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The Uniqueness of Architecture and Bamboo House Environment in Pengotan Traditional Village, Bali, Indonesia

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Abstract

Pengotan Village is a traditional village known as a tourism village in which it has unique architectures of bamboo house settlements and its natural beauty. These resources have led to an increase in tourist visits. However, the increase has led to the growth of tourist facilities such as accommodations and restaurants. The construction of tourist facilities has transformed agricultural and plantation lands' functions to support tourism and new settlements. This transformation has caused changes in traditional architecture even though these cultural productions are interesting for tourists. This phenomenon is an architectural challenge for the people to maintain the cultural productions, but at the same time, they can accommodate tourist activities in the village. Therefore, this paper aims to identify the traditional settlement and architecture of the bamboo, including socio-cultural conditions, village morphology, building typology, and problems faced. Using fieldwork investigations and interviews, this paper's output identifies and documents data conditions, problems, analysis, concepts, and strategies for future village architectural conservation. This activity's technical implementation includes preparation, survey, a compilation of data and analysis, formulation of concepts and structuring strategies, design, and socialization.

Keywords: Uniqueness, Architecture, Bamboo, House, Environment, Traditional, Village

1. Introduction

Bali is an island that has the uniqueness of nature, people's culture, and cultural artifacts. The uniqueness of Bali's nature is an inspiration for life that brings prosperity to the community. Balinese culture, which mostly comes from Hinduism, is the soul, spirit, breath, and is a big magnet for tourists to visit Bali.

Pengotan, a tourist village with unique bamboo house architecture and distinctive traditions, has led to an increase in tourist visits because tourists want to see, feel, and enjoy firsthand the natural environment and the socio-cultural nature of the village. In addition to natural tours, tourists also enjoy residential areas that are thick with Balinese culture.

Pengotan is closely related to its cultural philosophy and the Balinese cultural landscape related to the cultural system that governs it and the structural form of the village and environment. This village has several cultural philosophies manifested in the spatial concept of the village cultural preservation areas, so at macro and micro levels, it can be a harmonious and balanced spatial concept approach with its designation elements, cultural philosophies based on the concept of *Tri Hita Karana*.

The increase of tourist visits has caused various phenomena in Pengotan, such as restaurants' existence along the village coastline, land conversion for tourism, and new settlements, which can change the architectural and settlement order and pattern.

Pengotan has unique architecture and settlement patterns that are still preserved. Seeing the change in settlement arrangements and the occurrence of land use changes due to the surge in tourism like other tourism destinations in Bali (Putra, Lozanovska & Fuller, 2017 & 2019), there has been concern and awareness of the community to maintain their traditional village order. Community concern and awareness are the main factors in the preservation of the village. The uniqueness of the village architecture, the natural beauty of the rice fields, the beautiful environment, and the village structure's preservation are the main attractions that make it a cultural tourism object. One form of awareness is identifying the uniqueness of Pengotan. However, this village does not have sufficient documents and human resources to formulate a precise and accurate identification concept, strategy, and plan to do this. The paper to produce comprehensive strategy and plans that can be used and empower the community. From the abovementioned background, it can be argued that the problems faced by Pengotan, Bangli Regency, are what the conditions of the building architecture, village patterns, and social culture of the existing and the village development trend are? Moreover, what are the recommendations for the future development of Pengotan architecture?

Furthermore, this paper is to give service to the community that is expected to provide great benefits and contributions to both the government and the community. The first benefit is that it can contribute to the community and implementers of tourism development policies, which are one of the priority programs for national development. The second benefit is that it can be used to determine the direction of developing a conservation program for the traditional residential pattern of the world cultural heritage of Pengotan, particularly Bali and Indonesia in general.

2. Research Method

The Pengotan management plan data collection activity was carried out through observation, observation, measurement, and documentation. The observation was a data collection tool that must be carried out systematically. The observations were recorded according to certain procedures and rules so that other researchers could repeat them. In general, observation is divided into two types, namely the participant and non-participation types. In the first type, the researcher is part of the natural state in which the observation is carried out. In the second type, the researcher observes other people's behavior in natural conditions, but the researcher does not become or is not part of the natural state (Nasution, 2004). So that, researchers collect data by seeing, observing, and taking documentation directly into the field. This paper's data collection was classified as a non-participant

type because the researcher was not part of the Penguin population.

The observation carried out was to fill in the checklist with real conditions. In this study, residents' activities were observed and recorded as data from physical and non-physical components. Field Research was a method that was used to document. In-person field visits were carried out four times. During this visit, measurements and photographs were carried out. Measurements were made to obtain accurate data regarding the area of the area so that the village's current development could be observed. The researchers were also looking for additional data from written documents that can support research, for example, from literature books on the village.

