

Local uses and traditional knowledge of *nibung* (*Oncosperma tigillarium*) in Riau Province, Indonesia

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Abstract. Desti D, Mastuti R, Azrianingsih R, Arumingtyas EL. 2024. Local uses and traditional knowledge of *nibung* (*Oncosperma tigillarium* Jack. Ridl.) in Riau Province, Indonesia. *Biodiversitas* 25: 2043-2050. *Nibung* (*Oncosperma tigillarium* Jack. Ridl.), the symbolic plant of Riau Province, serves as its mascot flora. This research analyzes the local uses and traditional knowledge of *nibung* in both coastal and non-coastal areas of Riau, Indonesia. Ethnobotanical information regarding *nibung* was gathered from local communities through interviews, conducted with a structured questionnaire, supplemented by field observations and discussions with community members. Respondents were chosen using purposive and snowball sampling methods. It found that more than five types of utilization of *nibung* practiced by the local community, consisting of constructions, tools and utensils, medicinal purposes, as a source of vegetables or additional food, and for flavoring some dishes. In this case, stem is the highest part of *nibung*, which was used by the local people. In the coastal areas show a higher utilization of *nibung* compared to the non-coastal areas. Respondents show an understanding of the cultural and socio-economic importance of *nibung*, reflecting local wisdom in its utilization. They selectively harvest mature plants, leaving saplings to grow and thrive, only take a mature one, and leave the saplings to grow. Before cutting down *nibung* trees, they carefully choose the mature ones, and avoid cutting down those without shoots in a clump. In this investigation, the local wisdom regarding the cutting of *nibung* among Riau's coastal communities is known as the "memenyan" tradition. Before harvesting *nibung*, they perform the tradition of burning incense ("kemenyan") as a ritual for seeking permission to cut down the *nibung*. On the other hand, in the non-coastal areas, its tradition involves the *datuk penghulu* and *nikik mamak*, elders who play a crucial role in granting permission to cut *nibung*. It support conservation efforts through sustainable utilization and engaging local communities within the *nibung*'s habitat.

Keywords: Local uses, mascot, *nibung*, Riau, traditional knowledge

INTRODUCTION

The issues of climate change, habitat degradation, decreasing natural resources, and environmental friendliness have become crucial topics in recent years. These environmental problems are largely attributed to human behavior and are assumed to affect the balance of human life and the environment, including the *nibung* plant. *Nibung* (*Oncosperma tigillarium* Jack. Ridl.) is a native plant species in almost the entire Riau Province, making it a symbol of the region's biodiversity. It holds significant cultural value for the Malay community in Riau, symbolizing unity, togetherness, strength, and family spirit. Consequently, *nibung* is designated as the mascot of Riau's flora, as stated in the Decree of the Minister of Home Affairs Number 48 of 1989, which outlines guidelines for determining the identity of regional flora and fauna. This designation reflects the plant's importance and the need for its conservation.

Nibung can be found growing naturally in both coastal and non-coastal areas of Riau Province, including Bengkalis, Meranti Islands, Indragiri Hilir, Siak, Rokan Hilir, Rokan Hulu, Kuantan Singingi, Indragiri Hulu, and Kampar District, which have diverse topographies. Despite its wide distribution, there is a lack of scientific information about *nibung*, leading to limited awareness of the plant among the

people of Riau. In addition, habitat degradation and the conversion of forest land, which are widespread issues in Riau Province, seemed as a significant threat to the *nibung* population. Therefore, it is crucial to preserve *nibung* to mitigate those detrimental effects.

Almost all parts of the *nibung* can be used by the local people of Riau because due to its ideal characteristics for widespread use (Desti et al. 2019a). However, this potential is not accompanied by public awareness of its sustainability. The *nibung* population in Riau Province continues to decline due to the conversion of natural forests into oil palm plantations. Additionally, people, especially youth (young local people) living around the habitat of *nibung*, are less familiar with this plant and have limited knowledge about it. The lack of knowledge among the people about *nibung* may accelerate the extinction of this plant in its natural habitat. It is feared that the erosion of knowledge about *nibung* in Riau will accelerate the extinction of this plant in its habitat.

