

Unveiling Ethnoscience Practices among Indigenous Tribes in Indonesia

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Abstract: The local knowledge of indigenous communities has great potential to enrich modern science, particularly through an ethnoscience approach. This study aims to uncover ethnoscience practices in the lives of the Suku Anak Dalam (SAD) people. This study uses a qualitative approach with a descriptive design narrative inquiry. Data were collected through in-depth interviews and participant observation with traditional leaders and members of the SAD community in the Jambi region, then analyzed thematically. The results show that SAD ethnoscience is present in the Besale ritual as a form of traditional healing with elements of music, dance, and natural materials, a Melangun tradition. as an adaptive mechanism for psychological recovery and conservation of living space, as well as the use of Tengeris and Sentubung trees in birth rituals and ecological preservation protected through customary sanctions. These three practices demonstrate that the Orang Rimba (SAD) has a holistic knowledge system that combines scientific, spiritual, and ecological values. In conclusion, the ethnoscience practices of the Anak Dalam Tribe play a vital role in cultural preservation and community health, and can be adapted as a resource for contextual and transdisciplinary science learning.

Keywords: Ethnoscience, Indigenous Tribes, Indonesia, Science Education, Suku Anak Dalam.

1. Introduction

Indonesia is known as a country rich in cultural diversity, ethnicity, and local wisdom that has been preserved from generation to generation (Sujinah et al., 2020). Indonesia is characterized by diverse cultures, regional languages, races, ethnic groups, and religions (Fatimah, 2023). Local values have the potential to enrich modern scientific understanding, especially when examined through an ethnoscientific lens (Harding, 1997). Local values significantly enrich modern scientific understanding by providing diverse perspectives on human-environment interactions (Turner et al., 2022). Ethnoscience is a science learning approach based on local wisdom, integrating traditional knowledge and practices into scientific education (Misbah et al., 2024). Ethnoscience emphasizes the importance of local values and knowledge systems in enriching modern scientific understanding (Diasuti & Ahmadi, 2024).

One community that possesses unique local knowledge is the Suku Anak Dalam (SAD). SAD, or as they prefer to call it, *Orang Rimbo* is a group of indigenous people who live semi-nomadically in Jambi Province, Sumatra, Indonesia (Wardani, 2022). Indigenous Peoples (SAD) possess unique local knowledge, including ancestral beliefs, dependence on forest resources, and a nomadic lifestyle (Ningtias, 2023). The local knowledge held by Indigenous Peoples (SAD) not only represents a way of surviving in the midst of nature but also reflects a value system, cultural identity, and ecological wisdom passed down from generation to generation (Sabinot & Lescureux, 2019). However, Indigenous Peoples' local knowledge is now threatened by the currents of modernization and environmental change (Júnior et al., 2016).

Research related to SAD tends to highlight social aspects (Ningtias, 2023; Putri et al., 2024; Zakiyah & Nurhafizah, 2021), economic (Muchlis et al., 2025), and cultural aspects in general (Ginting et al., 2025; Hidayati et al., 2023). Still, there is little exploration of the local scientific knowledge systems and practices within the Suku Anak Dalam culture. Therefore, it is important to research these ethnoscience practices so that they are not only documented but also integrated into a contextual educational approach that respects local identity and the environment (Budiarti et al., 2024; Sari et al., 2023). By exploring SAD ethnoscience practices, it is hoped that alternative forms of knowledge relevant to the development of culture-based science education can be discovered. Theoretically, the ethnoscience approach views

each community group as possessing a knowledge system shaped by their local ecological and cosmological experiences (Putra, 2021).

Through this study, researchers aim to uncover the well-preserved ethnoscience practices of the Suku Anak Dalam (SAD) and expand the literature on local culture-based education in Indonesia. This article aims to uncover and describe the ethnoscience practices of the Suku Anak Dalam (SAD).

2. Methodology

This study uses a qualitative approach with a narrative inquiry design, which aims to explore and reconstruct the experiences and practices of ethnoscience that are present in the daily lives of the Suku Anak Dalam community (Lindsay & Schwind, 2016). This approach was chosen because it is able to capture subjective meanings, life narratives, and cultural values that cannot be explained through numbers or statistical data (Portillo, 2000). The subjects of this study were members of the Suku Anak Dalam (SAD) community who live in the forests of Sumatra, specifically in the Jambi region. Subject selection was carried out purposively, considering the subjects' direct involvement in traditional practices containing elements of ethnoscience. Data were collected through in-depth interviews with teachers and traditional leaders and participant observation. Data were analyzed using thematic analysis (Squires, 2023).

