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RESEARCH ARTICLE

Ethnographic exploration and documentation of Kannadippaya (Bamboo reed mat) weaving among tribal communities in Kerala

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Abstract: The weaving practices of traditional Kannadippaya (bamboo reed mat) among tribal communities in Kerala, India, are explored in this study. Data was collected between 2021 and 2023 with an ethnographic approach along with exploratory design, employing methods such as participant observation, in-depth interviews, focus group discussions, document analysis and visual ethnography. With the tradition being one not studied before; key informants were identified using the snowball sampling method. The research aims to document the traditional knowledge and techniques of weaving bamboo mats, the preferred bamboo species, and the socio-economic implications of the craft. The study investigates the current challenges faced by weavers, including resource depletion, economic constraints, and the waning interest of younger generations. It also analyses the role of government and non-governmental organizations in supporting this traditional craft. The findings underscore the cultural significance of Kannadippaya weaving and emphasize the urgent need for interventions to preserve and promote this intangible heritage

Keywords: Kannadippaya, bamboo mat weaving, traditional ecological knowledge (TEK), tribal communities

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Introduction

In Kerala, India, various tribal communities practice the centuries-old bamboo reed mat weaving craft, with Kannadippaya being a prominent style (Fig.1) (Raghu and Viswanath, 2021). This traditional craft fulfills practical needs and symbolizes the cultural and historical heritage of these communities. However, bamboo weaving encounters many challenges. Diminishing natural resources, economic pressures and a shift in the occupational preferences of younger generations remain the main ones.

The main objective of this study was to record and analyse the conventional techniques, traditional knowledge systems, and socio-economic circumstances related to bamboo reed mat weaving in the tribal settlements of the Idukki, Ernakulam, Thrissur, and Palakkad districts in Kerala. Using an ethnographic approach and exploratory design, the study aims to capture the intricate aspects of the craft, the bamboo species used and the market dynamics

Fig 1. Kannadippaya

linked to bamboo products. Furthermore, the study delves into the impact of interventions by governmental and non-governmental organizations on sustaining this traditional craft.

Materials & methods

Study Area

The study was conducted in selected tribal settlements of Kerala, focusing on areas where Kannadippaya weaving is practiced. The snowball sampling method was used to identify weaving communities in Idukki, Ernakulam, Thrissur, and Palakkad districts (Fig. 2).

Data Collection

Field visits and data collection were carried out from 2021 to 2023, and a total sample of 200 skilled weavers were identified using the methodology followed by Rao and Hajra (1987). Primary data were collected through interviews, observations, and focus group discussions with key informants selected through snowball sampling. The focus group discussions and in-depth observations helped to gain an understanding of the method of collection and processing of raw materials and weaving of kannadippaya. The interview schedule helped to identify bamboo species used for mat weaving, especially Kannadippaya, the characteristics of preferred species, harvest period, current weaving scenario, marketing options and challenges faced by weavers. Audiovisual documentation was used to capture the intangible skills of bamboo weaving. The study also investigated the measures taken by various government and non-government agencies in the bamboo sector.

