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Preservation of the Indigenous Medicinal Knowledge Network of the Bonda Tribe

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HIGHLIGHTS

- Indigenous Medicinal Knowledge (IMK), a synthesis of religious and cultural elements passed by Desaristo the people living in the Bonda community.
- IMK is an intangible cultural heritage essential to the historical significance and wellness of the Bonda tribe.
- Verbal transmission of IMK occurs through social networks encompassing older people, communities, & medicinal practitioners (Desaris).
- Historic or Spiritual groves, the safeguarding of herbal remedies, and multigenerational transmission of information are safeguarding for IMK that necessitate religious convictions, concealment, and communal understanding.

ARTICLE INFO

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ABSTRACT

For tribal people to preserve their historical legacy and advance environmentally friendly healthcare habits, traditional medicinal knowledge must be preserved. This is especially true for the Bonda tribe in the Malkangiriarea of Odisha. The Bonda tribe, who live in the Eastern Ghats, mostly depend on narrative Indigenous Medicinal Knowledge (IMK) shared among elders and traditional healers (Desaris). This study investigated the processes of knowledge transmission, the social networks that sustained the IMK system, and the preservation and ways adopted in Bonda Community. Data were gathered from multiple Bonda villages using purposive sampling technique during 2023-24 years. Qualitative methods and participatory research were used for data collection, and chord diagrams were used for visualization. The results showed a strong IMK network with important contributions from Desaris and strong community linkages. The preservation of sanctified groves and therapeutic herbs through conservation techniques, incorporating new information and preserving transmission secrecy were examples of adaptation tactics. This investigation promoted approaches that encouraged safeguarding Indigenous Medicinal Knowledge (IMK) by highlighting the significance of Indigenous Knowledge Network (IKN) in maintaining traditional identities and social well-being.

INTRODUCTION

The largest number of tribal people, who follow strange traditions and live completely distinct lives, may be found in India (Gavit et al., 2013). Protecting the traditional medicinal knowledge of indigenous people is vital in upholding their cultural heritage and encouraging sustainable health practices within their communities. Tribal communities have specialized individuals respected for their expertise in herbal remedies and are therefore regarded as the society's drug administration authorities. Their secret ability to treat a wide range of illnesses with a variety of magical rituals and the administration of herbal medications forms the basis of the conventional medicinal system and welfare initiatives. Indigenous cultures employ certain theoretical, conceptual, and logical procedures when approaching a sickness to cure it (Ota, 2020).

Research has demonstrated how vital indigenous knowledge systems are to the provision of long-term, culturally relevant

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healthcare (Baskin, 2022). For example, the importance of conventional environmental wisdom and its significance in safeguarding biodiversity and ecological sustainability (Agrawal, 2002). The transmission of traditional knowledge must continue to be preserved. The Indigenous Medicinal Knowledge (IMK) system is a collection of herbal remedies and a complex network interwoven with social, cultural, and ecological dimensions (Baidya et al., 2020).

The Bonda tribe of Odisha, among the many indigenous groups in India, are an exclusive source of traditional medicinal knowledge transmitted through generations. The Malkangiri district's indigenous people acknowledge that while certain plants are unlucky, others promise greater qualities. The Bonda tribe community live in isolation on the upland northwest of the Machkund River, confined inside the Bonda Hills, a range of lofty hills bearing their name in the Malkangiri district, the Eastern Ghats region, of Odisha (Naik & Dansana, 2022). The Bonda people possess valuable knowledge that is important to their identity and cultural heritage. This knowledge could also potentially make valuable contributions to modern medicine (Kalita et al., 2024). They have been able to keep their unique cultural and medicinal heritage because they have been isolated. The Bonda people rely on their extensive knowledge of medicinal plants and traditional healing methods, which are integrated into their daily routines and spiritual beliefs. This serves as their main source of healthcare since they have limited access to modern medical facilities (Bala et al., 2020). The present research explores how the Bonda community protects and transmits their IMK, the social networks that sustain this knowledge, and the intricate linkages within and beyond the community that support this traditional healthcare system. The community knowledge network is characterized by a strong oral communication tradition, where knowledge is passed down through rites, audio recordings, and storytelling (Borunda & Murray, 2024). Practical learning is also a key feature, with newer members acquiring knowledge by assisting and observing more experienced members in the preparation and administration of medicine. Medicinal practices are deeply embedded in broader cultural ceremonies and rites, ensuring their continuity and preservation within the community (Lenka & Satapathy, 2020).