Local community knowledge of utilizing plant diversity as a food source is crucial for building Indonesian food sovereignty, starting with local food independence. This knowledge underscores the economic value of *nibung* and its potential benefits. The food consumption patterns of communities are influenced by various factors, including

natural conditions and local wisdom unique to each region. Therefore, research on local uses and traditional knowledge of *nibung* is essential for conservation efforts, particularly in Riau Province.

Previous research has characterized *nibung* in terms of morphology, local wisdom regarding *nibung* (Desti et al. 2019b), molecular and DNA barcoding (Fitmawati et al. 2022), and ethnobotanical aspects (Desti et al. 2019a). Nevertheless, there is a lack of scientific information about *nibung*, particularly in coastal areas compared to the non-coastal areas in Riau assumed can combat the conservation efforts. One of the alternative solutions to this problem is survey about local uses and traditional knowledge of *nibung* by local people in Riau.

This research aims to address this gap by providing new information about the ethnobotanical aspects of *nibung*. The main objectives of the study are to record the local uses and traditional knowledge of *nibung* among communities in coastal and non-coastal areas in Riau, and to compare the data between the two locations. This research will provide crucial information for sustainable uses of *nibung*, and can facilitate recommendations for the stakeholders in formulating conservation strategies in Riau in the future. The results of this research aim to provide comprehensive information about the relationship between local Riau communities and *nibung*. This important information will lead to economic benefits by enabling the development of *nibung* potential, traditional environmental management systems, and the exploration of *nibung* uses serving as a reference for development, especially in Riau Province. It can support the conservation efforts and utilization of *nibung* based on the local wisdom of Riau's people.

MATERIALS AND METHODS

Study area

This research was conducted in Riau Province, Indonesia, specifically in two districts: Bengkalis District for the coastal area, and Kuantan Singingi District for the non-coastal area. The research locations included Tanjung Medang Village, Rupert Island in Bengkalis District (A1 Figure 1), and Koto Sentajo Village, Muaro Sentajo Village, Pulau Komang Village, and Kampung Baru Village, in Sentajo Raya Protected Forest, Kuantan Singingi District (A2 Figure 1). These five villages were selected because they have a significant presence of *nibung*, and represent the various uses of *nibung* by the local people in Riau Province. Additionally, these villages exhibit different social, economic, ethnic, and community conditions, providing a comprehensive understanding of *nibung* utilization. Moreover, the residents of these villages have a historical connection to *nibung*, further highlighting the significance of these locations for the study.

Tanjung Medang Village, is one of the villages on Rupert Island in North Rupert, Bengkalis District, Riau Province. It is situated between 0°55'24" and 2°7'41" North Latitude and between 101°25'43" and 101°47'14" East Longitude, covering an area of 628.50 km². The village is predominantly agricultural, with areas spanning 6,600 Ha and population of 2,860 people. Rupert Island is characterized by a strong Malay atmosphere, with the Malay language widely spoken. It is strategically positioned facing the Strait of Melaka and is the closest point to the neighboring Malaysia island. Access to Rupert Island from Malaysia is facilitated by fast boats that can land directly on the beach, highlighting the island's potential for tourism development. The island's natural resources, including the presence of *nibung*, also indicate potential for ecotourism development.