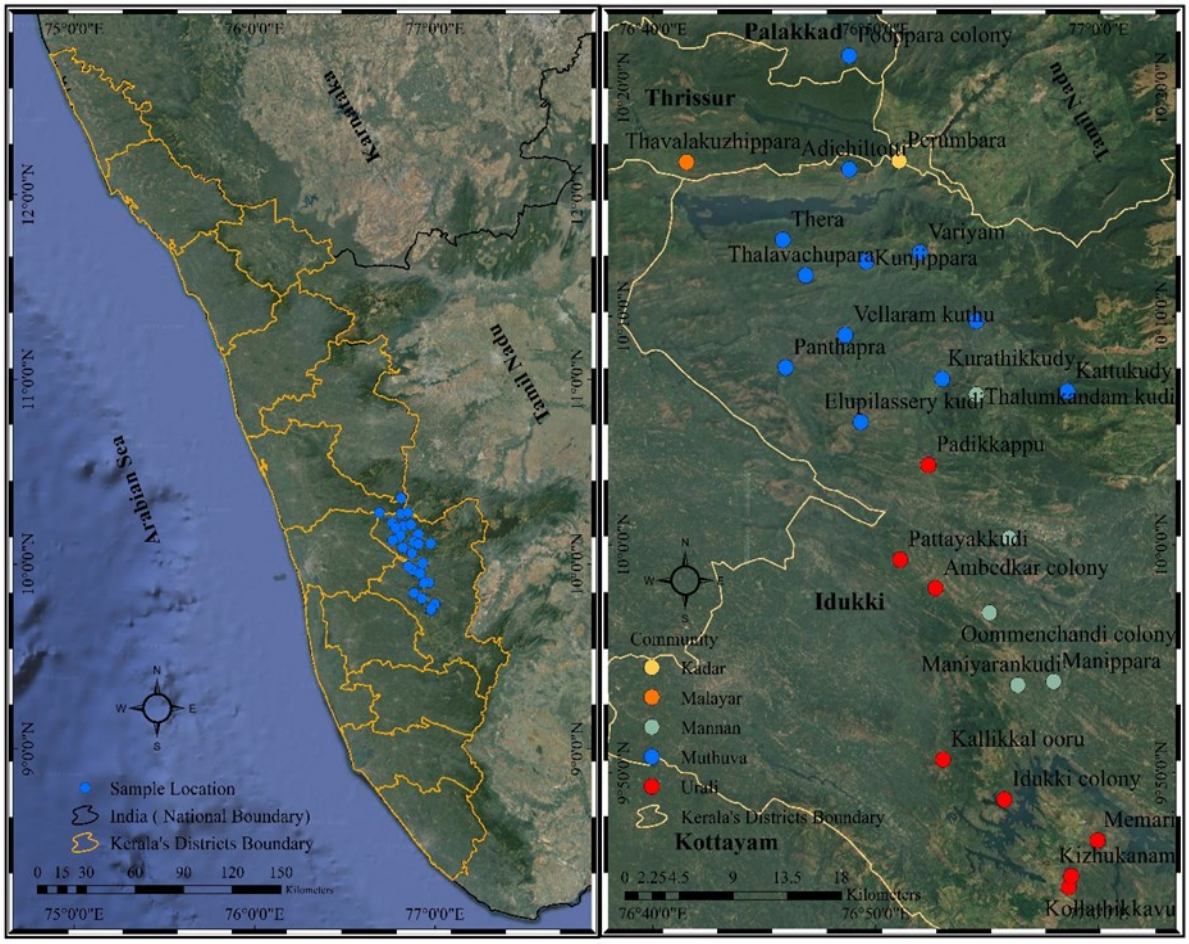

Fig 2. Area of production of Kannadippaya

Result and discussions

Communities

The craftsmanship of weaving Kannadippaya reflects the intricate skills of different indigenous communities. In this research tribal communities, *Muthuvan, Mannan, Urali, Malayar,* and *Kadars* from Palakkad, Ernakulam, Thrissur, and Idukki districts of Kerala were identified as the ethnic groups involved in weaving Kannadippaya (Table 1). Like other bamboo products, Kannadippaya is skillfully woven by these tribes for daily use. As per their belief, the *Mannan* King would present the royal family of Poonjar (a place in Idukki, Kerala, India) with valuable forest resources, including Kannadippaya, during his annual visit. Culturally, newly woven mats hold significance in every religious ritual within these communities. The mat is often used as a customary item to dispel malevolent spirits. It was also commonly given as a precious gift to brides during weddings. In certain communities like *Urali* and *Mannan*, the mat is specifically used as a sleeping mat while in certain races of *Muthuvan*, Kannadippaya is not used as a sleeping mat. It was often reserved as a designated sleeping mat for the King. The *Uralis*, believed that the art of weaving Kannadippaya helped to lessen severe punishments when singled out, as authorities were fascinated by the unique design and the flexibility of the mat which enabled it to be rolled and stored inside a reed culm.

