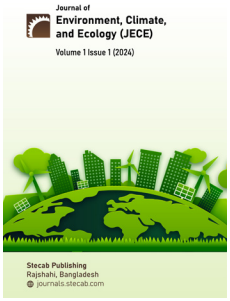

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Research Article

Forest Fibers for Traditional and Contemporary Weaving Practices

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About Article

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ABSTRACT

Non-timber forest products (NTFPs), particularly for weaving purposes, are abundant in Mansalay, Oriental Mindoro, Philippines. These resources have a significant impact on the economy and culture of the indigenous locals. This study assessed the forest fibers in the Panaytayan communities and local handicraft stores. The assessment covers the inventory and plant index of forest products, community directory, and SWOT analysis. The study was conducted through key informant interviews, community immersion, interviews with locals, observations, and documentation. The findings of the study revealed that the community possesses a wealth of natural resources like non-timber forest products (NTFPs), particularly buri fibers, which are readily available for weaving. Various community groups, both formal and informal, engage in the production and marketing of woven products, with initial steps taken towards introducing them to the international market. While local stores offer a diverse range of woven products, primarily handcrafted from local materials by community members, insufficient marketing efforts limit their sales potential. The compilation of assessments can help enhance the marketing efforts for woven products, strengthening the production and business skills of community artisans, and promoting sustainable harvesting and forest management practices. These interventions can be aligned with the livelihood community development efforts of concerned private and public agencies.

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1. INTRODUCTION

Non-timber forest Products (NTFPs) are increasingly recognized for their economic significance in the Philippines, highlighted by the notable rise in forest charges collected from these resources over recent decades. Such products are crucial not only for their economic value but also for their role in preserving cultural heritage. NTFPs, particularly those used as fibers in weaving, are integral to the fabric of community life, manifesting in various forms such as accessories, bags, mats, clothing, and even structural elements within homes. The Indigenous communities are known to be naturally skilled in weaving. It is a craft that has been passed down through generations, embodying tradition, skill, and heritage. Weaving often provides a source of income for local communities with abundant natural resources used in the weaving process. Especially in remote areas, traditional weaving is practiced. Traditional weaving is often passed down from ancestors and is part of their cultural heritage. Its process, materials, and designs are integral to their ancestral practices. However, traditional weaving is gradually disappearing due to modernization and development. This has led to changes in processes, tools, and even the materials used in weaving, giving rise to what is now known as contemporary weaving. Contemporary weaving may use synthetic fibers, which poses a threat to the survival of traditional weaving, which is a part of the culture of local communities.

In recent years, there has been a growing interest in supporting local artisans and preserving traditional crafts, leading to the establishment of community directories for weaved products. These directories serve as platforms to showcase the diverse range of woven goods created by skilled artisans, providing them with a means to reach a broader market and sustain their livelihoods (Wood, 2012; Tung, 2012). Various assessment studies on NTFPs have played significant importance such as inventory status awareness, market size and reaching sustainable practices, and policy inputs (Reta *et al.*, 2020; Borah *et al*, 2020; Lovrić *et al.*, 2020) Assessing the forest fibers can foster effective resource management by documenting the availability and distribution of plants used in weaving or crafts, thereby preventing overexploitation, and ensuring sustainable use. Also, it contributes to cultural preservation by documenting the plants and materials integral to indigenous practices, safeguarding traditional knowledge and cultural heritage. Providing a comprehensive database of local resources enables informed decision-making for sustainable livelihoods. Additionally, the inventory serves as a valuable resource for researchers and policymakers, facilitating studies on indigenous practices and the development of new products or policies for sustainable resource management. Lastly, it can enhance market access for communities, as buyers interested in culturally sourced materials may find such inventories useful for sourcing.

The Indigenous Peoples' Rights Act (IPRA) of 1997, also known as Republic Act No. 8371, is a landmark legislation in the Philippines that recognizes and protects the rights of Indigenous Cultural Communities/Indigenous Peoples (ICCs/IPs) over their ancestral domains and the resources found within them, including Non-Timber Forest Products (NTFPs). IPRA acknowledges the vital role NTFPs play in the cultural and economic well-being of ICCs/IPs. These resources can include medicinal plants, rattan, bamboo, honey, nuts, and fruits. The Act recognizes the right of ICCs/IPs to manage and utilize NTFPs from their ancestral domains in a sustainable manner. This includes developing their customary laws and regulations for NTFP harvesting and use, participating in decision-making processes related to NTFP management and conservation, and sharing benefits derived from the utilization of NTFPs. It's crucial to ensure continuous efforts towards effective implementation, strengthening ICCs/IPs' capacity to exercise their rights, and addressing ongoing challenges to fully realize the potential of IPRA in protecting their ancestral domains and ensuring sustainable use of NTFPs.

