JSDC
Journal of Studies in Dynamics and Change (JSDC);
Vol-13, Issue-2, ISSN: 2348-7038
International Peer Reviewed Quarterly Journal
www.jsdconline.com

Ethno-Ecology, Eco-System and Environmental Wisdom: Looking from Janjati Perspective

Sandeep Kumar Sahu[1]

Nilakantha Panigrahi[2]

ABSTRACT

Human society from the ancient times maintains a symbiotic relationship with forest and forest-based resources which influence their life, living and source of livelihood from birth to death. The forest resources in the form of plants, animals, birds, fruits are adopted in various cultural practices in the form of totems, beliefs and customs which are considered as the environmental wisdom in which human society is an integral part of both physical and meta physical entities. Most of the concepts of environmental wisdom used as a part of environmental explanations in this field have western origin and looking from etic perspectives. The humor theory of Hippocrates considered as the important foundation for environmental determinism has its origin in the theory of 'Panchatatva' of Indian Philosophy includes Prithvi (Earth), Jal (Water), Agni/ Tej (Fire), Vayu (Air) and Akash (Space/ Ether), which are the fundamental building blocks which influences our physical and mental wellbeing. The geographic differences in the physical form and their effects on personality resulted in variations in their world by life and living. However, over the period scientific methods based on simple, linear, cause-effect relationships ignored or neglected the complex interactions and feedback processes that make environmental wisdom. However, only recently a new approach is focused to look at environmental resources and ecological relationships from participants' point of view which is called as ethno-science, ethnographic semantics indigenous traditional knowledge systems broadly known as Environmental Wisdoms build over centuries through various coping processes which need to be understood from emic perspective. Keeping this in mind, attempt is made through empirical studies and understanding among few Janjati communities of Chhattisgarh with respect to their emic understanding of the Ethno-ecology, Eco-system, and environmental wisdom long been practiced and handed over from generation to generation as a part of the processes of cultural continuity and change.

Keywords: Ethno-Ecology, Eco-system, Environmental wisdom, Janjati communities, Forest resources, Emic-Etic perspectives

Author Details:

1. Sandeep Kumar Sahu (Corresponding Author) is Doctoral Research Fellow, Department of Anthropology and Tribal Development, Guru Ghasidas Vishwavidyalaya, Bilaspur, Email: sandeepsahu0698@gmail.com
2. Nilakantha Panigrahi is Professor and HoD, Department of Anthropology and Tribal Development, Guru Ghasidas Vishwavidyalaya, Bilaspur, Email: nilakantha.panigrahi@gmail.com

Suggested Citation:
Sahu, S. K. & Panigrahi, N. (2026). Ethno-Ecology, Eco-System and Environmental Wisdom: Looking from Janjati Perspective, *Journal of Studies in Dynamics and Change (JSDC), 13*(2), 25-40.
DOI: www. https://doi.org/10.5281/zenodo.22133352
Published on: 01 April 2026

I. INTRODUCTION

Human society has historically maintained a symbiotic association with forests, rivers, mountains and biodiversity. However, among Janjati groups, this association assumes a deeper ontological significance. Forests are not merely economic assets, but living landscapes inhabited by ancestral spirits, deities and sacred forces. Scholars have observed that traditional ecological knowledge is cumulative, adaptive and transmitted across generations through oral traditions and ritual practices (Gadgil, Berkes, & Folke, 1993). This accumulated experiential understanding forms what may be termed as Environmental Wisdom system of ecological consciousness rooted in lived interaction with nature.

The interrelationship between human societies and the natural environment has long been central to anthropological and ecological inquiry. Among traditional and Janjati communities of Chhattisgarh, this relationship is characterized not by domination but by coexistence, reciprocity and moral responsibility. The study of Ethno-Ecology, Eco-System and Environmental Wisdom: Looking from a Janjati Perspective seeks to examine how tribal knowledge systems conceptualize ecological relationships, regulate resource use and embedded in environmental ethics within cultural institutions. By incorporating case illustrations from the Kamar and Baiga PVTG of Chhattisgarh, this study situates traditional ecological knowledge within broader debates on sustainability, emic–etic distinctions and ecosystem theory (Harris, 1976; Berkes, 2012).

The Baiga tribe, classified as a Particularly Vulnerable Tribal Group (thus known as PVTG) in Central India, traditionally inhabits in the forested regions of Madhya Pradesh and Chhattisgarh. The Baiga worldview conceptualizes the Earth as sacred, often referring to it as “Dharti Mata” (Mother Earth). Historically known for their shifting cultivation practices (Bewar), the Baiga maintained rotational agricultural systems that allowed forest regeneration. Their healing traditions, rooted in extensive knowledge of medicinal plants, demonstrate sophisticated ethno-botanical understandings. Plants are classified not merely by physical characteristics, but by spiritual potency, seasonal availability and ritual appropriateness. Such practices illustrate how ecological knowledge is embedded within cosmology, health systems and community norms (Elwin, 1939).

Similarly, the Kamar community recognized as one of the Particularly Vulnerable Tribal Groups (PVTGs) of Chhattisgarh exhibits a deeply integrated ecological worldview rooted in customary traditions and forest-based subsistence. The Kamar maintains clan-based belief systems in which specific plants, animals and natural elements are regarded as sacred ancestral symbols. These customary norms act as informal conservation mechanisms, as clan members traditionally avoid harming or exploiting species associated with their lineage. Sacred spaces, ritual sites and forest patches further reflect Kamar environmental ethics, where ecological protection is guided by spiritual beliefs, taboos and community consensus rather than legal frameworks. Thus, environmental stewardship among both Kamar and Baiga communities operates through culturally embedded institutions, sustaining ecological balance through traditional knowledge systems instead of external enforcement mechanisms (Dube, 1951; Gadgil & Vartak, 1976).