Table 1. The details of Kannadippaya weavers in the State

District	Settlement	Village	Community	Number of skilled weavers identified	Age group of weavers	Gender
Idukki	Ambedkar colony	Kanjikkuzhy	Urali	5	70-90	Female
	Kallikkal ooru	Udumbannoor	Urali	10	60-70	Female
	Pattayakkudi	Vannappuram	Urali	10	60-70	Female
	Memari	Upputhara	Urali	2	60-71	Male & Female
	Kollathikkavu	Upputhara	Urali	5	60-70	Female
	Kizhukanam	Upputhara	Urali	5	60-70	Female
	Idukki colony	Idukki	Urali	6	60-70	Female
	Maniyarakudi	Idukki	Mannan	1	60-80	Female
	Perumkala	Idukki	Mannan	6	70-80	Female
	Oommanchandi Colony	Kanjikkuzhy	Mannan	4	60-80	Female
	Chinnaparakkudy	Mannakandam	Mannan	15	60-70	Female
	Thalumkandam kudi	Mankulam	Mannan	10	60-70	Female
	Kozhiyilakkudi	Mankulam	Muthuvan	5	60-70	Female
	Sevalkkudi	Mankulam	Muthuvan	10	40-80	Female
	Kurathikkudy	Mankulam	Muthuvan	15	30-80	Female
Thrissur	Adichiltotti	Athirappilly	Muthuvan	13	28-70	Female
	Thavalakuzhippara	Athirappilly	Muthuvan	4	70-80	Female
	Perumbara	Athirappilly	Kadar	3	65-80	Female
Ernakulum	Kunjippara	Kuttampuzha	Muthuvan	10	60-80	Female
	Thera	Kuttampuzha	Muthuvan	5	60-70	Female
	Thalavachupara	Kuttampuzha	Muthuvan	10	70-80	Female
	Vellaram kuthu	Kuttampuzha	Muthuvan	15	70-80	Female
	Panthapra	Kuttampuzha	Muthuvan	6	60-80	Female
	Variyam	Kuttampuzha	Muthuvan	10	70-80	Female
	Elupilassery kudi	Kuttampuzha	Muthuvan, Urali	10	60-80	Female
Palakkad	Pooppara	Muthalamada 1	Muthuva	5	70-80	Female

Bamboo Species

Species of reed bamboo (locally called *eetta/oora*) are commonly used for Kannadippaya weaving. The communities prefer reed bamboo, locally known as *njoonjileetta /njoojoora /meieeta,* as the premium raw material. This species was identified as *Teinostachyum wightii* Bedd. / *Schizostachyum beddomei* (C.E.C. Fisch.) R.B. Majumdar/ (Fig. 3) an arborescent bamboo reed growing along the slopes of the Western Ghats. *T. wightii,* is a straggling species that grows to its full potential with the support of neighboring trees and can grow up to a height of 15- 18 meters (Raghu and Viswanath, 2021). A long internode and a distinct white band below the node can be used to distinguish this species (Fig. 3). The culm sheath is covered with scattered, appressed black hairs. According to weavers, long internodes of this species give long slivers that are very thin and durable. However, the species is seen in deep interior forests often on slopes, and hence difficult to extract.

Kareetta, another reed bamboo widely used by communities, is identified as *Ochlandra travancorica* (Bedd.) Gamble (Fig.4). It is commonly available and easily accessible compared to *T. wightii* as it is nearer to settlements (Bourdillon, 1893; Gopakumar and Motwani, 2013; Pavithra and Jacob, 2018). The Kerala State Bamboo Corporation (KSBC) commonly uses this species to make mats and bamboo ply-boards. The species *O. travancorica* has a smaller internodal length and the presence of excessive hairs make it difficult to handle. Community members have reported difficulties in extracting and smoothing the slivers of this species, which is said to have a whitish shade and less flexibility.