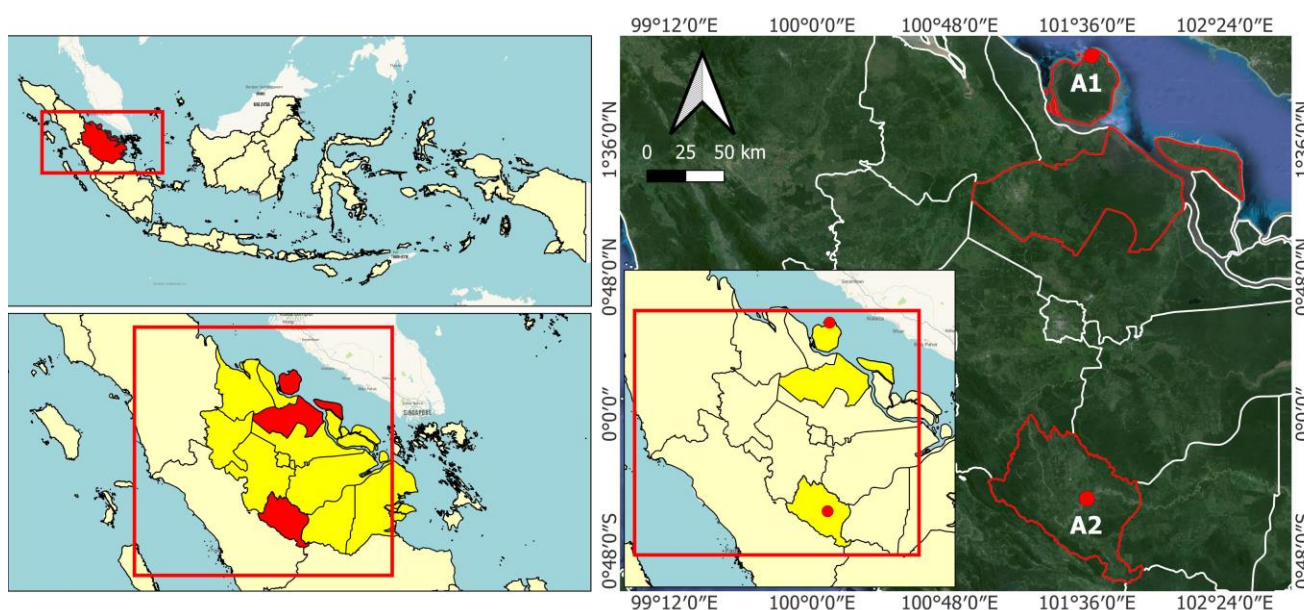


Figure 1. Locations of the research in Riau Province, Indonesia: A1: Tanjung Medang, Rupert Island, Bengkalis District, and A2: Sentajo Protected Forest, Kuantan Singingi District

The Forbidden Forest of Sentajo Raya, located in Kuantan Singingi District, Riau, also known as "*Rimbo Larangan*," is a protected forest area regulated by a customary system. It was designated based on the Decree of the Minister of Forestry No. 254/Kpts-11/1994. This forest covers a total area of 416.25 ha, divided into two separate blocks, namely block A, which covers an area of 86.88 ha, and block B which covers an area of 329.38 ha. The forest, characterized by its tropical rainforest ecosystem, is known for its high biodiversity. It is bordered by three villages: Koto Sentajo Village, Muaro Sentajo Village, and Kampung Baru Sentajo Village, which are part of the Kenegerian Sentajo customary system. Historically, Kenegerian Sentajo was founded by *Datuk Simambang Rajo Nan Putiah* and was inhabited by four tribes: *Piliang*, *Caniago*, *Patopang*, and *Melayu* (Riau's Malay).

Procedures

This research employed various methods, including field observations, discussions, and personal interviews with the local community. Additionally, surveys, interviews, and documentation of each research stage were conducted. Survey activities targeted previously identified informants/respondents, particularly indigenous people around the *nibung*'s habitat. Semi-structured interviews were conducted with each informant/respondent at both *nibung* growing locations/districts in Riau Province. Respondents were selected using purposive sampling and snowball sampling methods by identifying individuals living around the *nibung*'s area. The survey was carried out by referring to a research survey questionnaire that was prepared to find out about the public's knowledge of *nibung*, its uses, philosophical meaning, potential, and opinions regarding the plant (Gruca et al. 2016; Panigua-Zambrana et al. 2016; Corroto and Macía 2021). Direct observations were also conducted during interviews, and researchers actively participated in community activities related to *nibung*.

This study involved 63 respondents from the population in two research locations. The information collected includes socio-economics, their knowledge of *nibung*, the initial condition of *nibung* in the environment, the organs/parts of *nibung* that are used (both vegetative and generative organs), the age of *nibung*, the type of uses, the processing/utilizing method, the cultivation aspects, willingness to participate in *nibung*'s conservation activities, as well as attitudes towards *nibung*, and their hopes.

