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## Raw material of Besemah traditional house construction in Indonesia

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### ABSTRACT

The traditional house is one of the nature reserves that have the characteristics of various regions and must be protected and preserved. This research aimed to explain the species of wood used in the manufacture of traditional Besemah houses in the Pelang Kenidai Village, Central Dempo District, Pagaralam City, South Sumatra Province, Indonesia. The implemented methodology of this study was a qualitative approach alongside a case study method. The wood species used in the preservation of traditional Besemah houses (ghumah baghi) consisted of three species: mersawa (*Anisoptera* sp.), surian (*Toona sureni* Merr.) and rasamala (*Altingia excelsa* Noronha). The government is expected to support the preservation of traditional houses through policies on preserving traditional houses, rehabilitating forests and land, cultivating the species of wood used as raw materials for making traditional houses, providing alternative species of other wood as a substitute for these woods, developing culture-based tourism and supporting the community in preserving the culture they have.

### KEY WORDS

Besemah, cultural values, culture-based tourism, ghumah baghi, policy, traditional house, wood species

## INTRODUCTION

The traditional house is a reflection of cultural values that manifest in the realisation of the form, structure, layout and decoration (Arifin 2010). According to Hermawan (2014), traditional houses are homes built with traditional methods. The traditional houses are also a reflection of the socio-economic conditions (Suharjanto 2014). Ilham and Sofyan (2012) stated that a traditional house is one of the nature reserves that are typical of different regions and should be protected and preserved.

Traditional settlements may reflect the symbols of the nation's cultural tribal owners that can be realised through the use of land, house-making and trust that governs public confidence (Arios 2014). The characters could be seen from a tribal tradition and culture, which is formed in a settlement and how they maintain their local wisdom (Sabrina et al. 2010). People usually make the traditional house with a lot of social and cultural information in it (Bellal 2013), so it is a complex phenomenon based on the fashion style of the architecture used (Munawaroh et al. 2017). Traditional houses are also believed to be able to adapt the surrounding environment, which will provide local knowledge of the area (Juwita et al. 2017).

The traditional concept is very pragmatic and cannot be strictly limited, because it is relative and depends on the mastery of technology to build communities in the region. This is what is referred to as the local culture formed by the community by their understanding of the natural and social environment (Arios 2014). The use of wood in houses on stilts is needed in this traditional house for wood as a main component of the structure (Winarno et al. 2012). The existence of traditional houses is also important, as it relates to the availability of raw materials and government policy in the preservation of the traditional house. This study aimed to explain the species of wood used as raw material for the manufacture of traditional Besemah houses as well as the government policies in its preservation in the Pelang Kenidai Village, Dempo Tengah District, Pagaram City, South Sumatra Province, Indonesia.

## MATERIAL AND METHODS

The study was conducted from November 2018 until January 2019 in Pelang Kenidai Village, Dempo Tengah District, Pagaram City, South Sumatra Province, Indonesia. The approach used in this study was a qualitative approach with a case study method. Data were collected through the interviews, participant observation and documentation study. The key informant interviews and in-depth research were implemented in a society that has traditional Besemah houses and is a community leaders, traditional institutions, the Mayor of Pagaram City in 2018–2023, the Mayor of Pagaram City 2013–2018, the Head of Human Resources for the Creative Economy of Pagaram City and the Chair of the Development Planning Agency Pagaram City. The data collected were qualitatively analysed to explain the wood species used as raw material for the manufacture of traditional Besemah houses and government policies in its preservation.

## RESULTS AND DISCUSSION

### Description of research location

The Pelang Kenidai Village is located at an altitude of 150 m above the sea level and has an area of 1,777.5 ha. The topography of the area is generally hilly and a small of the marshes area. The administrative boundaries are in the north bordering Karang Dalo Village and Padang Temu Village, to the east by Fajar Bulan District, to the south by South Dempo District and to the west by the Jokoh Village.