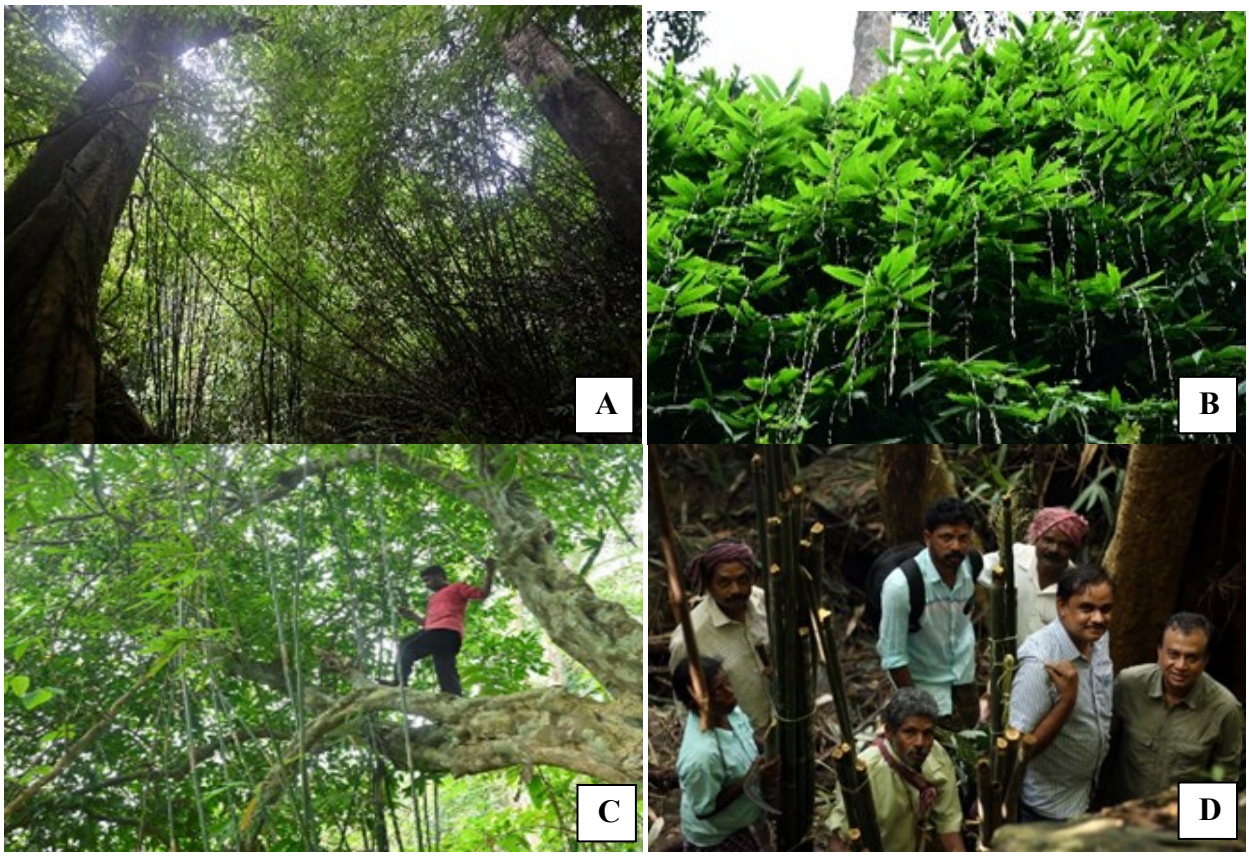

Fig 3. *Teinostachyum wightii* Bedd. Habit (A); Flowering (B); Collection of *T. wightii* (C,D)

Fig 4. *Ochlandra travancorica*. Habit (A); Hairy culm sheath (B)

Genera *Ochlandra* and *Teinostachyum* are thin-walled, reed-like bamboo belonging to the Melocanninae subtribe. The distribution of reed bamboo genera *Ochlandra* is restricted to South India, which is mainly used by traditional artisans for weaving (Koshy 2011; Sharma and Nirmala, 2015). In both species, flowering (which occurs at an interval of 25 -30 years) results in the complete death of both the aerial and underground parts (Kumar, 2011; Beena, 2011). Among the communities studied, *Muthuvan, Mannan*, and *Kadar* extensively use *Ochlandra travancorica* for Kannadippaya weaving. Although *T. wightii* is recognized as a potential raw material, the challenges of gregarious flowering followed by subsequent loss of resources and difficulties in resource collection force weavers to rely on the more readily available *O. travancorica* for Kannadippaya weaving.

Collection, Processing, and weaving

The women in the tribal communities are mainly engaged in Kannadippaya weaving. Communities still follow traditional methods to collect reeds for mat-making from the interior forest before the rainy season. The lunar cycle plays a crucial role in the bamboo collection. Most communities gather bamboo during the last days of the new moon phase and the initial days of the full moon phase. There is a belief that reed bamboo collected during the darker phases of lunar cycles is less susceptible to fungal and pest attacks. Though it was commonly believed that most raw materials are collected between August and March following year, interviews during the study period showed that the collection of raw material is a year-round process. The collection and transportation of reeds to households takes one to three days for species like *T. wightii* found in the deep forest. After collecting the reeds, they are left to dry for at least one week, depending on the season. The weavers then transform them into slivers and dry them again. Sometimes they store these dried slivers for extended periods. Traditional preservation techniques, such as boiling the slivers in water to leach out starch to enhance durability, were once common but no longer observed due to the hard labour involved. The weaving of mats is undertaken during the summer to minimize fungal attacks.

