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CULTURAL BOTANY: A STUDY OF PLANT USAGE IN MANDAILING TRADITIONS IN KAMPUNG MANDAILING AYER TAWAR PERAK, MALAYSIA

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ABSTRACT

The Mandailing community, originally from North Sumatra, migrated to Malaysia in the early 19th century, settling in Negeri Sembilan, Perak, and Selangor. They have preserved their rich heritage while blending some traditions with Malay culture. Their way of life is deeply tied to nature, relying on local vegetation for sustenance, health, and rituals. Key crops like rice, coffee, and fruit trees are integral to their agricultural practices and cultural identity. This study highlights the connection between Mandailing culture and vegetation, promoting awareness of their heritage and sustainable practices. It explores the cultural significance and practical uses of plants in traditional practices, ceremonies, and landscape architecture. Using qualitative methods, the research includes interviews with three respondents representing the Mandailing culture in Ayer to provide visions into the traditional uses and symbolism of specific plants. Based on thematic analysis there are several plants used by the Mandailing community in Ayer Tawar such as i) Food (Solanum torvum), ii) Medicinal (Akar Kayu), iii) Industry (Oryza sativa), and iv) Cultural services (Carica posoposa). These plants demonstrate their reliance on natural resources and the deep-rooted connection to their environment. The findings emphasize a harmonious integration of culture, tradition, and sustainability, offering valuable lessons for preserving cultural identity through vegetation.

Keywords: *Mandailing, Vegetation, Cultural botany*

INTRODUCTION

Historically, the Mandailing peoples' culture can best be described as deeply rooted in nature, characterized by the presence of adat, Islam, and dependence on nature for peacefulness, sustenance, rituals and even good health (Lubis, 2005). Moreover, their traditional horticulture and medicine is based on the use of their local plants. These traditions not only reflect their deep connection to the land but also showcase the integration of cultural and environmental knowledge that has been carefully preserved over generations. Communal gatherings such as harvest or planting seasons strengthen ties among families, allowing traditional songs and dances to reinforce their collective identity (Nasution, 2018).

Based on the study by (Nasution, 2018), the Mandailing culture will hold ceremonial practices such as weddings, harvest festivals and Onang-onang[1] (Onang-onang is a form of oral poetry sung during the Mandailing's traditional dance as part of wedding ceremonies.) (Pulungan, 2020). These ceremonies often include symbolic use of natural elements offerings such as rice, fruits, and certain plants, reflecting the Mandailing people's close relationship with agriculture and nature (Nasution, 2018). Some of the plants' material mentioned by Ritonga (2019) are such papaya, watermelon.

However due to the modernization era, traditional Mandailing food is starting to experience a shift in popularity especially among the younger generations (Rahmawati 2021). Therefore, besides oral tradition, these knowledge of plant usage culture need to be exposed by digital innovation. (Mititelu et al., 2023). This will help to increase knowledge about Mandailing cuisine while implying the idea of cultural knowledge. Aligned with the goals of Lembaga Adat Mandailing Malaysia (LAMA), this study seeks to enhance awareness of Mandailing customs through scholarly research and to foster greater appreciation and awareness upon plant usage of these cultural traditions among the broader public. (Lembaga Adat Mandailing Malaysia, 1996).

LITERATURE REVIEW

Cultural Botany

Cultural botany is an interdisciplinary field that explores the relationship between people and plants (Narkhede, 2024). In recent years, the study of cultural botany has shifted toward understanding the dynamic relationships between human societies and plant species (Davis & Choisy, 2024). For example, a study on Egyptian endemic plants identified specific indices such as relative importance, and cultural value, which quantify how communities prioritize the plants (Shaltout et al., 2023).

Cultural botany makes major contributions to a variety of fields, including food security, cultural services, industrial economies, and medicine. Plants are crucial in the food industry, providing necessary nutrients and serving as the foundation for agricultural systems that support human populations (Ryan, 2011). In the realm of food, plants are fundamental, providing essential nutrition and forming the basis of agricultural systems that sustain human populations. Culturally, plants are integral to traditions and rituals, exemplified by practices like the "Chhath Puja" festival in India, Nepal, and Mauritius, where specific fruit species are maintained for ceremonial use.