II. REVIEW OF LITERATURE

Theoretical Perspective

The academic field of Ethno-Ecology provides a framework for understanding these traditional knowledge systems. Ethno-ecology studies how communities perceive, categorize and interact with ecological environments from an insider's perspective. It emphasizes the emic viewpoint—understanding ecological relationships through indigenous categories of meaning (Harris, 1976). In contrast, mainstream ecological science historically adopted an etic perspective, applying universal analytical frameworks to interpret environmental phenomena. While etic approaches have contributed significantly to scientific ecology, they often overlook symbolic, spiritual, and moral dimensions of human–nature interaction.

The modern ecological concept of the ecosystem, as articulated by Odum (1971) defines it as the interaction between biotic (living organisms) and abiotic (physical environment) components functioning as a system. This model advanced ecological science by highlighting energy flow, nutrient cycles and trophic interactions. However, early ecosystem models were largely reductionist, focusing on linear cause–effect relationships and measurable variables. Complex socio-cultural feedback mechanisms were often excluded from ecological analysis. In contrast, indigenous communities such as the Kamar and Baiga conceptualize ecosystems holistically, integrating material, spiritual and social dimensions within environmental understanding.

Indian philosophical traditions offer further contextual grounding through the doctrine of 'Panchatatva' Prithvi (Earth), Jal (Water), Agni (Fire), Vayu (Air) and Akash (Space/Ether). This elemental framework posits that all life forms and cosmic processes arise from the interplay of these five elements (Hippocrates, 400 BCE/1956). The emphasis on balance and harmony among elements parallels ecological principles of equilibrium and interdependence. Tribal cosmologies often resonate with this elemental philosophy, viewing environmental imbalance as both ecological and moral disruption. Thus, environmental degradation is not only a material crisis but a violation of sacred relationships (Radhakrishnan, 1953).

Environmental Wisdom, therefore, emerges as an integrative construct encompassing ecological knowledge, ethical norms and adaptive strategies. It is developed through centuries of interaction with local landscapes, climatic variability and resource constraints. For the Baiga, seasonal knowledge determines the collection of medicinal herbs and non-timber forest produce, ensuring sustainable harvesting. Among the Kamar, ritual calendars regulate hunting and agricultural cycles, aligning economic activities with ecological rhythms. These practices illustrate adaptive management long before the formalization of sustainability discourse in modern environmental policy (Berkes, 2012).

The emic–etic distinction becomes particularly significant in interpreting such practices. From an etic standpoint, shifting cultivation or ritual restrictions may appear economically inefficient or superstitious. However, an emic perspective reveals their ecological rationality and conservation outcomes. Harris (1976) argues that integrating emic and etic approaches enables a more comprehensive anthropological understanding. In environmental studies, this integration is essential to avoid epistemological marginalization of indigenous knowledge systems.

Recent scholarship on Traditional Ecological Knowledge (thus known as TEK) thus known as emphasizes its relevance to contemporary environmental governance. TEK encompasses long-term empirical observation, adaptive experimentation and community-based resource management (Berkes, 2012). For communities like the Kamar and Baiga, environmental knowledge is neither static, nor isolated from change; rather, it evolves through interaction with socio-economic transformations and policy interventions. Yet, despite modernization pressures, core ecological values respect for sacred landscapes, totemic prohibitions and ritual conservation continue to shape environmental behaviour.

From a Janjati (Tribal) perspective, the environment is not external to society but constitutive of their identity and existence. Forests shape not only livelihoods, but cosmology, kinship structures and moral obligations of the Janjati community. The integration of ethno-ecology with ecosystem theory allows for a more holistic understanding of socio-ecological systems. Recognizing Environmental Wisdom as a legitimate knowledge system challenges dominant paradigms that privilege only scientific.

Looking Environmental Wisdom from Global Perspective

The intellectual foundations of ethno-ecology and environmental wisdom may be traced to classical antiquity, where (Hippocrates, 400 BCE/1956) in Airs, Waters, and Places argued that climate and geography shape human health and temperament, laying the groundwork for environmental determinism. This climate theory influenced later geographical thought and resonates with elemental explanations in Indian philosophy such as the 'Panchatatva' articulated in the Upanishadic tradition (Radhakrishnan, 1953). Classical philosophers like (Plato, 380 BCE/2004 and Aristotle, 350 BCE/1984) examined the interrelationship between nature, polity and ethics, proposing that environmental conditions influence social organization and moral order. In the nineteenth century, Darwin (1859) revolutionized ecological and anthropological reasoning through the theory of natural selection, emphasizing adaptation and variation, which later shaped social evolutionism and ecological anthropology. Ratzel (1896) formalized environmental determinism in anthropogeography, whereas, Blache (1926) countered with possibilism, asserting that environment offers opportunities rather than rigid constraints.

The Three Age System proposed by Thomsen (1836) introduced a technological–ecological sequence (Stone, Bronze, Iron Ages) that linked material culture with environmental adaptation. In American anthropology, Boas (1896) critiqued determinism and advanced historical particularism, arguing that each culture must be understood in its own environmental and historical context; his student Kroeber (1939) developed the concept of the superorganic, emphasizing culture as an emergent system interacting with environment. White (1949) reintroduced evolutionary perspectives by correlating cultural development with energy harnessing, thereby bridging ecology and cultural evolution. Steward (1955) institutionalized cultural ecology, analysing how core cultural features are shaped by environmental adaptation, while Rappaport (1968) demonstrated ecological feedback mechanisms through ritual regulation among the Stemberg, illustrating systems ecology in practice. Odum (1971) defined ecosystems in terms of energy

flow and trophic dynamics, providing a scientific basis for systems ecology and Bateson (1972) conceptualized ecology of mind, integrating cybernetics and environmental epistemology.

