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Indigenous Knowledge System towards Sustainable Livelihood in Achieving Sustainable Development: An Anthropological Study in Madhya Pradesh

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Abstract: Indigenous or Traditional knowledge has been defined as the knowledge base acquired by Indigenous peoples and local people over many hundreds of years through direct contact with the environment and passed on from one generation to another. This is the basis of local-level decision-making in the economy, health, education, natural resource management, etc.

Since the 'Earth Summit', held in Rio de Janeiro, Brazil, in 1992, the idea of Sustainable Livelihoods (SL) began as an approach to maintain or enhance natural resources productivity and the capacity of individuals or communities to engage in activities that sustain their well-being while safeguarding the environment's vitality and robustness. In essence, SL brings together the thinking and practice of poverty reduction strategies, sustainable development and, participation and empowerment process into a framework for policy analysis and programming.

Indigenous knowledge systems (IKS) are the complex arrays of knowledge, know-how, practices and representations that guide human societies in their innumerable interactions with the natural milieu: agriculture and animal husbandry; hunting, fishing and gathering; struggles against disease and injury; naming and explaining natural phenomena; and strategies for coping with changing environments. IKS is inextricably mixed up with this participatory process of the agro-economic system under the decentralised governance and institutional mechanism for sustainable use and conservation of bio-resources.

The study of Indigenous knowledge systems as part of common property resources and their interactions

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with the surrounding ecology falls within the purview of Anthropology, particularly within the realms of cultural ecology or environmental anthropology. The Anthropologists understand Indigenous knowledge as participants' knowledge of their temporal and social space. In this context, the Anthropological method of holism is a particular kind of epistemology. The term Indigenous knowledge system delineates a cognitive structure in which theories and perceptions of Nature and culture are conceptualised.

The study focuses on three Particularly Vulnerable Tribal Groups (PVTG) of Madhya Pradesh, viz. Baiga, Bhariya and Sahariya,

Attempts have been made in this paper in Anthropological perspectives to discuss the role of Indigenous knowledge in attempting sustainable livelihood for achieving sustainable development in three Particularly Vulnerable Tribal Groups (PVTG) in Madhya Pradesh.

Keywords: Indigenous, Knowledge, Community, Livelihood, Management, Sustainability

1. Introduction

The term 'indigenous' signifies originality, connecting diverse communities to specific regions through ancestral territory and cultural heritage. This identity predates European influences and maintains deep historical and cultural ties with original societies. Indigenous knowledge, formed over centuries through direct interaction with the environment and passed down through generations, encompasses learning, perception, and reasoning. Rooted in local customs, it shapes community history, identity, traditions, and technology. Indigenous communities recognise the importance of biological diversity in generating ecological services and natural resources crucial for their livelihoods. Their conservation practices, based on trial and error over time, are grounded in traditional beliefs and rules of thumb. Preserving this knowledge is best achieved by supporting the community-based resource management systems of Indigenous peoples (Gadgil *et al*., 1993; Gadgil, 1995).

Indigenous or Traditional knowledge has been defined as the knowledge base acquired by Indigenous peoples and local people over many hundreds of years through direct contact with the environment and passed on from one generation to another (Berkes & Folke, 2002; Berkes *et al*., 1995; Berkes, 1988).

Conservation practices are evident in the utilisation, cultivation, and protection or restoration of these ecosystems. It is vital, however, that the value

of the knowledge–practice–and belief complex of Indigenous peoples relating to the conservation of biodiversity is fully recognised if ecosystems and biodiversity are to be managed sustainably. The conservation of biodiversity can be categorised into several types:

1. Conservation of biodiversity through diverse uses of various species.
2. Conservation of biodiversity through religio-cultural practices.
3. Conservation of biodiversity through social traditions.
4. Conservation of biodiversity for health purposes.
5. Conservation of biodiversity for non-timber forest product (NTFP) collection.

2. Interconnection among IKS, Sustainable Livelihoods, and Sustainable Development

Indigenous knowledge systems are the complex arrays of knowledge, know-how, practices and representations that guide human societies in their innumerable interactions with the natural milieu: agriculture and animal husbandry; hunting, fishing and gathering; struggles against disease and injury; naming and explaining natural phenomena; and strategies for coping with changing environments. It is through this fine-grained interplay between society and environment that Indigenous knowledge systems have developed diverse structures and content; complexity, versatility and pragmatism; and distinctive patterns of interpretation anchored in specific worldviews.