Relative to this, the town of Mansalay in Oriental Mindoro stands out for its rich abundance of NTFPs suitable for weaving, presenting an invaluable opportunity to explore these resources' potential further. This research aims to conduct a comprehensive assessment of the available weaving materials and their derived products, alongside developing a community directory that catalogs both raw materials and finished goods. Such an evaluation is pivotal for fostering informed, sustainable practices in using forest fibers, guiding community livelihood projects towards optimal use of specific fibers, and understanding the market dynamics of products made from these resources. Additionally, this study seeks to enrich the sparse literature on forest-based products, offering insights into their sustainable exploitation and contribution to local economies and cultural preservation.

By compiling information on Non-Timber Forest Products (NTFPs) and the communities utilizing these materials, future assistance from intermediaries or collaborators can be informed about the materials' availability, sources, and common uses within specific locations. This compilation serves as a reference for collaborators to co-create designs that leverage existing skills, traditional processing techniques, and visual narratives rooted in the heritage of partner communities. Such informed design processes can lead to the development of products that align more closely with the needs and cultural contexts of these communities, fostering sustainable practices and preserving indigenous knowledge and heritage.

2. LITERATURE REVIEW

The forest area in the Philippines spans approximately 7,665,000 hectares, which constitutes about 25.7% of the country's land area, according to FAO data (as cited from Mongabay.com, n.d.). This includes primary forests, planted forests, closed forests, open forests, and mangrove forests. While specific data on the percentage of forests containing non-timber forest products (NTFPs) is not readily available, it is known that NTFPs are found in various forest types, including closed forests, open forests, and mangrove forests, which collectively represent a significant portion of Philippine forests (Globalforestwatch.org).

Common NTFPs in the Philippines include anahaw palms, bamboo, and rattan, regulated by the Department of Environment and Natural Resources (DENR). According to the Non-Timber Forest Products - Exchange Programme (NTFP-

EP, 2020), NTFPs are categorized into five major groups: (1) Food, beverages, and spices; (2) Pharmaceutical, cosmetic, and medicinal products; (3) Industrial chemicals and biochemicals; (4) Fibers and structural materials; and (5) Animal-derived products. These categories cover a variety of products, such as fruits, nuts, vegetables, fish, game, medicinal plants, resins, essences, and various barks and fibers (UPLB, 2018).

NTFPs play a crucial role in the livelihoods of many Philippine communities, particularly through traditional and contemporary weaving practices. Bamboo, rattan, and various plant fibers are commonly used to weave a range of products, from baskets to clothing and other handicrafts. These materials are prized for their durability, flexibility, and cultural significance.

Indigenous Philippine baskets are typically made from materials such as rattan, abaca, nito, tikog, buri, bamboo, pandan, coconut leaves and sticks, palm leaves, and beeswax (Pazon & Rio, 2018). These baskets serve diverse functions, including carrying agricultural products, storage, ritual use, food and paraphernalia containers, and auxiliary household roles (Pazon & Rio, 2018). The weaving patterns, such as checker weave, twill weave, wicker weave, twine weave, and coiled weaves, vary depending on the materials, design, style, and purpose of the basket (Pazon & Rio, 2018).

Traditional weaving techniques, passed down through generations, remain prevalent in many rural communities. These techniques are often specific to certain ethnic groups or regions and are a significant part of the Philippines' cultural heritage. However, traditional weaving is in decline due to various factors, including the decreasing number of skilled weavers, the interruption in the transmission of craft skills, lack of interest from younger generations, limited raw materials, and insufficient capital and markets (Alauya, 2020).

Contemporary weaving practices may incorporate new designs, techniques, or materials but still rely on sustainably harvested NTFPs. The integration of traditional knowledge with modern design has enabled Philippine weaving to remain relevant and economically viable. New woven products that blend contemporary and traditional designs have been evaluated and found comparable to traditional designs in terms of color, design, workmanship, and product utility (Odiem *et al.*, 2012). These modified cloth designs can compete with traditional designs regarding color combinations, patterns, and craftsmanship (Odiem *et al.*, 2012).

3. METHODOLOGY

3.1. Research Design

A qualitative approach was utilized for the interview process, employing semi-structured interviews conducted in the field. While guide questions were utilized as prompts, the objective was to delve into participants' perceptions of plants, fibers, and fiber production within their communities. Key information was collected regarding their introduction to the use of Non-Timber Forest Products (NTFPs), their methods of sustaining their practices, and the type of assistance needed to develop their practices more sustainably.

3.2. Research Locale

The study extends its coverage to include six specific sitios located within Mansalay, Oriental Mindoro, as well as proprietors of locally owned handicraft stores situated in the town's central area as endorsed by the LGU-Tourism Office. These sitios were selected based on their relevance to the study's focus on non-timber forest products (NTFP) fibers and their utilization in local crafts and economic activities. By incorporating both the rural communities in the sitios and the urban-based handicraft store owners in the town proper, the research aims to provide a comprehensive overview of the entire value chain associated with NTFP fibers in the region.

