

Influence of Spatial Context on the Technique of Crafting the Rapai Pase Musical Instrument in the Vernacular Settlements of North Aceh, Indonesia

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Received	Revised	Published
10.01.2024	29.04.2024	30.04.2024

<https://doi.org/10.61275/ISVSej-2024-11-04-08>

Abstract

Crafting is a common activity in many vernacular settlements. In North Aceh in Indonesia, crafting of the Rapai Pase musical instrument is a popular activity. This research explores the influence of the spatial context on the techniques of crafting the Rapai Pase musical instruments. It seeks to understand how the spatial contexts affect the local knowledge of the people in crafting the Rapai Pase musical instrument, and its process of making.

It employs a qualitative ethnographic perspective to gain a deep understanding of how the community adaptations to the local environment influences knowledge and practices in the crafting of this traditional musical instrument. Data collection involves observations at Rapai Pase musical instrument production sites, interviews with the local artisans and craftsmen, analysis of documents related to local wisdom and the practice of crafting.

It reveals that the influence of spatial context on the practice of crafting Rapai Pase musical instruments can be understood from three main aspects: First, geographical factors affect the availability of raw materials and manufacturing techniques, with natural topography playing a crucial role in shaping these instruments. Second, local history and culture, especially the history of the Samudera Pasai Kingdom based on Islam provide unique colors in the process of crafting Rapai Pase musical instruments. The concept of "habluminal'alam" also contributes to shaping the local knowledge related to crafting. Third, the practice of crafting Rapai Pase is confined not only to technical processes but also relates closely to its social and physical environmental contexts.

Keywords: Spatial context, Crafting techniques, Rapai Pase musical instrument, North Aceh, Hablummin'alam, Environmental conservation.

Introduction

Rapai Pase is one of the important traditional arts in North Aceh, Indonesia. It has deep cultural roots and importance to the local community, often performed in various traditional ceremonies, religious celebrations, and cultural events. Its significance goes beyond mere entertainment, as it is believed to represent the soul of the community, reflecting the deep connection between music, culture, and the spatial context in which it has developed. In other words, Rapai Pase is not just entertainment but also an integral part of North Aceh's cultural heritage.

Specifically, Rapai Pase as an object of research has only been studied at the level of artistic form (Karina, 2014; Hamzah, 2018; Amarlia, Fitri & Zuriana, 2019). This means that the exploration of this art still needs to be deepened. Blench & Dendo (2006) has shown that the study of material culture has not received enough attention in archaeology. One important aspect of material culture studies in North Aceh is the crafting of Rapai Pase musical instruments, which is a subject that has not been touched upon in previous research. The craftsmen of Rapai Pase musical instruments inherit knowledge and skills from generation to generation, and the manufacturing process is often closely linked to the spatial context of the region.

In the study of ethnic arts, an understanding of spatial context plays a central role in uncovering the complexity of cultural practices and social identity formation. Spatial context refers to the complex interactions between people and their environment, which shape daily life, cultural values and local traditions (Campbell 2018; Hesse 2020). In the context of traditional instrument crafting, factors such as geography, climate, local flora and fauna, and history play a crucial role in determining cultural practices, material selection, and instrument-crafting techniques. Understanding this relationship between spatial context and instrument-crafting techniques will not only enhance the understanding of local arts and culture but can also make an important contribution to the preservation and development of traditional arts in the area, including documentation (Aluede 2020).

This research aims to explore the influence of spatial context on Rapai Pase instrument-crafting techniques in North Aceh, focusing on factors such as geography, history, and local culture. The objectives are as follows.

1. To gain a deeper understanding of how the physical and cultural environment influences the practice of crafting this musical instrument.
2. To provide new insights into the role of local knowledge in traditional arts.
3. To provide a foundation for future efforts to document and develop these arts.

To achieve these objectives, the research focuses on exploring

1. how the spatial context influences the local knowledge of the people of North Aceh in crafting Rapai Pase musical instruments and
2. the process of crafting Rapai Pase musical instruments in North Aceh.

This research thus has the potential to make a substantial contribution to the academic literature on traditional music and local culture, in addition to providing new insights into the context of cultural heritage preservation and revitalization in North Aceh.

Theoretical Framework

This research is based on two fundamental assumptions about the spatial context of North Aceh and local knowledge in the production of Rapai Pase musical instruments. First, it posits that spatial context significantly influences the practices involved in crafting traditional musical instruments, such as Rapai Pase. This implies that factors such as geography, history, local fauna and flora, as well as social interactions, impact the selection of materials and crafting techniques of these instruments. Secondly, it asserts that local knowledge within the North Aceh community contributes significantly to the crafting of Rapai Pase musical instruments. This suggests that indigenous wisdom and inherited knowledge play a significant role in the

crafting techniques of these musical instruments. Based on these two assumptions, this research employs cultural ecology theory and ethno-organology in its analysis.

In scientific research, spatial context often refers to the physical environment in which a natural phenomenon or event occurs (Jeffery *et al.*, 2004). This may include parameters such as geographic location, topography, climate, and other environmental aspects that influence the behavior of the system under study. For instance, when constructing a building in a densely populated urban area, the spatial context encompasses characteristics of the surrounding environment, including population density, traffic patterns, and the height of neighboring buildings (Lertlakkhanakul, Do & Choi, 2006). Understanding spatial context is crucial in designing buildings that are appropriate to their surroundings, drawing inspiration from surrounding elements, and ensuring that the building harmonizes with its context.