The indigenous leadership in Pelang Kenidai Village is governed by indigenous institutions, or the so-called *Jurai Tue*. The institution sequence is different from the traditional institutions that established by the Government of Pagaram City to socialise the government culture programmes to the public. Tue sequence is a leader of the customs fields that govern society, culture and ancestral heritage. *Jurai Tue*'s sequence is accompanied by an *Apit Jurai* on the traditional ceremonies or during the deliberation. When *Jurai Tue* has a hitch and could not lead the activity, then *Apit Jurai* will take over his position.

The inhabitants of this area are part of the Besemah Tribe. Besemah is a tribe that inhabits the highlands of

South Sumatra Province and spreads to various regions in the regencies and other cities around it. Besemah cultural centre is believed to be in Pagaralam City with quite a lot of cultural objects as attributes of the weak culture. (Arios 2014) stated that one of the relics is a traditional settlement in the Pelang Kenidai Village.

Traditional settlements in Pelang Kenidai Village is characterised by the division of the living area by social and cultural conditions and also the interests of the inhabitants of this region. The utilisation was intended for traditional houses, farming and traditional halls. Structuring the region was believed to have time immemorial, since the existence of traditional houses, known as *ghumah baghi*/old house (Fig. 1) by the local community and has reached around 200 years old.



**Figure 1.** Traditional house (*ghumah baghi*) in Pelang Kenidai Village, Indonesia

Traditional settlement conditions in Pelang Kenidai Village have undergone many changes. This hap-

pens due to the construction of new houses and other buildings. Construction of settlements makes the area increasingly narrow. Currently, there are 14 traditional houses (*ghumah baghi*) remaining that are still liveable and consisting of eight *ghumah tatahan* and six *ghumah gilapan*. *Ghumah tatahan* is a house that has carvings on the outer wall, while *ghumah gilapan* house does not have an engraving on its walls. *Ghumah tatahan* is older compared to *ghumah gilapan*.

#### Species of wood used in making traditional Besemah houses

The wood species used in the preservation of traditional Besemah houses consisted of three species such as mersawa (*Anisoptera* sp.), surian (*Toona sureni* Merr.) and rasamala (*Altingia excelsa* Noronha). This species of timber will have a different level of durability and strength class (Tab. 1).

**Table 1.** Durability and strength class of wood used in the manufacture of *ghumah baghi*

Wood Species	Durability Class	Strength Class
Mersawa ( <i>Anisoptera</i> sp.)	II–III	II–III
Surian ( <i>Toona sureni</i> Merr.)	II–III	III–IV
Rasamala ( <i>Altingia excelsa</i> Noronha)	II	II

Source: (Martawijaya et al., 1981); (Martawijaya et al., 1989)

These wood species were selected in the manufacture of Besemah traditional houses since 200 years ago because they are still easy to find and known as wood that has good quality and dense fibres. Entenam wood is the name given by the Besemah community for the type of mersawa wood, this type of wood is a type that belongs to the Dipterocarpaceae. This mersawa tree has a large embodiment with a height of up to 45 m, clear bole trunk 15–35 m long, no buttresses and a diameter of up to 135 cm. Mersawa has an outer skin of kelai, grey-yellow, grey-brown. The buttress could reach 1.5–3 m height. The tree trunks emit white resin, light green, yellowish-green or yellow.

The sapwood is white to light yellow and contains resin, while the heartwood is dirty orange-yellow, dirty yellow or yellow-grey, and the wood is sometimes red or reddish-brown. The timber is a Strength Class II–III, Durability Class II–III and the wood also has a slightly

rough to coarse texture with a straight grain direction. This wood has a high level of durability, especially for its heartwood. This wood texture is rather coarse and uneven, which has a straight grain direction or sometimes so chime. The impression is somewhat rough wood touch with a slightly shiny wood surface (Martawijaya et al. 1981).