Geertz (1973) shifted focus toward symbolic and interpretive dimensions of ecological practices, highlighting meaning-making in environmental adaptation. Worster (1977) advanced environmental history, linking ecological ideas with socio-economic transformations and Netting (1981) documented sustainable smallholder farming systems, demonstrating long-term adaptation. Ostrom (1990) empirically validated community governance of common-pool resources, challenging the tragedy of the commons thesis and supporting indigenous management systems. Berkes (1999 & 2012) articulated Traditional Ecological Knowledge (TEK) as cumulative, adaptive knowledge embedded in belief systems, reinforcing the concept of environmental wisdom. Ingold (2000) proposed the dwelling perspective, asserting that humans inhabit rather than exploit landscapes, while Escobar (2008) critiqued development discourse and emphasized place-based ecological knowledge. Recent syntheses such as IPBES (2019) global assessment reports have recognized indigenous and local knowledge as central to biodiversity governance, and contemporary resilience theory scholars like Folke et al., (2010) integrated social–ecological systems thinking, validating feedback-based environmental wisdom up to 2025 sustainability frameworks.

Looking Environmental Wisdom from Indian Perspective

In Indian intellectual tradition, ecological thought is deeply embedded in "Vedic Cosmology" and the "Panchatatva doctrine" as interpreted by Radhakrishnan (1953) and Dasgupta (1975), emphasizing harmony among earth, water, fire, air and space. Ancient treatises such as Kautilya's Arthashastra (c. 300 BCE/2013) prescribed forest conservation norms, demonstrating early environmental governance. In colonial and postcolonial scholarship, Elwin (1939) documented intimate forest relations among central Indian tribes, foregrounding indigenous ecological ethics. Dube (1958) analysed Indian village structure in ecological context, while Vidyarthi (1963) conceptualized the sacred complex linking ritual landscapes with ecological spaces. Gadgil and Guha (1992) reconstructed India's environmental history, highlighting community conservation traditions; Gadgil, Berkes and Folke (1993) further argued for integrating indigenous knowledge in biodiversity conservation.

Guha (1989) examined colonial forestry disruption of tribal ecological relationships, Agarwal and Narain (1985) emphasized traditional water harvesting as sustainable practice. Shiva (1988) linked ecological sustainability with indigenous knowledge and ecofeminism. Sengupta (2003) explored common property resource management, reinforcing participatory ecological governance. Sivaramakrishnan (1999) critically examined state forestry and local resistance, while Baviskar (1995) analysed tribal environmental movements in central India. Nandini (1997) investigated forest policy and identity, foregrounding emic perspectives. More recent Indian ecological scholarship such as Gadgil's People's Biodiversity Registers Gadgil (2000) institutionalized documentation of local ecological knowledge and contemporary works on socio-ecological resilience in India Singh et al. (2021) integrate indigenous knowledge within climate adaptation discourse. By 2025, interdisciplinary research in ethno-ecology increasingly bridges Western systems ecology and Indian cosmological frameworks, emphasizing emic approaches,

ethnoscience, and environmental wisdom as dynamic, adaptive systems shaped by cultural continuity and change across generations, particularly among Janjati communities of central India.

III. OBJECTIVES

- To conceptualize Ethno-Ecology from Janjati Perspective more particularly among the Kamar and Baiga PVTGs of Chhattisgarh.
- To analyse the Eco-System as a form of relationships of the Kamar and Baiga PVTGs with forest resources available and around their habitations.
- To examine Environmental Wisdom embedded in Cultural practices of the Kamar and Baiga PVTGs.
- To explore implications of Environmental Wisdom for Sustainable Development of the Janjati s of India maintaining symbiotic relations with natural resources.

IV. METHODOLOGY

Study Universe

Chhatisgarh – The Study State

Chhattisgarh, which occupies 135191 square kilometres of land area is the ninth largest state in India, with 2.55 million people living there (Census of India, 2011). According to the Indian Forest report, forests cover 41.34% of the total land area. The abundant forest resources include timber, honey, Tendu leaves, and lack. In Chhattisgarh, the average literacy rate is 84.05% where male literacy was 90.58% and female literacy was 73.39%. The primary crop in Chhattisgarh is rice grown on almost 77% of the net sown land. The sex ratio in the state is one of the most balanced in India with 991 females per 1,000 males, as is the child sex ratio with 964 females per 1,000 males (Census of India, 2011). The state is inhabited by 30.67% ST communities of which Five groups are declared as Particularly Vulnerable Tribal Groups (thus known as PVTGs) while two groups also declared as state sponsored PVTGs.

Gariyaband – The study District

Gariyaband occupies 5822.861square kilometres of geographical area. Around 5.97 lakhs people living in the district (Census of India, 2011). According to the Indian Forest report, forests cover 2,935.801 km2 of the land area. The abundant forest resources include timber, honey, Tendu leaves, and lac. In Gariyaband the average literacy rate was 85.49%, where male literacy was 92.37% and female literacy was 78.71%. The primary crop in Gariyaband is rice grown on almost 72.9% of the net sown land. The sex ratio in the district is 1010 females per 1,000 males, as is the child sex ratio with 970 females per 1,000 males (Census of India, 2011).