On the other hand, Jellis (2014) defines spatial context in arts research as the environment or context that produces, performs, or receives artworks. This includes the physical location where the artists work, the influence of local culture or history, and the physical spaces where artworks are exhibited or performed. For instance, in visual arts studies, spatial context can influence how the artists choose mediums, themes, or styles in their works or how audiences respond to artworks based on the environment in which the artwork is displayed (Charitos & Korakidou, 2011).

When referring to spatial context in scientific research however, the focus often lies on measuring and analyzing physical parameters to understand natural phenomena. In contrast, in arts research, spatial context also encompasses a broader understanding of how the physical and cultural environment influences the production, distribution, and appreciation of artworks (Partarakis *et al.* 2022). This means that interpreting spatial context involves deeper social, historical, and cultural analyses to understand how space and place contribute to the meaning and value of art. By understanding this spatial context, research can identify how these factors interact and influence the practices involved in crafting Rapai Pase instruments in North Aceh. This is critical because spatial context not only shapes the crafting techniques of musical instruments but also influences the cultural meanings and local identities embedded in them. Therefore, this research is needed to address this knowledge gap by exploring the influence of spatial context on the crafting techniques of Rapai Pase instruments in North Aceh.

Cultural ecology theory emphasizes that the physical and social environment influences human behavior and shapes creative cultural patterns (de Bernard, Comunian & Gross, 2021). Human culture is influenced by the natural environment, such as geography and climate, as well as activities such as agricultural practices (Rummler, 2014; Hanspach *et al.*, 2016; Uwajeh & Ezennia, 2018).

In the context of musical instrument crafting, factors such as geography, climate, and history play a critical role (Montagu 2017; Listya 2022; Montagu 2003). Ethno-organology theory highlights how these factors influence the crafting, usage, and evolution of musical instruments within the local cultural contexts (Ohi, 2020; Supeno & Nugraha, 2021). The relationship between ethno-organology and spatial context enhances our understanding of the relationship between musical instruments and culture in specific geographical regions (Magnusson 2021). Indeed, the synergy between these theories can help us understand the complexity of Rapai Pase instruments' crafting practices in North Aceh.

In addition to physical aspects like form and material, musical instrument crafting practices also take into account innovation, usage, and the socio-cultural contexts of the instruments' use (Bijsterveld & Peters 2010). Rapai Pase underscores the significance of comprehending the production and adaptation of instruments by North Aceh's instrument makers, taking into account factors like technology, culture, and innovation. Meanwhile, McIntyre & Woodhouse (1978) reveal the evolution of theories of musical instrument crafting, which now encompass broader perspectives from the Science & Technology Studies (STS). This suggests that research on Rapai Pase should not only consider the physical aspects of instrument crafting but also involve considerations of innovation, instrument design practices in laboratory contexts, and contemporary practices such as 'retro-innovation'. Research must consider engineering, maintenance, and adaptation of Rapai Pase musical instruments across

various social, technological, and cultural contexts in North Aceh to gain a holistic understanding of their crafting.

This theoretical framework suggests that the Rapai Pase context necessitates a concept of musical instrument crafting that extends beyond the physical aspects, taking into account factors like innovation, usage, design practices, and the socio-cultural contexts in which these instruments find use. A thorough understanding of Rapai Pase musical instrument crafting techniques in North Aceh not only enriches the understanding of cultural values, traditions, and practices of the North Aceh community but also helps identify potential innovations and new developments in traditional musical instrument crafting to support cultural and economic sustainability in the North Aceh community. As a result, a comprehensive understanding of Rapai Pase musical instrument crafting necessitates a holistic and multidisciplinary approach from a variety of fields, including cultural ecology and ethno-organology.

Review of Literature

Previous research has revealed a close relationship between the creation of ethnic musical instruments worldwide and the spatial context, which includes environmental aspects, history, religious ideologies, and culture (de Bonfils & Fabretti 2022; Jia & Jia 2023; Wang & Wu 2020). For example, Jia & Jia (2023) has found that the musical instruments discovered in the Yungang Grottoes, China, exhibit diverse shapes influenced by the cultural integration of eastern, western, and northern ethnic minorities. These findings illustrate the diverse influence of spatial context on the evolution of musical instruments in China during the period 460–524 AD. Furthermore, Wang & Wu (2020) have revealed that Xinjiang's location at the crossroads of the ancient Silk Road facilitated frequent trade exchanges, allowing the Uighur community to adopt various types of musical instruments from different regions, including musical instruments from the Chinese Plain, West Asia, and South Asia. This underscores the significant role of spatial context in the formation and development of Uighur musical instruments.

In Indonesia, spatial context plays a crucial role in influencing ethnic artistic expressions. Sunarto (2020) has found that the natural environment around the Unda River, Bali, served as the paradigmatic basis for artist Wayan Setem's visual arts creation. Sunarto asserts that Setem's artworks are distinctive due to their inspiration from specific environmental contexts, which serve as a foundation for critical creativity. On the other hand, Peradantha (2023) has demonstrated that the natural environment surrounding the Sentani Tribe, Papua, has inspired the formation of artistic elements in Isolo performances, with motifs reflecting the nature and life of the local community. These findings highlight the close relationship between spatial context and ethnic cultural art practices in Indonesia. Mokay (2023) reinforces these findings by mentioning that the carved ornaments on the Tifa musical instruments in the Sentani Tribe's Kampung Ifale closely relate to the Lake Sentani environment through motifs known as "Waku Bhulakhoi." This motif, which characterizes the forms of nature and animals living in Lake Sentani, is interpreted by the Sentani people as symbols of unity.