Industrial plants are also pivotal in supplying raw materials like timber, paper, and textiles, which support various economic activities. For instance, Finland's forest industry processes raw materials into sawn wood and paper products, contributing significantly to its economy (Mäkinen et al., 2014) Plants have also been and continue to be key sources of cures and pharmaceuticals, with traditional medicinal plants playing an important part in global healthcare systems (Sofowora et al., 2013). This symbiotic relationship has evolved over millennia, with humans relying on plants for survival and cultural development (Halder et al., 2021).

The erosion of traditional practices can lead to the loss of culturally significant species, undermining both cultural identity and ecosystem health. Traditional plant-related practices are gradually disappearing due to these difficulties in effectively preserving cultural botany (Aziz et al., 2017). As a

result, digital platforms have emerged as critical tools for addressing threats to cultural botany through the preservation and dissemination of traditional botanical knowledge. Despite the advancements in digital platforms, the majority of them do not incorporate cultural aspects into plant morphology. (Anderson et al., 2011)

Mandailing Community

The Mandailing community is known as an ascendant of the northern region of Sumatra, Indonesia. They have a colourful culture which has been nurtured and inherited through generations. According to (Tanjung et al., 2016), the Mandailing people and other sub-ethnic Batak communities are descended from a common progenitor named Batak. Furthermore, many Mandailing people are of Minangkabau heritage from Pagaruyung in the Minangkabau highlands, including the Nasution clan (Sahrul et al., 2024).

The Padri War in the year 1803-1845 in West Sumatra resulted in a massive migration of Mandailing people to the Malay Peninsula. Leaders such as Raja Asal and his nephew, Raja Bilah, led expeditions to Malaysia's Lower Perak and Kinta Valley. The British colonial authorities acknowledged their leadership and appointed Raja Bilah as Penghulu of Blanja (Khoo & Sabin, 2023). This ethnic group started mass migration processes to Malaysia in the early 19th century, in which they occupied mainly Perak, Selangor and Negeri Sembilan. In Perak, the Mandailing community established settlements in Papan where they built a village near the town center, complete with a large gathering house called 'Rumah Besar'[2](Rumah Besar was more akin to a council chamber. Particularly after Friday prayers, it served as a meeting place for the Mandailings and other Muslims who would visit Raja Bilah with their issues and suggestions) (Khoo & Lubis, 2005).

The Mandailing community is often described as a hardworking agricultural society with indigenous traditions and community governance. Lukas Pawera et al., (2020) describe ethnobotanical activities among the Minangkabau and Mandailing ethnic groups of West Sumatra, Indonesia. Among the Mandailing people, farming becomes dominant since it is embedded and practiced on the landscape of the land, which is dominated by rice paddy and other plants that are cultivated (Sahrul et al., 2024).

Mandailing cuisine, originating from the Mandailing people of North Sumatra, Indonesia, is deeply rooted in Indonesian culinary traditions. The use of local plants, such as cassava leaves in dishes like daun ubi tumbuk, highlights the indigenous ingredients prevalent in the region. While there are cultural exchanges between Indonesia and Malaysia, the core elements of Mandailing cuisine are distinctly Indonesian. (Emilia et al., 2024).

RESEARCH METHODOLOGY

Site Selection

The Mandailing primarily settled in areas i) Kampung Mengelembu, ii) Batu Gajah, iii) Teluk Intan, iv) Kinta, v) Kampung Mandailing Ayer Tawar and, vi) Papan in Perak in the year 1900 (Lubis, 2005).

Figure 1.0. Site Plan of Batu 16, Ayer Tawar
Source: Google Earth 2024

However, from the visits to these sites, Batu 16 Kampung Mandailing Ayer Tawar has been selected because of the present Mandailing community makes up about 80% of the local community (Kushairi Siregar, 2024). The other sites such as i) Kampung Mengelembu, ii) Batu Gajah, iii) Teluk Intan, iv) Kinta, and v) Papan indicate signs of migrations where local traces of Mandailing culture subside in those areas.

Population Study

According to the Department of Statistics Malaysia (DOSM) in 2023, Ayer Tawar consists of 3,050 people with the majority of them being Chinese who work in the agriculture and plantations industry. However, as stated by Ketua Kampung (head of village) there are less than 500 residents living in Batu 16 Kg Ayer Tawar and 80% of them are from the Mandailing community which majority of them are elderly aged 50 years and older. The youngsters in Ayer Tawar mostly migrated for better job opportunities and career growth.