The selected respondents consisted of local people, women and men (Salim et al. 2020), with each having three different age groups (Azrianingsih and Kusumahati 2019; Martins and Shackleton 2021), including the category age 11-17 years old, aged 18-45 years, and aged over 46 years, and key informants (Blacutt-Rivero et al. 2016; Paniagua-Zambrana et al. 2016; Elias et al. 2019b), such as traditional medical practitioners, carpenters, craftsmen, and local communities, as well as the government and related agencies/services, were included in the study.

Data analysis

The data analysis involved both qualitative and quantitative methods. Qualitatively, an analysis was conducted

on the respondents' knowledge of *nibung*, its philosophical meaning, benefits, potential, and perceptions and appreciation of the *nibung*. Information collected through the *nibung* ethnobotanical survey was categorized based on respondents inputs, including scientific names, names in everyday language, and parts/organs of the *nibung* used. The study also reports the use of *nibung* in supporting the traditional lives of local communities through qualitative and quantitative data analysis. The Cultural Index (CI) value is used to describe the cultural index of all parts of the *nibung* used by respondents. The CI value was calculated by dividing the Use Report (UR) value (parts of the *nibung* used) by the number of informants who answered for each part used. The data obtained was then compiled using Microsoft Excel software and analyzed using the ethnobotany R package in the R Program software. The results were then visualized using diagrams/pictures (Whitney et al. 2018).

RESULTS AND DISCUSSION

Traditional knowledge and utilization of *nibung* in Riau

This study shows that the local people in Riau have knowledge about the *nibung*. The villagers in both study locations understand the importance of *nibung* and have had experiences with it. Overall, villagers are knowledgeable about *nibung*, with over 90% of the respondents having interactions with *nibung* in their daily lives. The elders tend to have more knowledge about *nibung* than young people, which can be attributed to their life experiences in the forests and their personalities. The differences were linked to the experience of life in the forests and the personality of the villagers.

The elders were considered to be knowledgeable about plants by the younger generation due to their childhood background in the village and their daily activities. They mentioned learning the names of many plants, including *nibung*, from their mother and friends. Additionally, they learned about the uses of *nibung* from their neighbors when accompanying them to the forest. Among the high school aged youth (over 15), young women had less experience with *nibung* compared to younger men. This gender-based difference in knowledge could be attributed to differences in labor division. Men have more chances and time to go to the forests than women, often for hunting or spend their time searching for honey bees, wood, birds, and other forest products for a couple of days or weeks. In contrast, women tend to spend more time in their homes in the village.

The transmission of *nibung* knowledge and its utilization occur primarily between generations and during childhood. Elders play a central position in this process, serving as knowledge transmitters to their families and neighbors. However, recent changes in the transmission of traditional knowledge and local uses of the *nibung* in Riau have been influenced by different family backgrounds and various external and internal factors.

Local communities in Riau utilize almost all parts of the *nibung*. Some uses of *nibung* were reported in Figure 2, consisting of constructions, tools, utensils, medicinal purposes,

vegetable or additional food sources, and for flavoring the taste of some foods. This indicates that almost all parts of that plant are involved in its utilization. The current utilization of *nibung*'s organs/parts can be seen in Figure 3.

Ethnochord provides information on the use of *nibung* parts in Riau (Figure 3.A). The graph shows the various purposes for which different parts of the *nibung* are used. At a glance, compared to vegetative parts, the generative

organs are less utilized by the local people in Riau. They primarily use the young fruit of *nibung* as a secondary material for their tradition "*makan sirih* or "*eating betel*" tradition. In contrast, the vegetative organs such as wood/stem, bark, leaves, young shoot and bamboo shoot of *nibung* are widely utilized for construction, medicinal purposes, and as a source of vegetables.



