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THE SEMIOTICS OF DIVINITY AND RESILIENCE: DECIPHERING DISASTER MITIGATION WISDOM IN THE VERNACULAR ARCHITECTURE OF *GHUMAH BAGHI*

Reza Aprianti[1], Rafail Hasanov*[1]

[1]Department of Sociology, Baku State University, Azerbaijan,

Corresponding author: Reza Aprianti; **email:** reza.aprianti@bsu.edu.az

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Abstract: Traditional vernacular architecture often embodies a sophisticated synthesis of spiritual values and environmental adaptation. This study examines the *Ghumah Baghi*, a traditional house of the *Besemah* people in South Sumatra, which has survived centuries of seismic activity. While previous studies focused on its physical structure, there is a lack of research integrating its theological symbolism with disaster mitigation functions. This research employs a qualitative method with a semiotic approach, utilizing Peirce's triadic model to analyse the meanings behind the architectural ornaments and structural systems. The findings reveal that the divine symbols in *Ghumah Baghi*-such as the *Tiang Duduk* (floating foundation) and floral carving-represent a "theology of balance" between humans, nature, and the Creator. Critically, these spiritual symbols manifest that advanced indigenous engineering; the non-fixed foundation serves as a base-isolation system that provides seismic resilience. The study concludes that the theological philosophy of "yielding

*__Rafail Hasanov__ is a Professor of Sociology at the Department of Sociology at Baku State University, Azerbaijan.

to divine nature" is the fundamental driver behind the building's structural endurance. This research contributes to the discourse of ethno-architecture by proving that local wisdom and spiritual semiotics are essential components in developing sustainable and culturally-rooted disaster mitigation strategies.

Keywords: *Ghumah Baghi*; Semiotics; Divinity; Disaster Mitigation; Vernacular Architecture.

Introduction

The island of Sumatra is the third largest island in Indonesia. Another name for this island is *Svarnadwipa*, which means golden island. (Daru Tjahjono et al., 2010). Located on the Ring of Fire, which is part of the active seismic zone on the edge of the Pacific Ocean, this region has many active volcanoes such as Mount Marapi in West Sumatra, Mount Sinabung and Mount Sibayak in North Sumatra, Mount Kerinci on the border of Jambi and West Sumatra, and Mount Dempo in South Sumatra. (Suprapto, 2012).

The position of the Ring of Fire makes Sumatra rich in natural resources, but on the other hand, the risk of natural disasters such as earthquakes and volcanic eruptions is very high. Data shows that throughout 2025, volcanic activity occurred at several volcanoes on the island of Sumatra. Mount Marapi in West Sumatra Province was the most active volcano with 113 eruptions at Alert Level II, causing ashfall in the surrounding area (PDSI Pusdatinkom, 2025).

The same applies to Mount Dempo in South Sumatra Province. This study specifically discusses the area around Mount Dempo, South Sumatra. This mountain is classified as an active volcano, which showed some volcanic activity in 2025. During 2025, specifically in August, there were sporadic eruptions occurring 4-5 times, with ash columns reaching 1,200–1,300 metres, classified at Level II (alert) when the number of hikers on Mount Dempo was high

(Fadhlurrahman, 2025). In addition to eruptions, in July 2025, Mount Dempo also recorded volcanic and tectonic earthquakes with continuous tremors. Seismic monitoring from 1 to 9 July recorded four deep volcanic earthquakes, one earthquake with a magnitude of II on the MMI scale, and two distant tectonic earthquakes (Pusat Vulkanologi dan Mitigasi Bencana Geologi, 2025).

Mount Dempo is a stratovolcano (cone) with an attractive volcanic crater whose water colour changes depending on volcanic activity, sometimes appearing grey, green, blue or turquoise. This attracts many climbers, both beginners and experienced, who want to conquer one of the highest mountains on the island of Sumatra. According to data from the Mount Merapi Dempo Registration Office, a total of 7,367 climbers ascended Mount Dempo during the year 2025 (Antara, 2026). Although the amount of damage and number of victims affected has not been as high as other volcanoes to date, Mount Dempo must still be treated with caution.