3. Results and Discussion

3.1. Social System

Pengotan is one of Bali's traditional villages in the mountains area that a characteristic linear village pattern and mostly uses bamboo material obtained from the surrounding environment. This village is around 17 kilometers from Bangli and 57 kilometers from Denpasar, the capital city of Bali Province. Based on the national administration system, this traditional village belongs to the Pengotan National Administration Village called *desa dinas* Pengotan. In this national system, Pengotan consists of 6 (six) traditional hamlet associations called *banjar adat* and 8 (eight) national hamlet associations called *banjar dinas*.

As some traditional villages in Bali's highland, the community structure of the Pengotan is a horizontal community structure without recognizing the existence of the clan membership system called *catur warna* that distinguishes the social status of the community. This society's structure is very different from the structure of society in other villages in Bali, which generally applies *catur warna* system.

In their daily lives and traditional lives, the community is divided into two groups: *krama pengayah* and *bala angkep (roban)*. Of the 862 households in Pengotan, only 204 households are the *krama pengayah* while the rest are *bala angkep (Roban)*. The *krama pengayah* is a family that has privilege to heritage their traditional house. This family is the oldest married son in a traditional house. On the other hand, the *bala angkep (roban)* is the married younger son. According to the traditional custom of Pengotan, only one family in a kinship group has the right to live in the traditional house. If other sons are married, they make a house called *pondok* in their family fields. The *krama pengayah* have traditional manners obliged for all forms of ceremonies at the three main village temple called *pura kahyangan tiga*. If there is a ceremony at the temple, all the families related to a household system gather in the main village in their traditional houses. After the ceremony was finished, *krama bala angkep* return to their house (*pondok*) and only the *pengayah* manners remained. Still, there were also those whose houses were empty because the *pengayah* manners also live in *pondok*.

In the traditional village structures, the village is managed by *prajuru desa*. The composition of the *prajuru* consists of *pamuncuk*, *pasek*, *penyarikan* and *pemangku*. *Pamuncuk* are the *prajuru* who hold the highest power in the village. Everything related to customary matters must receive consideration and approval from *pamuncuk*, and in consultation with other *prajuru*. *Pamuncuk* decides on the matter. The system of determining *pamuncuk* is based on election by the village, so it can be said that a *pamuncuk* has extensive knowledge and is wise in terms of customs and religion. A *pamuncuk* will be replaced when he dies or is unable to carry out his duties. *Pasek* is a traditional *prajuru* who is in charge of leadership in every customary meeting held regularly. *Pasek* also serves as the representative of *pamuncuk*. *Penyarikan* is a customary officer who serves as a coordinator in every customary activity. This *penyarikan* has a similar position with the *sinoman*, which is commonly known in other villages in Bali. It is similar with public relations. *Pemangku* are traditional *prajuru* who serve as leaders in every religious ceremony.

3.2. Cultural Uniqueness

Upacara Kawin Massal. It is a mass wedding ceremony usually performed, based on Balinese calendar, in *Sasih*

Kedasa (April) and *Sasih Kapat* (October). This ceremony is held at the village temple and usually involves more than 10 pairs of brides. This ceremony is unique from the first to the final marriage processions, which is different from the marriage processions in other villages. This mass wedding ceremony is carried out by local community members simultaneously at that time. The ceremonial offerings used are very simple, made by each family of the bride and groom to be used at the village temple. There is also a ceremonial offering issued in groups or cooperation by the entire bride family to be handed over to *prajuru desa* as a ceremony to be held at the village temple. A cow is a part of offerings that are used in this ceremony.

Upacara Kematian (Penguburan) and Ngaben. This ceremony is a death ceremony or burial ceremony (*penguburan*) and the cremation ceremony called *ngaben*. These ceremonies are unique in terms of the procedures, tools and processes for performing the ceremony. The unique way here is when bringing the corpse to the grave called *setra* done using one bamboo stick, and then the corpse is tied to a bamboo stick using three pieces of rope that have been prepared and previously the corpse was already wrapped in cloth and mat. The bamboo and the corpse were wrapped in a white cloth covering the corpse and the bamboo. Another uniqueness that can be found at this ceremony is that when the corpse is already in the grave, at that time after the hole has been prepared, the corpse is lifted by his family members around the hole three times and after that, the body is opened until it is naked and then inserted into the hole. With the head position facing southwest, the meaning of this position is that when awakened the corpse's spirit can be illuminated by the sun. At the same time, with the scratched fingernails, it is intended that the spirit can know that it is dead.