Global awareness of the crisis concerning the conservation of biodiversity is assured following the United Nations Conference on Environment and Development held in June 1992 in Rio de Janeiro, Brazil. Since then, the idea of Sustainable Livelihoods (SL) began as an approach to maintain or enhance natural resources productivity, secure ownership of and access to assets and income-earning activities, as well as to ensure adequate stocks and flows of food and cash to meet basic needs. Sustainable Livelihoods denote the capacity of individuals or communities to engage in activities that sustain their well-being while safeguarding the environment's vitality and robustness. In essence, SL brings together the thinking and practice of poverty reduction strategies, sustainable development and, participation and empowerment process into a framework for policy analysis and programming. SL approach aims to promote a holistic vision of development that includes income generation, natural resource management, people's empowerment, use of appropriate technology, financial services and good governance (Kaushal & Kala, 2004).

In this context, the sustainable livelihoods approach comprises food security, sustainable employment generation, increasing crop productivity, soil and water conservation, value addition and marketing of NTFPs, *in situ* conservation and *ex-situ* cultivation of medicinal plants, infrastructure development, asset building and capital accumulation, etc.

These embody indigenous and community-conserved species. The conservation of plants, especially endangered ones, heavily relies on preserving the ecosystems in which they thrive:

(a) Preserving Traditional Knowledge: The significance of acknowledging and preserving IKS is highlighted in studies, given its pivotal role in fostering sustainable livelihoods. Indigenous practices, finely attuned to local environments, offer enduring and sustainable solutions.

(b) Enhancing Resilience: IKS serves as a repository of adaptive strategies, fortifying community resilience amidst environmental changes. This becomes particularly poignant in the face of climate change's impacts on traditional ways of life.

(c) Bridging Traditional and Modern Knowledge: There's a burgeoning acknowledgement regarding the integration of IKS with contemporary practices and policies to attain sustainable development objectives. Collaborative endeavours between Indigenous communities and external stakeholders emerge as indispensable in this pursuit.

3. Participatory Forest Management

From that point of view, forest management systems are referred to as indigenous when they are primarily based on the local experience of the specific society and have evolved and transmitted from generation to generation by word of mouth or by practice. The efficient management and conservation of forest ecosystems is critical to the continued survival of man on earth. Forest ecosystems are gradually becoming synonymous with biological diversity as a result of the innumerable and varied plants and animals that depend upon the ecosystem for survival and existence. They view their forest management as an integrated and holistic system of forest land management rather than individual species. Thus, long-term management strategies increase biological diversity by developing their cultural system for the protection, preservation and conservation of forest resources, which establish the following links between culture and bio-diversity:

(a) Species conservation,
(b) Habitat preservation.