Fig 5. Splitting of culms (A); Slivering (B); Smoothening the slivers (C, D); Sun drying of slivers (E); Mat weaving (F)

It is important to use mature culms for weaving bamboo mats, especially Kannadippaya, to ensure flexibility and durability. Traditional methods like tapping with a knife (known as *vettukathi*), checking the presence of the culm sheath and observing the colour of the culm are practiced to determine the maturity of the bamboo. Six to eighteen-month-old culms are selected to ensure the flexibility of the mat. Culms above two years of age are avoided as they lose flexibility. Culms are cut down from the base and top and pulled out of the clump. Selecting reed bamboo of proper maturity, making slivers,

drying the slivers and weaving involves traditional know-how as well as the skill of artisans. Collected culms are dried and split vertically into four to five pieces with a sharp knife. The nodes are removed before making the slivers. Slivers are dried in the hot sun on the first day, followed by half-drying in mild sunlight. The same effect is achieved during the rainy season by placing the slivers above the fireplace. The long slivers ensure that they need not be joined for weaving. The collection of culms and the preparation of slivers require a blend of skills, accurate knowledge of the raw material and familiarity with the tools used, all of which are honed to perfection through consistent practice.

Only the fourth and fifth slivers, starting from the inner core, are used for weaving Kannadippaya. The unused slivers are used to make baskets, winnowing structures, and other handicraft items. Slivers may get blackened due to fungal attack if not processed within 2-3 days of collection. After traditional treatment methods, slivers are polished and smoothened by placing them over a piece of cloth and pulling them under a sharp knife (often a small one) (Fig. 5). The smoothness and thinness of the mat are enhanced by the traditional knowledge of smoothening slivers, which includes the special movements of fingers, application of various degrees of pressure and the art of balancing slivers in various positions. Skilled weavers, with their "practical knowledge" and "knowledge practice," ensure smooth and well-finished slivers that increase the beauty of the mat (Narayanan, 2023).

Dried slivers are sorted into two categories: *paya poli* (used to make mats) and *param poli* (used for baskets). The slivers are kept ready in advance to weave mats. Collecting reeds, processing, extracting slivers, polishing, and drying slivers may take one to two weeks and weaving a sleeping mat may take nearly one month. Weaving mats with small mirrors that are very fine in texture and design takes more days. Throughout the weaving process, the weaver has to sit on the floor to keep the warp and wefts under the feet, making it a physically laborious process.

The setting of warp (vertical sliver) and weft (horizontal sliver) begins from a corner and progresses diagonally. Each *kannadi* (square) woven on the mat has a central eye over which a square pattern develops. The square design starts with the warps and wefts is called '*chuvadorukkal'* which is translated to setting the initial steps or laying the foundation. The steps in this process vary with the design selected. To describe weaving of a common design, *Chuvadorukkal*, the first *kannadi* is made by setting 9 warps or vertical slivers (depending on the size of the mat, this number may vary) below the artisan's feet, pointing outward from the weaver. The first weft is carefully placed below the first three warps, then above next 3 warps, then below the remaining three warps. Second weft is then placed below the first two warps, then above the next three warps, then below the next three warps and then above the remaining one warp. Third weft is placed below the first warp, then above the next three warps, then below the next three warps and then above the remaining two warps. As the weaving progresses warps and wefts are differentially arranged to create one *kannadi* with the "eye" in the centre. Warps and wefts are deployed as described above, to form the eye or central point of the first square design for the mat. Vertical warps and horizontal wefts are interlaced in a particular way for weaving (Fig .6). The mats are made according to its use and the weavers take about one month to finish a Kannadippaya of sleeping mat size.

Discussion

The focus of this research is on the traditional skill of Kannadippaya-style bamboo mat weaving which is practiced by indigenous communities in Kerala. Despite a rich heritage, the number of proficient weavers has significantly decreased. In this study, we could identify fewer than 150 artisans specialized in the craft. The fragility and sustainability of the craft is emphasized by a diminishing group of weavers, mainly elderly women who encounter various obstacles, such as difficulties in sourcing raw materials and inadequate financial incentives. Weaving is often viewed as an extra source of income, leading to a minimal interest from the younger generation who prefer more stable and financial job opportunities in the private sector.