Respondents

From the 500 Mandailing residents in Batu 16 Ayer Tawar, only three (3) were involved in this research due to the consent from Ketua Kampung as the head of the village. However, to ensure the data collection variable and not biased, three respondents were selected from the same generational tree with different age backgrounds and occupations to provide insights into their cultural practices and plant usage. Respondent 1 (R1) is Ketua Kampung aged fifty-seven (57) years old. Meanwhile, respondent 2 (R2) is a housewife aged thirty-eight (38) years old. Lastly respondent 3 (R3), an IT Assistant aged twenty-five (25) years old.

Sample Size

In qualitative research, especially within cultural studies, smaller sample sizes are often justified by the depth and richness of the data collected (Vasileiou et al., 2018). Despite having a small sample size for this research, the concept of 'information power' suggests that the more relevant information a sample holds, the fewer participants are needed (Wutich et al., 2024). This is particularly pertinent when the study's aim is narrow, the sample is specific, and the quality of dialogue is strong, as in the case of the Mandailing community in Ayer Tawar. The selection process is guided by the Ketua Kampung and employs the snowball sampling method, ensuring that the respondents were highly knowledgeable and actively engaged in Mandailing traditions and practices. The snowball sampling approach provides a focused yet diverse range of perspectives as stated by Lowe et al. (2018), enhancing the study's ability to capture detailed insights into the cultural and environmental dynamics of the community.

Research Instruments

The research employs two primary instruments which are interviews and observations. Interviews are conducted with three (3) residents of the Mandailing community in Batu 16 Kampung Ayer Tawar, to gather qualitative insights into the cultural significance of vegetation in traditional ceremonies. The interview questions consist of demographic information, cultural plant usage, and environmental and agricultural practices.

Demographic information focused on the respondents' backgrounds, including age, gender, occupation, and family structure, to contextualize their responses within their social and cultural framework. For cultural plant usage, this section explores the traditional and symbolic use of plants within the Mandailing community, including their roles in rituals, ceremonies, and daily practices. Third, environmental and agricultural practices addressed the integration of local vegetation in farming and sustainability practices, reflecting the community's connection to their environment and natural resources.

Before conducting the interviews, respondents are asked to provide their informed consent through the Participant Information Sheet to ensure their participation is voluntary and aligns with the core principles of research ethics (University of Oxford, 2022). This process also allows respondents ample time to reflect on the information provided, ensuring they have the freedom to participate.

An iPhone 13 equipped with the "Voice Memos" application is utilized to record the conversations. These audio recordings are subsequently transcribed and analyzed using ATLAS.ti software, enabling a thematic analysis to identify recurring patterns and cultural themes. Additionally, a site survey was conducted at Batu 16, Kampung Ayer Tawar, to observe and document the vegetation used within the house compound. A structured checklist is developed to catalog the identified plants, which are then categorized based on their thematic usage, such as industrial, medicinal, economic, ornamental, or ceremonial importance.

Research Procedures

This study already undergoes research ethics approval two (2) months before the date of data collection. The primary data for this research was collected through field interviews conducted over weekends dated 22nd November 2024 (Saturday) and 23rd November 2024 (Sunday) to ensure the maximum availability of local respondents. Viable respondents were finally found at Masjid Al-Falah, a key community hub in Batu 16 (refer Figure 2a). The Ketua Kampung played a pivotal role in connecting the research team to other respondents who were subsequently interviewed. The interview sessions were done at the resident's compound of Ketua Kampung (refer Figure 2b).

Figure 2.0. Interview Session with Respondents

a)Masjid Al-Falah b) Resident compound c) Researcher with R1 d) Researcher with R2

Source: Author

DATA ANALYSIS

For qualitative research focusing on interviews about cultural practices, Atlas.ti is more appropriate than SPSS as ATLAS.ti allows to manage and analyze large amounts of unstructured data, such as interview transcripts, audio recordings, and notes. It is excellent for identifying patterns, relationships, and themes in qualitative data. This aligns with this study's focus on cultural practices and traditions, which require nuanced and in-depth exploration (Ñañez-Silva et al., 2024).

ATLAS.ti also provides tools like network views and word clouds to visualize connections between concepts, which can help in presenting the findings effectively. Since the data will be collected via an audio recorder, ATLAS.ti allows recordings to be linked directly to the codes or segments of text. By using this software, the analysis maintained a structured and rigorous approach, allowing for the identification of meaningful insights while preserving the richness of qualitative data (Soratto et al., 2019).

