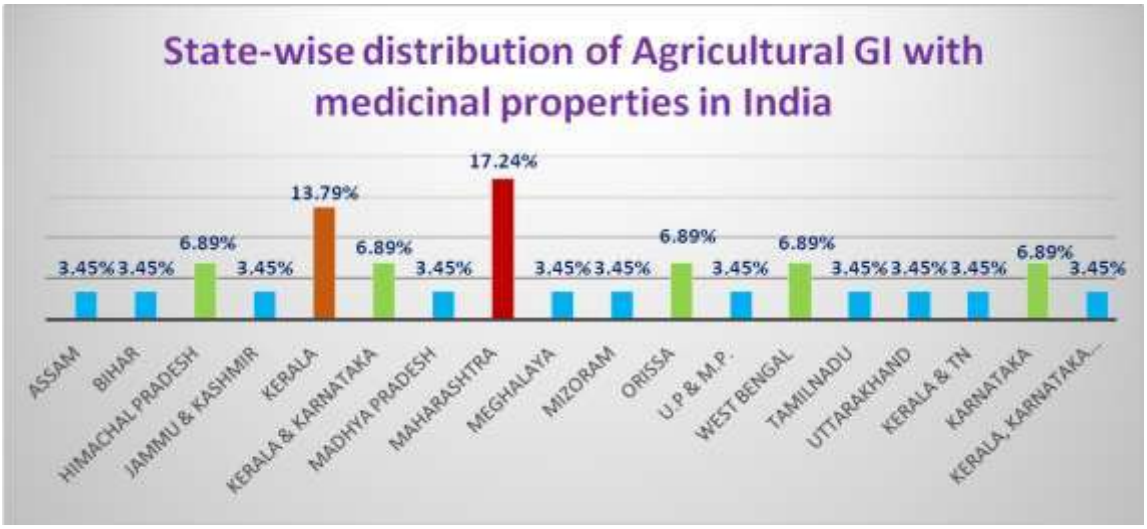

Fig 3: State-wise distribution of Agricultural GI with medicinal properties in India The figure 3 shows states-wise medicinal plants distributions in India. Themost highlighted figure in the chart describes thatMaharashtra having highest production on GI medicinal plants. The Kerala, states of Southern part of India contains second highest positionfollowed by Himachal Pradesh, Karnataka,Orissa, West Bengal, and jointly Kerala and Karnataka hold the next position in production of medicinal plants. Less number of medicinal properties indicated to eleven states in India.

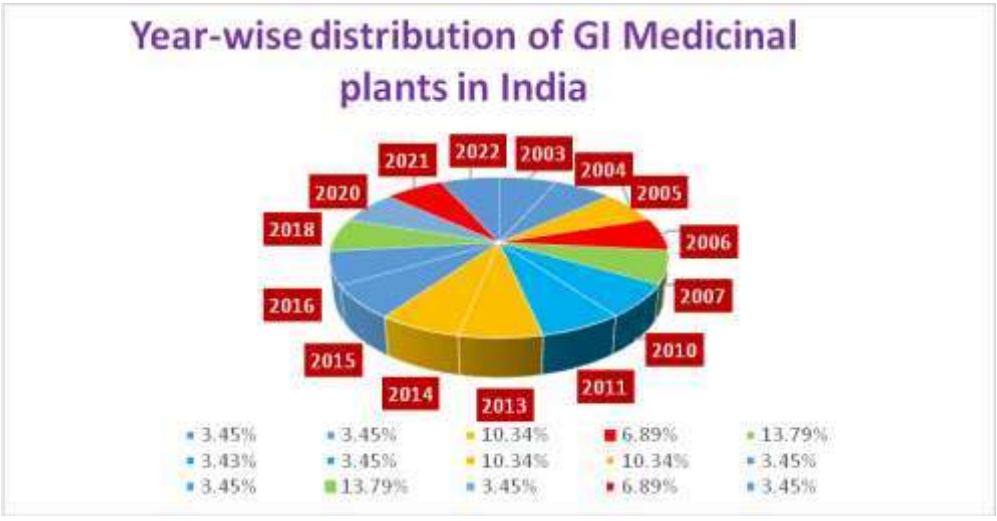

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Figure 4:Year-wise distribution of GI Medicinal plants in India

Figure 4: shows Distribution of GI tag of medicinal plants in the years 2003-2022. Similar colour represent same percentage in the diagram.The figure shows that maximum GI tag was obtained 13.79% in the year 2007 and 20018followed by 10.34% in the years 2005, 2013, and 2014. The same amount, 6.89% of GI tag was obtained in the years 2006 and 2021 in agricultural products of medicinal values. The fewer number, 3.43% of GI tag was awarded to the rest of the years.

Conclusion

Geographical Indications (GIs) serve as a powerful legal and economic instrument to protect India's medicinal plant heritage by preserving their authenticity, quality, and traditional value. GI tags not only prevent bio-piracy and misappropriation but also empower local communities by enhancing marketability and ensuring fair economic returns. However, the full potential of GIs remains untapped due to challenges such as lack of awareness, weak enforcement, and insufficient infrastructure.

This study is evaluated and listed according to their proven therapeutic qualities as reported in government journals such as Geographical Indications Journal, NISCAIR s and ICARJournal, as well as scientific research papers on the particular GI-designated product. The data was gathered from the official Intellectual Property India website (https://ipindia.gov.in).The overall analysis shows that only 13.21%(Figure 2) of the therapeutic properties of agricultural GIs have been discovered so far. This suggests that a very small fraction of the potential benefits have been explored, leaving vast opportunities for future research.

To strengthen the GI framework for medicinal plants, India must prioritize awareness campaigns, infrastructure development, stricter enforcement, and collaborative research**.** Publicprivate partnerships, along with policy interventions, can help bridge existing gaps and promote sustainable utilization of these resources. By effectively implementing GI protections, India can position itself as a global leader in the herbal medicine industry while ensuring biodiversity conservation and equitable benefit-sharing.

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