Kesenian Daerah (Traditional Arts). Pengotan has many types of traditional arts that are still considered sacred by its people. Besides, the people's lives cannot be separated from the local cultural arts to be seen in every religious ceremony. Aspects of arts are still upheld by the community, especially the sacred dances. Pengotan has several kinds of sacred dances staged at the temple at the time of the *Dewa Yadnya* ceremonies, including *Baris Dance*, *Wayang Wong* and Traditional Rejang Dance. Other dance arts were also developed by art groups in Pengotan, such as the *Calon Arang Dance*, and the *Joged Dance*. Regarding the *Baris Dance* in Pengotan, it consists of several types, namely: *Baris Jangkang* and *Jojo Dance* (which is specifically performed by cadets), *Baris Dadab*, *Baris Presi*, *Baris Belongsong*, *Baris Bajra*, and the most sacred to the local community is *Baris Babwang* using a banana leaf staple weapon which is often called the *Perang Papah Dance*.

3.3. The Pattern of the Village

Bali's settlement patterns are generally influenced by several factors, namely, factors of ritual values, natural conditions and potential factors, and economic factors (Puja, 1982: 12). Conceptually, the physical environment of the Pengotan uses a linear pattern extending from north to south. The village orientation is towards the north/*kaja*/upstream (Mount Batur) and south/*Kelod/Teben* (sea). The main village road that extends to the north and south is a core that functions as a public circulation and functions as a plaza or open space, which increases the relationship between paths/alleys/pedestrians leading to each yard of the house (Figure 1). Thus, the "core" is the center of spatial orientation and population movement orientation in every activity.