Hafidz et al. (2023) has revealed that the relationship between ethnic musical instruments and spatial context in Indonesia also encompasses historical aspects. They have demonstrated that the Sasando musical instrument from East Nusa Tenggara, Indonesia, embodies a strong relationship between historical, ecological and local cultural aspects. This perspective supports Cypess's (2020) claim that music and musical instruments serve as knowledge sites in historical contexts. However, Wu & Cacciafoco (2024) demonstrate that cultural exchange processes also influence the crafting of ethnic musical instruments in Indonesia, beyond the availability of raw materials and local knowledge. They show that the Moko musical instrument in Alor, Eastern Indonesia, is one of the forms of ethnic musical instruments that has emerged from the cross-cultural trade in the past.

Consistent with this perspective, Weifen et al. (2023) has revealed the influence of Chinese culture on the creation of the Gong Beri musical instrument in Bali. Since the reign of King Jayapangus around 1181 AD, Bali has maintained cultural relations with China, leaving

traces of cultural acculturation, including the Gong Beri, which remains in use today, particularly in ritual contexts in Bali.

In addition to Chinese culture, Islam, as both a culture and an ideology, significantly influences the form and function of ethnic musical instruments in Indonesia (Irawan & Hidayatullah 2022; Mahadika & Misbahuddin 2023; Mukani 2018; Ninin 2024; Nur 2015). Karina (2014), in particular, adds a new dimension by demonstrating the connection between Rapai Pase and the history of the Samudera Pasai Kingdom with an Islamic character. However, his research does not explicitly demonstrate the relationship between spatial context and the process of crafting Rapai Pase musical instruments. These studies expand our understanding of the influence of the spatial context, which encompasses not only physical aspects but also more abstract concepts.

Although this literature outlines the extensive impact of the spatial context on the creation of ethnic musical instruments in various regions of Indonesia, previous studies have not deeply explored how spatial context influences the practices of crafting ethnic musical instruments, particularly in North Aceh. The phenomenon of spatial influence in North Aceh indicates the involvement of distinctive geographical, historical, religious, and cultural elements in the region. Hence, this research endeavors to bridge this knowledge gap by delving into the ways in which spatial context shapes the Rapai Pase musical instrument crafting practices in North Aceh, an area that has largely remained unexplored until now. Therefore, it is anticipated that this research will significantly improve our understanding of the interplay between ethnic musical instruments and spatial context, as well as its significance for cultural heritage and environmental sustainability in North Aceh.

Research Methodology

This research adopts a qualitative approach, utilizing an ethnographic perspective. In other words, it explores the social, cultural, and historical contexts of the musical instruments through an ethnographic approach (Butler 2008). Ethnographic research offers the chance to delve deeply into the perceptions, production, use, and interpretation of the Rapai Pase musical instrument within the local community (Rutten 2016). Moreover, it facilitates direct interaction with musicians, instrument makers, and other community members involved in this tradition, thus providing rich and profound insights into music practices and local culture (Horst & Hjorth 2014).

Diyah, a maker of Rapai Pase musical instruments, resides at the center of the research locus. His home in Matang Tunong Village, Lapang District, North Aceh Regency, serves as the site for the ongoing production of Rapai Pase instruments. Data collection used three main techniques: active observation, interviews, and document analysis.

Active observation involves directly observing the process of crafting these musical instruments, from preparation stages to actual crafting. Observations conducted between May and October 2023 recorded visual data such as the types of wood used, wood processing procedures, supporting materials, and equipment utilized.

In-depth interviews with Diyah also provided data to understand the rules and principles of local knowledge held by the instrument makers. Through these interviews, verbal data such as rules, processes, principles, and norms for crafting Rapai Pase musical instruments were obtained.

Document analysis using previous literature on Rapai Pase musical instruments also produced data. Documentation such as photos and videos related to the wood procurement process and the crafting of Rapai Pase instruments produced data to construct the arguments and analysis

Data from these processes were analyzed using an interpretative approach, cross-validating all statements with informants to ensure validity. This method provided a deep understanding of the relationship between spatial context, local knowledge, and the crafting techniques of Rapai Pase musical instruments in North Aceh.

The Case Studies

The Lapang District, North Aceh Regency, Aceh is home to Matang Tunong Village. According to the Matang Tunong Village government website, the village spans approximately 2.12 km² (Pemerintah Kampung Matang Tunong 2024). Matang Tunong Village's topography is characterized by extensive paddy fields, as it lies in a relatively flat lowland area on the northern coast of Aceh Province. The fundamental reasons behind this research are as follows:

1. **Cultural Tradition Conservation:** To date, Matang Tunong Village in North Aceh has continued to preserve Rapai Pase performances, making it an exemplar of local cultural sustainability amidst modernization. This underscores the importance of safeguarding and understanding these traditions to preserve their unique cultural heritage.
2. **Utoh Diyah's Perseverance:** As the sole traditional Rapai Pase instrument craftsman in Matang Tunong Village, his presence becomes the focal point of the study. His profound knowledge of instrument-making techniques is critical to understanding these traditional practices.
3. **Rare Knowledge Exploration:** Through interviews with *Utoh Diyah*, this research unearths valuable local knowledge regarding the Rapai Pase instrument-making process. Information offers deeper insights into cultural heritage and traditional crafting techniques.
4. **Cultural and Environmental Interrelation:** This study also examines how local culture, such as Rapai Pase instrument-making, adapts to contemporary environmental and societal changes. In this context, the research sheds light not only on cultural aspects, but also on the interaction between culture and the environment in North Aceh.