Figure 2. Some uses of *nibung* in Riau: A. Trunk/wood for constructions; B. Tools; C. Utensils; D and E. Leaves for roofing; F. Bark of stem for flooring; G. Bark for skin medicine; H. Young shoots for food (vegetable); or I. *Gulai lemak*

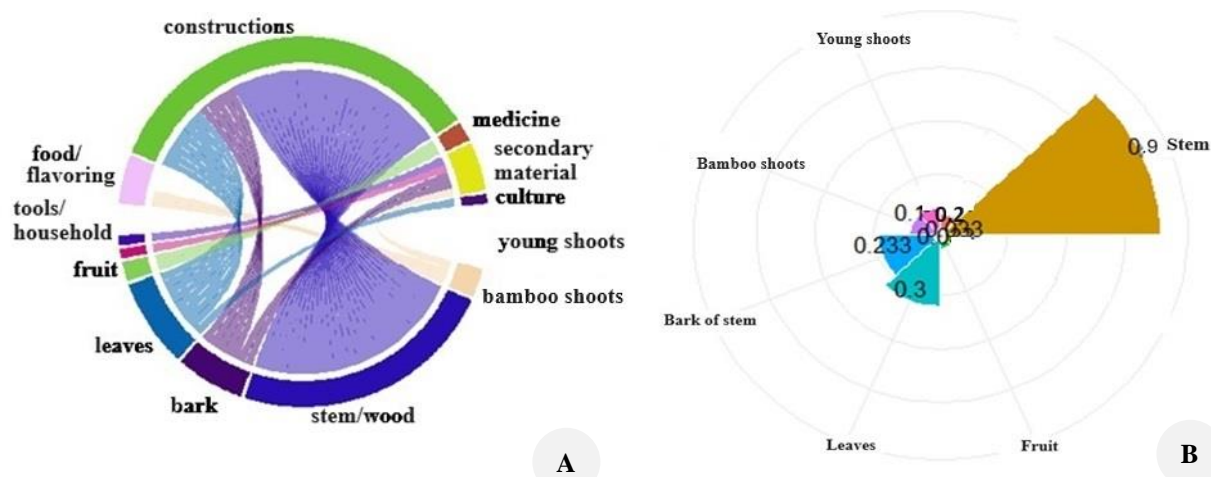


Figure 3. Ethnochord. A. Utilization of *nibung* in Riau; B. Comparison of uses of *nibung*'s parts

More than half of the uses of *nibung*'s parts were dominated by stem/wood, bark of the stem, and leaves, with nearly one-third of these uses related to constructions. The remaining 50% of all parts of *nibung* were reported for five other purposes, namely medicine, secondary material, culture, food/flavoring, and tools/household. In further detail, about 25% of all *nibung* parts, including bamboo shoots and young shoots, were used as food sources or vegetables. On the other hand, the uses for medicine and cultural purposes each accounted for about 5% of the entire utilization of *nibung*'s parts. The least utilized was the fruit, which is primarily used for skin medicinal purposes. In short, the stem/wood, bark of the stem, and the leaves were still the highest uses in Riau Province, while the fruit was the lowest.

The Cultural Index (CI) values for each part of the *nibung* in Riau are depicted in Figure 3.B. The highest cultural index is in the stem/wood, followed by the leaves, bark, young shoots, and bamboo shoots of *nibung*, respectively. Meanwhile, the lowest use of the *nibung* by the local people of Riau is the fruit part.

A similar pattern is observed in the utilization categories of *nibung* in both the coastal and non-coastal areas of Riau. Local people in Riau currently utilize *nibung* in five categories: for construction, including tools, utensils, and animal shed; for medicine; for food/secondary material/flavoring; and for food/vegetable (edible) (Table 1).

The stem of the *nibung* is commonly used for house construction due to its strength and resistance to water and termites. Local communities use *nibung*'s trunk/wood for various construction purposes, including making houses, pier poles, support poles for stilt houses in coastal areas, and even bridges, and other building materials such as pet

and animal sheds, such as goats and buffalo in non-coastal areas of Riau. The wood's durability and resistance to termites make it a preferred building material. Additionally, the bark of stem is used as a building material, namely for floors, roofing, as well as for medicinal purposes for the skin. The leaves are also used for roofing. The main advantages, especially of *nibung*'s trunk/wood, bark of stem, and leaves, are that they have long durability and do not rot easily even if submerged in water. *Nibung* is a support pillar for stilt houses, floors, and bridges. Those facts support the *nibung* to become one of the useful plants with use and cultural values for the people in both research locations.