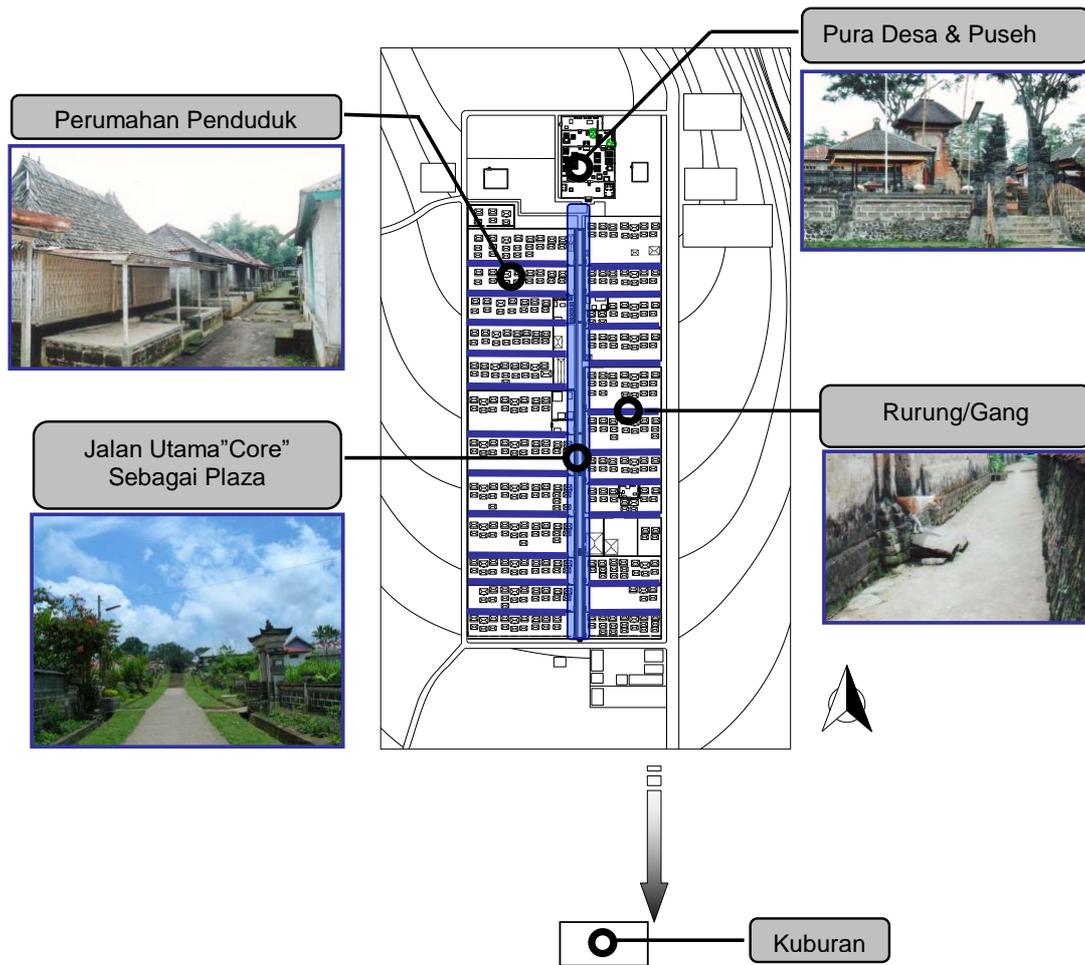


Figure 1: Village Pattern of Pengotan

3.4. Land Use

Land use in Pengotan is based on the *Tri Hita Karana* philosophy with the *Hulu-Teben* value system and the environment in the form of a linear pattern. The land use is implemented, namely: (1) *Upstream Zone* (northern part), where the facilities for village spiritual activities are placed, namely: *Pura Desa/Puseh* and *Pura Dalem*, (2) *Zone Antara* (middle part), is a residential area with buildings residential houses which are broadly divided into 24 plots (units) of yards with an arrangement of 12 units to the left of the core and 12 units to the right of the core and in this zone there are also various public service facilities and (3) *Teben Zone* (south part), this zone is the lowest part (physically and philosophically) with its use as a grave area/*setra* (Figure 2).

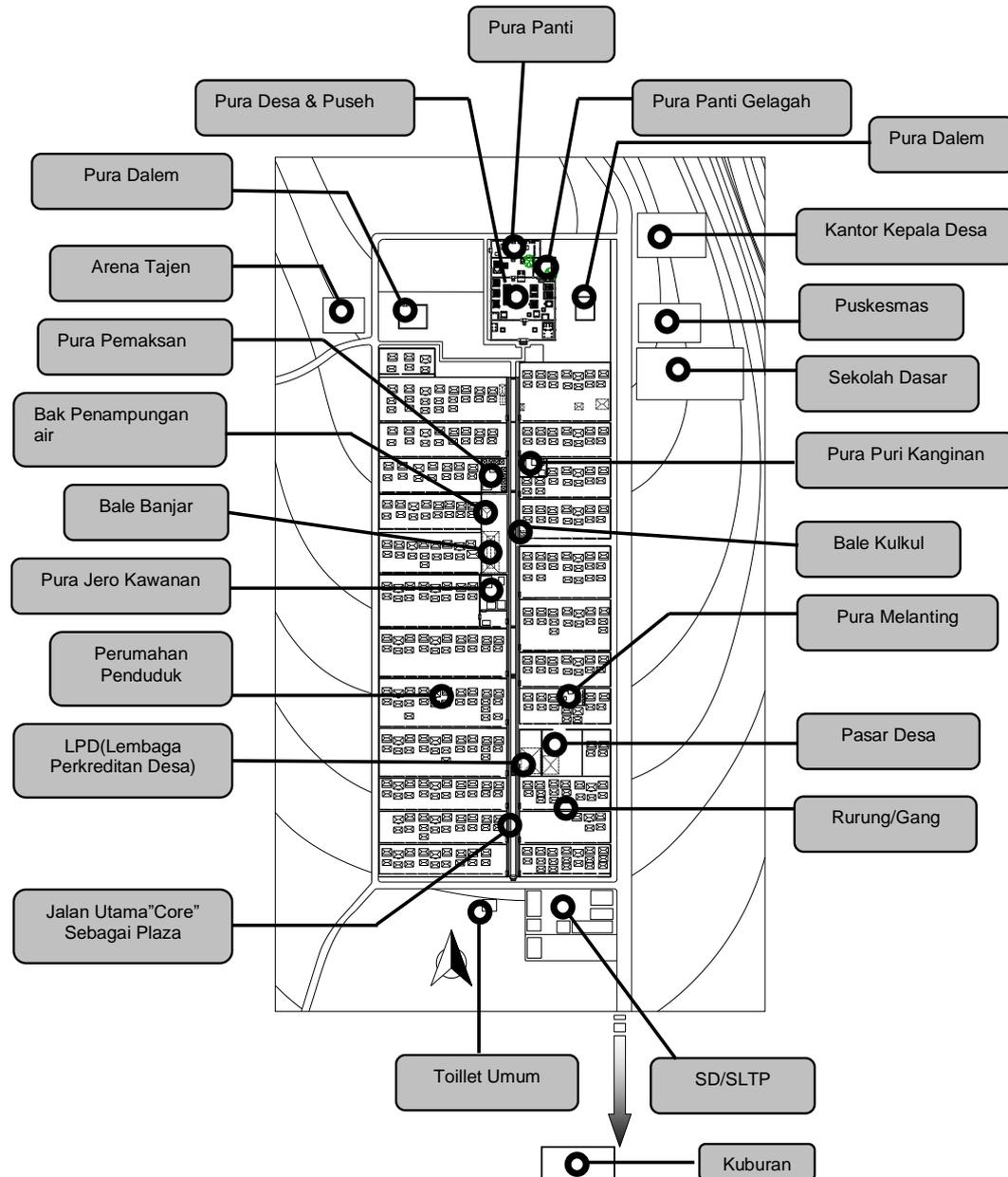


Figure 2: Land Use in Pengotan

3.5. Building Layout

The yard's pattern in the Pengotan has a very different pattern from the house patterns commonly known in Bali. The pattern of yards in Bali generally uses the *sanga mandala* concept which divides the yard into 9 (nine) parts, with values ranging from *utamaning utama*, the most sacred zone to *nistaning nista*, the most profane zone. Meanwhile, zoning for buildings within the yard in Pengotan is very simple, namely based on the concept of the *hulu-teben* value system. *Hulu* means upper part and *teben* means below.