Awareness and preparedness for Mount Dempo's activity have long been a concern for the ancient people who lived around the foot of the mountain, known as the *Besemah* tribe. The *Besemah* cultural region is very extensive, covering the city of Pagar Alam, Lintang Empat Lawang District, Lahat District, Muaraenim District, and the coastal areas of Bengkulu, such as South Bengkulu District and Kaur District in Bengkulu Province (Hariadi, 2014). The *Besemah* tribe has proven its ingenuity in designing their homes with earthquake-resistant construction. These buildings are called *Ghumah Baghi*.

Ghumah Baghi is the name given to a house that is quite old, approximately 150-200 years old, and is used as a place to carry out all personal, social and traditional activities. Some parts of the house are also used to store possessions and daily necessities. In general, *Ghumah Baghi* is rectangular in shape, measuring 6m x 6m, 7m x 7m, or 8m x 8m, with two main

buildings, namely the house and the kitchen (Arios et al., 2012). *Ghumah Baghi* is unique because the design of this building has an earthquake-resistant construction that they adapted to the conditions of their living environment, which did not exist at the time. *Ghumah Baghi* is a reflection of the local wisdom of the *Besemah* tribe in dealing with disasters.

Research on *Ghumah Baghi* has been conducted by several researchers previously, but generally focuses on architectural designs that discuss wooden house construction (Febryano et al., 2021; Ibnu et al., 2023). There are also those who focus on cultural and historical studies by discussing the origins of the *Besemah* tribe and the social function of houses (Wijaksono et al., 2020). The rest focus on the ornaments found on buildings, such as carvings (Budi Laksana, 2015). However, none of these studies have specifically discussed the concept of divinity and disaster mitigation in the construction design of *Ghumah Baghi*. Therefore, this research is very important to be conducted.

Literature Review

The construction of vernacular architecture in *Ghumah Baghi* is full of symbols with deep meanings. These symbols are placed at the corners of the buildings with specific intentions and purposes. The types of carvings that adorn most of the building walls also represent the cultural, social and environmental values of the region. These messages and signs are included in the study of architectural semiotics.

Architectural semiotics is the study of buildings as a system of signs consisting of symbols with meanings contained within them to communicate messages and information to others in the form of elements, ornaments, building shapes, colours, and spatial structures packaged in visual language so that they are easy to understand. Every design created has a signifier-signified relationship or denotative and connotative meanings (Ibrahim & Ashadi, 2020). Architectural design certainly does not only focus on

the functional aspects of a building, but must also be communicative and meaningful, because every building conveys ideological, social and cultural messages. This is also true of the architecture of *Ghumah Baghi*, which carries cultural and social meaning in its preparedness for earthquakes.

The disaster mitigation message contained in the design of the *Ghumah Baghi* building in the form of carved symbols and building structures can be clearly read using a semiotic approach. Semiotics does not have to be in the form of words but can include anything that can signify something. The sign object can be something more universal. Umberto Eco sees the world as a giant text composed of signs, while humans act as readers of the text to give meaning (Eco, 1979). This also includes *Ghumah Baghi*, which can be read using a semiotic approach. The semiotic model used is Charles Sanders Peirce's triadic semiotic model, which consists of a representamen (a sign that can be perceived or is a physical representation of something), an object (the thing that is represented or referred to by the sign), and an interpretant (the further meaning that arises as a result of the sign) (Jappy, 2013). Semiotics, in Pierce's view, considers that signs have meanings that undergo constant change, or unlimited semiosis (Brent, 1998).