Residents in coastal areas of Riau are more familiar with and make greater use of *nibung* compared to those in non-coastal areas of Riau Province. This is because *nibung* in coastal areas is easier to find on the outskirts, in their villages, or around their houses, as a common characteristic of palm (Elias et al. 2019a). In contrast, *nibung* in non-coastal areas of Riau is scarcer and typically found only in forests, making it harder to reach. On the other hand, local people think that the *nibung* population in Riau has begun to decrease compared to the past. Meanwhile, *nibung* grows a lot around local people's houses and fields, which increases economic activities of local people. Eales et al. (2021) stated that natural resources in marine or coastal areas impact human well-being in these areas, aligning with the use of *nibung* as a food source by local communities. This correlates with research indicating that the number of uses of a palm species affects its overall use value (Gruca et al. 2016; Campos et al. 2019; Salim et al. 2020).

Table 1. The uses of *nibung* in the coastal area and non-coastal areas in Riau

Parts of <i>nibung</i>	Categories	Descriptions of utilization	
		Coastal area	Non-coastal area
Wood (trunk/stem)	Construction	The wood is used as a building material to make houses, stilt houses, bridges, poles, and hunting equipment	The wood is used as pillars to support buildings, houses, and fences, known as " <i>tore</i> ," and to make huts for resting in local people's rubber or oil palm fields " <i>tore</i> "
	Tools and utensils/animal shed	The wood is used to make house floors and bathroom floors and used to make fish traps by fishermen	<i>Nibung</i> wood is used to make livestock sheds and tools for cooking traditional food in Riau (" <i>galamai</i> ") and used to make " <i>dodos</i> " for harvesting oil palm fruit
Bark	Constructions	Making " <i>para-para</i> " as a base for drying <i>rebon</i> shrimp, salted fish, and other fishermen's catches	Used for house floors, bathroom floors, " <i>cottage</i> " walls
	Medicine	by rubbing the soaked water on the affected skin	by rubbing the soaked water on the part of sick or itchy skin
Leaves	Constructions	Used as a roof for houses, huts, and other supporting/building materials	Used as roofs for houses, huts, or stilt houses in rubber fields and rice fields, and as supports/building materials for animal sheds such as chicken, goat, and other livestock, also used in the " <i>memandah</i> " tradition, namely for roofs to make huts, a place to take shelter when staying in the forest to search for honey bees, wood, and other forest products
Fruit	Food/secondary material/flavoring	The young fruit of <i>nibung</i> is used as a flavoring in the tradition of " <i>makan sirih</i> "	The young fruit of <i>nibung</i> is used as a flavoring in the tradition of " <i>makan sirih</i> "
Bamboo shoots and young shoots	Edible/food/vegetable	This part is used by cooking it with concentrated coconut milk (" <i>gulai lemak</i> ")	Used as a source of vegetables, by cooking it in coconut milk sauce (making " <i>gulai</i> ") curried with chicken or meat in the " <i>mendo'a</i> " tradition

The use of *nibung* as food comes from the legacy of ancestors or previous generations who also used wild plants for daily food. Among the parts of the *nibung* consumed by the local community is the apical shoot on the young stem, commonly known as "*umbut nibung*" or young shoots. According to local beliefs in Riau, *nibung*'s young shoots are particularly delicious. People in both locations in Riau believe that the young shoot of this plant is sweeter and tastier than others, such as coconut shoots, *Areca* young shoots, and bamboo shoots of bamboo. Furthermore, these shoots are noted for their potential medicinal properties, including antimicrobial effects (Saptiani et al. 2018; Sasidhar 2021).

Based on the interviews, it was found that the young shoots of *nibung* can be consumed raw due to its sweetness, and they can also be processed into various dishes, such as stir-fries, steamed with fish, or made into a curry. The method of processing the young shoots is similar in both locations, with only minor differences influenced by different ethnicities. In Tanjung Medang Village, Bengkalis District, which is a coastal area, the Riau Malay ethnic group who live in that area often consume the young shoots. They do not eat the young shoot directly but prefer to cook it before consumption. In contrast, the Sakai ethnic group consumes the young shoots raw, as they find it tastier and sweeter than when cooked. Additionally, some people prepare the young shoots by making curry, dipping it, or using it in vegetable soup. Various cooking methods are employed, including boiling, making soup, stir-frying, and the most common method, "*gulai lemak*," which involves cooking it in coconut milk. This dish is often found at major events in non-coastal areas of Riau, such as weddings, praying for *aqiqah*, or praying for other important events that we call "*mendo'a*". The consumption of *nibung*'s young shoots among the local community is relatively rare due to the plant's thorny nature, making it difficult to harvest. The local community, especially in non-coastal areas in Riau Province, only consumes it at certain times. So, it is not sold in markets.