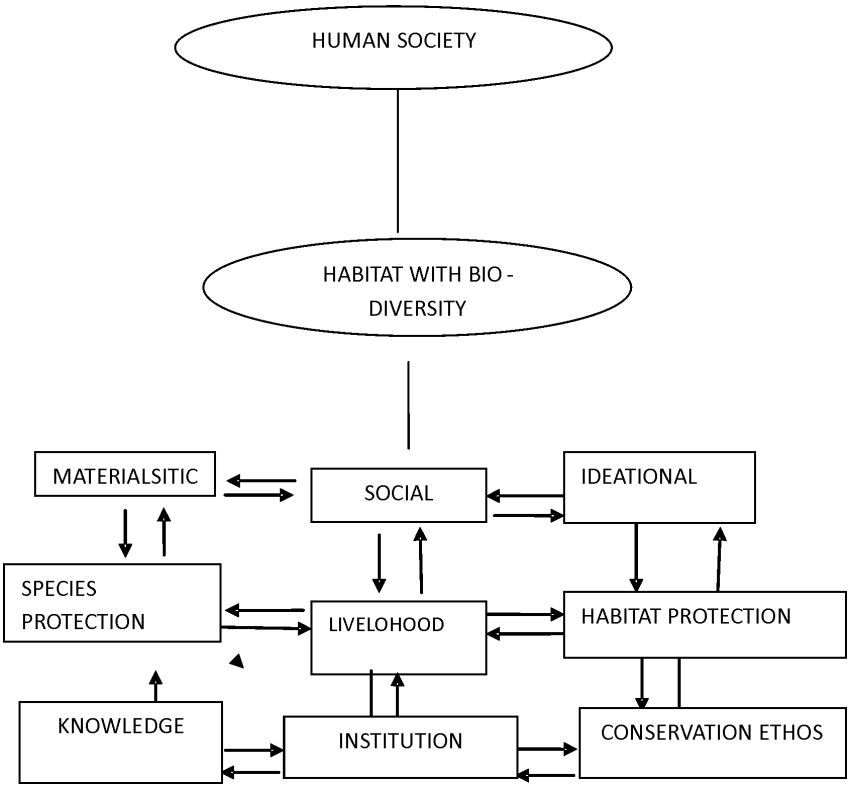

Figure 1: Flow of Conceptual Framework

The preservation is not simply the mechanism but is governed by knowledge, conservation ethos and cultural practices. The latter is bounded by the community institutions, which are adapted to the changing socio-economy policies and programmes. Biodiversity conservation appears to be an integral part of many traditional management systems, from tropical forests to coastal fisheries. Thus, the self-interest of traditional peoples has been the key to biodiversity maintenance. As traditional peoples are integrated into the global economy and come under various pressures, they often lose their resource base and, in the long run, their knowledge systems, social institutions, and their worldview, which shape their relations with the environment. The process of decoupling traditional peoples from their resource base is likely to reduce the resilience of their social systems, as well as their local ecosystems, through biodiversity loss.

Biological diversity is a crucial factor for generating the ecological services and natural resources on which they are dependent. Natural resources are becoming scarce as a consequence of environmental degradation, with loss of habitat as the major factor contributing to the depletion of these natural resources. Traditional approaches to conservation often assume that nature must be protected from use by humans. Although this has been useful in some situations, it has not enabled us effectively to prevent the widespread degradation of our natural resources. The loss of biodiversity continues: tens of thousands of plant species are threatened with extinction, and today, we are seeing the greatest rate of species extinction in Earth's history.

4. Anthropological Approaches in Indigenous Knowledge Study

The study of Indigenous knowledge systems as part of common property resources and their interactions with the surrounding ecology falls within the purview of Anthropology, particularly within the realms of cultural ecology or environmental anthropology. Anthropologists examine Indigenous knowledge systems, which encompass the accumulated knowledge, practices, beliefs, and innovations developed by Indigenous or local communities over generations in their interactions with the environment.

These studies focus on understanding how these knowledge systems are intricately linked to the management and utilisation of common property resources (such as land, forests, water bodies, etc.) within specific ecological settings. Anthropologists explore:

1. **Cultural Context:** Influence of cultural beliefs, traditions, and social structures on the way Indigenous communities perceive, manage, and use natural resources.
2. **Socio-ecological Interactions:** The reciprocal relationship between Indigenous knowledge systems, community practices, and the surrounding ecology. These include how indigenous practices shape and are shaped by the local ecosystem, sustainable resource use, and environmental management strategies.
3. **Community-Based Resource Management:** The methods and practices employed by Indigenous societies for conservation, resource allocation, and decision-making regarding common property resources.

5. Indian Context

India is a country which is famous for its Indigenous peoples living in the natural habitat constituted by forests, hills and water bodies. The Indian

Indigenous peoples, known as 'tribals' or 'Scheduled tribes' (constitutional or political category), are found to be living in hilly and forested areas of rich biodiversity. The Indigenous peoples have been living in their natural habitat for centuries before any invasion or colonial rule. They depended on their local ecosystems of hilly and forested areas and have been accumulating a rich local environmental knowledge that made the basis of their common institutional arrangements in common property resource management systems in the utility of natural resources, agriculture, aquaculture, forestry and so on. The forest has been a common property resource since time immemorial. In the common property resource management and Indigenous knowledge, as one of the communal resources, is the outcome of cumulative human experience in the distinct natural and social compound, which is adapted to the local culture and environment and is very much dynamic with changing conditions. The tribal communities maintaining a symbiotic relationship with surrounding natural wealth have been conserving the rich biodiversity through the fulfilment of daily requirements for their survival and livelihoods. Thus, their collection and processing of bio-resources, especially non-timber forest products, including medicinal plants for self-consumption and commercialisation, provide good sources of revenue. Indigenous knowledge is very significant for the various kinds of information about the growth of trees and plants, seed preservation, people's belief systems, indigenous technology, farmer's experimentation of introducing new species, traditional healing system, local political system and so on. These are well revealed in the existing classification of the ecological zones in cognitive or emic categories.

