

Geo-Economic Study of Medicinal Plant Trade Networks in Churu District, Rajasthan

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Abstract: The Churu district of Rajasthan lies within the arid zone of the Thar Desert, where medicinal plants have historically played a critical role in rural healthcare systems, regional economies, and cultural practices. Despite low rainfall and extreme climatic variation, the district supports a diverse range of xerophytic, halophytic, and drought-tolerant medicinal species. This study investigates the geo-economic structure of medicinal plant trade networks in Churu, focusing on collection, processing, storage, pricing, transportation, and market linkages. Through field surveys, interviews with traders, pansaris, farmers, folk healers, and intermediaries, as well as analysis of trade flows, this research reveals the existence of informal yet resilient economic networks connected with regional markets such as Jaipur, Hisar, Bikaner, Delhi, and Gujarat. Key medicinal species—including *Commiphora wightii* (Guggul), *Withania somnifera* (Ashwagandha), *Capparis decidua* (Kair), *Tecomella undulata* (Rohida), and *Salvadora persica* (Pilu)—play a significant role in trade volume and household income generation. However, factors such as overharvesting, climate stress, shifting livelihood patterns, and weak regulation threaten the long-term sustainability of this economic system. The study concludes that promoting structured value chains, community-based collection rights, and market-supported conservation strategies can enhance livelihood resilience while protecting endangered flora.

Keywords: Geo-economics; medicinal plant trade; Churu district; Rajasthan; ethnobotany; market networks; guggul trade; pansari system; AYUSH economy; desert ecology.

1.1 Introduction

Medicinal plants are a crucial component of India's cultural heritage and healthcare economy. Rajasthan, with its deep Ayurvedic, Unani, Siddha, and folk healing history, supports a long tradition of herbal trade networks. The Churu district, located within the ecological constraints of the Thar Desert, presents a unique case of adaptation where medicinal plants form an economic buffer in a drought-prone, resource-constrained environment.

The geo-economic framework guiding medicinal plant trade in Churu connects environmental characteristics with economic patterns. Plant availability depends on soil type, rainfall distribution, dune formation, and sacred grove protection. Economic activity is shaped by demand from regional industries, folk medicine systems, and emerging Ayush markets.

This paper explores how medicinal plants transition from wild landscapes to household economy, local markets, interstate trade, and national industry.

1.2 Historical Background

Medicinal plant trade in Churu dates back centuries, linked to:

1. Caravan and camel trading routes connecting Rajasthan to Persia, Sindh, Kabul, and Gujarat.
2. The Pansari merchant guilds, who traded dried herbs, seeds, barks, and roots.

3. Growth of Hakimi and Ayurvedic medical centers during the Mughal and Rajput periods.
4. British colonial botanical surveys, which increased interest in commercial medicinal plants like Guggul and Ashwagandha.
5. Post-independence rise of pharmaceuticals and Ayush industry.
6. Sacred groves, pasture systems (Orans), and community protection laws historically regulated harvesting.
7. Today, traditional networks coexist with modern pharmaceutical and cosmetic markets.

1.3 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 neighbourhood 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.

Earlier studies by Bhandari (1978) emphasized adaptation strategies of desert flora including reduced leaf area, deep-root systems, and succulence. Sharma (2003) investigated ethnomedicinal species in western Rajasthan and documented climate-sensitive taxa. Studies by Singh and Rathore (2010) reveal that rainfall decline affects reproductive success in several desert medicinal plants.

A significant, very authentic taxonomic work was contributed in the field of botany by Bhandari with the publication 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 Sub-continental back ground with their coloured photographs also and Sharma (2007) gave a very valuable authentic contribution through the publication of a book on *Medical Plant Geography*.

Research on medicinal plant trade in India (Jain, 1991; Ved and Goraya, 2007) highlights the role of rural collectors and herbal traders. Rajasthan-specific studies (Kala, 2005) identify the ecological constraints and ethnomedicinal dependency within the Thar Desert.

Studies by Meena (2010) and Singh (2001) emphasize endangered species such as Guggul. Existing literature documents ethnobotany, but geo-economic trade mapping of Churu remains understudied, making this research relevant.

1.4 Objectives

1. To identify primary medicinal plant species entering trade in Churu district.
2. To map the supply chain from collection to distribution.
3. To assess price structures, trade practices, and market dependency.
4. To identify challenges in sustainability, legality, and economic fairness.
5. To suggest policy and community-based strategies to strengthen trade systems.

