IRSAJ
International Remote Sensing Applied Journal
e_ISSN = 2775-3409
p_ISSN =_____- ____
Vol 6 No 1 | June 2025

THE ROLE OF LOCAL WISDOM "*MANOKOK TABUAH*" AS AN EARLY WARNING SYSTEM AGAINST FLOODING IN NAGARI SUNGAI LIKU, PESISIR SELATAN REGENCY

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ABSTRACT: This research seeks to explore the role of the *Manokok Tabuah* system as a traditional early warning mechanism for flood disasters in Nagari Sungai Liku, assess its effectiveness in enhancing community preparedness, and examine its potential integration with modern technology. A descriptive qualitative approach was employed, utilizing data collection methods such as in-depth interviews, field observations, and documentation. Data were analyzed using the Miles and Huberman model, involving the stages of data reduction, data display, and conclusion drawing. The findings indicate that *Manokok Tabuah* serves not only as an effective culturally-based early warning tool but also fosters social cohesion within the community in the face of disasters. Although it has been largely replaced by modern sirens, the system retains significant cultural value. Therefore, combining traditional practices with modern technological approaches is considered essential for developing an adaptive and sustainable disaster mitigation system.
Keywords: early warning system, local wisdom, manokok tabuah

1. INTRODUCTION

According to Law Number 24 of 2011 (in Taryana, 2022), a disaster refers to an incident or a series of incidents that have the potential to endanger and disrupt the lives and livelihoods of communities. These events may originate from natural causes, non-natural factors, or human actions, and can lead to significant consequences such as loss of life, environmental destruction, economic damage, and psychological trauma.

Flooding ranks among the most common natural disasters in Indonesia. It predominantly impacts areas located near rivers, especially when the volume of runoff from intense rainfall surpasses the rivers' capacity. Rivers are vital to maintaining ecological stability they not only provide water but also act as natural drainage systems, directing rainwater from upstream to downstream through designated catchment zones. These zones, referred to as Watersheds (DAS), play a key role in the sustainable management of water resources (Willianto et al., 2024). Nagari Sungai Liku in Pesisir Selatan Regency is one of the regions frequently affected by floods. Situated along the Batang Pelangai watershed, this area faces limitations in its drainage capacity. The recurring floods are primarily driven by its geographical characteristics and the high intensity of rainfall. The consequences extend beyond property damage, posing risks to human life and significantly disrupting the community's socio-economic activities (Safitri et al., 2022).

Flooding is one of the most frequently occurring disasters in Indonesia. It typically affects regions located near rivers, particularly when these rivers lack the capacity to manage excess rainwater runoff. Rivers play a crucial role in preserving environmental stability. In addition to being a source of water, they serve as natural drainage systems that collect and channel rainwater from upstream catchment areas to downstream locations. These catchment zones, known as Watersheds (DAS), are vital components in managing water resources effectively (Willianto et al., 2024). One of the flood prone areas is Nagari Sungai Liku in Pesisir Selatan Regency, which lies along the Batang Pelangai watershed a system with limited flow capacity. The area's geographic features combined with intense rainfall are the primary causes of the recurring floods. These events not only result in material losses but also pose risks to human life and disrupt the socio economic activities of the local population (Safitri et al., 2022).

Even though they are rooted in tradition, early warning systems like *Manokok Tabuah* have significant potential for further advancement through a comprehensive approach. Traditional knowledge has historically been integral to the community's approach to adapting to the environment, particularly regarding disaster risk reduction. As stated by Nasir et al. (2017), local wisdom can enhance community resilience systems as it is derived from

IRSAJ
International Remote Sensing Applied Journal
e_ISSN = 2775-3409
p_ISSN =_____- ____
Vol 6 No 1 | June 2025

historical experiences that have proven effective in managing natural dynamics. Numerous studies indicate that the combination of traditional systems with modern technology can greatly enhance the efficiency of disaster mitigation. For instance, merging conventional alarms with digital weather devices and app-based information systems can offer more precise and timely alerts to the community, while still preserving local cultural values that have been deeply rooted (Purwanto & Nugroho, 2021).

2. METHODS

2.1 Research Location

The research was conducted in Nagari Sungai Liku, a village located in Ranah Pesisir District, Pesisir Selatan Regency, West Sumatra, Indonesia. This area lies along the Batang Pelangai Watershed, which frequently overflows during periods of high rainfall, making the village highly prone to flooding.