ANALYSIS AND DISCUSSION

Based on the transcript derived from respondents, thematic analyses can be derived. This thematic analysis categorizes the usage of plants into four (4) categories which are i) food, ii) cultural services, iii) medicinal, and iv) industrial. These four (4) categories also support the role of generational knowledge in sustaining plant-based practices, which face gradual decline. Data from respondents R1, R2, and R3 were analyzed using ATLAS.ti to identify overlapping themes and patterns, (refer to Figure 3.0).

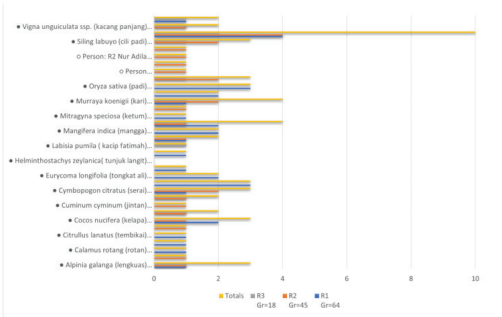
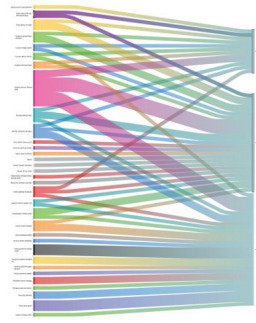


Chart 1.0 Frequency of Plant Species



b) Figure 3.0 Pattern Analysis

Source: Author

From Figure 3.0, data was analyzed using thematic analysis to ensure systematic identification and organization of patterns from all three (3) respondents. Furthermore, this method allowed for the generation of meaningful codes that facilitated the clustering of related ideas into broader themes (Ñañez-Silva et al., 2024).

Table 1.0. Plant Usage at Batu 16, Kg Mandailing Ayer Tawar

No.	Plant Species	R1	R2	R3	Food	Cultural	Medicine	Industrial
1	Allium cepa (bawang merah)	/	/		spices			
2	Alpinia galanga (lengkuas)	/	/		spices			
3	Calamus rotang (rotan)	/					antioxidant	craft
4	Carica posoposa (betik)	/				timbang berat		
5	Citrullus lanatus (tembikai)	/				timbang berat		
6	Citrus hystrix (limau purut)			/	spices			
7	Cocos nucifera (kelapa)	/			fruits	timbang berat		crops

8	Cucumis sativus (timun)		/	/	ulam			
9	Cuminum cyminum (jintan)		/	/	spices			
10	Curcuma longa (kunyit)		/	/	spices			
11	Cymbopogon citratus (serai)	/	/		spices			
12	Durio zibethinus (Durian)	/			fruits	timbang berat		agriculture
13	Elaeis guineensis (kelapa sawit)	/						crops
14	Eurycoma longifolia (tongkat ali)	/					vitality	herb
15	Garcinia atroviridis (asam gelugor)	/			spices			
16	Helminthostachys zeylanica(tunjuk langit)	/					hypertension	
17	Hevea brasiliensis (getah)	/						crops
18	Labisia pumila (kacip fatimah)		/				reproductive	
19	Lawsonia inermis (pokok inai)	/	/			weddings	keratin	
20	Mangifera indica (mangga)	/			fruits	timbang berat		
21	Baccaurea motleyana (rambai)		/			weddings		
22	Manihot utilissima (ubi kayu)	/		/	dish			
23	Mitragyna speciosa (ketum)	/		/			energy	
24	Morus nigra (mulberry)		/		ulam			
25	Murraya koenigii (kari)	/	/		spices			
26	Musa spp. (Banana)	/			fruits	timbang berat		
27	Oryza sativa (padi)	/			staple food	timbang berat		crops
28	Pandanus amaryllifolius (pandan)		/		spices			
29	Psophocarpus tetragonolobus (kacang botol)		/		ulam			
30	Siling labuyo (cili padi)		/	/	spices			fertigation
31	Solanum torvum (Terung pipit)	/	/	/	dish			
32	Vigna unguiculata ssp. (kacang panjang)		/	/	ulam			
33	Zingiber officinale (halia)	/		/	spices		gut health	
34	Akar kayu[3]	/	/		drinks		diabetes	

Source: Author

[3]Akar kayu is mentioned by R2 however, R2 cannot specify which species akar kayu is used for herbal drinks.