3. Findings and Discussion

Traditional knowledge has long been the foundation of indigenous communities in Indonesia. In this context, ethnoscience is understood as a system of local knowledge integrated with the environment, spirituality, and empirical experience, passed down through generations (Rahayu et al., 2021; Sari & Santosa, 2019). The Suku Anak Dalam (SAD), also known as the Orang Rimba, is one indigenous community that still maintains ethnoscience practices in various aspects of their lives, from medicine and conservation to life-cycle rituals (Asniah, 2023; Wulandari et al., 2022). These practices reflect a strong integration of ecological and spiritual values.

3.1 Besale

Besale is a cleansing ritual of the Anak Dalam tribe, aimed at purifying evil spirits (Asniah et al., 2023). Besale involves shamans, dancers, and singers (Asra et al., 2020). One of the most prominent forms of ethnoscience in the Besale ritual combines elements of prayer, dance, sounds, and offerings of various flowers and other natural materials. A 37-year-old female informant who participated in this ritual explained:

"When my child had a high fever that wouldn't improve with medication, we performed a Besale ritual. After that night, his body gradually improved. I think it wasn't just the prayers, but the atmosphere, the dancing, and the fragrances also had an effect."



Figure 1. Besale Ritual

The Besale ritual in the Suku Anak Dalam (SAD) community consists of three main stages, each reflecting the integration of spiritual beliefs and traditional healing practices. The first stage is called Bejampi, a preparatory phase in which the traditional shaman (Malin) identifies the patient's illness. This process is followed by a family meeting and the collection of ritual materials such as flowers, incense, and other offerings. The second stage is Beterkas, the core ritual, which takes place at night in a solemn atmosphere. The patient to be healed sits on a pavilion surrounded by four bamboo pillars, surrounded by ritual participants such as Sidi, Pembayung, and Berentak dancers who accompany the procession with rhythmic music and mantras. During this stage, food offerings such as coconut, juwadah, chicken, and eggs are

presented as an offering to the ancestral spirits. The final stage is Besale, the closing stage of the ritual. The patient is removed from the pavilion as a symbol of healing, and if the patient no longer shows any signs of illness, the ritual is declared successful. One of the male dancers in the ritual, aged 28, said:

"When it reaches Beterkas level, the atmosphere is quiet, everyone is focused. The fast movements and the accompanying music make people go inside. We are like helping the patient through our body."

The Besale ritual is usually performed collectively, involving traditional figures, family, music, and offerings. Scientifically, this process can create a strong sense of emotional support from the community. In psychology, social support and belief in healing (the placebo effect) have been shown to accelerate physical and mental recovery (Petrie, 2001; Wampold, 2018). When a person feels heard, cared for, and protected, the body tends to respond positively to the healing process (Bodie, 2016; Dahl, 2024; Roos et al., 2023).

A male informant who is a relative of the patient said:

"The patient feels less alone. Many people help, pray for him, and even spend the night with him. This makes him feel loved and motivated to get better."

Besale uses frankincense, flowers, and other natural ingredients with specific aromas. Many studies have shown that the aromas of natural ingredients such as flowers and spices can stimulate relaxation, reduce stress (Ahmad et al., 2025), and even have antimicrobial effects (Pant et al., 2019). Frankincense has been shown to block inflammatory pathways, helping conditions such as asthma, arthritis, and inflammatory bowel disease (Bokelmann, 2022; Hamidpour et al., 2013). The aroma of frankincense is associated with positive psychophysical effects, promoting relaxation and reducing stress (Mertens et al., 2009).

A traditional shaman (Malin) said:

"Frankincense and flowers have power. But they also have a scent that can soothe the heart. That's no coincidence; it's part of our healing tradition, passed down through generations."

This ritual is accompanied by sounds and dance, which are known in neuroscience and psychology to have therapeutic effects (Flores, 2018). Rituals that combine sound and dance have powerful psychological effects (Goodwyn, 2016). Traditional music can calm the nervous system (Aluko et al., 2023), lower blood pressure (Dewi et al., 2023), and stress reduction associated with music therapy has shown potential for increased happiness and well-being (Aluko et al., 2023; Siahaan et al., 2025). Dance and rhythmic movement can also stimulate blood flow and strengthen the body's involvement in the healing process (Evans, 2017).

The 25-year-old female dancer explains:

"We practice rhythm to match the steps and beats. There are times when the body feels warm and light. The patient also moves slightly, which is a sign of energy flowing."