The traditional methods associated with bamboo mat weaving including bamboo collection, are on the verge of extinction. The slow death of the craft is mainly driven by the shift towards alternative professions, environmental challenges and increasing dependence on daily wage labour. The financial incentives for mat weaving are notably low, with skilled artisans receiving minimal prices for their labour-intensive products. While some community members have started using online platforms for sale, pricing is often controlled by middlemen which leads to further financial distress to the weavers.

Preserving the traditional knowledge related to mat weaving involves safeguarding the weaving practice and protecting rare and coveted species like *T. wightii*. Recently, there has been a considerably increasing focus from all over the world on traditional knowledge particularly those that could conserve biodiversity and manage natural resources (Sinthumule, 2023).

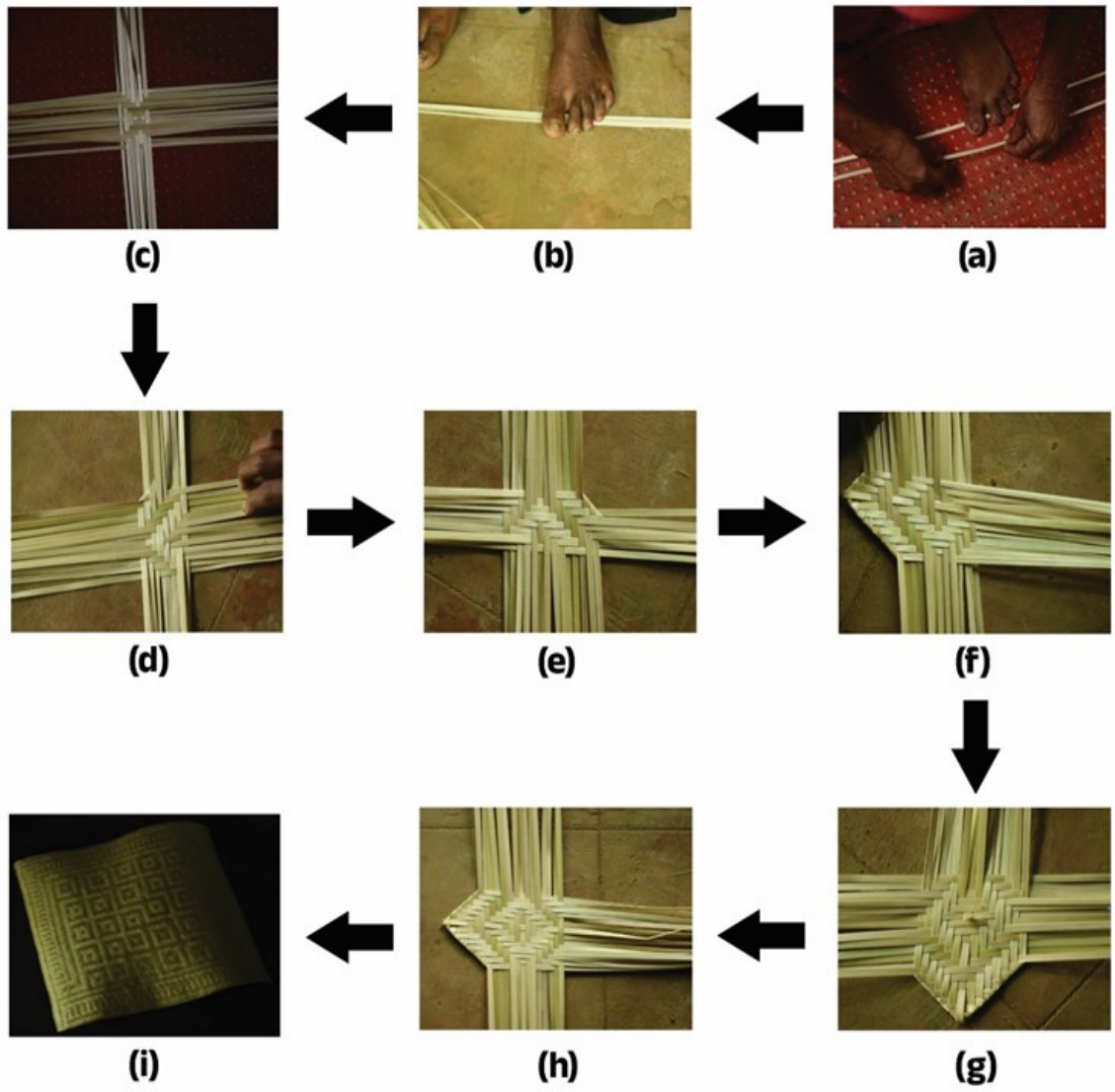

Fig 6. Steps in Kannadippaya weaving; setting up of slivers (A); steps in *Chuvadorukkal (B—H)*; final mat (I)