Since the British regime, the government policies of nationalisation of the forest lands and products brought out a good amount in the state exchequer and generated man-days for tribal collectors. However, the deprivations of their rights and alienation from their ancestral lands have developed various issues in their cultures and lives. In the historical context, the transformation of community-owned village commons to state-owned forests during British rule and after the attainment of independence, two policies and several acts were framed to marginalise the tribals. From the 1960s onwards, the community regime was strengthened by the self-initiated forest protection by the Indigenous peoples in different parts of the indigenous land, resulting in the National Forest Policy, 1988 as a pro-tribal or pro-poor policy and thereby a resolution for initiating participatory forest management. Adopting the 1988 National Forest Policy, various community-based forest Management systems have been initiated, which are known as Joint Forest Management (JFM) and Community Forest

Management (CFM). Forest Management is now a decision-making process for the conservation, management, development and sustainable harvesting of the bio-resources in Forest Lands. From the inception of Participatory Forest Management, various actions have been taken to provide livelihood securities to the fringe forest dwellers of the state forest by developing small and micro enterprises. To develop a common property resource management situation, the management system emphasises a people-centred, people responsive and pro-democratic process with social arrangements of community-based social grouping in the promotion of traditional livelihoods with preservation and conservation of bio-resources and bio-diversities.

In participatory forestry, their decision-making rights and responsibilities, starting from planning implementation to evaluation, were given due importance. In this, two more institutions, civil societies or NGOs and markets, have also been added to catalyse the developmental activities in the implementation of participatory forestry, the building of community institutions based on institutional mechanisms and the utilisation of forest resources in a sustainable way. In the institutional mechanism at the grassroots level, the decentralised governance was also set up in decision-making processes as well as in actions. But participation has not been to the extent expected, and the community institutions have not been found strengthened due to lack of belongingness, various intra- or inter-conflicts of different world-views of multi-stakeholders and lack of mutual trust. The Indigenous peoples applied the Indigenous knowledge for the conservation and utilisation of various non-timber species for their survival and livelihoods. But in the implementation of participatory forestry, the basic objectives of conservation of the bio-resources and species diversities, viz. collection and conservation of the non-timber forest products, including medicinal plants, participatory silviculture, processing, value addition and local market development, were not given due importance to that extent as required.

6. Background

Madhya Pradesh is the second largest Indian state in size and is better known as a 'Tribal' and 'Tiger' state. The state is divided into 11 agro-climatic zones. The forests are distributed over all the agro-climatic zones. Out of a total of 3,08,245 sq km geographical area, which is 9.4% of the country's geographical area, of which 30.82% comes under forest cover, which equals 2.33% of the total forest cover of India. At present, as per the 2011 census, out of the total population of the state, that is 7,26,26,809, the population of tribals in the

state is 1,53,16,784, constituting 21.09% of the total population of Madhya Pradesh. There were 46 identified Scheduled Tribes, and three of them have been identified as "Primitive Tribal Groups" (PTGs) in the State, presently also known as 'Particularly Vulnerable Tribal Groups (PVTG). They are distributed as follows:

(1) Baiga- Mandla, Dindori, Shadol, Anupur, Balaghat districts;
(2) Sahariya- Guna, Sheopur, Shivpuri, Morena, Gwalior, Vidisha, Rajgarh districts;
(3) Bhariya- Chhindwara, Jabalpur, Seoni, Sahdol districts.

The study was conducted in six villages in the Baiga-Dindori district;

(1) Sahariya- Sheopur district;
(2) Bhariya- Patalkot of Chhindwara district.

7. Objectives of the Paper

This study utilises an empirical database and anthropological methods to examine the role of Indigenous knowledge among PVTGs. It aims to analyse their knowledge transmission, conservation ethos, traditional techniques, and innovative practices for ecological restoration. Additionally, the study explores community mobilisation and Community Forest Management, highlighting their contributions to sustainable livelihoods and overall sustainable development.

8. Methods Adopted

(A) Secondary data collection: An intensive review of studies dealing with tribal culture and knowledge from various academic literature, viz. Books, Journals and Project Reports submitted by different institutes or Universities

(B) Field Research Activities

Site selection and Villages : Looking into the objectives of the project, the three tribal groups had been selected based on a pre-agricultural economy and strong Indigenous knowledge. In this regard, three Primitive Tribal Groups- Baiga of Baiga Chak of Dindori district, Bhariya at Patalkot of Chhindwara district and Sahariya in Sheopur district– were purposively selected. Six villages for each tribal group were sampled based on the criteria as follows:

(i) Uni-ethnic tribal village
(ii) Bio-diversity rich areas
(iii) Less acculturated

(iv) Good forest areas

(v) Village institution and forestry activities.:

(b) Sampling techniques: 10% of households were randomly selected in every village.

(c) Survey: A household survey on forest dependency, Sustainable use, Biodiversity conservation and livelihoods, etc.