Besale is not performed haphazardly but is usually held in a dedicated location, near a forest or community center. This provides direct contact with nature, known in ecopsychology as a healing factor. Contact with nature is associated with reduced stress, emotional well-being, and improved recovery from illness (Soga & Gaston, 2022; Westlund, 2015). Furthermore, spiritual belief in the power of Bahelo (gods) provides important existential meaning to the healing process, and spirituality is often associated with increased immunity and life expectancy (Saad & Medeiros, 2017). Spirituality can reduce pro-inflammatory cytokines and improve immune system function (Caldeira, 2023). A traditional leader stated:

"We believe that sacred places are at one with nature and our ancestors. If rituals are performed there, healing can occur not only through the action, but also through the work of the spirits of nature."

3.2 Melangun

Melangun is a tradition of the Orang Rimba to leave their homes after a family member dies. The goal is to avoid bad luck and ease grief. While it used to last 10–12 years, it now lasts only 4 months to 1 year due to shrinking forest cover. The body is not buried but placed in a hut in the forest because they believe the deceased can come back to life (Alfiani & Kristiyanti, 2025; Waryono et al., 2021). The deceased's name is also not mentioned again to avoid adding to the grief (Marmoah, 2014; Ramli et al., 2021).

One 52-year-old male informant said:

"If we stayed where someone had died, we'd be doomed. We left and moved, so the spirit could rest in peace and we could gain our strength. The children weren't afraid either, being far from the funeral home."

Through this tradition, the SAD community indirectly implements a regional rotation system that reduces the overexploitation of natural resources (Masyud et al., 2020; Muchlis & Sardi, 2023). Furthermore, this residential relocation has emotional healing value, serving as a form of collective post-death therapy (Bachrach, 2018; Mustika &

Dastina, 2022; Asniah, 2023). This relocation is closely linked to ecopsychological approaches and environmentally based local wisdom (Takiddin, 2022; Persoon & Wardani, 2023).

A 30-year-old woman, who experienced daydreaming after the death of her mother, explained:

"Moving was hard, but it was more peaceful. If I stayed, every little thing reminded me of my mother. But after moving, I could start living again, slowly... while still carrying her memory with me."

In the SAD tradition, the place of death is believed to bring "bad luck" or negative energy, making it uninhabitable (Prasetijo, 2017; Waryono et al., 2021). Melangun is a form of spiritual and emotional escape from grief, as well as a form of respect for the soul of the deceased (Alfiani & Kristiyanti, 2025; Ramli et al., 2021). The spirit should not be disturbed, and mentioning the deceased's name is considered taboo as it can reawaken grief (Mustika & Dastina, 2022; Asniah, 2023).

A traditional figure said:

"The name of the deceased is kept secret. Don't mention it, or the sadness will return. It's a sign of respect and allows them to pass away peacefully."

Scientifically, melangun functions in line with the psychological approach to trauma recovery (Takiddin, 2022; Bachrach, 2018). By moving, individuals or families with SAD are given space to process grief, move away from environments that trigger painful memories, and build new emotional attachments (Prasetijo, 2017; Masyud et al., 2020; Muchlis & Sardi, 2023). In psychology, this action is similar to a coping mechanism or adaptive defense mechanism (Mustika & Dastina, 2022; Asniah, 2023).

One 47-year-old male head of the family revealed:

"If we stay in our old place, the sadness will never end. But if we move, we can slowly start over. The kids and I have been sleeping better since we moved."

Furthermore, moving with a social group creates a space for collective support. Grieving with SAD is not an isolated experience, but rather a communal experience, which psychologically strengthens the emotional recovery process (Ramli et al., 2021; Waryono et al., 2021; Alfiani & Kristiyanti, 2025).

A young woman stated:

"We walked together, cooked together, slept close together. It felt like we weren't alone in our sadness. There were many silent hugs between us, small acts of kindness."

This tradition also regulates the timing and rhythm of social recovery naturally, without being forced by formal systems (Takiddin, 2022; Persoon & Wardani, 2023; Asniah, 2023). A 58-year-old informant explained:

"We don't use a calendar or a schedule. Only when the grief has subsided and the new place feels safe do we return or find a permanent place to live. We all follow our own instincts."

From the various statements above, it appears that *Melangun* is not just a tradition of moving from one place to another, but a practice of psychosocial recovery based on culture and ecology that harmoniously brings together emotional needs, spiritual beliefs, and environmental wisdom.

3.3 Utilization of Tengeris and Sentubung Trees

In the lives of the Suku Anak Dalam (SAD) people, the Tengeris and Sentubung trees are not just ordinary forest plants, but important ecological and spiritual symbols. Both play a role in birth rituals and infant protection, and are revered as guardians of life (Asniah, 2023; Wulandari et al., 2022). The use of these trees reflects ethnoscience practices, namely the integration of local knowledge, belief systems, and ecological values (Rahayu et al., 2021; Sari & Santosa, 2019). This tradition demonstrates that the SAD has developed a form of sacred conservation through culture and ritual (Fadli et al., 2017; Darmawan et al., 2020). A spiritual life integrated with the environment creates a strong relationship between humans and nature (Yuliana & Fauzi, 2021; Tuhuteru & Titaley, 2022). Therefore, preserving these trees is not only an ecological action, but also a spiritual and cultural one (Fitriani et al., 2023; Handoko, 2018).