From the table, there are a total of thirty-four (34) plant species identified with Solanum torvum (Terung pipit) being mentioned by all respondents as a key ingredient in traditional dishes like Masak Lemak and is commonly grown in the wild. (refer Table 1.0)

Plant Usage in Food & Culinary Analysis

According to Table 1.0, data gained during the interview highlights (11) plant species that are used for culinary. Solanum torvum (Terung pipit) being the most frequent mentioned at 10 score (refer Chart 1.0). Meanwhile, Manihot utilissima (ubi kayu) highlighted by R1 and R2 usually used in Pucuk Ubi Tumbuk.

Figure 3.0. Plant Usage in Mandailing Cuisine at Kg Ayer Tawar

Source: Author

Notes: From the left. psophocarpus tetragonolobus (kacang botol), Solanum torvum (terung pipit), Zingiber officinale (halia), Siling labuyo (cili padi), and Cymbopogon citratus (serai).

There are about nine (9) spices are used as staples for Ayam Kerabu[4] ([4] "Ayam Kerabu" is one of the traditional dish that are commonly made in Batu [16], Kampung Mandailing Ayer Tawar.) and curries dishes. According to R2 and R3, fresh vegetable such as Cucumis sativus (timun), Morus nigra (mulberry leaves), Psophocarpus tetragonolobus (kacang botol), and Vigna unguiculata ssp. (kacang panjang) are commonly used as sidedish or "ulam" (refer Figure 4.0).

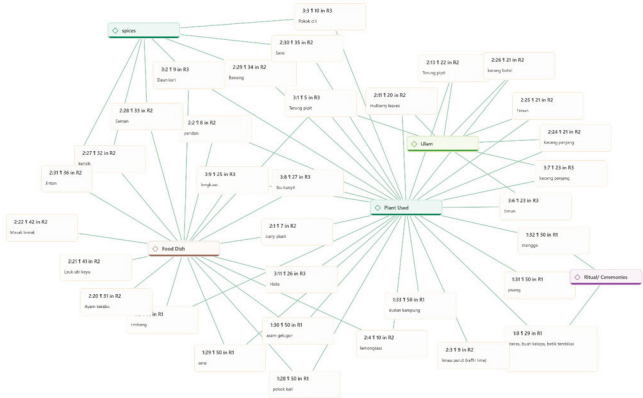


Figure 4.0. ATLAS.ti Network Culinary Analysis

Source: Author

Plant Usage in Medical Analysis

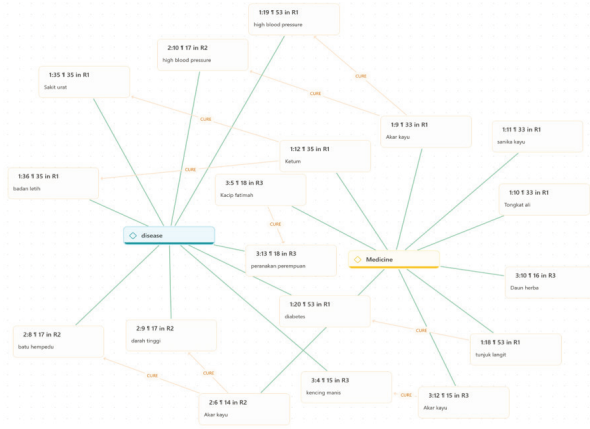


Figure 5.0. ATLAS.ti Network Medicinal Analysis

Second thematic analysis is focusing on medicinal benefits derived from plants. Based on Figure 5.0, the Mandailing community revolves around plant-based remedies, reflecting the community's reliance on natural resources for health and well-being. Respondent 1 stated in Quotation 1:9 where Akar Kayu aid in reducing high blood pressure while R2, Quotation 2:8 stated Akar kayu helps with gallstone disease as well hypertension. R1 has identified Eurycoma longifolia (tongkat ali) as evident in Quotation 1:10 as a rare yet effective energy and vitality treatment. R1 also brought up Helminthostachys zeylanica (tunjuk langit) which is utilized to treat diabetes and hypertension as evident in Quotation 1:18. Next, Mitragyna speciosa (ketum) is observed to aid in energy enhance as evidendent by Respondent 1, Quotation 1:36. Labisia pumila (kacip fatimah) is quoted by Respondent 3 to become the cure for female production (Quotation 3:5).