METHODOLOGY

The research utilized a purposive sampling technique, whereby particular individuals or groups are purposefully chosen according to pre-established standards to guarantee their pertinence to the study's goals. This approach made it possible to get data from participants who had the desired traits or experiences that were essential to answering the study questions in an efficient and concentrated manner. Through careful selection at each stage of sampling, this approach enhanced the indigenous knowledge of obtaining in-depth insights and meaningful results that aligned with the study's purpose. The Malkangiri district of Odisha was selected because of its distinct ethnobotanical knowledge, significance for the region, cultural uniqueness, ability to preserve indigenous knowledge, and emphasis on a thorough investigation of the tribe's use of plant medicines. The Malkangiri district is composed of 07 blocks. Two of these 07 blocks, Mathili and Khairput, were purposively selected for the research because Bonda tribe mainly lived in these two blocks with huge populations. The villages of Kadamguda in the Mathili block, Andrhal, Badpada, Badpada, and Dumripoda in the Khairput block were selected. The sample size of the respondents for the study was 180.

Using software tools such as Atlas-ti and UCI-Net, a social network analysis was performed to map linkages within the community about the diffusion of medicinal information. Both qualitative and quantitative methodologies were used in the data analysis. An important tool for visualizing the relationships between the various indigenous medicinal plant knowledge network systems was the use of chord diagrams.

RESULTS

The transmission of IMK in the Bonda community was *primarily oral* and facilitated through a robust social network involving families, elders, and traditional healers (known as *"Desaris*"). Elders and healers play a crucial role in educating the younger generation.

The Network of Indigenous Medicinal Knowledge System

The IMK network in Badpada village (Figure 1) comprised 1.76 ties that weaved a complex web of connections around the sharing and conservation of medicinal information. Sukra Badnayak and Budha Kirsani were important characters in this network. Sukra Badnayak was a highly esteemed Desari with a network density of 1.87, which suggested that he had a great deal of influence in the community. Alongside recovery, he provided spiritual advice through sacred rites; this is particularly evident during Purnima and Amavasya, held beneath a sacred banyan tree. His all-encompassing approach to health integrates philosophical and medicinal treatments, allowing him to be a key player in the village's overall well-being. Budha Kirsani was another important person from the Badpada, with a network density of 1.46. He was a well-respected person because of his in-depth understanding of the therapeutic qualities of the indigenous flora. His knowledge and demeanour comfort the locals, solidifying his position as a defender of customs and a ray of faith.

The IMK network of Badbel village (Figure 2) has 140 connections to one Desari and two well-known persons from village.Lachhima Badnayak was a modest but potent force in the area, with a network density of 1.47. She was an invaluable source of information and healing due to her profound expertise in herbal remedies and her kind disposition.Magu Sisa wascommitted to protecting Badbel's cultural treasures; Mangu Sisa had a density of 1.29. The community's traditions and rites will continue because of her meticulous focus on information and regard for traditions. Sambari Kirsani was known for her bright character and commitment to heritage safeguarding, Sambari Kirsani had a 1.26 network density and was a well-liked individual. She enlivens local culture via her enthusiastic involvement in ceremonies and her education of the upcoming generations.

The IMK network of Andrahal village (Figure 3) revealed the importance of Somnath Desari, who was known for having a network density of 1.69; Somnath Sisa's significance was highlighted by his purported heavenly guidance and deep closeness to nature. He was well-respected for his knowledge of spiritual healing and