2.3. Data Collection

This study was conducted over three months, specifically focusing on fieldwork and data collection. The initial phase, spanning from December 2023 to March 2024, was dedicated to remotely identifying communities within the selected regions of Panaytayan that have connections to specific non-timber forest products (NTFP) fibers. During this phase, the research team gathered information and stories from participants about the NTFP materials accessible to them, as well as how these materials are utilized for economic or social purposes.

The primary methodology for collecting data involved conducting both individual and group interviews on-site. Moreover, forest walks were organized when deemed appropriate, with local community members serving as guides. These walks allowed for a more in-depth understanding of the community's interaction with NTFP fibers. To ensure comprehensive documentation of the fieldwork, audio, video, and photographic recordings were made, always with the informed consent of all participants. This approach not only facilitated the collection of valuable data but also respected the rights and privacy of the individuals involved.

3.4. Data Analysis

In the data analysis phase of the research, the collected data were organized and analyzed to derive informative insights. This process involved the following key components:

3.4.1. Inventory of Raw Materials and Plant Index: According to Makkarennu & Desembri (2009), a smooth production process relies on enough raw materials. Without sufficient supplies, production can have a potential halt. It is significant to make an inventory of the raw materials as this is important to attain resource sustainability not just for the whole industry but most importantly for the whole community that relies upon its availability.

The data were tabulated to create a comprehensive inventory of the raw materials, specifically focusing on non-timber forest products (NTFP) fibers utilized by the communities. This inventory included detailed descriptions of each material, such as its source, characteristics, and availability. Alongside this, a plant index was developed, cataloging the various plant species from which the NTFP fibers were harvested. This index provided botanical information, including local names, scientific names, locations, photos, and descriptions under which each plant thrives, offering a valuable resource for understanding the biodiversity within the study areas.

3.4.2. Community Directory for Woven Forest Products: The research also compiled a directory of communities engaged

in weaving and other crafts utilizing forest products. This directory included information on the part of resource used, the dominant form of management, the scale of availability, finished products, the extent of use, and the extent of trade. It served as a tool for mapping the distribution of craft skills and practices across the region and identifying key hubs of artisanal activity. Determining the community directory gave the researcher a glimpse of the challenges that the stakeholders present in the trade and use of its finished woven products which can be a consideration for further study.

3.4.3. SWOT Analysis: According to Mondal (2017), a SWOT analysis is essentially a tool that examines both internal and external factors influencing a system. Internally, it assesses strengths and weaknesses, while externally, it considers opportunities and threats. A SWOT analysis was conducted to evaluate the current state and potential future of the utilization of NTFP fibers in the area. This analysis considered the internal factors, such as the communities' skills and the quality of the raw materials, and external factors, like market demand. The SWOT analysis aimed to identify strategies for sustainable development, pinpointing areas where support and intervention could promote the economic viability of NTFP-based crafts while ensuring environmental conservation.

4. RESULTS AND DISCUSSION

4.1. Area, Communities, and the People

Mansalay has production forests that are devoted mainly to the production of forest products and other services. These are forestlands, not classified as protection forests, which include agro-forests, timber production, and watershed areas (orminagri.com). The municipality has a land area of 44,662 hectares which constitutes 10.54% of Oriental Mindoro's total area. Panaytayan area covers almost 40,000 hectares of forest land. From 2000 to 2020, Mansalay gained 327 ha of tree cover region-wide equal to 23% of all tree cover gain in Oriental Mindoro (globalforestwatch.org).

In Panaytayan, the local community derives livelihood from weaving handicrafts using plants like emerald-green buri palms, towering bamboo, rustling pandan leaves, and vibrant anahaw mats. These plants not only contribute to the area's aesthetic beauty but also serve essential functions. These plants serve as a source of livelihood in the area, especially for the indigenous people, providing materials for weaving, construction, and handicrafts. The supple buri fibers and resilient bamboo provide shelter and tools, while rattan's toughness gives rise to functional handicrafts. Also, these plants help maintain the area's ecological balance, providing wildlife habitat and contributing to the region's overall biodiversity. The presence of these plants also enhances the beauty of the landscape, making the area more attractive to tourists and visitors.

The intertwining of nature and culture in Panaytayan creates a unique experience for tourists, showcasing the community's artistry and harmonious relationship with the environment. The Panaytayan communities are thriving in a combination of flatlands, hills, rivers, mountains, and forests. 10,000 to 15,000 hectares of Panaytayan are planted with various types of bamboo and naturally growing plants. Most of these are planted by the elderly indigenous people or Gurangon, while some are wild plants. These plants greatly help the locals and indigenous people, especially those in the business of bamboo handicrafts. They are also used in building houses, huts, fences, and many other things. Livelihood and income are generated from these abundant forest resources.