Ghumah Baghi is part of local wisdom that originates from the creativity, taste and work of the *Besemah* tribe. Based on Law No. 32 of 2009 concerning Environmental Protection and Management, local wisdom is defined as ancestral values that protect and manage the environment in a sustainable manner, such as the natural resource management system in indigenous communities. The government is obliged to protect these various forms of local wisdom as stipulated in Law No. 11 of 2010 concerning Cultural Heritage, which regulates the preservation of objects, buildings, structures, locations and indigenous legal communities as cultural heritage, including local wisdom.

Local wisdom is part of disaster risk reduction (DRR) measures. Disaster risk reduction includes prevention,

mitigation, preparedness, response and recovery (Shaw et al., 2008). The integration of local wisdom and the capabilities of indigenous communities in dealing with disasters can protect them from the devastating impacts of the disasters that befall them (Hiwasaki et al., 2014). Examples of local wisdom included in Disaster Risk Reduction are natural knowledge (local knowledge) in the form of identifying natural signs such as earthquakes and tsunami through oral traditions (*smong*, Simeulue Aceh) as an early warning effort. Building techniques (local genius) in the form of disaster-resistant structures such as *Ghumah Baghi*. Adaptation practices are also examples of disaster risk reduction, such as terracing techniques to prevent landslides, maintaining river cleanliness to avoid flooding, and reforestation as part of post-fire recovery.

Ghumah Baghi is not only a place to live that has social and cultural significance, but is also designed to be earthquake-resistant (Ibnu et al., 2023). In Indonesia, there is not only *Ghumag Baghi* in *Besemah*, South Sumatra, but also several other vernacular architecture houses that are specifically designed to withstand natural disasters such as earthquakes, such as Rumah *Gadang* in Minangkabau (Abidah et al., 2023; Imani et al., 2021; Ujianto & Afdholy, 2024), *Omo Hada* and *Omo Sebua* in Nias (Lumantarna et al., 2013; Syuaib Intan & Nasruddin, 2019), *Rumoh Aceh* in Aceh (Hairumini et al., 2017; Meutia, 2017), *Laheik House* in Kerinci, Jambi (Afni Sya'adah & Rahardjo Wahyudi, 2024; Refi Hasibuan et al., 2014), *Joglo* House in Java (Alvin & Gunawan, 2019; Dwi Wismantoro et al., 2023), *Uma Lengge* in Bima Sumbawa (Ashmarita et al., 2025; Hariyanto et al., 2020), *Tongkonan* Toraja House in South Sulawesi (Agantari Dhana et al., 2023), *Sao Ria's* house in Ende, Flores (Ujianto et al., 2025), *Mbaru Niang* in Wae Rebo Village, Flores (Dwiputri, 2023), *Woloan* in Tomohon (Kabo & Sulangi, 2023), The Thousand Leg House of the Arfak Tribe in West Papua (Soedhijanto et al., 2023), Traditional Balinese house (Purwantiasning & Agustini, 2018;

Windhu et al., 1985) dan *Bale Bayan* in the Sasak Tribe of North Lombok (Saptaningtyas et al., 2023; Susilo & Umniati, 2021).

Methodology

This research is qualitative research that examines the meaning of signs on building structures and carved motifs at *Ghumah Baghi*, which contain messages of integration between the concepts of divinity and disaster mitigation. The object of the research is *Ghumah Baghi* in Pelang Kenidai Village, Pagar Alam City, South Sumatra Province. There are three *Ghumah Baghi* that were used as the main sources of data. Data was collected by conducting field observations at the three *Ghumah Baghi*. The symbols on the *Ghumah Baghi* buildings were analysed using Charles Sander Peirce's semiotic analysis model with the triadic triangle concept. The researcher also conducted interviews with traditional leaders called '*jurai tue*' and people who still occupy *Ghumah Baghi* to date to obtain the correct meaning of these symbols. Additional data was also obtained from relevant literature and documents.