A 63-year-old traditional leader explained:

"Tengeris and Sentubung are like parents to us. They must not be cut down. If anyone dares to cut them down, it's like killing one's own brother. They've looked after our children since birth."

The Tengeris tree is believed to symbolize protection and life. Indigenous peoples (SAD) apply the sap of this tree to the crowns of babies as a ward against disaster and as a spiritual protector (Fitriyanti & Sumantri, 2019; Gunawan & Sulistiyo, 2022). This practice reflects ethnopharmacology, where natural compounds are used based on beliefs and experiences passed down through generations (Supriadi & Nurdin, 2021; Siregar et al., 2020). Various studies have shown that the sap of tropical forest plants does indeed have antimicrobial and immunoprotective activity (Nurhayati et al., 2016; Dewi et al., 2021). Similar practices have also been found among other indigenous communities in the Indonesian archipelago and Southeast Asia (Nguyen et al., 2019; Adi et al., 2022). Although not all have been

biomedically tested, this pattern of use shows a relationship between spiritual health and natural medicine (Rahmadani & Yusuf, 2020; Astuti et al., 2023).

A new mother shares her experience:

"When my baby was born, a shaman rubbed Tengeris sap on the crown of his head. He said it would ward off evil spirits. I believe it because my child has rarely been sick since then."

The Sentubung tree plays a role in the placenta planting ritual of the SAD community. Planting the placenta under this tree symbolizes the beginning of life connected to nature (Sulaeman et al., 2017; Kartika et al., 2022). This practice establishes a symbolic and spiritual connection between the human body and the tree, which is viewed as a sacred living being (Almira & Putra, 2020; Manurung & Lubis, 2021). The unique shape of the Sentubung tree is believed to symbolize stability and steadfastness of character (Yusuf et al., 2018; Lestari & Sujana, 2021). From an ecopsychological and environmental anthropological perspective, this act demonstrates an emotional attachment to the ecosystem (Kusnadi, 2019; Susilowati & Arifin, 2022). Placenta implantation also functions as a bio-identification of the child to the ancestral land and the SAD social system (Hidayat & Pramono, 2017; Wahyuni et al., 2024).

A traditional shaman explains the important symbolism of Sentubung:

"The placenta is like a baby's twin. If planted under a Sentubung tree, the child grows with the tree's roots and strength. Their connection to the forest is never broken."

The SAD (Sad) has customary rules prohibiting the felling of Tengeris and Sentubung trees, with customary sanctions equivalent to "killing a human" (Syamsuddin & Halim, 2020; Ramadhan et al., 2022). This is a form of biocultural conservation, where preservation is not solely ecological, but is also bound by cultural norms and sacredness (Maulana & Hermansyah, 2016; Setiawan et al., 2021). Sacred conservation has proven effective in maintaining high-value tree species in tropical forests (Mawardi et al., 2018; Putri et al., 2023). This prohibition also serves as a means of transmitting ecological values between generations (Marlina & Andriani, 2019; Risnawati et al., 2020). In a global context, this approach is consistent with UNESCO principles on the preservation of local knowledge and biodiversity (Soedjito, 2015; Wibowo & Nasution, 2022).

One young informant from the next generation said:

"We were taught from childhood not to touch the Tengeris and Sentubung trees. Even picking their leaves requires permission. They are our heritage and our protectors."

From these findings, it can be concluded that Tengeris and Sentubung are not just ordinary trees for the SAD, but rather central to their value system, beliefs, and the conservation of their lives. Preserving these trees not only maintains the forest ecosystem but also preserves a spiritual heritage and social identity that has been passed down through generations.

4. Conclusions

The ethnoscience practices of the Suku Anak Dalam (SAD) Tribe, such as Besale, Melangun, and the use of tengeris and sentubung tree, demonstrating the integration of local knowledge, spirituality, health, and ecology, which is scientifically and educationally relevant. The implication is that these values can be integrated into ethnoscience-based teaching materials to enrich the learning context, foster an appreciation for local wisdom, and connect science to students' real lives. Developing such teaching materials not only strengthens cultural identity but also encourages contextual, holistic, and transdisciplinary learning. Therefore, it is recommended that teachers and curriculum developers adapt local ethnoscience content, such as that of SAD, into science subjects using an interactive, project-based approach that involves direct exploration of local culture.

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Conflict of Interest

The authors declare there is no conflict of interest

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