The Mangyans residing in the Panaytayan area are naturally skilled in weaving. Some of the main plants they use are bamboo, buri, pandan, anahaw, abaca, nito and others. They pass down this weaving knowledge from their ancestors, which plays a significant role in their culture. Almost all adult females are skilled in weaving. They have a unique weaving design using traditional tools, which sets their weaving process and products apart from others. This has great potential for their livelihood and sustainable livelihoods if given value and enriched. Some of the methods that can be seen are sharing training on weaving, studying modern designs that will appeal to the market without losing their cultural identity, and marketing their products correctly.

4.2. Plant Index

One of the main goals of this work is to create a compilation of the NTFPs found in studies that are used in craft production. Below is an index of the various plants identified during fieldwork. Each listed plant is presented in its common name, and locality-specific name, as well as short descriptions of its physical traits and uses when available.

Figure 1. Rattan

Figure 2. Hammock made of rattan(left) and looped rattan (right) used for a broom made of palm leaves midribs

Local name: Rattan/Yantok/Uway
Scientific name: *Calamus manillensis; Callamus microcarpus*
Location: Calibang, Ether, Tanawan, Sinugbuhan
Description: Rattan, yantok and uway can be interchangeably used locally. It is used to make cradles, bags, chair baskets, and more. When it is split with a knife, it is called rattan, and it becomes clean and usable as rope. It is also used as rope in building huts. It is a strong tool used by the natives. Rattan is used in strips that contribute to the structure of hard-body woven items such as baskets, hammocks, winnower, storage boxes, and plates (Nito). Despite being used as flat strips measuring around ~1-1.2 cm in width, their integrity is utilized in making basket bases and frames.

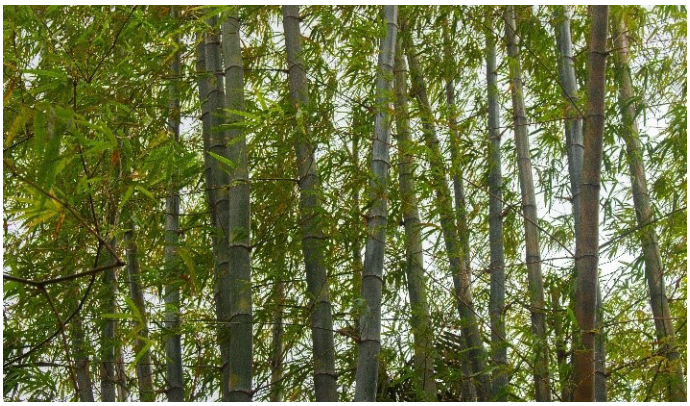

Figure 3. Kawayang Tinikan (Bamboo)

Local name: Bamboo (Kawayan) – Kawayang Tinikan
Scientific name: *Bambusa Blumeana*
Location: Calibang, Ether, Tanawan, Sinugbuhan, Galang
Description: Tinikan bamboo is known for its strong and durable culms (stems), which are smooth and relatively thin compared to other bamboo species. It has prominent nodes with sharp spines or "tinik" (hence the name), which give it a characteristic appearance. Due to its strength and durability, tinikan bamboo is used for various construction purposes, such as building houses, fences, and scaffolding. The culms of tinikan bamboo can be used to make furniture, such as chairs, tables, and cabinets. Tinikan bamboo is also used for making baskets, mats, and other woven products. The young shoots of tinikan bamboo, called "labong," are edible and can be cooked in various ways.
Local name: Bamboo (Kawayan) – Bagakay
Scientific name: *Schizostachyum lumampao*
Location: Calibang, Ether, Tanawan, Sinugbuhan

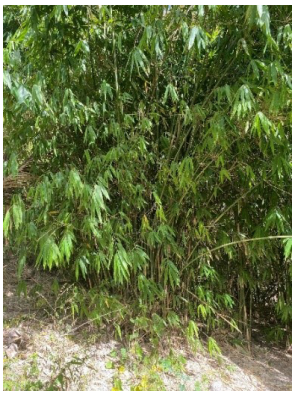

Figure 4. Bagakay (bamboo)

Figure 5. Bagakay used as a roof frame
Description: This type of bamboo is known for its strong and flexible culms, which can be used for various purposes such as construction, furniture making, and weaving. This is used in households and local businesses like in their restaurant ceilings, walls, and others. This is widely utilized in local business areas because of its durability and aesthetic feel when designed.

Figure 6. Anahaw

Figure 7. Anahaw leaves are used as the roof (left) and husks(right) as a strainer.

Figure 8. Fan (Pamaypay) made of young anahaw leaves captured from one of the handicraft stores in Mansalay

Local name: Anahaw
Scientific name: *Saribus rotundifolius*
Location: Calibang, Ether, Tanawan, Sinugbuhan
Description: Anahaw is mostly used in both households and for business purposes. Its leaves are used as roofs in community homes and businesses. The husks of anahaw are being dried up and are made into strainers. Local market-sourced products made from this multi-purpose plant such as a fan (pamaypay in local terms).