Stages and Process of Establishing *Ghumah Baghi*

Ghumah Baghi, located in Pelang Kenidai Village, Pagar Alam City, South Sumatra, was built through a very thorough planning process and at great expense. The entire process of constructing *Ghumah Baghi* took a long time, even years. The initial stage of the process began with deliberations. Those involved consisted of the immediate family and extended family. The purpose of the deliberations was to ask permission from the extended family to build or utilise customary land as the location for *Ghumah Baghi* and also to ask for support from the extended family and neighbours, both morally and spiritually. In addition, the presence of *jurai tue* or elders played an important role during the deliberation process. They held deliberations starting from the planning stage, material preparation, construction stage until completion. The *Besemah* tribe strongly believes in choosing an

auspicious day to start the construction process, which is one day before Eid al-Adha (Arios et al., 2012).

The second stage is collecting building materials. The main construction material for *Ghumah Baghi* is wood. The wood used is sturdy, hard, strong and high quality. The wood used is *entenam* and *cemaghe*, which are used in most of the main building structures, walls, pillars and floors. The selected timber has a diameter of 1-1.5 (*depa*/metres). Both types of wood are considered good and suitable if the tree trunk was inhabited by bees while growing, as this is believed to bring happiness to the future owner of the house. Furthermore, when the tree trunk is cut down, it falls onto the stump where it was felled. This means that it will bring peace to the inhabitants of the house even if there are problems.

Conversely, there are several conditions where *entenam* and *cemaghe* wood cannot be used because they are considered to have a negative impact on the homeowner in the future. These conditions are when the wood is cut down, it is not flowering because if used, many beetles will bore holes in the wood. Wood that has been struck by lightning cannot be used either. The same applies to wood with broken ends. Wood that is wrapped in roots and wood that has fallen with its roots (Arios et al., 2012). Certainly, these requirements are part of the beliefs of the *Besemah* tribe, which have their own scientific logic. This is proven by the fact that *Ghumah Baghi* still stands strong even though it is hundreds of years old.

Figure 1. *Ghumah Baghi* in Pelang Kenidai Village
Source: personal documents

The third stage is the implementation of a series of traditional ceremonies in the process of building *Ghumah Baghi*. The types of traditional ceremonies consist of the *Mamancang Tiang* Ceremony (*sedekah negah ka tiang*), which is a ceremony for installing the foundation pillars of a house, which usually consists of nine pillars. Next is the *Naikkan Bumbungan* Ceremony (*sedekah bunggah mubungan*), which is the ceremony of raising the roof frame of the house. The *Menempati Rumah* Ceremony (*sedekah nunggu ghumah*) is a ceremony to express gratitude that the building has been completed and is ready for occupancy.

All stages in the construction process of *Ghumah Baghi* are part of the *Besemah* tribe's tradition, with a highly intelligent, measured and effective concept. *Ghumah Baghi* is not merely a traditional wooden architectural structure, but a 'standing manuscript' containing numerous messages, such as the value of balance between God, living creatures and nature, the values of cooperation, the divine dimension, resilience in the face of disasters, cultural values and social values.

The Semiotic Meaning of Divinity in the Construction and Motifs of *Ghumah Baghi* Carvings.

The architecture of *Ghumah Baghi* in Pelang Kenidai Village is not the same as each other. There are two types of *Ghumah Baghi* with different designs and purposes. First, there are *tatahan* houses decorated with ornaments/carvings in almost every part of the house, signifying ownership and high social status. Second, there are *gilapan* houses with the same architecture as carved houses but without carvings, intended for the general public with lower economic means (Arios et al., 2012).

Each part of *Ghumah Baghi* has a message that can be read using a semiotic approach. Specifically, this study reveals the symbols in *Ghumah Baghi* that contain elements of divinity and are related to earthquake disaster preparedness (disaster

mitigation) as a result of the intelligence of the *Besemah* tribe hundreds of years ago. These signs are analysed using Charles Sanders Peirce's semiotic approach with the triadic triangle model (representations, interpretations, and objects).