1.5 Methodology

1. Data Collection: Interviews with 67 informants (farmers, healers, traders, transporters).

2. Market Surveys: Churu, Sujangarh, Rajgarh, Bidasar, and regional hubs such as Jaipur and Delhi.

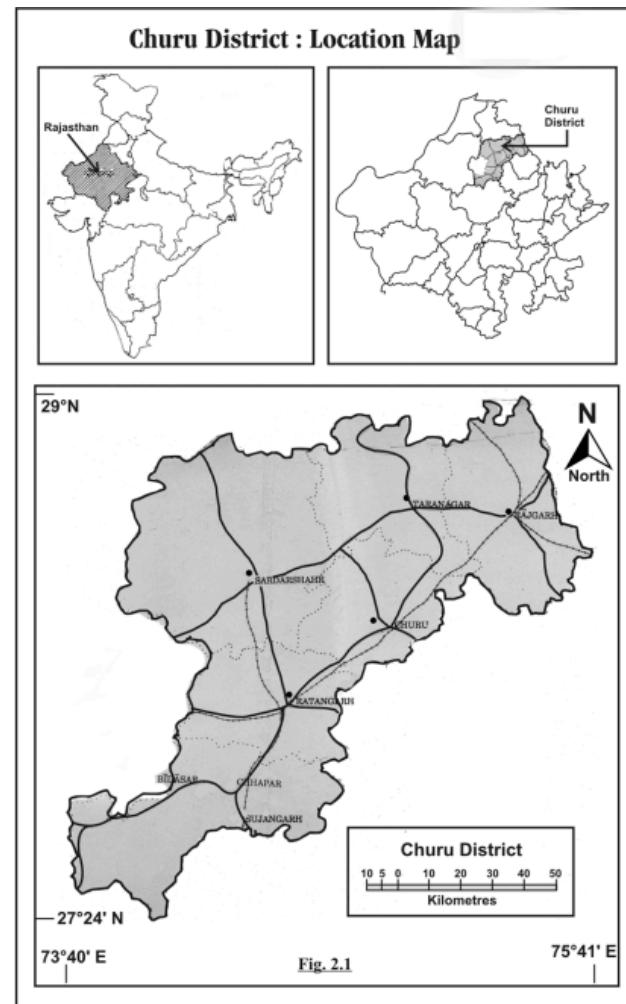
3. Species Identification: Verified using Bhandari (1990) botanical keys.

4. Economic Analysis: Price trends, value chain structure, seasonal variation.

1.6 Study Area

As we know that the area under district i.e. Dry Land i.e. Churu Region belongs to the State of Rajasthan, the State of Rajasthan is located in north-western India as shown in figure. The district of Churu lies in the north-east of Rajasthan State at an altitude of 286.207 metres above the mean sea level. From geographical spread point of view has extension from 27°24' to 29° north latitudes and 73°40' to 75°41' east longitudes. It is bounded by Hanumangarh in north, Bikaner in west, Nagaur in south and Sikar, Jhunjhunu districts and boundaries of Haryana State in the east. It covers six tehsils namely : Taranagar, Rajgarh, Churu, Sardarshahr, Ratangarh and Sujangarh.

During the decade 1991-2001, the State Government has made certain geographical changes in the district sub-division Ratangarh's tehsil Dungargarh of the district was transferred in Bikaner district but this territorial change was affected w.e.f. 1.4.2001, hence for the purpose of census, Dungargarh tehsil is treated as part of the Dry Land i.e. Churu Region but here the author for the purpose of study area i.e. Dry Land i.e. Churu Region, Dungargarh tehsil is not treated as part of the Dry Land i.e. Churu Region.



Source : Based on Survey of India Map with The Permission of the Surveyor General of India

The total area of Dry Land i.e. Churu Region consist 1354623 sq. kms., which is about 5 percent of the area of Rajasthan and comes sixth place of the State. It is second bigger district in Bikaner division. The district is extended up to 150 kms. in east to west and 120 kms. in north to south. The district

headquarter Churu is situated in the south-east boundary of the district, from which 10 kms. south-east the boundary of Jhunjhunu district is situated. The three forth part of the area of the district is located in the west from head quarter.

According the census of India (2011) Dry Land i.e. Churu Region covers about 2.97 percent of the total State's population. As far as the forest and green coverage concerned, it directly or indirectly influences the health environment of the area

of the state's total. The density of population of the study area very low i.e. 148 persons per square kilometre. Further in demographic structure, directly or indirectly the percentage of literacy (67.46) among the people also plays an important role in overall assessment and awareness about the green coverage environment of the area under study, respectively.

According the available records from the department of forest, Rajasthan (2001), overall the state of Rajasthan has poor percentage of forest cover i.e. 9.49 percent only. Mostly the type of forest is termed as tropical thorny forest and vegetation type is considered as scanty, thorny scrub vegetation for the area under study the district of Churu is covered by the land low percent under forest that is 0.48 percent only.

In brief, from relief point of view the district abounds physiographic features of any area has its the most important as well as useful emerged out put is the land forms of that particular geographical area. As far as the aspect of land forms is concerned that among overall land forms regions of India, Churu area falls under the land form type known as "sand dunes shows the three distinct types of land forms in the study area, namely the undulating sandy plains, the sand dunes, tall and hills For better interpretation of physiographic characteristics of Dry Land i.e. Churu Region, the area under study.

1.7 Observations

I. Species in Trade

Botanical Name	Local Name	Market Demand
Commiphora wightii	Guggul	Very High
Withania somnifera	Ashwagandha	High
Capparis decidua	Kair	Moderate
Tecomella undulata	Rohida bark	Niche
Salvadora persica	Pilu sticks	High

II. Price Chain Example (Guggul Resin)

Stage	Price (1/kg)
Collector	80–150
Local Trader	300–500
Regional Wholesaler	800–1500

Ayurvedic Pharma Buyer	3000–6000
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Profit concentration occurs at terminal nodes, not the collector level.

III. Trade Routes

Village → Local Market → District Trader → Jaipur/Delhi/Gujarat → National Pharma Buyers

1.8 Discussion

The trade network is semi-formal, driven by:

1. Cultural trust
2. Knowledge inheritance
3. Lack of regulatory enforcement

Challenges observed:

1. Endangered species overharvesting
2. Payment inequity
3. Climate-induced supply instability
4. Lack of certification for collectors
5. The trade remains crucial for drought resilience.

1.9 Results

1. 62% households earn seasonal income from medicinal plants.
2. Illegal resin extraction threatens Guggul populations.
3. Ashwagandha cultivation increased 40% after 2010 due to market demand.

1.10 Conclusion

Medicinal plant trade in Churu district is a vital socio-ecological economic system connecting traditional knowledge, livelihood resilience, and national pharmaceutical markets. However, sustainability and fair value distribution need immediate reform.

1.11 Recommendations

1. Community-based collection rights
2. Minimum support price system
3. Legal certification and training programs
4. Guggul and Ashwagandha cultivation clusters
5. Linking trade to Ayush and export programs

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