The concept of placing a building unit in the yard depends on the function and sacred value of the building unit. The arrangements are as follows: (1) upstream zone for sacred buildings/objections, (2) central zone for *meten* and bale *sakanem* buildings (ceremonial buildings) and (3) *teben* zone for *angkul-angkul* (entrances) and sometimes added the granary building (Figure 3).

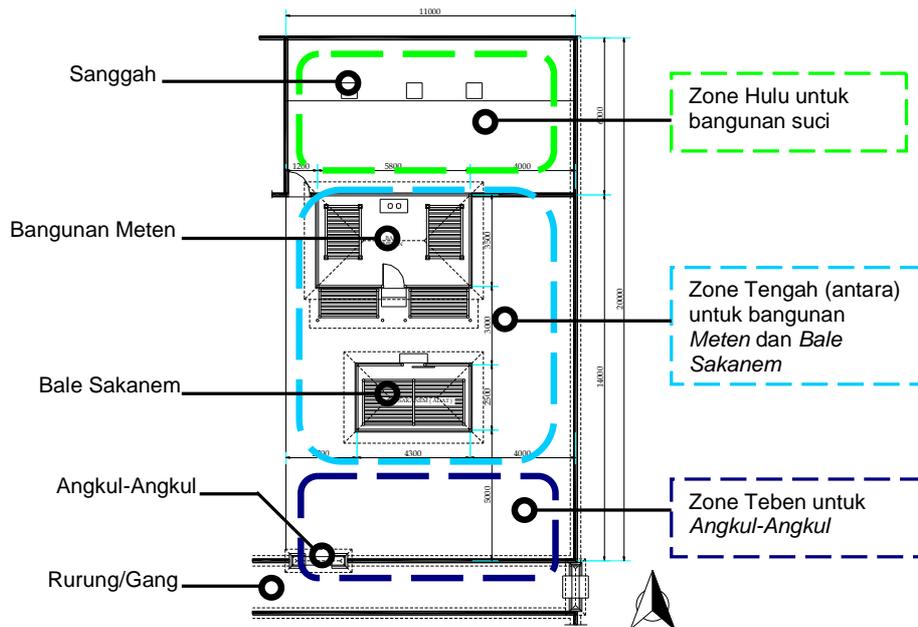


Figure 3: The Layout of the traditional house of Pengotan

Upper zoning for sacred buildings (sanggah). The buildings' function is as a holy place or worship to God and to the spirits of the ancestors who have been purified. In this sacred building unit, there are several buildings with their respective functions and the number of these buildings varies greatly depending on the owner's status. However, what is absolutely contained in one sacred building unit consists of (1) *Pesimpangan Bhetara Gunung Agung* and *Bhetara Tuluk Biu*. The two buildings have the characteristic of having to use fibres from the palm tree and (2) *Persimpangan Bhetara Majapahit* and *the Bhetara Maospahit*. These shrines and several other complementary buildings generally use bamboo roofs (Figure 4).



Figure 4: Buildings in Sacred Zone

The forms of these sacred buildings are elementary with the entire building consisting of wood and bamboo construction and materials. The difference in physical values is regulated by distinguishing the height of the courtyard of the *sanggah* (sacred building) from the courtyard of the house.

The middle Zone is for Residential Buildings. The middle Zone is for Residential Buildings. There are some pavilions in this zone, including *bale meten* and *bale sakenem*, where the occupants perform domestic and some socio-cultural activities. *Bale meten* is located in the northern part of the courtyard called *natah* or south direction of the sacred zone, often called *bale daja*. The function of this *Bale Meten* is for a bedroom and functions as a kitchen (*paon*). The *bale meten* consists of 2 bales located on the left and right and a furnace located in the middle between the bales and docked at the northern wall (Figure 5). The shape of the *Bale Meten* building is a rectangular

shape using 8 pillars made of woods. As other Balinese buildings, the floor of the *bale meten* in Pengotan is high enough from the ground that is around 75-100 cm), to avoid groundwater infiltration. The *bale meten* is closed from four directions with woven bamboo walls so that the room inside is very dark without sufficient lighting (the only light is from the entrance).