Matang Tunong Village, North Aceh, presents a unique landscape with extensive paddy fields, making this research crucial in a spatial context. North Aceh itself is one of Aceh's largest rice producers, contributing approximately 17% of the province's total rice production by 2023, reaching around 238,088 tons (Badan Pusat Statistik Provinsi Aceh 2023). Geographically, the area is situated on the northern coast of Aceh Province, characterized by flat terrain dominated by rice fields traversing the region. The practice of crafting Rapai Pase instruments is significant as it involves the extraction of primary raw materials, namely tualang or merbau wood, obtained from the Geureudong Pase forest. This area is located in the highlands southeast of Matang Tunong Village. Therefore, this research not only highlights cultural and local traditions but also closely relates to social activities and environmental sustainability in the region.

The social interaction phenomenon centered on agricultural practices in Matang Tunong Village closely links with the practice of crafting Rapai Pase instruments. Agriculture, particularly rice production, which dominates the area, serves not only as the primary source of livelihood but also as the focal point of local economic and social activities. Daily life around the agricultural cycle, such as planting and harvesting seasons, is often filled with rituals and communal events, such as feasts or traditional ceremonies. In this context, the practice of crafting Rapai Pase instruments serves as a cultural expression that accompanies the rhythm of local social life. Individuals and communities form strong bonds through the crafting and performance of these instruments, thereby strengthening cultural identity and social solidarity. As a result, this research aims to understand how social interactions in the context of agricultural activities in Matang Tunong Village influence and shape the practice of crafting Rapai Pase instruments, as well as how these dynamics contribute to the sustainability of local traditions and cultural life.

Findings

The Influence of Spatial Context on Local Knowledge of Rapai Pase Crafting

The historical and geographical aspects of North Aceh closely intertwine with the local knowledge of its people regarding the crafting of the Rapai Pase musical instrument. The history of the introduction of Islam, the existence of the Samudera Pasai Kingdom, and the rich geographical landscape have had a significant impact on shaping the knowledge of the techniques of crafting this musical instrument. Understanding the influence of history and geography is key to a thorough understanding of the practice of crafting the Rapai Pase instrument in North Aceh. Figure 1 depicts the research location in Matang Tunong Village, Lapang District, North Aceh Regency, Aceh, Indonesia.

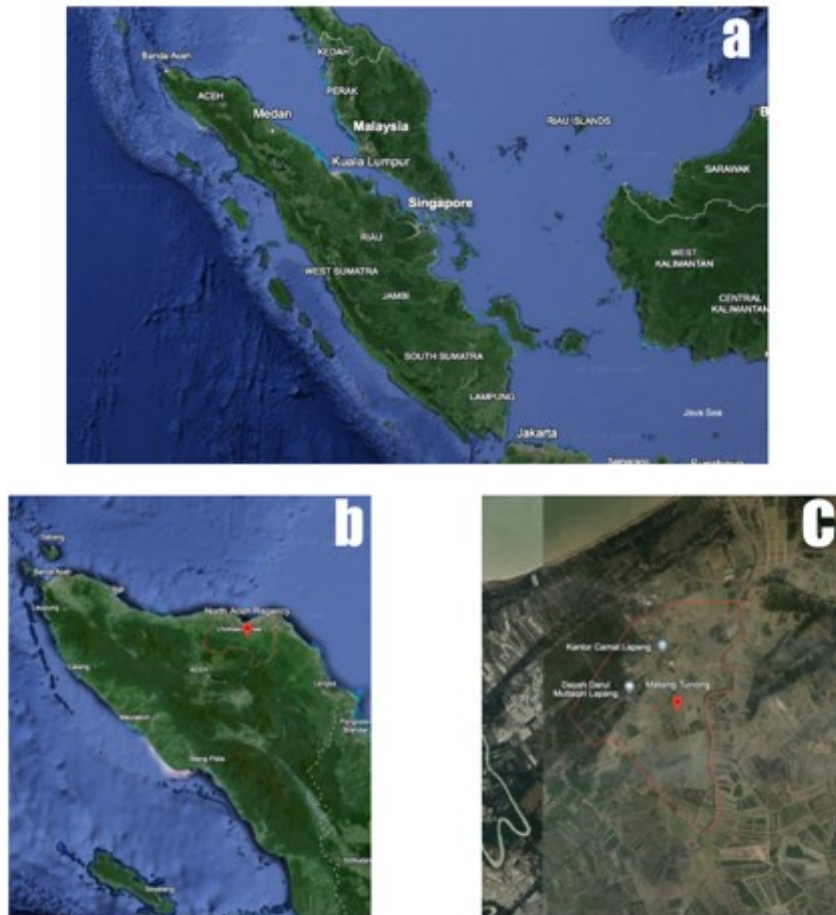


Fig. 1: Map of the Research Location: a) The map of Aceh in Sumatera Island, Indonesia. b) The Map of North Aceh Regency, Aceh Province. c) The Map of Matang Tunong Village, Lapang District, North Aceh.