Mainpur – The Study Block

Mainpur Block is a predominantly tribal region in the forested belt of Gariaband district where Scheduled Tribes constitute about 36–40% of the population. Major communities include Kamar, Baiga, Bhunjia and Gond, while the Kamar PVTG

population is estimated at around 14,285 individuals in about 3,350 households within the tribal development agency area. The sex ratio is about 1093 females per 1000 males, indicating relatively balanced gender relations and active participation of women in livelihood activities. The literacy rate is about 72.62% (Male 87.64%, Female 58.67%), though education among PVTGs remains lower due to remoteness and limited facilities. Livelihoods are largely forest-based, with 35–40% households in small agriculture, 20–25% agricultural labour, 30–35% Minor Forest Product collection and 10–15% following wage work. Dense forests supplies products such as tendu, mahua, sal seeds, honey, bamboo and medicinal plants, and 60–70% households depend on forest resources for subsistence and supplementary income (Census of India, 2011).

Research Design

The present study was conducted in Mainpur Block of Gariyaband district, Chhattisgarh, focusing on the Kamar and Baiga PVTGs, who maintain a close ethno-ecological relationship with forest ecosystems and depend significantly on Minor Forest Produces (thus known as MFPs) for their livelihood. In alignment with the because of the study "Ethno-Ecology, Eco-System and Environmental Wisdom: Looking from Janjati Perspective," the study adopted an Explanatory Research Design to examine the interrelationship between Kamar and Baiga communities with forest ecosystems, analysing traditional ecological knowledge, environmental wisdom, resource governance, Minor Forest Produce related policies, procurement systems, consumption patterns, selling practices, value addition processes and the impact of globalization on the socio-economic and ecological life of Kamar and Baiga households.

A mixed-method approach was employed, integrating qualitative and quantitative methods to generate a holistic understanding of traditional ecological practices and ecosystem interactions. Quantitative data were used to analyse patterns of resource extraction, income generation and marketing systems, while qualitative methods provided deeper insights into customary conservation norms, sacred beliefs, sustainable harvesting practices and traditional environmental knowledge systems. The study purposively selected one Baiga dominated and one Kamar dominated village representing district. All the 51 Kamar households and 47 Baiga households living in study villages and actively engaged in forest-based livelihood activities were adopted for in-depth study and to understand their ethno-ecological relationships. Primary data were collected through in-depth interviews, non-participant observation and Focus Group Discussions (FGDs), using a pre-tested interview schedule to ensure reliability, validity and contextual accuracy in documenting Janjati environmental wisdom and ecosystem interactions. The primary data collection was made 10 days in each village. The quantitative data were entered in excel sheets and simple statics were used in the form of absolute numbers, percentages and averages, while the qualitative data were analysed in descriptive form.

V. ANALYSIS AND FINDINGS

The Kamar PVTG

The Kamar tribe is one of the scheduled tribes and also considered as the PVTG of Chhattisgarh. Kamar tribe is basically living in Gariyaband, Dhamtari,

Mahasamund, and Kanker, districts of Chhattisgarh (Russel, 1916). Mostly, they are living in Gariyaband, Manipur, Chura, Nagar and Magarload blocks of Gariaband district. Kamar are also living in few areas of Maharashtra, Odisha, and West Bengal. As per the Census of India report (2011) there are around 26530 Kamar population of which male counts 13070 and that of female counts 13460. Female population is more to the tune of 1030 per 1000 males. Kamar have around 38.79 percent of literacy rate in which male literacy tunes to 47.70 percent and female literacy is 30.15 percent. Debdangar is the principal deity of the Kamar which is located at Baman Dongari.

Kamar people speak Kamari boli or a dialect in which we find the impact of Odiya language and Chhattisgarh dialect. Kamari speakers gradually decrease day-by-day. The agriculture activities long been practiced by the Kamar popularly known as Bedara cultivation or Dahia cultivation. In addition, the Kamar people are very good in bamboo basket makers hereditary (Grigson, 1944). In Kamar villages Kamar people live along with Gondi, Binjhwar, Bhunjiya, Kamar tribal communities. Kamar are the Dravidian tribe have, different gotras like Kashyap and Bharadwaj. The Kamar also found in Chota Nagpur region and Andhra Pradesh. The Kamar of the central provinces are the purely aboriginal tribe and they are the offshoot of Gond tribe. Kamar mainly have two divisions Bundharaj and Mankidia. The Kamar has three territorial divisions like Pahar Patiya, Bundharajia and Katehar Patia. They are again divided into little totemic clans like Netam and Sori. Kamar strongly follows the practices of pollution and purity during monthly period of women, birth and death periods. The dead is normally buried (Dube and Debe: 1948). Sons inherit the property equally and daughters are deprived of rights over parental properties. Kamar cultivate Dahiya i.e. shifting cultivation or slash and burn cultivation. Kamar are non-vegetarian and eat pork. They worship Dulha Deo, Devi Maa and believe on magical practices (Dube, 1947). They celebrate Hareli and Dassehra where they worship their Kul deity Kamar follows temporary exclusion to out caste somebody from their village life and living if any Kamar commit any serious offence. Before marriage the Kamar women tattoo their body.