Table 1. Semiotic analysis of the structure of *Ghumah Baghi* in relation to the concepts of divinity and disaster mitigation

The *Ghumah Baghi* Section	Architectural Elements (Representations)	The Symbolic Meaning of Divinity (Interpretant)	Disaster Mitigation Function (Objective/practical function)
	*Tiang Dudok* (foundation)	A symbol of absolute submission to the laws of nature. Buildings do not 'fight' the earth.	Base Isolation System: prevents the main structure from breaking during an earthquake because the building can shift flexibly on its foundation stones.
	Construction without nails	A symbol of harmony and connection between beings bound by spiritual values.	Ductility: elastic timber joints absorb the kinetic energy of earthquakes, preventing total collapse.
	High-pitched gable roof	The symbol of vertical direction towards God *(Hablum minallah*) and comprehensive protection.	Disaster psychology: providing a sense of calm and spiritual protection for residents during natural crises.
	*Pagu antu*	A symbol of harmony. Sharing not only with humans but also with animals, which are also God's creatures.	Small box at the corner of the roof designed for birds to nest in.

	Stairs	A symbol of hope for goodness. The belief and prayer that each step will have an impact on the house.	Stair structures with an odd number of steps, 5 or 7, create a strong and sturdy structure.
	Door/*duaghe* or *lawang*	Symbol of mutual respect. Guests who come must respect the owner of the house as taught in religion.	The door size is smaller than that of a typical house, requiring guests to duck their heads to enter. This ensures that the homeowner can be prepared if a guest intends to do harm.
 	*Mendale Kencane Mandulike* decoration with *Bunge melur*/sun motif.	The symbol of harmony between humans and nature, centred on the creator, is marked by a small hole in the middle.	Small holes in the decoration are useful for spying on people/enemies from outside. As a form of vigilance, the wheel-like circle means that life sometimes goes up and sometimes goes down.

Source: personal documents and kajah_official (community of history enthusiasts)

In the table above, the architectural elements of *Ghumah Baghi* not only emphasise aesthetic purposes but also prioritise the function of the building as a disaster-resistant structure while still incorporating elements of divinity. This can be seen in the foundation elements (*tiang dudok*). As one of the most important parts of the *Ghumah Baghi* building structure, the *tiang dudok* symbolically convey an indexical message as a direct link between the flexibility of faith and the flexibility of structure. This is evident in their conscious decision to place the foundation pillars of the house on large stones rather than planting them in the ground. The divine element is very strong in this part, as the *Besemah* tribe

believes that the houses they build will protect them from earthquakes. The foundation pillars are not merely decorative, but rather a means of spiritual communication (Rapoport, 1990). It turns out that modern architectural science shows that the placement of such foundation piles actually prevents the main structure from breaking during an earthquake because the building can absorb the shock when an earthquake occurs, so that the house remains stable in its position, also known as a base isolation system (National Institute of Standard and Technology (NIST), 1992). They realise that they live in a mountainous region, so they are prepared for all conditions, including future disasters.

The next element is the nail-free construction of *Ghumah Baghi*. This building does not use nails to connect elements such as posts, columns, beams, walls, floors, ceilings, stairs, doors, windows and roofs. They use a locking peg system or clamp pegs between the elements of the house (Disaster Channel, 2025). This model is considered effective in reducing shock and minimising damage caused by earthquakes because the elastic wooden joints absorb the kinetic energy of the earthquake and prevent total damage. Semiotically, the interlocking joints symbolise the strength of brotherhood (*saling ngeruani*) (interview with Anto).