Source: Karina, 2024

People of North Aceh perceive the Rapai Pase musical instrument as part of the Islamic art heritage that has existed since the early 13th century era of the Islamic Samudera Pasai Kingdom (Muhammad 2017). During that time, figures such as Sheikh Abdul Qadir Al-Jaelani and Sheikh Ahmad Rifa'i were known as preachers who spread the teachings of the Sufi order, including the Rifaiyah Sufi order, characterized by rhythmic chanting and the use of round membranophones. The people of North Aceh created the Rapai Pase musical instrument as a tribute to Sheikh Ahmad Rifa'i's teachings, with "Rapai" representing the pronunciation of Sheikh Ahmad Rifa'i's surname and "Pase" signifying the existence of the Samudera Pasai Kingdom at the time of its introduction. While we cannot confirm the existence of the Samudera Pasai Kingdom's buildings today, we identify the North Aceh Regency area as the site of its establishment. The Directorate General of Culture of the Republic of Indonesia recognized

Rapai Pase music as an intangible cultural heritage in 2017, supporting the claims of the people of North Aceh about its heritage. This long history motivates the people of North Aceh to continue preserving the Rapai Pase musical instrument to this day. The Rapai Pase musical instrument has evolved into an integral part of the local art and culture, often showcased in various events such as post-harvest rice celebrations, Islamic holidays, Aceh Cultural Week (Pekan Kebudayaan Aceh/PKA), political campaigns, and also as entertainment for the community.

After the introduction of Islam, the local community has gained knowledge about achieving harmony with God (*Hablumminallah*), harmony with fellow human beings (*Hablumminalnas*), and harmony with the natural environment (*Hablumminal'alam*) (Tolchah & Mu'ammam, 2019). The *hablumminal'alam* is a concept in Islam that emphasizes the close connection and respect between humans, nature, and their Creator. When crafting the Rapai Pase musical instrument in North Aceh, the concept of *hablumminal'alam* reflects the people's recognition and respect for their deep relationship with the surrounding nature.

The selection of raw materials, crafting techniques, and inherent cultural values reflect the understanding of *hablumminal'alam* in the crafting of the Rapai Pase musical instrument. Observation and interviews with Diyah, a Utoh or Rapai Pase craftsmen in Matang Tunong Village, revealed that the practice of crafting the Rapai Pase musical instrument, to the greatest extent possible, involves sourcing materials from their surrounding environment, including locally grown wood. Diyah added that the construction of this musical instrument should not compromise the preservation of forests in North Aceh. Furthermore, the generations have passed down knowledge to acquire the crafting techniques. This knowledge reflects an appreciation for traditional skills and a spiritual connection with nature.

The concept of *hablumminal'alam* indicates that the local community understands the importance of maintaining balance and harmony with the environment while crafting the Rapai Pase musical instrument. Factors such as climate, geography, and local natural resources can influence the local community's knowledge of selecting raw materials and developing crafting techniques suitable for their environmental conditions. Therefore, an understanding of *hablumminal'alam* can serve as a spiritual and philosophical foundation underlying the practice of crafting the Rapai Pase musical instrument in North Aceh, strengthening the relationship between humans, nature, and their Creator.

The influence on knowledge of crafting the Rapai Pase musical instrument also stems from North Aceh's topographical conditions. The natural landscape of North Aceh consists of coastal lowlands and mountains. Agricultural land, including rice paddies and settlements, predominantly dominates the lowland areas (Ari Saptari & Zakaria 2021). Agriculture in North Aceh still relies on traditional irrigation techniques for rice cultivation, and some areas still depend on rain-fed agriculture.

The spatial context of North Aceh, characterized by its extensive paddy fields, significantly influences the crafting of the Rapai Pase musical instrument. During each rice harvest season, farmers in North Aceh traditionally host their traditional celebrations. One such tradition, known as *khanduri blang*, epitomizes the practice of Islam Nusantara fiqh in Aceh. *Khanduri blang*, or rice field feast, is a communal prayer and meal held by farmers to mark the beginning of the rice planting season (Maliati 2017). Passed down through generations, this tradition aims to invoke blessings through expressions of gratitude and supplication to Allah for protection from pests in the fields. During these festivities, villages often stage Rapai Pase performances to convey joy, camaraderie, and unity. Given that these events take place in the rice fields and aim to draw in participants from afar, the Rapai instrument is crafted to produce loud and resounding sounds, ensuring its effectiveness in engaging distant attendees.

The availability of fauna, such as cattle, as one of the supporting elements of agriculture in North Aceh contributes to traditional knowledge about crafting the Rapai Pase musical instrument. The coastal areas consist of saltwater fish ponds, while the highland areas have the potential for forests and plantation land, including tualang wood, merbau wood, and bamboo, stretching from lowlands to highlands for the local community.

The extraction of tualang and merbau wood from the Geureudong Pase forest, located approximately 40 km southeast of Matang Tunong Village, constitutes a pivotal step in the practice of crafting the Rapai Pase musical instrument. This forest area serves as the natural habitat for tualang and merbau trees, which persist in abundance to this day. The presence of these woods not only serves as the primary source of raw materials for instrument crafting but also reflects a profound spatial awareness within the practice. The Rapai Pase artisans intuitively grasp the importance of preserving the environmental sustainability of their surroundings as an integral part of their cultural heritage. Thus, the extraction of wood from the Geureudong Pase forest is not only a practical endeavor, but it also embodies values of sustainability and awareness of the importance of ecological balance in the creation of this traditional musical instrument. Figure 2 displays the location map of Matang Tunong Village and Geureudong Pase Forest.



Fig.2 The location map of Matang Tunong Village and Geureudong Pase Forest.

Source: Karina, 2024

Testing the strength and durability of wood is an important step in understanding the potential of materials selected for crafting Rapai Pase musical instruments. Through quantitative testing, one can see to what extent tualang or merbau wood can meet the strength and durability requirements needed for such instruments. Furthermore, this testing aids in identifying factors that may affect the quality and performance of the instruments in the future, such as structural strength, moisture resistance, and climate change resilience. Thus, testing the strength and durability scale of wood can serve as concrete evidence to help explain the reasons for the selection of tualang or merbau wood by craftsmen in North Aceh, as well as provide an overview of the profile and characteristics of ideal wood as material for Rapai Pase musical instruments.