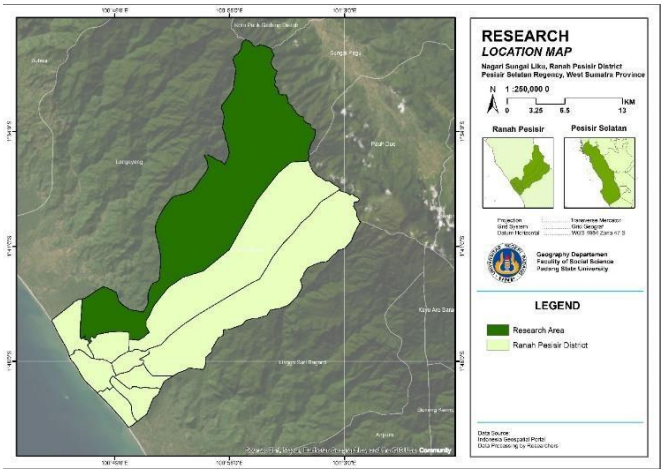

Figure 1. Research Location Map

2.2 Research Method

This study employs a qualitative descriptive method. Primary data was gathered via direct interviews with community members and village officials in Nagari Sungai Liku. In the meantime, secondary data was gathered through a literature review pertinent to the research subject. Methods for gathering data involve interviews, field observations, and documentation. In-depth interviews were carried out to investigate information aligned with the research focus.

The data analysis procedure adhered to the framework suggested by Miles and Huberman (2014), commencing with the data reduction phase, succeeded by data presentation, and concluding with the stage of drawing conclusions or validation. The data were examined by organizing pertinent information in line with the research goals and subsequently presented in a narrative format to aid in the conclusion formulation process. Throughout the analysis and verification process, researchers assessed the data's validity to confirm its accuracy and consistency.

3. RESULTS AND DISCUSSION

Nagari Sungai Liku is an area in Indonesia that is considered vulnerable to flooding. The significant degree of susceptibility is directly linked to its geographical situation along the Batang Pelangai Watershed (DAS), a river that traverses the Ranah Pesisir District, which includes Nagari Sungai Liku. Batang Pelangai is recognized for its high water discharge but restricted capacity, so when the rainy season comes, the river frequently overflows and results in flooding in the nearby regions.

Even with the significant risk of catastrophe, the residents of Sungai Liku continue to live in the region. This results from various significant factors, including emotional connections to ancestral territories, the presence of income sources, and relatively straightforward access to essential services. In addition to this vulnerability, the

IRSAJ
International Remote Sensing Applied Journal
e_ISSN = 2775-3409
p_ISSN =_____- ____
Vol 6 No 1 | June 2025

community possesses a type of local knowledge that is crucial for disaster mitigation strategies, particularly when dealing with repeated flood risks.

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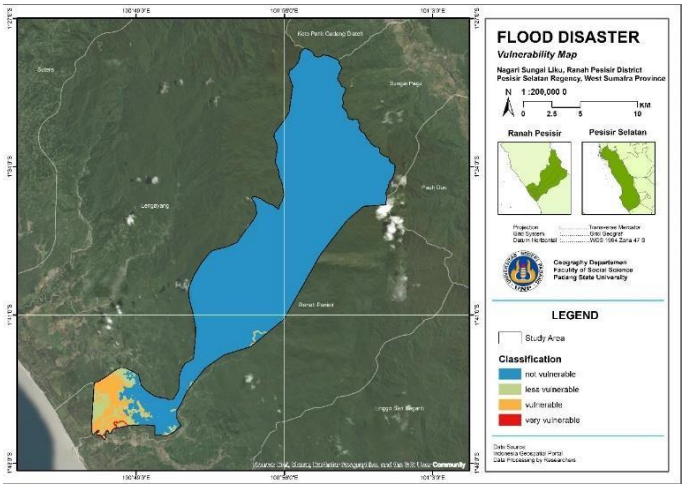

Figure 2. Flood Disaster Vulnerability Map of Sungai Liku

A type of local knowledge is the conventional early warning system referred to as *"Manokok Tabuah"*. This system, while straightforward, has demonstrated effectiveness in delivering early notifications to the community about possible flooding. As stated in the quote, "This system employs *Tabuah*, a conventional Minangkabau sound instrument that looks like a long drum and is akin to the drum found in several regions of Indonesia."