The Baiga PVTG

Baiga is a Dravidian tribe. It is one of the 42 tribal groups of Chhattisgarh and it is one of the five PVTGs of the State. As per the Census report 2011, the total population of the Baiga in the State is 89744, of which male counts 44847 and female counts 44897. The female population share 1001 to 1000 male population (Govt of India, 2011). The total literacy rate of the Baiga tunes to 32.17 percent. The male Baiga literacy is 40.01 percent while the female literacy tunes to 24.34 percent. The Baiga mostly live in the State of Madhya Pradesh and Chhattisgarh and very thinly distributed in few other States of West Bengal, Uttar Pradesh, Jharkhand, Maharashtra and Odisha. The Baiga in Chhattisgarh inhabit in the district of Bilaspur, Koria, Kabirdham and Rajnandgaon.

Baiga are the Mundari or Kolarian tribe living in central highland of India. Elwin (2007) classified them as the branch of the Bhuiyan tribe. Russel and Hiralal (1916) classified Baiga as the part of Bhumia. Baiga speak Baigani and Chhattisgarhi dialect of Hindi. Elwin (1939) viewed that Baiga have adopted Chhattisgarhi a modified dialect of Hindi and Gondi. Colonel Bloomfield (1885), Russel and Hiralal

(1916), Elwin (1932 and 1937,1939), Reddy and Modell (1997) Tiwari (1997), Sharma (2014) Soni (2015), Baghel and Patil (2022), studied various aspects of the life and living of the Baiga. The Baiga are divided into 3 clan groups. They are viz: Amthuria, Kathodia and Kulharia. With respect to their social organisations in relation to birth, marriage and death and family life rituals Baiga follow the age-old practices. This is also observed in their dress pattern, ornaments, and occupations largely. They are born hunters and exceedingly bold, courageous. The Baiga follow their principal deity Bhura Deo who lives in Saja tree (Terminialia tomentosa), Sal tree (Shorea robusta) and worshipped in the month of Jeth (May) offered with animal sacrifice and fresh Mahua liquor. Baiga believe different Gods and Goddesses in the form of water, soil, rainfall etc. The traditional leaders of the village still play important role in day-to-day administrative, religious and social life management (Soni, 2015).

Forest based Livelihoods and Traditional Knowledge System

Forest resources are the life line of the PVTGs without which it is difficult to conceive their life and living. They maintain a symbolic relationship with forest eco-systems for its maintenance, economic support, food and habitat. Forest for these people meant a natural eco-system which produces useful plants and fungi for them. The Kamar and Baiga PVTGs consider Forest produces or Non-Timber Forest Produces (thus known as NTFPs) as biological materials which besides other than timber are procured from the forest for their use in day-to-day life. The Government of Chhattisgarh has well recognized the potential of NTFPs for these PVTG people who are yet to harness because of inaccessibility, poor infrastructure, lack of documentation and under developed market facilities (2021). The report highlights the fact that the Kamar and Baiga PVTG do not have alternative to forest resources which can feed them in different seasons, they also meet their ritual requirements and knowledge systems (ibid). The major nationalized products are Tendu leaf, Sal seeds, Harra, Gum while the non-nationalized products are plentiful in nature, which they sell to the Chhattisgarh Minor Forest Produce Cooperative Federations Ltd. on pre- determined rates decided by the Federations.

The study documented that around 33 varieties of NTFPs are collected by the Kamar and Baiga PVTG household in different seasons of differential availability, use value and sale capacity. PVTG women and children play a major role in the procurement of NTFPs, while medicinal plants are collected by medicine men and senior men based in the village. The procurement, sale and use of NTFPs are determined by multiple factors for them as they believe. A few of these items have use value, ritual value income value price and sale potentiality during the season.

Forest Produces Procured by Kamar and Baiga Households

The Kamar and Baiga PVTGs of Mainpur Block of Gariyaband of Chhattisgarh procure a diverse range of Minor Forest Produce (MFPs), reflecting their rich ethno-botanical knowledge and ecological dependence on forest ecosystems. The collected species include leaves, roots, seeds/fruits, flowers and forest-based liquids, each possessing nutritional, medicinal and economic significance. The procurement pattern of these forest produces demonstrates a highly developed ethno-ecological knowledge system among the Kamar and Baiga PVTGs. Their classification of forest resources into functional categories (leaf, root, seed, flower, liquid) reflects a utilitarian yet conservation-oriented interaction with the ecosystem. The diversity of

species collected indicates multi-dimensional dependency covering subsistence consumption, traditional medicine, ritual practices and market-oriented income generation. This bio-resource utilization pattern highlights indigenous environmental wisdom and sustainable harvesting practices embedded within Janjati socio-cultural frameworks (Table-1).

Table-1: Distribution of Forest Produces Collected by Kamar and Baiga Households

Category of Use	No. of Species	Percentage (%)	Major Examples	Nature of Dependency
Food/Subsistence	11	33%	Mahua flower, Tikhur, Ber, Imli, Kevlal Bhaji, Barre Bhaji, Honey	Seasonal consumption, nutritional security
Medicinal	10	30%	Giloy, Ashwagandha, Shatawar, Harra, Bahera, Amla, Neem, Charota	Traditional healing, ethnomedicine, Disposal in the market
Commercial/Income Generation	9	27%	Tendu Patta, Chironji, Sal Seed, Mahua Seed, Lac, Kullu Gond	Market sale, livelihood support
Ritual/Fermentation/ Ecological Use	3	10%	Palash flower, Dhawai flower, Salfi, Tadi	Cultural practices, fermentation

Source: Primary Survey, 2025

The table above distribution indicates that the highest collection of 33% is on forest produces for subsistence and food security, highlighting the centrality of forest ecosystems in sustaining household nutrition. Medicinal use of Minor Forest Produces (thus known as MFPs) to the tunes 30% reflects the strong ethno-medical knowledge and their embedded within Kamar and Baiga traditional ecological systems. Commercial dependency to the tunes 27% demonstrates the potentiality of integration of indigenous forest economies into local and regional market structures. A smaller yet culturally significant proportion of MFPs to the extent of 10% is linked to ritual, fermentation and ecological practices, indicating the symbolic and cosmological dimensions of forest interaction of the Kamar and the Baiga. This distribution clearly reflects a multi-dimensional and ethno-ecological relationship, where forest resources are not merely economic commodities, but integral components of Janjati environmental wisdom, health systems, cultural identity and livelihood sustainability.