Culture and tradition have an intricate relationship and have been dwelt upon historically in social science research, particularly in social/cultural anthropology and various heritage studies. Environmental scientists who study environmental management, conservation, and restoration are also interested in traditional ecological knowledge (TEK) and indigenous and local knowledge systems. This is partly because policymakers and international institutions advocate for the integration of TEK into environmental work (Singleton *et al*., 2023). Concepts like "local environmental knowledge," "traditional ecological knowledge," and "indigenous and local knowledge" have become increasingly prevalent in environmental study, conservation, restoration and management (Johnson *et al.*, 2016; Berkes, 2018; Hill *et al*., 2020; Molnár and Babai, 2021). Since the 1990s, when the UN promoted the use of TEK in environmental research, policy and decision making, an increasing number of conservation biologists, ecologists, and environmental scientists have incorporated TEK into their work (Berkes, 2018; Buell *et al*., 2020). Examining traditional knowledge will significantly contribute to the preservation of culture and nature in a mutually beneficial manner. Such studies also offer solutions for conserving tradition, culture, and the environment in association with traditional knowledge (Chandrashekara *et al*., 2019).

In the light of challenging circumstances, the involvement of the local government and NGOs is crucial for the revival of the bamboo mat weaving tradition. Essential government initiatives, such as the establishment of craft instruction centers and support from government entities such as Kerala State Bamboo Corporation (KSBC), are vital for improving livelihood opportunities of the communities. It is important to strengthen the training provided by organizations like the National and State Bamboo Mission to equip artisans with relevant skills that can be applied to modern markets including e-markets.

Suggestions for follow-up:

1. Improved Training and Skill Development: Increased focus on skill development workshops tailored for traditional methods like Kannadippaya weaving and modern applications of bamboo crafting, ensuring that younger generations acquire these invaluable skills.

2. Financial Incentives and Support: Programs to provide financial support to weavers, including minimum price guarantees for products, to encourage more artisans to pursue weaving as a viable source of income.

3. Market Access and Fair-Trade Practices: Direct market linkages for artisans to sell their products should be established to reduce dependency on intermediaries. Encouraging the formation of co-operatives can empower weavers to negotiate better prices and retain a larger share of profits. Registration of Kannadippaya as GI will give better visibility and a greater market for Kannadippaya.

4. Sustainable Harvesting Practices and Regeneration: Guidelines for sustainable harvesting of bamboo reeds could be implemented to ensure the long-term viability of resources, thereby addressing environmental concerns and resource depletion. Mandatory replanting and proper care of seedlings in the flowered areas should be enforced to maintain raw material availability.

5. Promotion of Cultural Heritage: Exhibitions and fairs could promote bamboo mat weaving as a cultural heritage craft. This can enhance community pride and attract consumer attention, potentially increasing demand.

6. Investment in Technology: Access to modern tools and machinery can streamline the weaving process, improve production efficiency, and reduce labour intensity.

Conclusions

In this research, a comprehensive outline of the age-old practice of weaving traditional bamboo reed mats by tribal communities in Kerala is presented. The study emphasizes the intricate expertise and craftsmanship involved in Kannadippaya weaving, the socio-economic hardships encountered by the weavers, and the support extended to this craft by external organizations. Despite its cultural significance

and potential economic advantages, the future of bamboo weaving faces threats from several factors such as dwindling resources, financial limitations, and waning interest among younger generations. Preserving and promoting this intangible cultural heritage necessitates targeted interventions that tackle the challenges confronted by the weavers. This includes ensuring sustainable access to raw materials, strengthening market connections and providing training and assistance to young artisans. Acknowledging and appreciating the traditional knowledge and skills of these communities could pave the way for a sustainable and financially viable future for bamboo reed mat weaving; the Kannadippaya in particular.

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