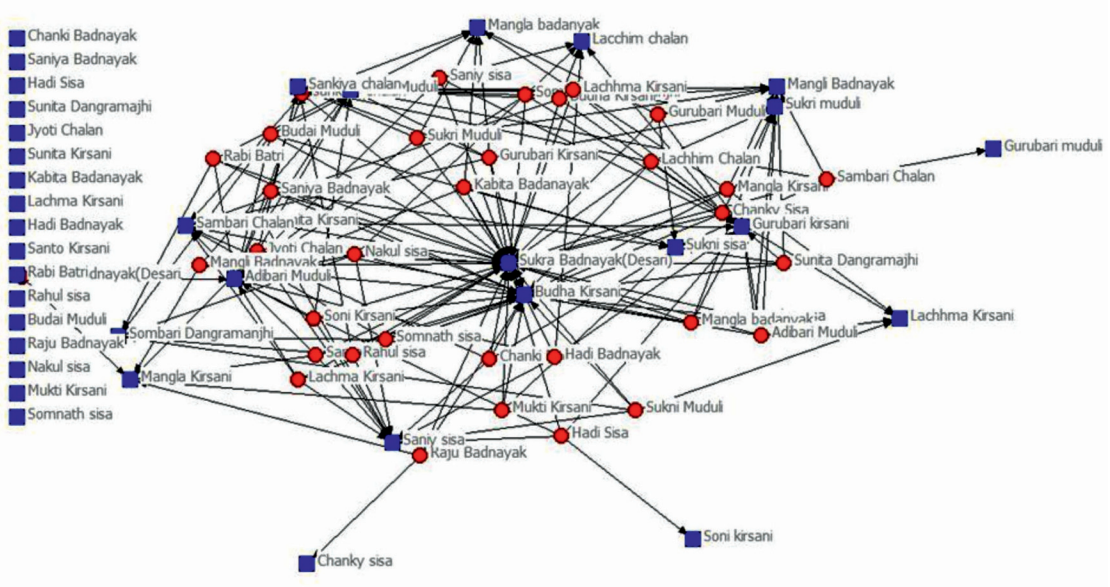

Figure 1. IMK network of Badpada village

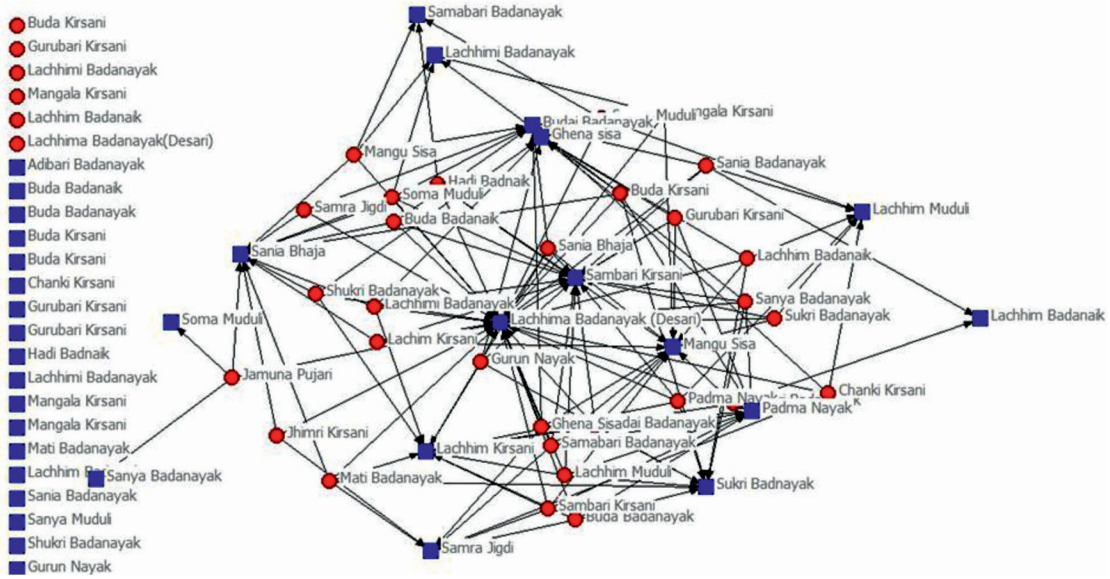

Figure 2. IMK network of Badbel village

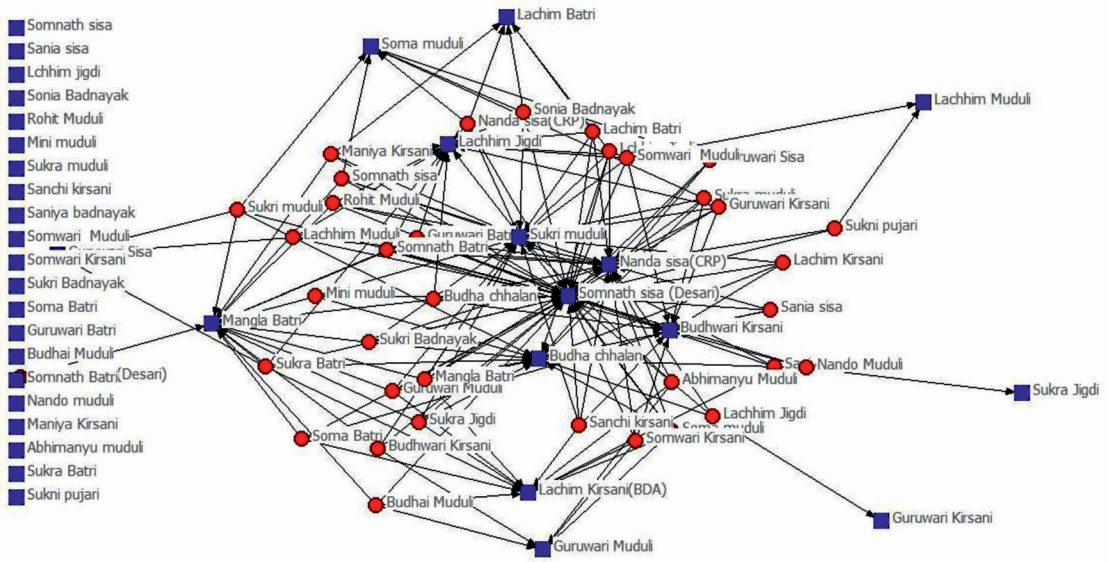

Figure 3. IMK network of Andrahal village

the local flora. Sukri Muduli, Nanda Sisa, and Budhwari Kirsani have 1.67, 1.57, and 1.46, which had notable network densities.

Sama Muduli, prominent figures were among the 141 ties that united its inhabitants. He was a respected healer and knowledge provider, and had a significant impact on the community, with a network density of 1.87 (Figure 4). As Desari, he safeguards the indigenous knowledge system and offers remedies to alleviate physical and spiritual ailments, utilizing the healing properties of the Bonda Hills. Daitari Hantal, a wise and healing woman in Kadamguda, defied societal norms to preserve the Indigenous knowledge system, demonstrated her profound impact on her community. Her network density of 1.47 (Figure 5) reflected the profound impact she has on her community. She embodied the spirit of resilience and determination that defines the village, her unwavering dedication to preserving indigenous knowledge served as an inspiration to all who know her.

Understanding conservation and adaptation strategies of IMK

In the Bonda community, the preservation and adaptation of Indigenous Medicinal Knowledge (IMK) were facilitated through various conservation strategies and adaptive practices. Data from Focus Group Discussions (FGDs) were transcribed and analyzed using UCI-net to uncover the interrelationships between these strategies. This analysis is visualized through a chord diagram (Figure 6), which illustrates the connections between conservation points (S1-S5) and adaptation strategies (A1-A5).

Conservation of IMK: Key indicators

S1: Conservation of Sacred Groves, S2: Conservation of Medicinal Plants, S3: Spread of IMK to the Next Generation, S4: Identification of Plants, S5: Inclusion of New Knowledge in IMK Archive.