(d) Tools and Techniques:

The following tools and techniques were applied:

(i) Questionnaire: Semi-structured Questionnaire for inventorying land and identification of problems at the local level;

(ii) Schedule for household scale livelihood analyses in which livelihood constraints and opportunities were identified;

(iii) Participatory Rural Appraisal (PRA) and Participant Observation.

(iv) Semi-structured interviews for key informants or opinion leaders to examine social, financial, physical, human and natural capital assets used by households to ensure livelihood security;

(v) Focus group discussion;

(vi) Village workshop

(e) Data Analysis and Preparation of the Final Report in the following manner:

(i) Description under different titles and subtitles;

(ii) Tabular form: Both qualitative and quantitative;

(iii) Discussion of the qualitative and quantitative data;

(iv) Results and analysis, and Report preparation.

8. Socio-demography and Socio-economy of the Studied Villages

The following table shows the socio-demography and socio-economy of the six tribal communities:

The socio-economic condition reveals that the Baigas are highly dependent upon forestry activities, though they eke out their existence in labour and non-agricultural labour[1] activities. Similarly, the Sahariyas and the Bhariyas also depend upon forestry activities and agricultural and non-agricultural labour activities. In their agricultural occupations, the Bhariya population is mostly engaged in agricultural livelihoods, followed by Baiga and Sahariya. Of the total Sahariya working force, 25% of them are involved in agriculture and labour activities, followed by 19.4% Baiga, and only 8.01% of Bhariyas are engaged

Table 1: Socio-demography of the Sampled Villages

S. No	*Socio-Demography Data*	*Baiga of Dindori*	*Sahariya of Sheopur*	*Bhariyas of Chhindwara*
1	Total sampled villages	06	06	06
2	Name of the Sampled Villages	Tarwa tola, Kapoti, Kharidee, Kandawani, Bangla Dadar of Dindori Block and Sarai of Samnapur Block	Uprikhoree, Nichlikhiree, Parond, Chak Bilari, Sonipura of Karahal Block and Sironi of Vijaypur Block	Chimtipur, Gal Dubba, Gurhi Chetri, Ghat Linga, Kariyam Rather than Tamia Block
3	Total HH	360	344	218
4	Total ST Population	1711 (100%)	1506 (100%)	1469 (100%)
5	Total ST Males	923	804	748
6	Total ST Females	788	702	721
7	Sex Ratio	854	873	964

Source: Primary Data

in agricultural labour. Cent per cent of Sahariyas work as non-agricultural labourers, half of the Baiga community is involved in non-agricultural labour, and in Bhariyas, less than one-fourth, only 15.2%, is involved in non-agricultural labour. Whereas 100% of the population is involved in forest produce collection in all three PVTG communities in the six sampled villages. All the sampled eighteen villages representing the three PVTG communities are situated near the forests. The villagers depend on forests for their survival. They have developed a symbiotic relationship with the forests. The Baigas, the Sahariyas and the Bhariyas are dependent upon forests for fuel, fodder collection of forest produce, medicinal herbs and plants for self-consumption and sale in the local markets. In their land holding pattern, 19.4 % of the Baigas are landless, and 80.6% of marginal farmers have a land area below 2.5 acres. Among the Sahariyas, 25% are landless, 68.9% marginal, 4.7% small (between 2.5 and 5 acres) and 1.6% medium farmers (between 5 and 10 acres). Similarly, in the Bhariyas, 8.02% are landless, 70.5% marginal, 6.3% small and 15.2% medium farmers. In consequence, most of the Baigas are found below the poverty line. A large number of Baiga families (above 80% of the total families) have an income of less than ₹10,000. Similarly, a large number of Sahariya families have an average income year of less than ₹10,000.00. All the Bhariya families have an average income annually of less than ₹10,000.00. In their educational status among the Baigas, 54.41%, among the Sahariyas, 82.6% and among the Bhariyas, 60.45% are illiterates. Out of the literates in the Baigas,

more than three-fourths of them have passed the primary standard, and only 6.96% have crossed the secondary standard. The educational status of females of the Baigas is declining. A very negligible population has crossed high school and higher education. On the contrary, among the Sahariyas, 15.80% of them have crossed the primary levels, and a very negligible population has passed secondary standard, high school and higher education. Among the Bhariyas, 22.47% and 8.78% of the literates have crossed primary and secondary standards, respectively, and out of the rest, a very negligible population has crossed high school and higher education.