The research provides valuable insights into the local uses and traditional knowledge of *nibung* among the people of Riau, which is essential for the conservation of this plant in the region. Traditional plays a crucial role in plant conservation, including *nibung*, in both coastal and non-coastal areas in Riau. Utilizing traditional knowledge can be an effective conservation strategy for *nibung* and its habitat, such as Sentajo Raya Protected. This approach has been recognized by researchers studying ethnobotany in various indigenous tribes in Indonesia, such as the Sasak tribe in Lombok, West Nusa Tenggara. The Sasak tribe's *pera api* ritual (Rahayu et al. 2023a) involves the use of various plants from various habitats, including home gardens, gardens, riversides, and rice fields demonstrating their indigenous ecological and ethnobotanical knowledge in land management. This cultural landscape contributes positively to environmental sustainability and socio-cultural preservation (Rahayu et al. 2023b). Similarly, the *Ammatoa Kajang* tribe in South Sulawesi (Syarif et al. 2016; Surtikanti et al. 2017) also has specific practices and beliefs related to environmental conservation, evident in their

actions and attitudes towards waste disposal and environmental management. Education plays a crucial role in enhancing environmental awareness and fostering positive attitudes towards conservation among these indigenous communities.

Local wisdom regarding *nibung*

Overall, respondents from both coastal and non-coastal areas of Riau demonstrated a significant familiarity with *nibung* plants, with 92.86% reporting knowledge about it. However, it is surprising that none of the respondents were aware that *nibung* used as the mascot of Riau Province, indicating a lack of awareness among them (100% were unaware of *nibung*'s role as the mascot). Nevertheless, all respondents acknowledged the widespread utilization of *nibung* in their daily lives, recognizing its significance across various aspects, such as socio-economic activities, cultural practices, and communication within the community with wisdom.

In the coastal areas of Riau Province, local wisdom has been applied in the practice of cutting down *nibun*. Before cutting down a *nibung*, a special ritual known as "*memenyan*" is performed. This ritual signifies that not just anyone can cut down a *nibung* tree, and cutting is done only at specific rules. Additionally, *nibung* has been incorporated into poetry and rhymes, reflecting Riau's Malay culture. It is hoped that these cultural values will be preserved for future generations, supporting efforts to conserve *nibung* and contribute to the preservation of Riau's ecosystem.

In the Sentajo Raya Forbidden Forest of Kuantan Singingi, Riau, a non-coastal area, the local wisdom concerning *nibung* was more complex. *Datuk penghulu* and *the ninik mamak* (elders) are the highest non-formal institutional holders of Kenegerian Sentajo customs. The *ninik mamak* plays a crucial role in passing down local wisdom to their descendants, with the aim of preserving traditions and protecting the forest, including *nibung*. This community demonstrated wisdom in managing space and land by dividing them into distinct zones. Consequently, traditional stakeholders established rules to uphold their ancestors' customs, ensuring the preservation of the forest and traditions.

In Sentajo Raya Forbidden Forest, the local community adheres strongly to customs in their interactions with fellow humans, God, and nature. Their values, deeply rooted in local wisdom, are based on notions of virtue and avoidance of vice (Yasir et al. 2022). This knowledge, specific to their community, enables effective communication, as it is intertwined with their locality and culture (Gislason et al. 2021). The ecological values are grounded in both customary and Islamic religious beliefs, forming the basis of social capital in their community life (Bakti et al. 2017). The decisions of *datuk penghulu* and *ninik mamak*, as customary elders, uphold and reinforce these values, including those related to *nibung* and other plants in Sentajo Raya Forbidden Forest. This commitment to environmental stewardship and forest conservation is evident in the preserving of the forest, ensuring the protection of not only *nibung* but also other flora in the area. Environmental communication in this context is deeply rooted in custom-

based values, representing a shared understanding, passed down by the village founders. This communication is not only conveyed through human interaction but also through environmental symbols that serve as informative messages for the local community.