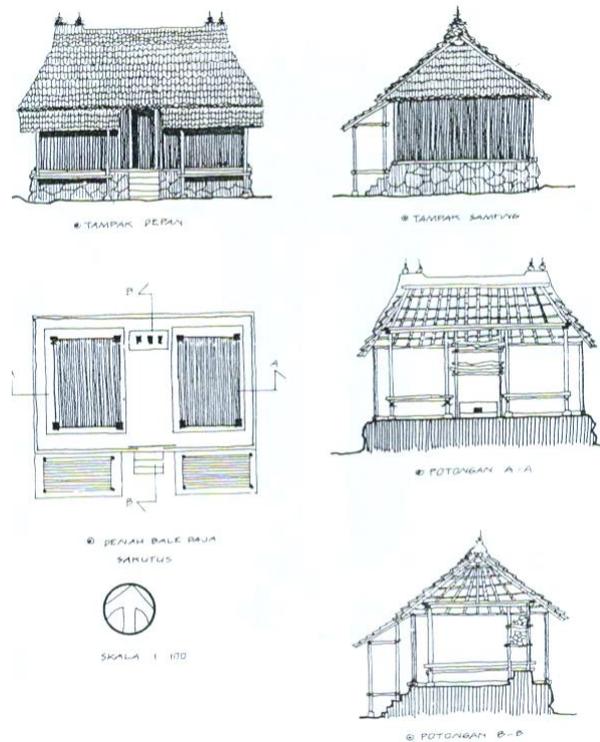


Figure 5: The *bale meten*

Bale sakenem is located in the southern part of the courtyard, opposite the *bale meten*. The *bale meten* and *sakenem* are like husband and wife (must be in pairs) or often referred to as *purusa* (male) and *pradana* (woman). As the name implies, *bale sakenem* is a rectangular shape with six poles (*saka*). This bale's function is a place to perform *manusa yadnya* ceremonies, and when there is no ceremony, it is used as a bed for men. With this function, *bale sakenem* has a *bale* that connects to the six pillars/*saka*. Following the function's demands as a ceremony venue, the walls of the building are only closed on two sides (east and south sides) to provide freedom of movement in ceremonial activities (Figure 6). However, because the *bale sakenem* also functions as a bed, a temporary wall (woven bamboo) is prepared on the open wall, easy to install and remove quickly. As *bale meten*, the high of *bale sakenem* is around 50-75 cm from the ground.

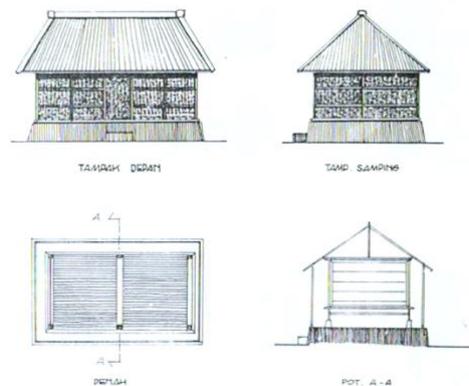


Figure 6: The *bale sakanem*

The traditional gate called *angkul-angkul* functions as the entrance of the house. In Pengotan, there are two types of *angkul-angkul*, namely *angkul-angkul* as the entrance from the core/neighborhood road to the *rurung* (alley) and *angkul-angkul* as the entrance from the *rurung* to the yard of the house. Each residential unit has a very simple *angkul-angkul* in which the building made from soil called *popolan* and the roof made from bamboo (Figure 7).



Figure 7: The *angkul-angkul*

The orientation of the buildings in Pengotan Traditional Village faces the courtyard called *natah* that is interpreted as a living room. This implies a meaning because in the living room a mixture of *purusa*/male elements in the form of empty spaces called *akasa* is created with *pradana* (female) elements, which is interpreted as the earth called *pratiwi*. *Bale meten* takes a south orientation, while *bale sakanem* is oriented to the north. The two-building units cross to the center/*natah* as the center yard for residential activities (Figure 8). The orientation of the entrance to the family holy place is to the south.