The distribution of mersawa wood, does not grow as a group, is found in the forests of Sumatra, Borneo and the Malay Peninsula (Lukmandaru et al. 2015). Mersawa wood in the manufacture of traditional houses is used for house walls, floors, blend for the manufacture of ladders, poles liaison between the wall and door and window frames. The existence of this entenam wood is scarce and as an endangered species and protected. Besemah has a protected forest that is still overgrown with wood, and the local government has protected its existence. The traditional institutions Besemah Chairman pointed out that: “entenam wood can still be found in the protected forest in Besemah Libagh, but its existence is only small in number and the government has protected the species of wood so it should not be cut down”.

Ghimau is a designation for surian wood, which is commonly mentioned by the Besemah community as having a height of 34 m, with a clear bole stem of 10–25 m. The diameter of this plant could reach 85 cm height, and the width of the buttresses of each is 0.6–0.9 m. The outer skin of wood is grey or red, not grooved. The heartwood is flesh-red to an almost-dark brown red with a slightly coarse or slightly fine texture, roughly bordered by a circle of plants.

The direction of the wood fibre is straight and wavy, usually somewhat combined. The impression of touch from wood varies greatly from rough to smooth. The durability class of wood surian is categorised in II–III and Strength Class IV–V. The durability against dry wood termites is classified to the Class IV, while resistance to wood rot is classified in Class IV–V. The durability of surian wood is a medium class, the process of drying wood is easy and fast without experiencing cracks and breaks or significant wood defects (Martawijaya et al., 1989). The surian grows and spreads in several regions, such as Sumatra, except Jambi, Java, South Kalimantan, East Kalimantan, North Sulawesi, South Sulawesi, Maluku, Bali, West Nusa Tenggara, East Nusa Tenggara and Irian Jaya.

The existence of this species has decreased due to population reduction of between 30 and 50% in the last three generations. In Malaysia and Singapore, these species are considered threatened with extinction (Chua et al. 2010). The presence of these species in South Sumatra, especially in Besemah, is still somewhat significant, but other than serving as a resource for the manufacture of traditional houses, the wood is also in use for the manufacture of handles and gloves for sharp weapons and Besemah’s regional specialties. The existence of the species is already endangered, it is recommended to protect species and the harvest should be monitored and restricted.

The cemaghe wood that people commonly refer to as rasamala wood belongs to the family of Hamamelidaceae and has the name botanist *Altingia excelsa* Noronha. Rasamala is classified as a hardwood species that has a specific gravity of 0.81 (0.61 to 0.90) and is a Strength Class II and Durability Class II. The height of this tree is up to 50 m with a clear bole stem of 15–40 m. The diameter of this tree could reach 150 cm, with roots and the outer bark are light brown or grey-red. The heartwood is between flesh-red, red-brown and dark brown. The sapwood is younger in colour and has no clear boundaries with patio wood.

This delicate texture of wood with straight grain direction is often twisted so that an integrated and sometimes choppy. Wood touch impression is slippery or somewhat slippery, has a somewhat shiny wood surface until glossy and has a fresh and sour smell. The durability of rasamala wood is categorised to the Class II–III with the durability of the wood is classified to the medium class. Based on the trial, the durability is classified to the Class I. Rasamala wood distribution areas are found in North Sumatra, West Sumatra, Bengkulu and West Java (Martawijaya et al. 1989).

This wood preservation is easy to do by mixing diesel oil with creosol (HB et al., 2015). This wood is used in making traditional houses as a combination with mersawa wood, which is used as traditional house poles, connecting pillars between walls and floors as well as the doors. The existence of this wood has been protected due to the existence, which is already rare.

The loss of wood habitats have a high commercial value that is due to the role of humans who exploit the presence of wood in excess; this is also caused by the deforestation to expand the agricultural land. The tim-

ber has a high quality and is also used and traded for having hardwood and being commercially valuable. The remaining habitats of this third timber species should be identified and protected.

The protection of endangered commercial tree species requires assistance from the government to carry out a policy on population. The loss of timber species is also due to the absence of the wood species breeding effort, no attempt was made to process the wood rejuvenation. The traditional house preservation efforts must also be followed by improvements to the existing traditional houses so that the existence is not damaged further and lead to the extinction.