Craftsmen in North Aceh believe that Tualang and merbau woods are the best choices for crafting Rapai Pase musical instruments. This is due to their resistance to weather and pests, such as termites, as well as their durability and resistance to deformation. The Department of Public Works (now the Ministry of Public Works and People's Housing of the Republic of Indonesia) has conducted research in Indonesia on the durability and strength of various types of wood. On a scale from I to V, the Department of Public Works has classified the durability and strength classes of wood into five categories.

The strength scale of wood in Indonesia, consisting of Scales I–V, provides important guidance in selecting wood for various construction projects (Penyusun 1960). Wood with Scale I (Very Strong) has the highest strength (minimum density of 0.90 gr/cm³) and is suitable for structural applications such as beams and posts. Below it, wood in Scale II (Strong) is still strong enough for construction (density between 0.60-0.89 gr/cm³) but requires special attention. Scale III (Moderate) indicates moderate strength (density between 0.40-0.59 gr/cm³) suitable for partition walls and flooring. Wood in Scale IV (less strong) is usually used for furniture or decorative applications (density between 0.20-0.39 gr/cm³), while Scale V (very less strong) indicates very low strength (density below 0.20 gr/cm³), often only suitable for non-structural use.

Scale I–V also classifies wood durability. Wood with Scale I (Very Durable) can last between 8 and 20 years if used in outdoor conditions exposed to heat and rain, or up to a minimum of 20 years if used indoors, free from heat and rain (Penyusun 1960). According to Scale II (durable), wood can last between 5 years (outdoor) and a minimum of 15 years (indoor). Scale III (Moderately Durable) means wood has a durability between 3 years (outdoor) and a minimum of 10 years (indoor). Scale IV (less durable) indicates that wood can only withstand 10 years in indoor conditions and is not suitable for outdoor use. Scale V (Very Less Durable) refers to wood that rapidly deteriorates or succumbs to termites, crafting it unsuitable for high-load applications and limited to decorative ornaments requiring special care (Penyusun 1960).

The average density of wood serves as a parameter for measuring the density or relative weight of a wood type under dry conditions. Its units are grams per cubic centimeter (g/cm³) or kilograms per cubic meter (kg/m³). In dry conditions, density refers to how dense or light the wood is. The higher the air-dry density value, the denser the wood is. Wood with a higher density tends to be stronger, harder, and more durable, while wood with a lower density tends to be lighter and easier to process. In the context of instrument sound quality, wood density also affects the characteristics of resonance and sound projection produced. Wood with a higher density tends to produce a richer and more resonant sound, whereas wood with a lower density may produce a brighter sound and be more responsive to vibration. Table 1 shows classification data on the strength, durability, and density of tualang and merbau wood, with comparisons to ulin wood and albasia wood.

Table 1: Comparison of strength and durability of Rapai Pase musical instrument wood materials
Source: Karina, 2024

No.	Name of Wood	Strength grade	Durability grade	Average density (gr/cm ³)
1.	Tualang Wood (<i>Koompassia excelsa</i>)	I	III	0,95
2.	Merbau Wood (<i>Intsia bijuga</i>)	I – (II)	I – (II)	0,80
3.	Ulin or Iron Wood (<i>Eusideroxylon zwageri</i>)	I	I	1,04
4.	Albasia Wood (<i>Albizzia falcata backer</i>)	V	IV-(V)	0,33

Table 1 illustrates the differences in strength grade, durability grade, and density of different types of wood. Tualang wood exhibits high strength and durability, despite its relatively low density. Merbau wood demonstrates good strength and durability, although it may not match that of tualang wood. Ulin wood is known for its high strength and durability, as well as its high density, although it may be too difficult to craft Rapai Pase musical instruments. Albasia wood has low strength and durability classes, coupled with a low density, crafting it less suitable as a primary material for musical instrument construction. In crafting Rapai Pase musical instruments, the strength standards typically range from Grade I to II and durability from Grade I to III, with an ideal density between 0.80-0.95 gr/cm³. In North Aceh, Tualang and merbau woods are considered substitutive materials for Rapai Pase musical instruments because they belong to the same family, *Leguminosae* (Seng-Choon, Samsudin & Kee-Seng 2007).

According to Diyah's account, the primary materials for crafting Rapai Pase musical instruments include:

1. *Banie* (Wood roots)

The tualang tree (*Koompassia excelsa*) or the merbau tree (*Intsia bijuga*) yield the root wood known as *banie*. Specific forests produce tualang, or merbau, root wood. The tualang tree, also known as the menggiris tree or the sialang tree, thrives in the tropical forests of Southeast Asia, including North Aceh, Indonesia. Its characteristics include high wood density and strength, dark red to blackish-brown coloration, attractive grain and texture, and resistance to termites or other pests, including weather conditions. Similar to tualang wood, merbau timber also exhibits excellent resistance to various weather conditions. Merbau wood is suitable for outdoor furniture, such as chairs or patio tables. Additionally, merbau wood possesses anti-termite and anti-fungal properties, crafting it a durable and long-lasting choice.

2. *Kilet* (Cowhide)

Kilet is a material that comes from selected male cowhides. Animal slaughterhouses typically obtain these cowhides during Eid al-Adha. Male cowhides are believed to produce a low-pitched sound. The process transforms the cowhide sheets into the membrane of the rapai passee.