The community's cultural values are fundamentally derived from their interpretations of environmental symbols, giving rise to local wisdom transmitted through generations. As custodians of tradition, the *Datuk penghulu* and *Ninik mamak* play pivotal roles in the social structure of Kenegerian Sentajo in Kuantan Singingi. They are instrumental in upholding ancestral cultural practices and passing down the values of caring for customary forests. Forest preservation and customs are intertwined elements for the local community, inseparable from one another (Yasir et al. 2022).

Numerous rules governing behavior have been handed down through generations. Anyone wishing to enter a customary forest must first convene a meeting with the customary head and the head of the *barompek* to explain the purpose of their visit. Entry into the forest area necessitates prior permission from the *Penghulu*. Because the forest is deemed sacred, this permission is linked to the belief that people may go missing in the forest. This community trust empowers traditional leaders to regulate community members and control access to the forest.

The environmental messages rooted in local wisdom are revered and adhered to by the community, as they have been transmitted through generations. However, new decisions and policies are formulated through deliberative communications aimed at forest protection. Based on customs, these new regulations are established through communication among groups of customary leaders in planned or impromptu meetings. The purpose of these gatherings is to formulate regulations regarding the use of customary forest lands. These new customary laws govern the use of forest and land resources, including household needs, village construction, and plantation activities. These regulations are devised through group communication among traditional leaders in regular and impromptu meetings (Yasir et al. 2022). The customary approach to discussing the environment and formulating policies contributes to conserving forests and the environment by promoting the judicious and sustainable utilization of forest resources (Asmin et al. 2017; Mutia et al. 2019). Once agreed upon, all community members must observe these new rules and prohibitions. Some of the decisions made by traditional leaders are longstanding, while others are recent, such as the prohibition of tree felling, burning forest areas, and selling forest products, including *nibung* and other plants.

Despite restrictions on collecting forest products, there are instances where they may be utilized. This regulatory communication is evident in issuing permits to villagers for constructing houses or stalls on the outskirts of protected forests. These permits are also granted for oil palm and rubber plantations or wood extraction. Logging permits or regulations are only granted on a small scale, corresponding to the wood required. Therefore, to preserve the Sentajo Raya Forbidden Forest, residents in proximity to the forest

are permitted to establish stalls selling various household products along the highway bordering the forest while still safeguarding the forest. This measure also serves as a live monitoring system; if anyone attempts to remove a tree from the forest illicitly, the shop owner must promptly report it to the *Datuk Penghulu* and *Ninik Mamak* first (Yasir et al. 2022).

In conclusion, this study highlights the local uses and traditional knowledge of *nibung* in Riau. In this province, more than five categories of utilization of *nibung* are observed. The stem occupies the highest of *nibung* parts which the local people use. In coastal areas show a higher utilization of *nibung* compared to the non-coastal areas. There was local wisdom regarding cutting *nibung*. They selectively harvest mature plants, leaving saplings to grow and thrive, only take a mature one, and leave the saplings to grow. Before cutting down *nibung* trees, they carefully choose the mature ones and avoid cutting down those without shoots in a clump. This practice plays a crucial role in supporting conservation efforts through sustainable utilization, engaging local communities within the plant's natural habitat. This value reflects ecological awareness in environmental management regarding of *nibung*. Respondents agreed that *nibung* must be preserved in their areas. In this case, local rules for access to and use of *nibung*, as well as participatory monitoring of exploitation and population status in Riau were needed. It would need to be based on local knowledge and traditional scientific approaches, which needs better documentation of the local uses, traditional knowledge, and the importance of *nibung* too. This study is the first to provide information about the local uses and traditional knowledge of *nibung* in Riau. However, more quantitative and qualitative ethnobotanical studies are needed. In short, this study implies that local wisdom affects *nibung* and environment conservation.

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