Figure 9. *Buri*'s palm.

Figure 10. Some of the products made of buri

Local Name: Buri/Buli
Scientific name: *Corypha utan Lam.*
Location: All areas
Description: This multi-purpose weaving raw material has been used ultimately since the old times. It is utilized both for household use and as their livelihood. According to locals, buri leaves can be boiled or sun-dried. Locally made woven products out of buri are buon-buon, a local term for a round storage box with a cover, wine holder, storage (tampipi) box, bags, hats, placemat, and bed mat (banig). Buri's leaves are mostly used as a weaving raw material while its body is used as the foundation for houses and other infrastructure due to its large size. Though the plantation of buri, both wild and propagated, is abundant in the area, its production is quite staggered and still in a traditional way due to a lack of weaving capacity equipment, and training.

Buri is a crucial material used by the Mangyan indigenous people, serving as a primary source of livelihood. Different parts of the Buri plant offer various benefits:

Ugbos: This refers to the unopened or unfurled shoots of the Buri plant. It is used to make bags, clips, pencil cases, baskets, mats, and other items.

Labong Buri: This translates to "unfurled Buri leaves." The strong fibers are used to create fish traps, while the leaves themselves are woven into mats.

Paklang Buri: The inner core of the Buri stalk is pounded and flattened to create a material like rattan, used for various purposes.

Puob Buri: The mature Buri trunk is allowed to decompose over several years. Once the internal part becomes soft and broken down, it is used as an organic fertilizer for vegetables.

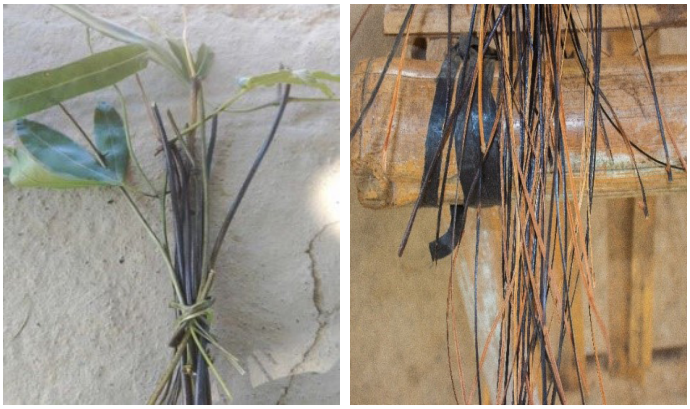

Figure 11. Raw Nito (left) and dried Nito (right)

Local Name: Nito
Scientific name: *Lygodium circinnatum*
Location: Sitio Galang
Description: Nito is like a cherry on top of woven products. It serves as a decorative piece as it adds to the attractiveness of finished woven materials made from other raw materials such as buri. Its finished products include bags, pencil cases, wallets, and baskets. Traditionally, locals used it in catching bats. Its roots are used for medicinal purposes as it is being boiled for and drank up. Local weavers used it as a material for weaving through sun-drying. They sank it in the water to easily bend the material.

Figure 12. Pandan plant and leaf.

Local Name: Pandan (Amak)
Scientific name: *Pandanus amaryllifolius*
Location: Sitio Galang, Tanawan
Description: Pandan refers to a type of tropical plant with long, blade-like leaves, commonly used in weaving. Its local term is Amak. It is widely managed in the area. As observed, wild pandans are limited in the area. It is used as a raw material in making woven materials such as baskets, mats, and bags like buri. But unlike buri, pandan is managed and is seldom found in Panaytayan.

Figure 13. Abaca

Local name: Abaca/Abaka
Scientific Name: *Musa textilis*
Location: Sitio Galang, Eter, Tanawan, Calibang
Description: The Abaca tree found here in Barangay Panaytayan is similar to the Banana tree, but it does not bear fruit as much. After its birth, its bunch dries up just a few weeks later. The undesirable portion of the abaca plant is removed from its tree to extract the valuable fibers. After separation, the fibers are hung and sun-dried swiftly. Once dried, they are transformed into ropes through a spinning process that cleans and tidies the abaca fibers. The resulting ropes can be utilized for various purposes such as tying or can be sold in the market. Additionally, the woven abaca fibers can be fashioned into bags, baskets, and other useful items. The only part of the abaca plant that is utilized is its fiber (from the body).
This index is a valuable resource for understanding local biodiversity and traditional crafting practices. The plant index of forest fibers highlights the significance of various species and is invaluable for compiling passive knowledge and understanding the cultural and practical relevance of plant fibers (Tardío & Pardo-de-Santayana, 2008).

4.3. Community Directory and Utilization as Woven Products

The below table shows the community directory for Non-Timber Forest Products (NTFPs) in Panaytayan. These include information about the various NTFPs found in a particular area, along with details about the communities that utilize these products.