3. *Aneuk Trieng* (Bamboo cord)

Bamboo is the origin of *aneuk trieng*, a material that undergoes processing into a type of cord. This material is still readily available in North Aceh Regency's surrounding environment. The process thins out the *aneuk trieng*, extracting the bamboo flesh and discarding the skin. The rapai Pase membrane uses the *aneuk trieng* as a frame.

4. *Ija* (patch fabric)

Ija is a material that originates from used or patched fabric. It serves as a reinforcement for attaching the cowhide membrane (*kilet*) to the bamboo cord (*trieng*). This material can be obtained from garment remnants or from collectors of used items in the surrounding villages of North Aceh.

Based on the above descriptions, the basic materials for the Rapai Pase musical instrument possess their own ecological characteristics. The North Aceh community's surrounding environment provides each of these basic materials. Diyah (interviewed on June 10, 2023, in Matang Tunong Village, North Aceh) asserts that despite the increasing difficulty in obtaining tualang or merbau root wood, the basic materials for the rapai Pase musical instrument remain unreplaced. This relates to one of Wegst's research findings (2008), which states that despite technological advancements and the availability of modern materials, instrument makers still rely on natural materials due to their unique acoustic properties and aesthetic appeal. Thus, the basic materials for the Rapai Pase musical instrument, consisting of tualang root wood, merbau, cowhide, bamboo cord, and patch fabric, constitute a unified set of traditional materials that produce the ideal quality of the Rapai Pase musical instrument.

Rapai Pase Musical Instrument Crafting Technique

In North Aceh, generations have passed down the tradition of crafting the Rapai Pase musical instrument. Creating a high-quality Rapai Pase musical instrument takes time and effort. According to Diyah, there are several processes that a craftsman must go through to make a Rapai Pase musical instrument, such as the process of selecting basic materials like wood and cowhide, cutting and shaping, assembly, sound adjustment, decoration, and sound quality testing (Interview, June 10, 2023, in Matang Tunong Village, North Aceh).

Firstly, the process involves the craftsmen retrieving tualang or merbau tree roots from the forest, known locally as 'cok banie.' Traditionally, the process of retrieving tree roots involves a series of procedures that include ritual practices aligned with the teachings of Islam.

Before heading into the forest, Rapai Pase instrument craftsmen are required to observe voluntary fasting on Mondays and Thursdays. After performing the obligatory prayers, craftsmen supplicate to Allah, seeking safety and success in searching for wood in the forest. Following these fasting and prayer rituals, the craftsmen proceeded on their journey to the forest. This can be understood as the craftsmen's spiritual effort to ensure that the subsequent process sequence yields a high-quality musical instrument. Figure 3 illustrates the process of retrieving tualang tree roots.



Fig.3: Taking the root of tualang wood using a chainsaw
Source: Karina, 2023

After finding tualang or merbau wood in the forest, craftsmen proceed with the "cok banie" process, preceded by performing the "peusijuk" ritual. The *peusijuk* ritual is a communal cultural practice in Aceh, rooted in Islamic beliefs. This ritual seeks divine blessings to facilitate the simultaneous and systematic extraction of tualang tree roots, aiming to minimize negative effects and achieve optimal results (Yusuf, Yuslem & Tanjung 2023). For this ritual, craftsmen use water and a handful of leaves found in their surrounding areas. The *peusijuk* ritual entails the craftsmen sprinkling water, using leaves, onto the tualang or merbau tree from which they will take the roots, while also offering personal prayers to Allah. By performing this ritual, craftsmen affirm their spiritual connection with nature and seek blessings in every step they take. After performing this ritual, the craftsmen proceed with cutting the wood roots.

The local craftsmen retrieve wood materials for Rapai Pase musical instruments. These instrument makers extract only a portion of the tualang or merbau tree root base without fully felling the tree. The people of North Aceh hold on to this traditional knowledge. By taking only what they need from the tree roots, they ensure that the trees can continue to grow and thrive for the future.

The advancement of time has transformed the wood retrieval practices in the forest, shifting the traditional methods of the craftsmen towards more modern approaches. Diyah asserts that practical and rapid methods, which prioritize efficiency and productivity, have replaced the fasting and *peusijuk* rituals. The wood-cutting process using machine saws without regard for natural conditions and previously valued spiritual aspects has impacted the quality of the wood obtained. According to Diyah's experience, wood from dead trees tends to have damaged, cracked, or even broken roots, reducing its quality compared to wood directly from living trees.

The second stage of crafting Rapai Pase musical instruments, "Pheuet pereuheng baloh," involves carving and drilling the wood material into a circular shape using tools like chisels and hammers. Diyah describes the final product of this process as "baloh," measuring

approximately 27 inches (68.58 cm) and embellished with ornaments known as "larek." *Larek* holds philosophical meanings, reflecting the subjective knowledge of an *utoh*, or craftsmen. For example, a *larek* consists of five lines and represents a message to adhere to Islam's five principles: 1. Shahada; 2. Salat; 3. Zakat; 4. Sawm; and 5. Hajj (Nurjannah 2014). As a result, the process of creating Rapai Pase musical instruments combines Islamic artistic and religious knowledge.

The third stage in crafting Rapai Pase musical instruments is the soaking of the *baloh*. The craftsmen then soak the shaped tualang or merbau wood into well water, pond water, or natural water bodies such as lakes. This process aims to strengthen and preserve the *baloh*. Diyah explains that the *baloh's* wood fibers have become tightly sealed, and their color has turned a deep black, indicating that they meet the criteria for quality material for producing musical sounds. Diyah states that it takes one to two years to achieve the desired quality of the *baloh* (interview, June 10, 2023, in Matang Tunong Village, North Aceh).