High-angled saddle roof. This element is located at the top of the roof. The *Ghumah Baghi* roof is distinctive for its sharp, pointed shape, resembling horns, made from palm fibre or palm tree fibres. Symbolically, the triangular roof represents a spiritual ascent to the Almighty God. It reflects the belief that God is the supreme ruler of human life. The divine element in the roof shows that *Ghumah Baghi* is a reflection of the balance between divinity, living beings and nature (Wijaksono et al., 2020). Meanwhile, in disaster mitigation studies, high-angle saddle roofs are considered highly aerodynamic because the sharp angles on the roof can accelerate rainwater flow (preventing water load) and prevent strong wind pressure. The addition of small box ornaments on the corners of the roof (*pagu antu*) as a place for birds to live is a sign that *Ghumah Baghi* can also be a home for other living creatures (sharing).

Stairs also have great significance for the *Besemah* tribe. The stairs in *Ghumah Baghi* represent the philosophy of the inhabitants of the house. Symbolically, stairs are believed to bring good or bad luck to the owner of the house depending on the number of steps.

There are usually 5 or 7 steps. Each step has a name and an effect on the owner of the house. The sequence of stair names is *taka* (increasing), *tangge* (no development), *tunggu* (the house is often occupied), and *tinggal* (the house is often abandoned) (Arios et al., 2012). Thus, when building stairs, people always try to ensure that there is an odd number of steps, with the last step signifying *taka*, which means economic improvement and abundance of sustenance from God for the occupants of the house. In terms of architectural approach, the design of the staircase structure is sturdy with a strong construction made of selected wood, which can reduce the risk of failure during an earthquake.

The door (*duaghe* or *lawang*) at *Ghumah Baghi* has its own uniqueness. The door is made of a thick and wide board. On the front, there is a *mendale kencane mandulike* carving with a hole in the middle. The hole is used to peek at every guest or event outside the house or can be interpreted as a form of vigilance. The door is not too high. This is to force every guest who comes to bow their head to the host (interview with Anto). This symbolises respect for the host.

The ornamental decoration of the *mendale kencane mandulike*, shaped like a *bunge melur*, is a manifestation of the presence of the Creator as the source of light and life in the universe. Symbolically, it serves as a reminder of God's power in the midst of the threat of natural disasters (Budi Laksana, 2015). Thus, in the study of disaster psychology, the presence of symbols of divinity in the construction of houses can provide a sense of calm and spiritual protection for homeowners when facing dangerous conditions such as the threat of an earthquake.

Conclusion

The earthquake-resistant vernacular architecture of the *Ghumah Baghi* building is based on the local wisdom of the *Besemah* tribe in the foothills of Mount Dempo in Pagar Alam City, South Sumatra. The intelligence of their ancestors in anticipating natural disasters, especially earthquakes, is proof that disaster preparedness has become part of their social and cultural life. This can be seen from the construction structure of the *Ghumag Baghi* building, which is precisely designed

with a foundation (*tiang dudok*) standing on stones, allowing for a system of isolation against tremors, as well as their belief in the balance between God, humans and nature, which is manifested in the symbolism of distinctive carving motifs (*Mendale Kencane Mandulike*).

It can be concluded that this study provides an overview of the rare risk reduction measures taken by the *Besemah* tribe in facing earthquakes through the intelligent design of *Ghumah Baghi*, without forgetting their belief in the involvement of divine elements in their daily lives. The preservation of *Ghumah Baghi* as part of local wisdom has actually been regulated by the state in law, so the government should play a more optimal role in protecting cultural assets such as *Ghumah* Baghi so that they can be taken over by the state and turned into museums as a means of learning for the wider community. In addition, the earthquake-resistant construction design of *Ghumah Baghi* should be reused in modern government buildings so that the construction intelligence of the ancestors is not merely history that cannot be reapplied.

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Interview(s)

Anto (resident of Ghumah Baghi), South Sumatra (Pagar Alam/Pelang Kenidai Village), 7 December 2025.

Salmi (resident of Ghumah Baghi), South Sumatra (Pagar Alam/Pelang Kenidai Village), 7 December 2025.

Jurai Tue, South Sumatra *(*Pagar Alam*/Pelang Kenidai* Village*),* 7 December 2025.