Table 1. NTFP Community Directory and Utilization

Area	NTFP	Local Name	Part of the resource used	Dominant form of management	Scale of Availability	Finished Products	Extent of Use	Extent of Trade
Calibang	Bamboo	Kawayan -Tinikan -Patong -Bagakay	pole	W	l	Basket, bilao, sawali	pc	l
	Ratan/ yantok	Tayiktik	vine	W	m	Basket, pangtali (rope), hammock	pc	l
	Abaca	Abaca	body	M	m	Pangtali (rope)	p	l
	Palm Tree	Buri	Leaves pole	w	l	Basket, bags, wallet,	pc	l
	Vanilla Grass	Pandan	Leaves	w	l	baskets, mats, and bags	pc	l
Ether	Vanilla Grass	Pandan	leaves	m	s	baskets, mats, and bags	pc	l
	Palm Tree	Buri	leaves	m	s	baskets, mats, and bags	pc	l
Tanawan	Ratan/Yantok	Ratan	vine	w	s	Mattock, basket	pc	l
	Palm Tree	Buri	leaves	w	m	baskets, mats, and bags	pc	l
	Vanilla Grass	Pandan	Leaves	w	s	baskets, mats, and bags	pc	l
	Bamboo	Kawayan	pole	w	l	Basket, bilao, sawali	p	l
Sinugbuhan	Bamboo	Kawayan	stem	w	l	Basket, bilao, sawali	p	l
	Rantan/Yantok	Ratan	vine	w	s	Mattock, basket	pc	l
	Palm Tree	Buri	leaves	w	l	baskets, mats, and bags	pc	l
	Vanilla Grass	Pandan	Leaves	w	l	baskets, mats, and bags	pc	l
Sitio Galang	Palm Tree	Buri	Leaves stems	w	l	baskets, mats, and bags	pc	l
	Bamboo	Kawayan	stem	w	l	*Basket, bilao, sawali*	pc	l
	Ratan	Ratan	vine	w	s	Basket, mattock	pc	l

Sitio Galang	Anahaw	Anahaw	leaves	w	l	Pamaypay	pc	l
	Nito	Nito	stems	m	l	Bags, wallet, jewelry storage, bed mats, table mats	pc	i
Manaul	Palm Tree	Buri	leaves	m	l	Bags, wallet, jewelry storage, bed mats, table mats	pc	i
	Rattan	Ratan	vine	w	m	Mattock	pc	l

Legend:
Dominant form of management: W= wild; M= managed
Estimate Scale of Availability:
Large (l)= 50-100% yield in the area
Medium (m)=less than 50-20 % yield in the area
Small (s)= less than 20-10 % yield in the area
Extent of Use: Personal= p; Commercial= c; Combined= cp
Extent of Trade: Local=l; International= i

The table provides a comprehensive overview of Non-Timber Forest Products (NTFPs) from various areas, highlighting their uses, management practices, availability, and trade. These insights underline the importance of NTFPs in local economies and their roles in cultural and traditional practices.

The table includes a variety of NTFPs such as bamboo, rattan, abaca, palm tree (buri), vanilla grass (pandan), anahaw, and nito. These products come from different parts of plants (e.g., poles, vines, leaves) and are used to create a wide range of finished products like baskets, mats, ropes, bags, wallets, and decorations. NTFPs are predominantly harvested from the wild (W), reflecting traditional practices and the reliance on natural forests. Some resources, like abaca and palm tree in certain areas, are managed (M), indicating organized cultivation and possibly sustainable practices. The scale of availability varies significantly: (1) Large (L): Many NTFPs like bamboo and palm tree leaves are abundantly available in most areas, supporting consistent supply for various uses.; (2) Medium (M): Some NTFPs have moderate availability, like rattan and certain managed resources, and (3) Small (S): Certain resources, especially specific types of rattan and vanilla grass, are less available, which could affect their usage and market supply.

In terms of the finished products, NTFPs are utilized to produce a diverse array of goods such as baskets, mats, and bags are common products made from various NTFPs. Some NFTPs have specific uses which include ropes from abaca and decorative items from nito, demonstrating the versatility of these materials. Some non-timber forest products (NTFPs) are primarily for personal use, indicating their importance in daily life and local traditions. These products are integral to the cultural practices and subsistence needs of local communities, providing essential items for household use. The personal use of these products underscores their role in maintaining traditional lifestyles and practices that have been passed down through generations. Many NTFPs are used commercially, demonstrating their economic significance and contribution to livelihoods. The commercial use of these resources highlights their value in generating income and supporting local economies. By selling these products, communities can earn money that contributes to their financial stability and overall well-being. A mix of personal and commercial use is evident in several NTFPs, highlighting their dual importance in both subsistence and income generation. These products serve the dual purpose of meeting daily needs while also providing a source of income. This combined use emphasizes the versatility of NTFPs and their critical role in enhancing both the economic and social aspects of community life.