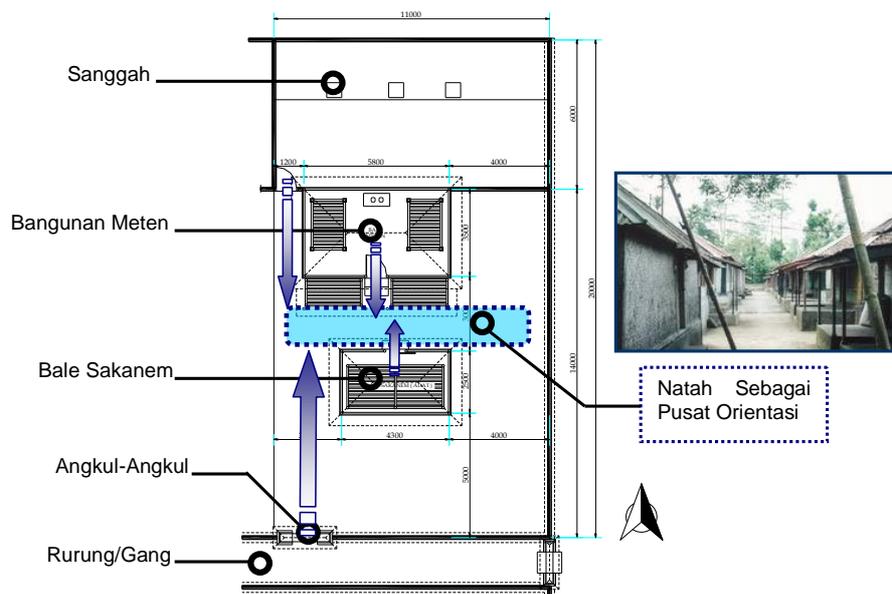


Figure 8: The orientation of the pavilions

The circulation pattern and the way to reach each building in the courtyard are straightforward, starting from *angkul-angkul* directly to *natah* and from *natah* to each building (Figure 9). Thus, conceptually the yard layout hierarchy only uses the *hulu-teben* system where the circulation starts from below value called *teben* to the upstream called *hulu*.

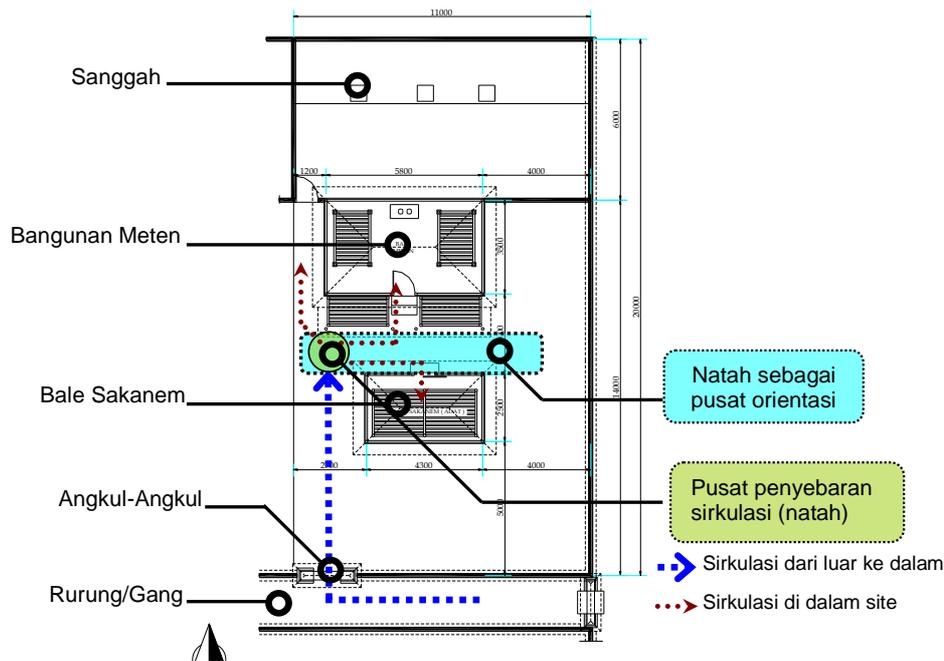


Figure 9: The circulation of the House

3.6. Structural Systems and Building Construction

The use of structural systems and building construction in Pengotan is not much different from traditional Balinese buildings' structural systems and construction. Only some parts of the structure and construction system in Pengotan are simpler, especially after the construction. This is related to the use of materials and technical implementation. Systematically, the discussion of structural systems and building construction can be described below.

Roof Structure. The forms of roofs of buildings, especially traditional residential buildings, generally use pyramid and saddle forms. The technical principle of such a roof structure system is a multi-faceted principle with even distribution in all directions. Then through the column/pillar/saka it will be channeled to the ground. In this traditional system, the construction components are known: *pemade* (big rafter in the middle of the roof structure), *pemucu* (a big rafter in every corner of the roof structure), and rafter called *iga-iga* which are joined together utilizing clamp called *apit-apit* and roof cover called *raab*. All building is done with a peg called *pasak* and tie system.

Wall Structure. Basically, the Balinese traditional building structural system of the walls is more accurately described as a pillar structure, because technically the pillar is a structural element. In contrast, the building wall is only a space dividing element. Technically, the pillar/saka supports the roof structure, transmitting the horizontal load to the ground through the pedestal called *sendi*. Adjustment to the vertical force is carried out using the traditional elements of beams called *lambang* that consists of *lambang sineb*, *canggah wang*, and *sunduk*. Thus, it can be said that the system is a portal system.