Average Collection, Consumption, Sale and Income from Forest Produces among Kamar and Baiga PVTG

The average collection, consumption, sale and income pattern of forest produces among Kamar and Baiga PVTGs clearly demonstrates the centrality of Minor Forest Produces (thus known as MFPs) in sustaining their livelihood system. The dominance of Tendu Patta in collection and sale indicates a market-oriented forest economy that significantly contributes to household income. Although subsistence consumption remains limited, selected food items and medicinal forest products continue to support their nutritional and health security. The income structure from the MFPs reflects both economic dependence and vulnerability due to reliance on a single dominant commodity by the PVTG (Table-2).

Table-2: Average Quantity and Income Structure of Forest Produces by the PVTG Households

Indicator	Quantity (Kg)/Amount (Rs.)	Percentage (%)	Dominant Forest Produce
Total Collection	1247.34 Kg	90.32% (Tendu)	Tendu Patta – 1126.70 Kg
Household		30.66% (Tendu)	Tendu Patta – 10.40 Kg, Ber – 2.64 Kg, Mahua – 2.13 Kg
Consumption	33.91 Kg		
Marketed Quantity	1213.43 Kg	91.97% (Tendu)	Tendu Patta – 1116.30 Kg
Selling Price Range	Rs. 5.50/Kg – Rs. 225/Kg	—	Honey – Rs. 225/Kg, Lakh – Rs. 149/Kg, Kullu Lasha – Rs. 141/Kg, Chiraunji – Rs. 138/Kg
Total Average Income	Rs. 13264.60	46.28% (Tendu)	Tendu Patta – Rs. 6139.65, Honey – 9.15%, Charaunta – 8.33%, Chiraunji – 8.23%, Kullu Lasha – 7.06%, Lakh – 6.21%

Source: Primary Survey, 2025

The table reveals a highly concentrated forest-based livelihood structure among Kamar and Baiga PVTGs. The average total collection tunes to 1247.34 kg is overwhelmingly dominated by Tendu Patta 90.32%, indicating a monocentric extraction pattern. Other Minor Forest Produces (MFPs) contribute marginally in quantitative terms, each accounting for less than one percent of total collection, reflecting limited diversification in forest items procurement basket.

Household consumption to the extent of 33.91 kg constitutes only a small fraction of total collection, demonstrating that forest produce is primarily market-oriented rather than subsistence-driven. Although Tendu Patta accounts for the largest share of consumption to the extent of 30.66%, food-oriented items such as Ber fruit and Mahua flower indicate selective subsistence utilization embedded within traditional dietary practices.

The marketed quantity of MFPs to the extent of 1213.43 kg closely mirrors total collection levels, with 91.97% represented by Tendu Patta, confirming strong commercial dependence on a single forest commodity. This suggests vulnerability to market fluctuations and policy changes affecting Tendu procurement systems.

Price variation analysis shows substantial disparities across products, ranging from Rs. 5.50/kg (Tendu Patta) to Rs. 225/kg (Honey). High-value Forest products such as Lakh, Kullu Lasha, and Chiraunji seed fetch premium prices, but are collected in comparatively smaller quantities, limiting their contribution to total income.

The income structure further confirms concentration, with total average earnings of Rs. 13,264.60, nearly half to the extent 46.28% are derived from Tendu Patta alone. Secondary income sources such as Honey 9.15%, Charaunta seed 8.33%, Chiraunji 8.23%, Kullu Lasha 7.06%, and Lakh 6.21% provide supplementary but not dominant support to the PVTG household.

Ethnomedicine Practices among Kamar and Baiga Communities

Ethnomedicine practices among the Kamar and Baiga communities are deeply rooted in their traditional ecological knowledge and forest-based healing systems.

These communities treat a wide range of diseases such as malaria, jaundice, tuberculosis, arthritis, snake bite and gastrointestinal disorders using locally available medicinal plants. The selection of specific plant species reflects their empirical understanding of disease symptoms and therapeutic properties. Different plant parts such as roots, bark, leaves, seeds, tubers and sometimes the whole plant are used depending on the nature of the ailment. This practice demonstrates an integrated relationship between biodiversity, indigenous knowledge and community health security within their ethno-ecological framework. The details of the distribution of list of disease, plants for ethnomedicine, their botanical names, local plant name and plant part used are given in Table-3.