As to extent of trading, most NTFPs are traded locally, suggesting that they are integral to local markets and economies. The local trade of these products ensures that they remain accessible to the communities that rely on them, supporting local commerce and fostering economic resilience within these areas. The prevalence of local trade reflects the immediate demand and cultural relevance of these products within their regions of origin. Only a few NTFPs, such as palm tree products from Manaul, reach international markets, indicating potential for expanding trade and economic benefits. The international trade of these select products highlights opportunities for broader market reach and increased economic gain. Expanding the international trade of NTFPs can open up new revenue streams and elevate the economic status of the communities involved in their production, while also introducing unique and valuable products to a global audience.

These data underscore the critical role of NTFPs in supporting local economies, cultural practices, and livelihoods. The reliance on wild resources calls for sustainable management practices to ensure long-term availability. Managed resources, though fewer, show promise for sustainable cultivation and potentially higher yields.

4.4. SWOT Analysis of Woven Forest Fibers

The analysis of strengths, weaknesses, opportunities, and threats (SWOT) for the woven forest fiber products industry reveals a complex interplay of internal capabilities and external pressures that shape the potential for sustainable growth and development.

Table 2. SWOT Analysis for NTF Woven Products

Strengths	Weaknesses
• Unique and Sustainable Raw Materials: Abundant and readily available natural materials like buri, bamboo, and nito offer a unique and sustainable selling point. • Made-to-Order Production: Reduces inventory waste and ensures products meet specific customer needs. • Durable Products: Long lifespan (1-3 years) with proper care provides value for customers. • Strong Community Involvement: Majority of artisans participate in associations, fostering collaboration and knowledge sharing. • Growing Market Potential: International interest in buri and nito products presents expansion opportunities.	• Price Control by Buyers: Limited bargaining power leads to lower profits for artisans. • Low Perceived Valuation of the Customers to Price: Customers often think that their product since made from local materials has to be more affordable. • Limited Marketing Efforts: Some sellers lack effective strategies to reach wider audiences and showcase product value. • Uncertainty of demand: The demand for woven products are uncertain since it is order-based. The frequency of orders is not regular. • Limited Business Management Skills of Artisans: The artisans need improvement on pricing and costing, financial management, quality management, and marketing.
Opportunities	**Threats**
• Leverage Social Media Marketing: Utilize platforms like Facebook to showcase products, connect with customers, and drive demand. • Nurture Future Generations: Implement training programs for younger artisans to pass on traditional skills and ensure the craft's sustainability. • Forge Resort Industry Partnerships: Collaborate with resorts to use woven products for decorations, building structures (walls, ceilings), and accommodations (table runners, pillowcases). • Expand to International Markets: Explore export opportunities to reach a wider customer base and increase sales. • Diversify Product Range: Develop new product designs and functionalities to cater to diverse customer preferences and attract new clientele.	• Competition from Synthetic Products: Synthetic alternatives may be perceived as cheaper and more convenient. • Imported Woven Products: Foreign competition could saturate the market and reduce demand for local products. • Unsustainable Association Management: Failure to comply with legal requirements could jeopardize operations and growth. • Reluctance of Artisans to Join Associations: Limited participation weakens collective bargaining power and knowledge sharing. • Incapacity of meeting the demand: The artisans may take longer period for bulk orders thus some customers may decline on the possible delay for lead time.

The NTFP-based artisan industry boasts significant strengths, such as the use of unique and sustainable raw materials like buri, bamboo, and nito, which offer a compelling selling point. Made-to-order production ensures minimal inventory waste and meets specific customer needs, enhancing satisfaction and loyalty. Additionally, the durability of these products, which can last 1-3 years with proper care, provides excellent value for customers. Strong community involvement, with many artisans participating in associations, fosters collaboration, knowledge sharing, and enhances collective bargaining power.

However, the industry faces several weaknesses. Artisans have limited bargaining power, leading to lower profits, and customers often undervalue locally made products, expecting them to be more affordable. Marketing efforts are often inadequate, limiting the reach and visibility of these unique products. The demand for woven products is uncertain and order-based, leading to irregular sales and income. Additionally, artisans often lack business management skills in areas such as pricing, costing, financial management, quality management, and marketing.

There are numerous opportunities for growth. Leveraging social media platforms like Facebook can enhance product visibility and customer engagement. Training programs for younger artisans can ensure the sustainability and innovation of traditional crafts. Collaborations with the resort industry for decorative and functional products can open new markets. Expanding into international markets and diversifying the product range can attract a wider customer base and increase sales.

Despite these opportunities, the industry faces significant threats. Competition from synthetic products and imported woven goods can undermine local artisans' market share. Unsustainable association management and the reluctance of some artisans to join associations weaken collective efforts. Additionally, the inability to meet bulk order demands promptly can lead to customer dissatisfaction and lost sales, damaging the industry's reputation.