Plant Usage in Ceremonial Analysis

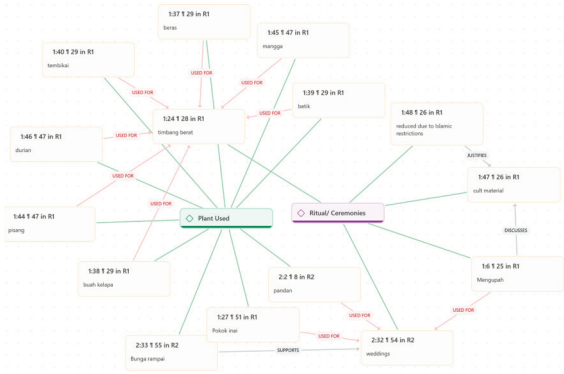


Figure 6.0. ATLAS.ti Network Ceremonial Analysis

Source: Author

Plants have symbolic value in Mandailing cultural celebrations, particularly marriages and healing rites. Referring to Figure 6.0, there are two (2) notable cultural ceremonies which are timbang berat[5](Timbang berat is believed to be a ceremonial performed when children become ill; the weight of the fruit is supposed to be equal to the children's weight. This ritual serves as a last resort for children who are afflicted with an incurable illness.) and mengupah[6](Mengupah is typically performed at weddings to provide advice to spouses. The fruits are used as an offering during the ceremonies). For timbang berat ceremony, there are seven (7) type of plant used which listed by Respondent 1 which are i) Carica posoposa (betik), ii) Citrullus lanatus (tembikai), iii) Cocos nucifera (kelapa), iv) Durio zibethinus (Durian), v) Mangifera indica (mangga), vi) Musa spp. (Banana), vii) Oryza sativa (padi). R1's mention of timbang berat highlights the spiritual connection between plants and healing, though this ritual is now rare.

For the wedding ceremony and mengupah tradition, R2 emphasized that Pandanus amaryllifolius (pandan) and Baccaurea motleyana (rambai) are used. Meanwhile Lawsonia inermis (pokok inai) is evident by Respondent 1 (1:27) to be used for henna. However due to the influence of broader Islamic customs, as noted by R1(Quotation 1:48), timbang berat and mengupah are reduced adherence to Mandailing-specific ceremonies.

Plant Usage in Industrial Analysis

Commercial farming, particularly chili and oil palm tree reflects the community's economic adaptation. However, R1 notes the environmental impact of kelapa sawit, particularly in diverting water resources, which has affected paddy farming. Aesthetic uses, such as pokok inai, maintain cultural relevance but are limited to specific ceremonies. R2 brought up Cili Fertigasi, which is grown commercially for financial benefit. R1 highlights Kelapa Sawit (Oil Palm), a significant commercial crop that is displacing traditional rice farming. R1 brought up Pisang (banana) and Durian Kampung (Village Durian), which are produced for local and economic consumption.

CONCLUSION

The analysis of plant usage in the Ayer Tawar Mandailing community reveals deep cultural, medicinal, and economic connections to nature. Culinary traditions, herbal remedies, and ceremonial practices demonstrate the community's reliance on plants for sustenance and identity. By fostering education and awareness, the Mandailing community can preserve its rich cultural heritage for future generations (Lowe et al. 2018).

The findings reveal that plants serve as more than just resources; they are integral to the identity and continuity of the Mandailing cultural heritage. Key species such as Solanum torvum (Terung pipit), Manihot utilissima (ubi kayu), Murraya koenigii (kari), and medicinal roots illustrate the multifaceted roles of vegetation in everyday life and rituals. However, the challenges posed by modernization, declining generational knowledge, and environmental changes threaten the preservation of this rich heritage.

To counter these challenges, fostering cultural awareness and promoting the documentation of traditional knowledge is essential. Integrating digital tools and community-based initiatives can bridge generational gaps, ensuring the survival of traditional practices for the Mandailing community in Malaysia. Moreover, sustainable agricultural practices and conservation efforts must be prioritized to protect the biodiversity that highlights the Mandailing way of life . By shedding light on the Mandailing community's

traditions, this work contributes to a broader understanding of how cultural and environmental sustainability can coexist, offering valuable insights for landscape architecture and cultural preservation initiatives.

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