Since these three tribal communities follow the traditional healing systems, they primarily rely on them for treating diseases. Now, various schemes of the Government have been implemented in the tribal villages to develop their health status. However, the tribal people have not benefitted to that extent due to unawareness, inaccessibility to their habitation, negligence of the administration, and inefficiencies of the implementer (Debnath, 2013).

8. Results and Discussion

From the analysis of the primary and secondary data as given above, the objectives can be analysed as follows:

(1) Role of Indigenous knowledge in conserving biodiversity

All the primitive tribal groups conserve the bio-diversities through diverse uses of various species, religio-cultural practices and socio-cultural traditions and also for their health purposes. The Baigas are found to utilise various parts, viz. roots, seeds, rhizomes, tubers, seeds, etc., or products, viz. fruits and flowers of the species under commercial or local level trading, traditional use and health use. Some of the species have multiple uses, signifying the bio-diversity conservation. Sometimes, the whole plant or extracted part is used. The Sahariyas are also found to utilise various parts, viz. roots, seeds, rhizomes, tubers, seeds, etc. or products, viz. fruits and flowers of the species under commercial or local level trading, traditional use and health use similarly. Here also, some of the species have multiple uses, signifying the bio-diversity conservation. Sahariyas sometimes use the whole plant or extracted parts for different purposes. Similarly, the Bhariyas are found to utilise various parts, viz. roots, seeds, rhizomes, tubers, seeds, etc. or products, viz. fruits, flowers of the species under commercial or local level trading, traditional use and health use. In their case also, some of the species have multiple uses, signifying the

bio-diversity conservation. Just like the others, they also sometimes use the whole plant or extracted parts for various purposes.

Thus, these PTG tribes of Madhya Pradesh have developed a symbiotic relationship with the forests, and they have evolved various strategies to conserve the biodiversity of the forests. One method of forest conservation by the PVTGs is through social traditions. Various parts of their bio-diversities are used in their life-cycle rituals. The sacred groves are found in all three PTGs, which have the areas protected, preserved and conserved with religious affiliation and have varied species conserved for different utilities and purposes. There are some temples which have the trees protected, preserved and conserved with religious affiliation for the conservation of various species. In the three PVTGs, several taboos are observed in the context of the trees, like Sal among the Baigas, Shaitu among the Sahariyas and Mahua among the Bhariyas. Additionally, various sacred water resources are recognised and preserved within these communities. All the PVTGs describe the different places of their habitation in various ways with the significance of IK; it describes the individual or community ownership. These may be open spaces, farmlands, ritual spaces for worship or funerals, natural resources and so on. The Indigenous people have a centuries-old heritage of medicinal plants and herbal medicines for curing human illness in the tribal world. Some medicinal plants are used by the Baigas to cure ailments, which they collect, use and sell in their local market. Similarly, for medicinal purposes, the Sahariyas use various herbs, plants and roots. These tribal communities under study rely on forest products from natural ecosystems to sustain their livelihoods.

(2) Community Mobilisation and Community Forest Management of these PVTGs

Forest management is nowadays a decision-making process with people's participation, popular democracy and people's responsiveness under decentralised governance and institutional mechanisms with significant stakeholder roles, rights and responsibilities for the conservation of bio-diversities and livelihood securities of the main primary beneficiaries. The beginning of community forest management in India took place in the pro-tribal 1988 National Forest Policy, which was followed by the declaration of the resolution of Joint Forest Management by the Ministry of Environment and Forests, Government of India. Then, it commenced the community mobilisation by the Forest Department (FD), the local NGOs or CSOs for involvement in protection and forestry activities.