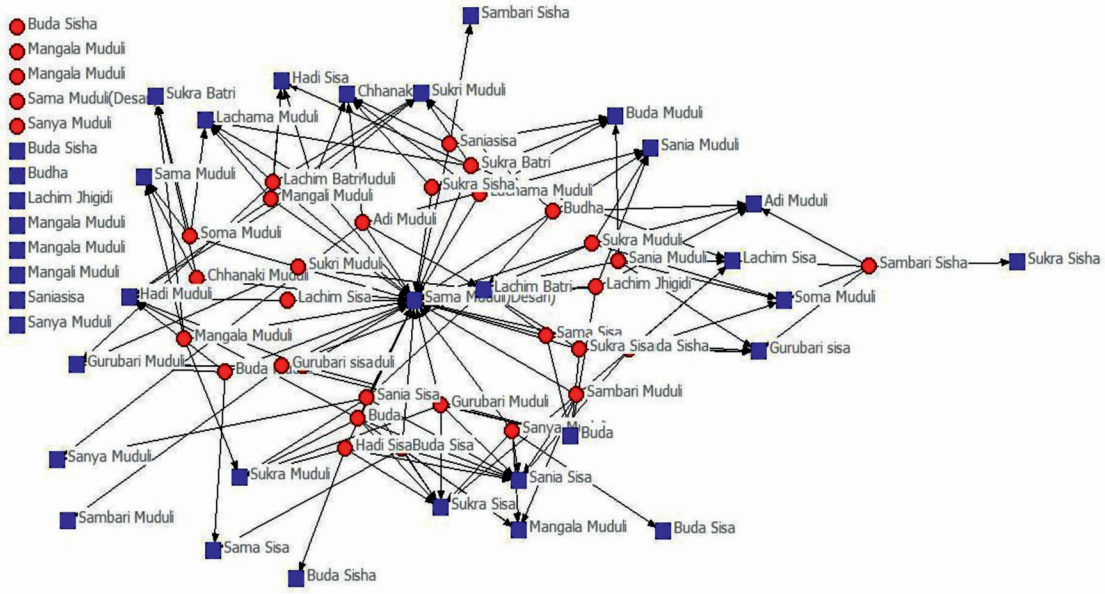

Figure 4. IMK network of Dumripoda village

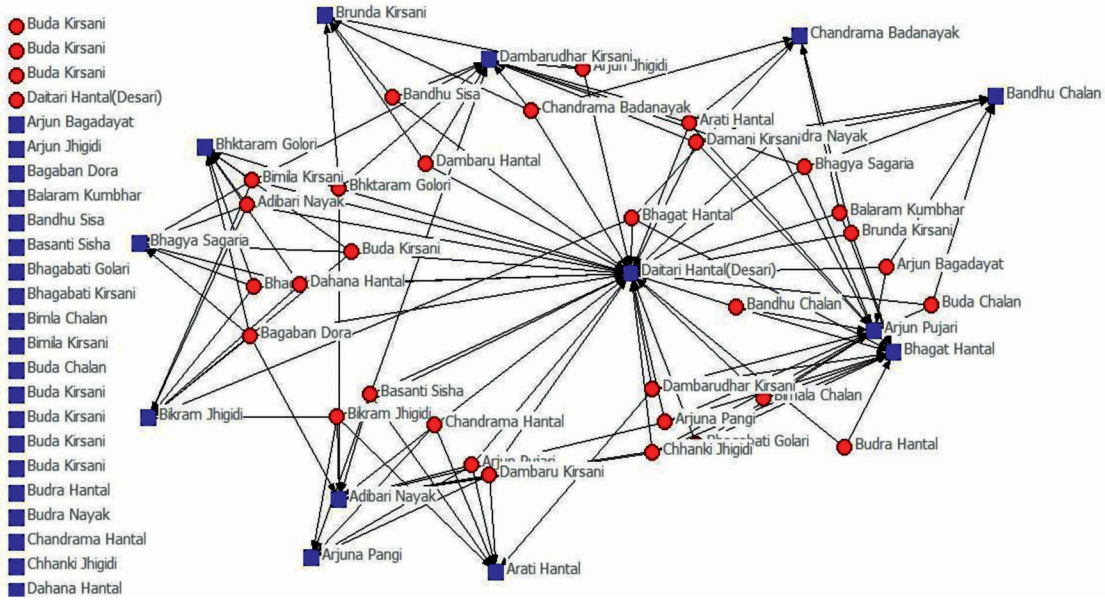

Figure 5. IMK network of Kadamguda village

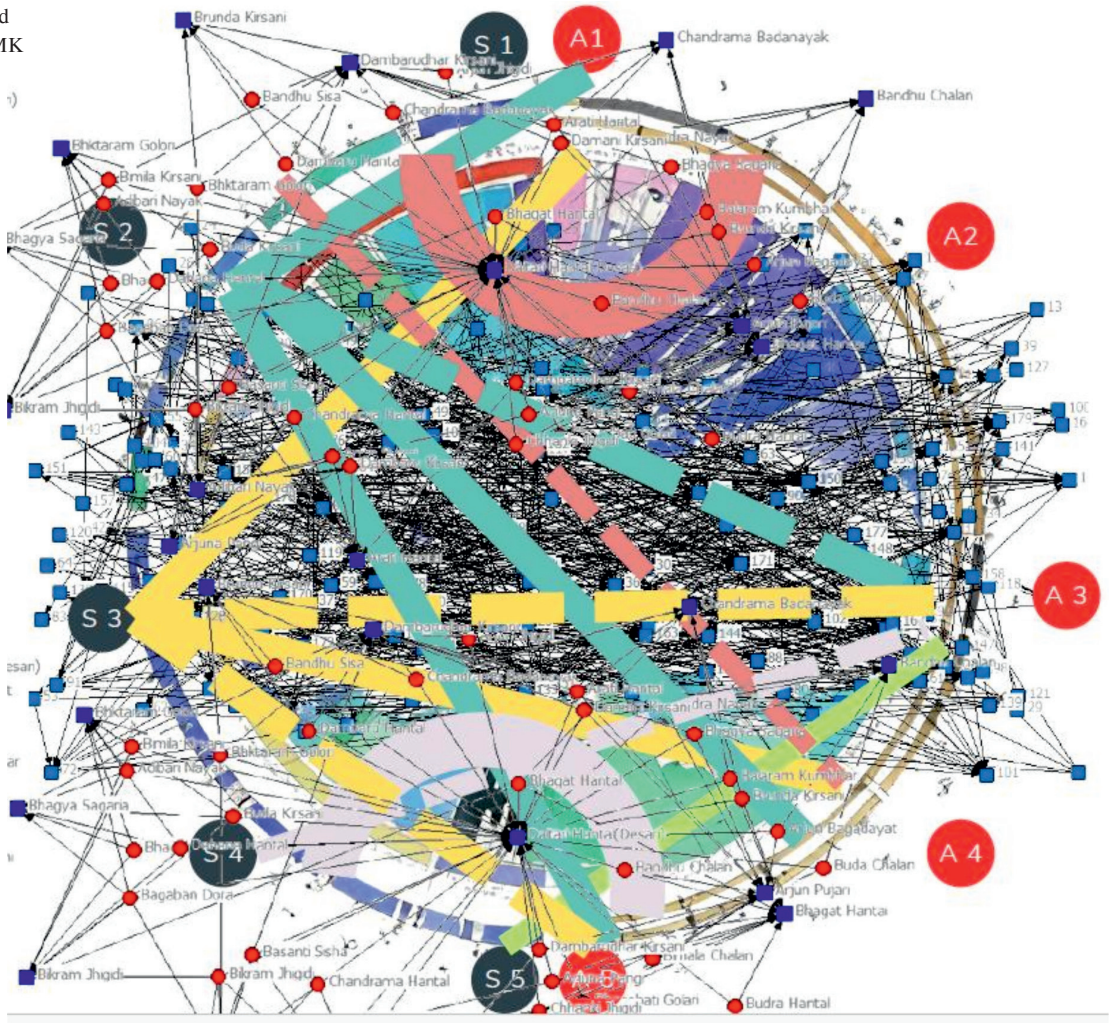

Figure 6. Conservation and Adaptation Strategies of IMK

Adaptation strategies: Key indicators

A1: Spirit, Myth, God, Taboo, A2: Secrecy in Knowledge Transfer, A3: Desari Takes Decision, A4: Community Understanding, A5: Desari and Next Identified Generation Conserve the Knowledge. The analysis using UCI-net and the chord diagram (Figure 6) revealed the following relationships:

S1: Conservation of sacred groves

Direct Relationship with A1 (Spirit, Myth, God, Taboo): Sacred groves are protected through spiritual beliefs, myths, and taboos, which deter misuse and ensure their sanctity. Direct Relationship with A4 (Community Understanding): The community's collective understanding and respect for the spiritual significance of sacred groves are crucial for their conservation.

S2: Conservation of medicinal plants: Relationship with A1, A2, A3, A4, A5

A1: Spiritual narratives and taboos enhance the reverence and protection of IMK. A2: Secrecy in knowledge transfer ensures that IMK was preserved within the community and protected from external exploitation. A3: Desari's decisions guided the appropriate transmission and application of IMK. A4: Community understanding fostered collective efforts in conserving IMK. A5: Collaboration between Desari and the next generation ensured continuity and preservation of knowledge.

S3: Spread of IMK to the next generation: Relationship with A1, A3, A4, A5

A1: Myths and spiritual stories made the transmission of IMK culturally significant and memorable. A3: Desari's role in selecting and training successors was vital for effective knowledge transfer. A4: Community involvement and support facilitate the intergenerational transmission of IMK. A5: The cooperation between Desari and the identified new generation ensured successful knowledge transfer.

S4: Identification of plants: Relationship with A1, A3, A4, A5

A1: Spiritual beliefs and taboos helped in the sustainable identification and use of medicinal plants. A3: Desari's expertise was crucial for accurate plant identification and knowledge dissemination. A4: Community understanding promoted collective stewardship of plant resources. A5: Joint efforts by Desari and the next generation in identifying and documenting plants ensured the integrity of IMK.