Table-3: Distribution of List of Ethnomedicine MFP items used by PVTGs Households

Tribesmen	Disease	Plant Botanical Name	Local Plant Name	Plant Part Used
Baiga	Tuberculosis	Anacyclus pyrethrum	Akarkara	Root
	Jaundice	Cuscuta reflexa	Amarbel	Climber
	Fever	Croton bonplandianus	Ban tulsi	Root
	Malaria	Andrographis paniculata	Bhui neem	Whole Plant
	Pneumonia	Semecarpus anacardium	Bhelwa	Seeds
	Diabetes	Anogeissus Latifolia	Dhaora	Bark
	Piles	Wendlandia tinctoria	Tilai	Bark
	Arthritis	Datura Alba	Kala	Flower
	Constipation	Pueraria tuberosa	Patal kumhara	Tuber
	Convulsion	Smilex mecrophylla	Ramdatun	Root
	Blood pressure	Terminalia arjuna	Arjun	Bark
	Chest pain	Linum usitatissium	Alsi	Seed
	Malaria	Andrographis paniculata	Bhui neem	Whole plant
	Piles	Gloriosa superba	Kalihari	Tuber
Kamar	Snake bite	Rauwolfia serpentina	Sarpgandha	Root, stem, leave, seed
	Arthritis	Aloe vera Linn.	Ghritakumari	Leaves
	Piles	Pongamia pinnata Vent.	Karanj	Fresh bark
	Wounds	Piper betle Linn.	Pan	Leave, root
	Urinary tract infection	Tinospora cordifolia	Giloe	Stem, bark
	Malaria	Andrographis paniculata	Bhuilim	Whole plant
	Body pain	Boswellia serrata	Saliha	Stem bark
	Loose motion in children	Cissampelos pareira	Pathri	Root
	Fungal infection	Psoralea corylifolia	Bukchi	Leaf
	Gall bladder stone	Raphanus sativus	Muli	Root

Source: Primary Survey, 2025

The ethnomedicinal data indicate that the Baiga community possesses a comparatively broader and more diversified traditional healing system, addressing

at least nineteen different ailments ranging from infectious diseases like Malaria, Pneumonia and Tuberculosis to chronic conditions like Diabetes, Blood pressure, Arthritis and emergency treatments such as snake bite. The frequent use of roots, bark, and whole plants suggests deep ecological knowledge of plant pharmacology and sustainable harvesting practices adopted by the Kamar and Baiga PVTG household.

In contrast, the Kamar community demonstrates a more selective but functionally significant medicinal repertoire, primarily focused on common endemic health issues such as malaria, body pain, gastro-intestinal disorders in children, fungal infections and gall bladder stones. The plant parts used especially includes types as roots, leaves, and stem bark reflect practical and locally available therapeutic resources. The recurrence of species such as Andrographis paniculata used by both tribes for malaria indicates shared their regional ethnobotanical knowledge within the forest ecosystem.

Discussion

The study reveals that Ethno-Ecology, Eco-System and Environmental Wisdom among the Kamar and Baiga PVTGs of Mainpur Block of Gariyaband district are deeply embedded in their cultural institutions, livelihood systems and cosmological beliefs, demonstrating a holistic and emic understanding of human–nature relationships. The study establishes that forest ecosystems are not merely economic resources, but constitute the ontological foundation of Janjati identity, health, subsistence, ritual life and social organization. Both communities maintain a multidimensional dependency on Minor Forest Produces (MFPs), reflected in food security 33%, medicinal use 30%, commercial income 27% and ritual–ecological functions 10%, indicating an integrated socio-ecological system, rather than a unilinear extractive economy. The procurement pattern shows collection of more than thirty varieties of forest produces categorized into leaves, roots, seeds, flowers and liquids, highlighting sophisticated ethno-botanical classification and sustainable harvesting knowledge. Quantitative analysis reveals a highly concentrated livelihood structure, with average annual collection of 1247.34 kg per household overwhelmingly dominated by Tendu Patta 90.32% and marketed quantity to the faced 91.97% also cantered on the same product, demonstrating their strong market integration, but limited diversification. However, the PVTG household also collects varieties of NTFPs in different seasons for generation together in differential quantitates which not only supports to the livelihood basket meets their cultural needs in different festival and social occasion. In this process the community maintains the age-old symbiotic relations in various forms with forest resources which have been partially degraded over the time.

The income pattern further confirms economic concentration, as nearly 46.28% of total average annual income to the tunes of Rs. 13,264.60 is derived from Tendu Patta alone, while high-value products such as Honey, Lac, Chiraunji, Charaunta and Kullu Lasha contribute supplementary yet comparatively smaller shares, indicating vulnerability to market fluctuations and procurement policies. Despite commercialization, subsistence consumption persists through selective use of Mahua flower, Ber, Tikhur, Leafy vegetables and Medicinal plants, ensuring nutritional and seasonal food security. The ethnomedicinal findings show that the Baiga community demonstrates a broader and more diversified healing repertoire 19 diseases treated compared to the Kamar community reported who carried out 5

major ailments, reflects depth of traditional ecological knowledge, particularly in the use of roots, bark, tubers and whole plants for infectious, chronic and emergency treatments such as malaria, tuberculosis, snake bite and diabetes. Shared use of species like Andrographis paniculata indicates overlapping regional ethnobotanical knowledge within the forest ecosystem. Cultural mechanisms such as totemism, sacred groves, ritual calendars and clan-based prohibitions function as informal conservation institutions regulating ecological access and reinforcing environmental ethics without formal state enforcement. The 'Panchatatva' worldview and belief systems such as Dharti Mata among Baiga and clan deities among Kamar further illustrate that ecological balance is perceived as moral and spiritual equilibrium. The study also finds that women and children play a crucial role in MFP procurement, indicating gendered dimensions of ecological knowledge transmission. Modern forest policies, market structures and globalization processes have increased commercialization of forest produce, yet core environmental wisdom practices continue through intergenerational transmission.