The fourth stage involves smoking the male cowhide. According to local tradition, this stage is known as "sale kilet." The instrument maker then spread out the freshly obtained male cowhide (*kilet*) on the ceiling of a cowshed. Underneath it, the craftsmen construct a small fireplace using dry wood as fuel. They carry out this smoking process to lower the cowhide's moisture content and eliminate any bacteria, thereby enhancing its durability. To ensure the expected quality, they carry out the *sale kilet* process for a minimum of six months to one year.

The membrane installation is the fifth and final stage of crafting Rapai Pase musical instruments. Next, they cut the smoked cowhide, or *kilet*, to the size of the *baloh* and install it on one side. The installation process necessitates the use of *Aneuk Trieng* and *Ija*, two additional tools. *Aneuk trieng* functions as a frame to hold the membrane in optimal tension, while *ija* serves as an adhesive to attach the frame to the wood. This membrane installation stage concludes with tidying up any remaining cowhide and fur still attached for a neater appearance.

Diyah emphasizes that generations have acquired knowledge of wood as a basic material for crafting musical instruments. This reflects a careful material selection process, taking into account the material's unique structure and properties (Lasocki & Prior, 2017). When crafting Rapai Pase musical instruments in North Aceh, local craftsmen choose tualang or merbau wood based on their acoustic characteristics, such as resonance and strength. This knowledge represents a practical application of the same principles in specific local contexts. Figure 4 depicts Diyah as an *utoh* carving tualang wood into *baloh*.



Fig. 4: Diyah, an *utoh*, or a Rapai Pase musical instrument craftsman
Source: Karina, 2023

Discussions

After analyzing the influence of spatial context on the practice of crafting the Rapai Pase in Aceh, it is evident that geographical factors play a crucial role in shaping the choice of materials and techniques used in traditional musical instrument making. A comparison with the crafting of the Tifa instrument in Biak, Papua, which utilizes materials such as pulai wood, monitor lizard skin, and symbolic ornaments influenced by local mythology, highlights the diversity of materials and cultural influences across different regions of Indonesia (Rai S 2021). In Kalimantan, artisans craft traditional instruments such as the Sape' and Tuma from jackfruit wood (*Artocarpus heterophyllus*), which is renowned for its ability to produce loud membranophone sounds (Sari, Linda & Rusmiyanto, 2018; Arbilianto, Ghozali & Silaban, 2019). Laboratory tests confirm that hardwoods generate louder sounds, meeting the acoustic requirements of instruments like the Rapai Pase, commonly played in open fields or rice paddies in North Aceh.

The process of crafting the Rapai Pase musical instrument in North Aceh highlights several important aspects of this traditional process. The process begins with a series of rituals and spiritual practices that honor Islamic beliefs, such as fasting and peusijek rituals, before retrieving tualang or merbau tree roots. This emphasizes the importance of spirituality in the musical instrument's creation process. Additionally, they conduct the process of obtaining wood materials with care and awareness of environmental sustainability, only taking a portion of the tree roots instead of felling the entire tree. This approach reflects the concern of the people of North Aceh for forest conservation as well as their efforts in global climate management (Schubert, Panzarasa & Burgert 2022; Marchi et al. 2018). Nevertheless, time evolution has transformed some traditional practices into more modern and practical ones, albeit at the expense of the quality of the wood produced.

The Rapai Pase musical instrument's crafting process also involves Islamic artistic and religious skills, with *baloh* ornaments carrying deep philosophical meanings. Generations pass down the knowledge of crafting this musical instrument, reflecting craftsmen's efforts to preserve their cultural heritage. This discussion highlights the complexity of the Rapai Pase musical instrument crafting process and underscores the importance of understanding the concept of *habluminal'alam* in Islamic teachings, which encompasses spiritual, environmental, and cultural factors in the process. These findings emphasize the importance of considering both cultural traditions and environmental factors when crafting traditional musical instruments.

Conclusion

This research highlights the significant influence of the spatial context in the practice of crafting Rapai Pase musical instruments in North Aceh. Spatial context encompasses not only physical aspects, such as natural topography affecting the availability of raw materials and crafting techniques, but also cultural aspects and local identity reflected in the instrument-crafting process. Furthermore, the spatial context in this study develops a holistic understanding of how geographic, historical, and social conditions affect each stage of Rapai Pase instrument crafting, as well as how craftsmen accommodate these factors in their practices. In-depth analysis reveals that factors such as natural topography, local history rooted in Islam, and physical and social environments play crucial roles in shaping the crafting techniques, material selection, and cultural significance of Rapai Pase instruments. There are three main aspects to understanding the influence of spatial context.

They are as follows.

1. Firstly, geographical factors influence the availability of raw materials and crafting techniques, with natural topography playing a vital role in shaping these instruments.
2. Secondly, local history and culture, particularly the history of the Samudera Pasai Kingdom based on Islam, provide unique characteristics in the process of crafting Rapai Pase instruments. The concept of "habluminal'alam" also plays a significant role in shaping the local knowledge associated with instrument crafting.

3. Thirdly, the Rapai Pase crafting practices extend beyond mere technical processes, forming a close relationship with their social and physical environment. This conclusion underscores the importance of understanding and appreciating the role of spatial context in preserving and developing traditional arts in North Aceh.

However, this research has several limitations, such as the geographical constraints that may limit the generalization of findings, the focus on ethno-organological aspects that may overlook other dimensions, and the lack of exploration into the influence of external factors such as globalization and modern technology. For further development, research could include broader comparative studies and a deeper analysis of the performative aesthetics of Rapai Pase performances.

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