The wood used to repair the damaged houses could be replaced with other wood species that have almost the same quality. The bambang lanang (*Magnolia champaca*) is a family of Magnoiaceae with a type of producing wood that could be used as a substitute to repair damaged traditional houses (Martin and Premono 2010). This is in accordance with the homeowner who said that:

“to get around the wood raw material that has been hard to find, wood bambang lanang could be used as a kind of timber replacement to repair damaged houses. The wood bambang lanang is also now widely used as a raw material for making houses on stilts, and today many people in Pagaralam City who grows this species in their gardens”.

The bambang lanang tree is a local species in South Sumatra, especially in Pagaralam City, Empat Lawang District, Ogan Komering Ulu District, Ogan Komering Ulu Selatan District, Lahat District, Musi Rawas District and Bengkulu Province. Pudjiono (2017) suggested that bambang lanang, known as manglid, is a native forest plant species in Indonesia. Bambang lanang wood is categorised in Durability Class II and Strength Class III; the wood has a dense structure, shiny, smooth, light and is timber that is easy to work with.

The wood-producing plants range widely on land owned and private forests in South Sumatra Province. This species of wood has long cultivated bambang lanang public on a coffee and rubber plantations in South Sumatra. This timber is used by the community as a construction material to build houses on stilts. The development of private forests is not only related to timber production alone, but also related to the livelihood systems of society, especially in rural areas. Planting

activities performed by society is not the odd jobs that are not planned, as well as afforestation or reforestation projects, but it is the realisation of the accumulation, intentions and desires to obtain economic assets. The potential revenue from planting bambang lanang trees would be obtained 15 years later, not deter the people to make bambang lanang as one of their assets due to the increasing demand for wood (Martin and Premono 2010).

Bambang lanang grows more than 50 m height, which is generally a straight rod with a cylindrical stem and the diameter could reach 200 cm width. The tree has no buttresses and the smooth stem surface has a greyish-white colour. Bambang lanang could be developed either in monoculture, mixed or agroforestry patterns. The wood is generally available as a shade of coffee trees as well as other wood crops that could improve the people's welfare. Herwanti et al. (2019), Salampessy et al. (2017) and Qurniati et al. (2017) suggested that the choice of plants and planting patterns is one way of farming households to manage their land resources contribute to their household income.

#### **Policy on preservation of traditional Besemah houses**

The Pagaralam City's Government is developing a policy in the form of local regulations governing the preservation of ghumah baghi. The aim is to encourage people to maintain and preserve ghumah baghi as part of the local culture. Ghumah baghi's existence is considered important by the government because it is associated with a regional identity, especially in Pagaralam City. Sari et al. (2017) stated that policy and legal entities are an important factor in regulating the preservation of ghumah baghi.

The Pagaralam's City Government is making ghumah baghi conservation policy that will be accommodated in the regional budget (Anggaran Pendapatan dan Belanja Daerah/APBD). In addition, Pagaralam's City Government has also proposed to the central government about receiving funding coming from the national budget (Anggaran Pendapatan dan Belanja Negara/APBN). The policy is a short-term programme that was realised to maintain and preserve the culture; it is known and invigorated by the society. As for the medium-term programme, it is to make ghumah baghi a place to stay or a homestay for tourists who visit Pel-

ang Kenidai Village. The long-term planning is to make the site a tourist village.

The activities have been done by the government in the development of Pagaralam City that is the Pagaralam Heritage Festival. These activities have not been routinely carried out so that the community does not feel the positive impact of these cultural activities, such as those delivered by the informant:

“Once it Pagaralam heritage festival held here ... but not yet scheduled ... so for now these benefits have not been so we feel”.