VI. CONCLUSION

The study concludes that the Kamar and Baiga PVTGs possess a deeply rooted ethno-ecological knowledge system that integrates livelihood, health care, spirituality and environmental ethics into a cohesive socio-cultural framework. Their dependence on forest ecosystems is not merely economic, but civilizational, shaping identity, worldview and community organization. Through traditional ecological knowledge, sustainable harvesting practices and ethnomedicinal expertise both the communities have maintained ecological balance while ensuring subsistence and cultural continuity. The Baiga community, in particular, demonstrates a comparatively richer ethnomedicinal repertoire, while the Kamar community reflects adaptive integration with forest-based livelihood strategies.

However, several challenges persist. Increasing commercialization of Minor Forest Produces market dependency on limited products, fluctuating prices, restrictive forest regulations and declining access to forest resources pose serious threats to livelihood security. The erosion of traditional knowledge among younger generations, lack of institutional recognition of indigenous healing systems, limited value addition at the community level and inadequate healthcare and education infrastructure further intensify vulnerability. Environmental degradation and policy-level exclusion also risk weakening customary conservation institutions such as sacred groves, totemic norms and clan-based ecological regulations.

Despite these challenges, the communities have gained certain advantages, including integration into forest-based market systems, improved income opportunities through MFPs collection, partial recognition under protective tribal policies and sustained subsistence security through diversified forest use. Their indigenous environmental wisdom continues to function as a strong foundation for resilience and adaptive sustainability.

For the future, it is essential to strengthen community-based forest governance, promote diversification and local value addition of forest produces, formally recognized and documented ethnomedicinal knowledge and integrate indigenous ecological perspectives into development planning. Capacity building among youth, women-centred livelihood programs, fair market access and participatory policy

frameworks can enhance socio-economic security without disrupting cultural integrity. Sustainable development initiatives must respect and incorporate indigenous knowledge systems to ensure that modernization complements rather than displaces traditional ecological wisdom.

VII. REFERENCES

Agarwal, A., & Narain, S. (1985). *The state of India's environment*. Centre for Science and Environment.

Aristotle. (1984). *Politics* (B. Jowett, Trans.). Random House. (Original work published ca. 350 B.C.E.)

Bateson, G. (1972). *Steps to an ecology of mind*. Chandler.

Baviskar, A. (1995). *In the belly of the river*. Oxford University Press.

Berkes, F. (1999). *Sacred ecology*. Taylor & Francis.

Boas, F. (1896). The limitations of the comparative method of anthropology. *Science, 4*(103), 901–908.

Census of India. (2011). *Primary census abstract data for villages of Chhattisgarh*. Government of India.

Darwin, C. (1859). *On the origin of species*. John Murray.

Dasgupta, S. (1975). *A history of Indian philosophy* (Vol. 1). Motilal Banarsidass.

Dube, S. C. (1951). *The Kamar*. Lucknow University.

Elwin, V. (1939). *The Baiga*. John Murray.

Escobar, A. (2008). *Territories of difference: Place, movements, life, redes*. Duke University Press.

Folke, C., Carpenter, S. R., Walker, B., Scheffer, M., Chapin, T., & Rockström, J. (2010). Resilience thinking: Integrating resilience, adaptability and transformability. *Ecology and Society, 15*(4), 20.

Gadgil, M., & Guha, R. (1992). *This fissured land: An ecological history of India*. Oxford University Press.

Gadgil, M., & Vartak, V. D. (1976). Sacred groves of Western Ghats in India. *Economic Botany, 30*(2), 152–160.

Geertz, C. (1973). *The interpretation of cultures*. Basic Books.

Guha, R. (1989). *The unquiet woods: Ecological change and peasant resistance in the Himalaya*. Oxford University Press.

Harris, M. (1976). History and significance of the emic/etic distinction. *Annual Review of Anthropology, 5*, 329–350.

Hippocrates. (1956). *Airs, waters, places* (W. H. S. Jones, Trans.). Harvard University Press. (Original work published ca. 400 B.C.E.)

Ingold, T. (2000). *The perception of the environment: Essays on livelihood, dwelling and skill*. Routledge.

Kautilya. (2013). *Arthashastra* (L. N. Rangarajan, Trans.). Penguin. (Original work published ca. 300 B.C.E.)

Kroeber, A. L. (1939). *Cultural and natural areas*. University of California Press.

Netting, R. M. (1981). *Balancing on an alp: Ecological change and continuity in a Swiss mountain community*. Cambridge University Press.

Odum, E. P. (1971). *Fundamentals of ecology*. Saunders.

Ostrom, E. (1990). *Governing the commons: The evolution of institutions for collective action*. Cambridge University Press.

Plato. (2004). *The republic* (C. D. C. Reeve, Trans.). Hackett Publishing Company. (Original work published ca. 380 B.C.E.)

Radhakrishnan, S. (1953). *The principal Upanishads*. Allen & Unwin.

Rappaport, R. A. (1968). *Pigs for the ancestors: Ritual in the ecology of a New Guinea people*. Yale University Press.

Sharma, C. (2000). *A critical survey of Indian philosophy*. Motilal Banarsidass.

Shiva, V. (1988). *Staying alive: Women, ecology and development*. Kali for Women.

Steward, J. H. (1955). *Theory of culture change: The methodology of multilinear evolution*. University of Illinois Press.

Sundar, N. (1997). *Subalterns and sovereigns: An anthropological history of Bastar, 1854–1996*. Oxford University Press.

Toledo, V. M. (2002). Ethnoecology: A conceptual framework for the study of indigenous knowledge of nature. In J. R. Stepp, F. S. Wyndham, & R. K. Zarger (Eds.), *Ethnobiology and biocultural diversity* (pp. 511–522). International Society of Ethnobiology.