Tabuah has served as a means of communication for traditional communities for thousands of years. It is often present in ancient surau or mosques throughout West Sumatra. The *word "manokok*" originates from the Minang language, signifying "to strike", thus *"Manokok Tabuah"* directly translates to "striking tabuah". The system is straightforward yet effective. When intense rainfall starts in the upstream region and the river levels rise noticeably, a resident will strike the *tabuah* to alert the community. The sound of the *tabuah* indicates a risk of flooding, encouraging residents to ready themselves, protect their possessions, and evacuate promptly if needed.

In terms of disaster risk reduction, Mercer et al. (2010) emphasize the importance of integration between local knowledge and scientific knowledge as complementary approaches. In Nagari Sungai Liku, traditional systems such as *Manokok Tabuah* reflect local wisdom in providing early warning to the community when disaster threats occur, such as floods or landslides. This knowledge has proven culturally and historically effective in mobilizing communities quickly and collectively. When integrated with modern technology such as sensor-based early warning systems or digital applications, this approach not only improves the accuracy and speed of response, but also strengthens local community participation in disaster mitigation. Thus, the synergy between *Manokok Tabuah* and modern technology in Nagari Sungai Liku can create a more inclusive, resilient and sustainable early warning system.

Nonetheless, with the progression of time and advancements in technology, the conventional *"Manokok Tabuah"* system started to be superseded by the announcement of sirens through the loudspeakers of mosques and surau. This system is seen as more efficient since it can cover a larger area in a shorter duration. Utilizing sirens enables a clearer and more consistent transmission of emergency alerts to all residents, particularly during nighttime or when severe weather hinders the clarity of *tabuah* sounds.

The involvement of local communities is essential for the effectiveness and sustainability of a reliable early warning system. Rai and Khawas (2019) highlighted that utilizing a community-oriented strategy for disaster risk management can enhance the incorporation of local expertise and boost community engagement in the mitigation efforts. The traditional warning system known as *Manokok Tabuah* in Nagari Sungai Liku exemplifies that local insights function not only as a technical alert system but also reinforce the social fabric and collective resilience of the community when confronting disasters. Nevertheless, a significant obstacle lies in merging traditional practices with modern technological advancements to create a more adaptive and inclusive early warning system. By empowering local populations and combining indigenous methods with technology, disaster management initiatives can become more impactful while preserving cultural heritage and enhancing overall community readiness.

Beyond serving as a preliminary alert system, *Manokok Tabuah* possesses a significant social aspect. The tradition of striking the *tabuah* often serves as a unifying event that gathers individuals together, particularly during times of crisis. This fosters social unity, which is crucial for effective disaster management, as individuals are more inclined to assist one another and respond swiftly when a strong sense of community exists. In this regard, *Manokok Tabuah* functions not merely as a technical framework, but also as a societal instrument that enhances the resilience of the community.

Research conducted by Ramadhan and Taqiyuddin in 2024 further verifies that such local wisdom contributes not just to providing early warnings but also hastens recovery efforts following disasters, thanks to the social connections and shared knowledge that have been inherited through generations.

4. CONCLUSION

Nagari Sungai Liku is a region that faces significant flood risks because it's situated along the Batang Pelangai watershed, which frequently floods during rainy periods. Nonetheless, the residents persist for reasons tied to emotional connections, financial stability, and accessibility. In response to the threat of flooding, the community has long utilized traditional knowledge by implementing the *Manokok Tabuah* early warning system, which uses sounds from customary musical instruments as alerts for danger.

In recent times, advancements in technology have led to this method being supplanted by sirens from mosques and suraus, deemed quicker, more widespread, and efficient. This blend of heritage and modernity exemplifies how the community adapts, enhancing local capabilities to tackle disasters. Even though it is becoming less common, *Manokok Tabuah* still embodies significant historical and cultural importance as a remnant of local wisdom for disaster management in Nagari Sungai Liku. To ensure the longevity of this traditional approach, there is a necessity for governmental policies that not only support the preservation of culture but also promote local innovation. According to the National Disaster Management Agency (BNPB), the incorporation of traditional wisdom is a crucial foundation in strategies focused on reducing disaster risks at the community level (BNPB, 2020).

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