The existence of ghumah baghi is considered as one of the attractions for both domestic and international tourists. The increase in the number of tourists visiting the community could improve the economy and the development of construction in the region. The activities of support tourism are considered a positive impact on the society that maintains the existence of baghi ghumah. Communities could serve a variety of traditional cuisine and also display its art and culture as a complement to the tourism activities held there. According to Harum et al. (2019), tourist villages are built to encourage people to develop their potential so that they could manage their tourism and make the village more independent.

A'inun et al. (2015) stated that the development of tourist villages requires the support and participation of all communities in the village so that people could jointly reap the benefits of tourism and the existence of tourists in their area. In line with this opinion, Gautam et al. (2019), Soflaei et al. (2017) and Zhang (2016) stated that culture plays an important role in economic development, because the culture is dynamic, so it must continue to be developed to increase social capacity by economic growth while maintaining local wisdom.

## CONCLUSION

The wood used to make the traditional Besemah houses is entenam wood and known as mersawa wood (*Anisoptera marginata* Korth) and ghimau wood, which has the local name as surian (*Toona sureni* Merr.), and cemaghe wood has the trading name as rasamala (*Altingia excelsa* Noronha). The government has a very big role in changing the mindset of the people and bring back a sense of love for their culture. The existence of

traditional houses is decreasing due to the presence of the species of wood used as raw material for making these houses become less in numbers. The government is encouraged to immediately rejuvenate the forest and cultivate the species of wood used or provide other species of wood innovations as a substitute for the wood.

## REFERENCES

- A'inun, F., Krisnani, H., Darwis, R.S. 2015. Community based tourism. *Prosiding Penelitian dan Pengabdian kepada Masyarakat*, 2, 341–346. <https://doi.org/10.24198/jppm.v2i3.13581>
- Arifin, R. 2010. Perubahan Identitas Rumah Tradisional Kaili di Kota Palu. *Jurnal Ruang* 2 (1), 20–30.
- Arios, R.L. 2014. Permukiman Tradisional Orang Basemah di Kota Pagaralam. *Jurnal Budaya*, 19.
- Bellal, T. 2013. Gender and Zones of Users in Traditional Berber M'zab Houses. *International Journal of Humanities and Social Science*, 3, 23–41.
- Chua, L.S.L., Suhaida, M., Hamidah, M., Saw, L.G. et al. 2010. Malaysia plant Red List: Peninsular Malaysian Dipterocarpaceae. Research Pamphlet-Forest Research Institute, Malaysia.
- Gautam, B., Rijal, H.B., Shukuya, M., Imagawa, H. 2019. A field investigation on the wintry thermal comfort and clothing adjustment of residents in traditional Nepalese houses. *Journal of Building Engineering*, 26, 100886. <https://doi.org/10.1016/j.job.2019.100886>
- Harum, O.M.A., Febryano, I.G., Wulandari, C., Hidayat, W. 2019. Preservation ghumah baghi (wood based traditional house): case study in Pelang Kenidai Village, Dempo Tengah Sub-District, Pagaralam City, South Sumatera Province. *Jurnal Hutan Tropis*, 7, 216–224.
- HB, I., Manurung, T.F., Herawatiningsih, R. 2015. Diversity of species meranti (Shore spp) In protected forest area Ambawang Mountain Districts Kubu Raya West Borneo. *Jurnal Hutan Lestari*, 3, 462–468.
- Hermawan. 2014. Karakteristik Rumah Tinggal Tradisional di Daerah Pegunungan Jawa Tengah. *Jurnal PPKM UNSIQ*, 3, 212–219.
- Herwanti, S., Febryano, I.G., Zulfiani, D. 2019. Economic value analysis of community forest food