S5: Inclusion of new knowledge in IMK archive

Direct Relationship with A5 (Desari and Next Identified Generation Conserve the Knowledge): The integration of new knowledge into the IMK archive relied heavily on the collaboration between Desari and the new generation, ensuring that the knowledge base evolved while maintaining its core principles.

The chord diagram (Figure 6) visually represents these relationships, illustrating the connections between each conservation strategy (S1-S5) and the corresponding adaptation strategies (A1-A5). The arcs in the diagram show how various elements are interlinked, emphasizing the holistic approach of the Bonda community in preserving and adapting their IMK.S1 (Conservation of Sacred Groves) is linked with A1 (Spirit, Myth, God, Taboo) and A4 (Community Understanding).S2 (Conservation of Medicinal Plants) is interconnected with all adaptation strategies A1, A2, A3, A4, and A5.S3 (Spread of IMK to the Next Generation) connects with A1, A3, A4, and A5.S4 (Identification of Plants) relates to A1, A3, A4, and A5.S5 (Inclusion of New Knowledge in IMK Archive) is directly linked to A5 (Desari and Next Identified Generation Conserve the Knowledge).

DISCUSSION

Tribal farmers, who make up a substantial part of India's agricultural community, encounter challenges such as scarce resources, insufficient technical knowledge, and lower socio-economic status (Johnson et al., 2023). The Bonda community IMK networks showed a strong network for information sharing that is mainly enabled by powerful Desaris. The roles of Mangu Sisa, Sambari Kirsani, Sukra Badnayak, Budha Kirsani, Lachhima Badnayak, Somnath Sisa, Sama Muduli, Daitari Hantal, were incorporated with spiritual activities. Since each actor in the chain was interconnected, they also had an impact on one another (Silva, 2022, Singh et al., 2023). These Desaris network densities underline how crucial a role they play in preserving the IMK system. Greater impact and a wider community reach were indicated by larger connection densities, underscoring the significance of these people in the spread and safeguarding of knowledge. Given the entwined relationship between religion and medicines in these societies, many Desaris credit divine intervention for their knowledge and healing powers (Sahoo et al., 2024). This conviction not only raised their profile but also solidified the community's faith in their actions. People like Daitari Hantal showed how these community dynamics were changing by questioning conventional gender norms. Her acceptance and deference represented a slow movement in the direction of gender parity and inclusivity in the conservation of traditional knowledge.

The IMK networks in the Bonda community constitute a robust and flexible framework that blends conventional medicinal procedures with aspects of spirituality and culture. The well-known Desaris were vital to maintaining this knowledge's applicability and consistency, which strengthened and fortified the community. The Bonda tribe was committed to conserving their IMK holistically. They employ prohibitions, supernatural stories, and the Desari's involvement in decision-making and training, as well as secrecy in the transfer of knowledge. The durability and long-term viability of IMK practices were reinforced by the understanding of the community and the interaction between Desari and the next generation (Rana et al., 2020). By adopting a comprehensive strategy, the IMK can maintain its essential ideals and continue to play an important role in its historical legacy, even in the face of shifting situations. The chord diagram demonstrates how various tactics are interrelated. The Bonda community employs a robust system of conservation and adaptation strategies to preserve their IMK. Through spiritual narratives, community involvement, secrecy, and strategic knowledge transfer, they ensure that IMK remains a vital part of their cultural heritage (Khanyile & Dlamini, 2021). The chord diagram effectively illustrates the interconnections between these strategies, highlighting the comprehensive and integrated approach of the Bonda community in safeguarding their medicinal traditions.

CONCLUSION

From the present study, it can be concluded that there is a significance of safeguarding and maintaining indigenous people's traditional medicinal expertise, such as that of the Bonda tribe. This knowledge system is vital to the community's health and well-being as well as its cultural legacy, as evidenced by the complex web of connections and strong social networks that support it. We can improve the well-being of indigenous people and promote sustainable health practices by aiding in the preservation and sharing of this important knowledge. The study has demonstrated how dynamic they are without compromising their essential beliefs and customs. The knowledge gathered from this research can help in shaping the programs and policies that support sustainable development and safeguard indigenous knowledge.

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