In this context, the sustainable livelihoods approach comprising food security, sustainable employment generation, increasing crop productivity, soil and water conservation, value addition and marketing of NTFPs, in-situ and ex-situ cultivation of medicinal plants, infrastructure development, community asset building, capital development, etc., were adopted. Thus, the Indigenous knowledge system is inextricably mixed up with participatory forestry, starting from protection or preservation, plantation, silvicultural operations, incentivisation of marketable commercial species, and gathering or non-destructive harvesting for meeting the daily requirements for living. Hence, in present-day participatory forestry, their forestry activities are treated as the cumulative effort of livelihoods, ethos and community regime management. As these three PVTGs are forest-dwelling tribes, their prime economy is based on the collection, utilisation, processing and selling of the numerous NTFPs, which support their livelihoods. Based on the availability of the amount of the products, they collect and process them before selling in the market. They use their Indigenous knowledge (IK) and customary practices in the collection of several non-timber forest products (NTFPs), including medicinal herbs, for their self-consumption and nominal income by selling some amount in the local market. Due to the regional economic system, they have been pulled towards the peasantisation of having plough-drawn agricultural livelihoods in the modern farming system. Earlier, they had traditional practices of shifting cultivation, in which they produced different varieties of crops and vegetables in different soils. Now, these PVTG tribes are largely agriculture-dependent communities. In the development process, after getting pulled into the agriculture of plough cultivation due to crop diversification, they are found to shift to traditional bio-diversity-based livelihoods for the cultivation of cash crops like paddy, wheat, maize, barley, etc. Baigas are an exception who still also grow rice, *kodo* and *kutki* in the traditional system of cultivation. Rice is their staple diet. The traditional methods of crop sowing are practised, and thus, the yield is just sufficient to meet their daily consumption requirements. As they do not have sufficient income, employment, savings or investments, the overall population below the poverty line is estimated to be 44%, whereas the fringe villagers are 80% below the Poverty line and they have meagre land and are not so much capable of investing in labours, fertiliser or seeds, they remain in poverty due to lack of opportunity to earn money from their agricultural livelihoods. The Baigas are hard-working people, whereas the Sahariyas were found to be lazy and dependent on the Government to fulfil their requirements. Cultivation is done by them. The Bhariyas living

in Patalkot Valley do not have proper agricultural fields; the land is uneven, and their staple diet is maize. Maize can be cultivated on such land. There is no irrigation facility available in these eighteen villages; they are dependent on rainfall to fulfil the water demands, and the rainfall is always inadequate. The Baiga, the Sahariya and the Bhariya live a hard life every day. They earn every day; they have no bank balances, and they do not believe in hoardings. They are searching for alternative livelihood options in government initiatives in the fields of livestock management, horticulture and fishery. But a huge number of indigenous species in livestock, fruits & vegetables (horticulture), as mentioned above, are found. The livelihood options are cost-effective as these suit the favourable inputs and local climatic conditions.

There are ample scopes to enhance their income sources from the forest products as they are living in the fringe forest villages and depend to a large extent on collections of fuel wood, fodder, NTFPs including medicinal plants, cattle grazing and marketing of the raw products at a nominal price in the local market. Moving away from the income or consumption criteria, poverty has been equated with the help of livelihood security. In the three PVTGs, the people have attempted to achieve livelihood security by producing some products. For instance, the Baigas produce brooms, ropes of mova grass, honey, mahua liquor and mohua oil; the Sahariyas produce bael pulp & basket of Harsingher, and the Bhariyas produce ropes and broom. All of them produce stuff using their traditional skills with locally available raw materials.

9. Conclusion

This paper highlights the importance of integrating biodiversity management with livelihood activities to formulate effective follow-up policy decisions. A key focus is on community mobilisation, ensuring active participation in decision-making processes related to forest management. By involving beneficiaries and key stakeholders, communities can influence the direction of natural resource management and contribute meaningfully to its implementation. Encouraging community-based natural resource management initiatives is essential to enhancing well-being and fostering sustainable development.

The process should begin with motivation and confidence-building to ensure active engagement. Effective participation occurs when all relevant stakeholders are involved in decision-making and have the ability to influence outcomes (Agarwal, 2001). Community Forest Management allows a community's problems, needs and solutions to be addressed while incorporating scientific and technical knowledge and skills. Well-defined

institutional systems within an empowered community can facilitate informed decision-making by providing essential process information. Additionally, they help minimise transaction costs, enabling community forests to be managed similarly to private property in terms of ownership and responsibilities (Padgee *et al*., 2006). The importance of community involvement in developing forest and environmental management plans, guided by people's democracy and responsiveness, has been widely advocated. These efforts focus on enhancing resource stocks through plantation, conservation, and rehabilitation. To achieve livelihood goals, establishing an institutional mechanism that defines stakeholder roles and responsibilities—across both formal and informal institutions—is crucial. These objectives encompass both economic and non-economic factors, including sustainable income and employment, community well-being, knowledge transmission, cultural preservation, conservation ethics, innovation, and the assessment and fulfilment of essential needs. To achieve these goals, the strategies could be chalked out based on micro-plan, assessment of community assets, micro-finance, infrastructural development and human capacity building. The projects could be implemented based on strategies which provide benefits which are shared on an equitable basis through robust institutional norms. Sharing also builds up the livelihood strategies and leads to personal or community empowerment comprising of social, economic and political.