- products in Ngarip Village, Ulu Belu Subdistrict, Tanggamus Regency (a case from Indonesia). *Forestry Ideas*, 25 (2), 314–328.
- Ilham, A.N., Sofyan, A. 2012. Tipologi Bangunan Rumah Tinggal Adat Sunda di Kampung Naga Jawa Barat. *Tesa Arsitektur*, 10, 1–8.
- Juwita, R., Kalsum, S.A.U., Awaludin, A., Samad, F.A. 2017. Structural test of traditional arfak house in Papua. *Procedia Engineering*, 171, 1542–1549. <https://doi.org/https://doi.org/10.1016/j.pro-eng.2017.05.043>
- Lukmandaru, G., Fatimah, S., Fernandes, A. 2015. Sifat Kimia dan Warna Kayu Keruing, Mersawa dan Kapur. *Jurnal Penelitian Ekosistem Dipterokarpa*, 1, 69–80. <https://doi.org/10.20886/jped.2015.1.2.69-80>
- Martawijaya, A., Kartasujana, I., Kadir, K., Prawira, S.A. 1981. Atlas kayu Indonesia jilid I. Bogor (ID): Badan Litbang dan Inovasi, Kementerian Lingkungan Hidup dan Kehutanan.
- Martawijaya, A., Kartasujana, I., Mandang, Y.I., Prawira, S.A., Kadir, K. 1989. Atlas kayu Indonesia jilid II. Pusat Penelitian dan Pengembangan Hasil Hutan, Bogor, Indonesia.
- Martin, E., Premono, B. 2010. Hutan Tanaman Kayu Pertukangan adalah Portofolio: Pelajaran dari keswadayaan penyebarluasan bambang lanang di masyarakat. Seminar Nasional Kontribusi Litbang Dalam Peningkatan Produktivitas Dan Kelestarian Hutan, 115–120.
- Munawaroh, A.S., Gunawan, R.A., Perwira, S.A. 2017. Penerapan Konsep Flexible Dan Green Architecture Pada Rumah Typical Di Lampung. *NAL-ARs Jurnal Arsitektur*, 16 (2), 101–112. <https://doi.org/10.24853/nalars.16.2.101-112>
- Pudjiono, S. 2017. Pengaruh Perbedaan Media Tanam Terhadap Perkembangan Perakaran Dan Keberhasilan Stek Pucuk. Seminar Nasional Pendidikan Biologi Dan Saintek II, 22–27.
- Qurniati, R., Febryano, I.G., Zulfiani, D. 2017. How trust influence social capital to support collective action in agroforestry development? *Biodiversitas*, 18, 1201–1206. <https://doi.org/10.13057/biodiv/d1844>
- Sabrina, R., Antariksa, A., Prayitno, G. 2010. Pelestarian Pola Permukiman Tradisional Suku Sasak Dusun Limbungan Kabupaten Lombok Timur. *Jurnal Tata Kota dan Daerah*, 1, 87–108.
- Salampessy, M.L., Febryano, I.G., Zulfiani, D. 2017. Bound by debt: nutmeg trees and changing relations between farmers and agents in a Moluccan agroforestry systems. *Forest and Society*, 1, 137–143.
- Sari, S.R., Harani, A.R., Werdiningsih, H. 2017. Pelestarian Dan Pengembangan Kawasan Kota Lama Sebagai Landasan Budaya Kota Semarang. *Modul*, 17, 49–55. <https://doi.org/10.14710/mdl.17.1.2017.49-55>
- Soflaei, F., Shokouhian, M., Zhu, W. 2017. Socio-environmental sustainability in traditional courtyard houses of Iran and China. *Renewable and Sustainable Energy Reviews*, 69, 1147–1169. <https://doi.org/https://doi.org/10.1016/j.rser.2016.09.130>
- Suharjanto, G. 2014. Konsep Arsitektur Tradisional Sunda Masa Lalu dan Masa Kini. *ComTech*, 5, 505–521.
- Winarno, B., Nurlia, A., Martin, E. 2012. Realitas Pengelolaan Bambang Lanang (*Michelia champaca* L) oleh Masyarakat pada Daerah Sebaran Alaminya di Kabupaten Empat Lawang. *Jurnal Penelitian Sosial dan Ekonomi Kehutanan*, 10, 211–223.
- Zhang, D. 2016. *Courtyard housing and cultural sustainability: theory, practice, and product*. Routledge.