The NTFP-based artisan industry has a robust foundation of unique materials and strong community involvement, but it must address its weaknesses and threats to fully capitalize on its opportunities. By improving business skills, enhancing marketing strategies, and exploring new markets and partnerships, the industry can overcome its challenges and achieve sustainable growth.

5. CONCLUSION

The community is endowed with a substantial number of natural resources, notably buri fibers from non-timber forest products (NTFPs), which are well-suited for weaving. The practice of traditional weaving techniques remains prevalent among the weavers, where the entire process from the preparation of raw materials to the production is performed manually using tools crafted locally. In addition to individual artisans, various community groups, encompassing both formal and informal collectives, actively participate in the creation and marketing of woven goods. These groups have begun to venture into the international market, although at an initial stage. Despite the presence of local stores that showcase a wide array of woven items, predominantly made from indigenous materials by community members, the potential for sales is not fully realized due to the lack of adequate marketing initiatives.

With this, it is recommended to amplify marketing strategies for the woven products. This entails conducting extensive market research to pinpoint both domestic and international markets, forging networks, establishing brand identities, and producing marketing collateral to capture a broader audience. Agencies responsible for these interventions should also consider organizing knowledge transfer workshops and using storytelling to highlight the cultural significance of traditional weaving techniques as part of their marketing strategy. Additionally, there's a call for the reinforcement of production capabilities and the entrepreneurial skills of local artisans through targeted training in product design, quality assurance, pricing, and business management, with an emphasis on preserving the integrity of traditional weaving. To ensure the sustainability of resources, promoting practices for sustainable harvesting and forest management is vital. This could involve community-led initiatives and collaborations with government bodies or non-governmental organizations to advocate for responsible and sustainable utilization of Buri and other NTFPs. Future research may focus on production and utilization including potential for community sustainable income from the abundant Buri in the area.

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REFERENCES

Agri-Info Hub; AGRI-PROFILE: MANSALAY, ORIENTAL MINDORO. Link

Borah, D., Tangjang, S., Das, A. P., Upadhaya, A., & Mipun, P. (2020). Assessment of non-timber forest products (NTFPs) in Behali Reserve Forest, Assam, Northeast India. *Ethnobotany Research & Applications, 19*(43), 1-15.

Department of Environment and Natural Resources (DENR). (n.d.). *Forestry Utilization: Non-Timber Forest Products.* https://fmbdev.denr.gov.ph/FMB_POLICY/2021/10/27/220-forestry-utilization-non-timber-forest-products/

Global Forest Watch. (n.d.). *Philippines Deforestation Rates & Statistics.* https://www.globalforestwatch.org/dashboards/country/PHL/

Lovrić, M., Da Re, R., Vidale, E., Prokofieva, I., Wong, J., Pettenella, D., ... & Mavsar, R. (2020). Non-wood forest products in Europe–A quantitative overview. *Forest Policy and Economics, 116*, 102175.

Makkarennu, M. M., & Desembri, A. (). Raw Material Inventory System in a Rattan Small Scale Industry. *INDONESIAN WOOD RESEARCH SOCIETY, 254.*

Mondal, M. S. H. (2017). *SWOT analysis and strategies to develop sustainable tourism in Bangladesh.*

Mongabay.com. (n.d.). *Philippines Forest Information and Data.* https://worldrainforests.com/deforestation/2000/Philippines.htm

Non-Timber Forest Products - Exchange Programme (NTFP-EP). (2020). *Assessment of Policies on Non-Timber Forest Products.* https://ntfp.org/2020/10/country-study-philippines/

Pazon, A. N., & Rio, J. M. (2018). Materials, Functions and Weaving Patterns of Philippine Indigenous Baskets. *Asian journal of multidisciplinary studies, 1.*

Philippine Wood Producers Association. (2019). *Plans and Programs for the Philippine Wood Industry.* https://www.pwpa.org.ph/wp-content/uploads/2020/01/D1-03_DENR_Phil-Wood-Expo_ilq_Oct212019_final.pdf

Republic Act No. 8371. (1997, October 29). Official Gazette of the Republic of the Philippines. Link

Reta, Z., Adgo, Y., Girum, T., & Mekonnen, N. (2020). Assessment of the contribution of non-timber forest products in the socio-economic status of peoples in Eastern Ethiopia. *Open Access J Biogener Sci Res.*

Tardío, J., & Pardo-de-Santayana, M. (2008). Cultural Importance Indices: A Comparative Analysis Based on the Useful Wild Plants of Southern Cantabria (Northern Spain). *Economic Botany, 62*, 24–39.

Tung, F. (2012). Weaving with Rush: Exploring Craft-Design Collaborations in Revitalizing a Local Craft. *International Journal of Design, 6.*

University of the Philippines Los Baños (UPLB). (2018). *A forest's bounty besides timber.* https://uplb.edu.ph/all-news/a-forests-bounty-besides-timber/

Wood, S. (2012). *Sustaining crafts and livelihoods: Handmade in India.*