Participation is a vital component of the self-help and empowerment process. So, besides planning and decision-making, there is an urgent need to involve the community to develop indicators and to measure progress towards sustainability (Fraser *et al*., 2006). People must be involved in those decisions that affect their lives, thus gaining confidence, self-esteem, knowledge and development of new skills. The process is cumulative; the more skills, the more the person can participate and the more they can gain. Participation must facilitate learning action and the achievement of goals (Onyx & Benton, 1995). This empowerment process will culminate in the direct impact on community mobilisation and institutional mechanisms in a cyclic order. The following framework outlines the key steps, from community participation to empowerment, through livelihood security and biodiversity management (see Figure 2).

The paper discusses the application of Indigenous knowledge for biodiversity conservation and livelihood in homogeneous small groups like PVTG and at micro-level fields. This has allowed looking into the ethnographic dimensions and approaches in Environmental Anthropology as important

in 'forest conservation and management', which focuses on the relationship between humans and their environment with special emphasis on how cultural practices maintain a balance in the relationship between a local group and its environmental resources.

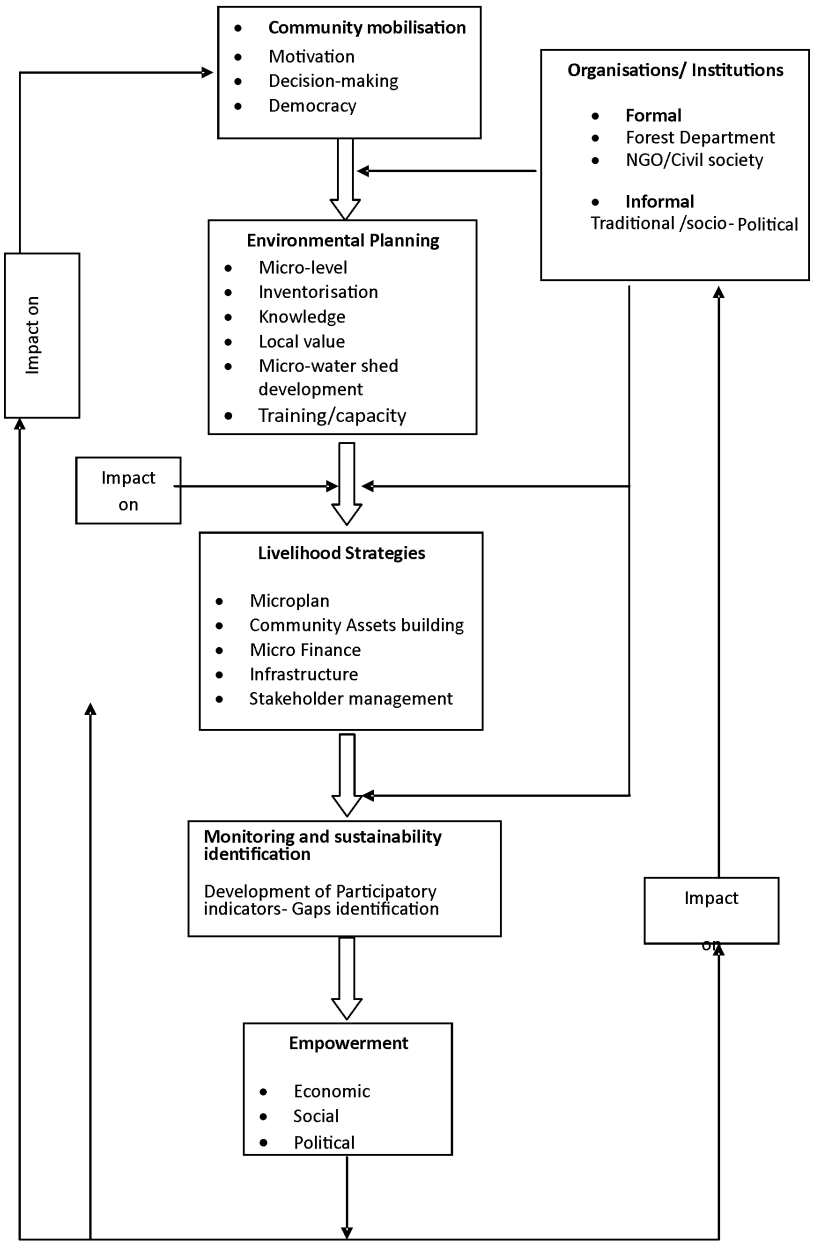

Figure 2: Framework for Development through Integrated Conservation and Development

Note

1. Labour is work done in exchange for wages, and non-agricultural labour is work that is not related to farming or agriculture.

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