Foundation Structure called batur. Basically, traditional buildings in Pengotan do not recognize the use of a foundation system as a building foundation. The building can already stand/be erected on the ground without a special foundation as the traditional Balinese building principle. This is due to the pole structure system's use as the main structure and because in general Balinese traditional buildings, especially residential houses, have relatively small span dimensions. Thus, the horizontal bonding with the use of pillars called *saka*, the system of beams called *lambang*, *canggah wang*, and bales have guaranteed the building structure's rigidity.

But even so, concerning the principle of structure, the connection or transmission of the building's load to the

ground is also carried out by placing the building on the joints with the pedestal system's connection. Then these joints are placed on the floor called *bebaturan*. Technically, these rules are made with a certain height between 50 - 100 cm to avoid infiltration of groundwater, so that the floor height is made different from the demands of the space function.

Building materials. The discussion of building materials is basically related to the structural system applied to the building. Regarding building materials, the buildings in Pengotan, especially the traditional type buildings, fully use local materials found around the village environment. Meanwhile, transitional and modern types of buildings no longer use local materials. The patterns of using building materials for each building element are as follows:

Roof Element. The roof frame structure generally uses wood, and coconut sticks called *seseh* and bamboo for the rafter elements called *usuk* connected by a peg and tie system. In sacred buildings, the roof frame structure uses wood. Bamboo is used as a roof covering material, which is shaped like a shingle shape. Besides bamboo, the sacred buildings (*Pesimpenen Bethara Gunung Agung* and *Tuluk Biu*) use palm *fiber*. In some buildings, the roof covering material is replaced with tile and zinc, especially in residential buildings.

Walls. The room dividing walls (in traditional residential buildings) uses woven bamboo with large matting dimensions so that there are pores that allow air circulation (although relatively small). Structural buildings are made of jackfruit wood called *kwarditan*, which is not too difficult to find in the village. The pillar structure's supporting elements, such as *lambang sineb*, *canggih wang* and *bale-bale*, also use wood and *seseh* (coconut stem).

Floor called Bebaturan. Building floors generally still use the earth floor, especially in traditional buildings. Non-traditional buildings have switched to the use of cement and tiles. Batur walls use river stone (in traditional buildings) while masonry/plastering is used in non-traditional buildings. Joints, which are a medium for conveying building loads (concerning poles/pillars), are made of solid stone, and some of them use river stone.

As mentioned above, building material technology has provided convenience in technical implementation and economic value so that there has been a tendency to switch to the use of non-traditional materials. In fact, this has happened to several buildings in Pengotan.

3.7. Aesthetic Elements

As is the case with other traditional Balinese buildings, traditional buildings in the Pengotan also apply ornaments as a form of building art. When viewed as a whole, the use of this ornament art is not too common for the people of Pengotan. There are not many houses and holy buildings applying the art of ornament. Even the use of the ornament is found in several buildings, especially sacred buildings.

The forms of ornament widely used are the forms of *pepalihan*, especially in sacred buildings and *angkul-angkul*. The form of this *pepalihan* is straightforward, not too complicated like the shape of the *pepalihan* in other villages of Bali such as the villages of Gianyar, Klungkung and Badung style. Other forms of ornament are forms of *pepatran* (the ornament that copies much vegetation), *kekarangan* (the ornaments that copy the forms of the animal) and *keketusan* (the ornaments that copy the form of objects such as stone, water, sand, and seed) (Satria & Putra 2020). However, these forms are limited to use in sacred buildings, and even have simpler stylistic forms with those in general (Gianyar style). This is very much influenced by the workforce, which comes from the village with distinctive skills and styles.

4. Conclusions

The Pengotan Traditional Village Pattern is closely related to its cultural philosophy, which is related to the cultural system that governs it and the structural form of the Pekraman Village. Pengotan Traditional Village has several cultural philosophies, manifested in the spatial concept of village cultural preservation areas, so at macro and micro

levels it can be a harmonious and balanced spatial concept approach with its designation elements, cultural philosophies based on the concept of *Tri Hita Karana*.

Pengotan as a tourist village with unique bamboo house architecture and unique customs traditions has led to an increase in tourist visits to Pengotan, because tourists want to see, feel, and enjoy firsthand the natural existence of the socio-cultural nature of the village community. Besides natural tours, tourists also enjoy residential areas that are thick with Balinese culture in Pengotan Traditional Village. This increase in tourist visits causes various phenomena in Pengotan, such as restaurants and land conversion for tourism and new settlements, which can change the architectural order.

Pengotan has unique architecture and settlement patterns that are still preserved. Seeing the change in settlement structure and the occurrence of land use change due to the surge in tourism, there has been concern and awareness of the community to maintain their traditional village order. Community concern and awareness are the main factors in the preservation of the village. The uniqueness of the architecture, the natural beauty of the rice fields, and the village structure's preservation are the main attractions that make it a cultural tourism object.

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