

Study of the Spatial Layout of Traditional Balinese Houses Based on *Asta Kosala Kosali* in the *Pengurip Lembu Agung* Typology for Homeless Individuals

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Abstract Traditional Balinese houses are a cultural heritage that reflects the philosophical, spiritual, social, and functional values of Balinese society through the application of the *Asta Kosala Kosali* guidelines in the design process. These guidelines regulate building layout, spatial orientation, an anthropometry-based measurement system namely, a system for determining spatial and building dimensions based on the human body as well as the relationships among buildings within a residential compound, thereby creating a dwelling that is harmonious with the cultural values and beliefs of Balinese society. However, with the rapid development of modern housing, the comprehensive application of *Asta Kosala Kosali* has become increasingly uncommon. Therefore, efforts are needed to document and demonstrate its implementation as a means of preserving local wisdom. This study aims to design a traditional Balinese house based on *Asta Kosala Kosali* for the *Kasta Satria Wesia* typology, specifically the *Pengurip Lembu Agung* category, with the occupant's profession designated as homeless person. The study employed a qualitative descriptive approach using primary data obtained through anthropometric measurements of the occupant and secondary data collected from a literature review on *Asta Kosala Kosali* and the concepts of traditional Balinese architecture. The design process included determining the dimensions of the residential compound, organizing the spatial layout, positioning the buildings, establishing the number and dimensions of the *saka*, and arranging the vegetation according to the principles of traditional Balinese architecture. The design results demonstrate that the application of *Asta Kosala Kosali* produces a spatial arrangement consistent with the concepts of *Tri Hita Karana*, *Tri Mandala*, and *Sanga Mandala*, in which each building possesses functions, dimensions, orientations, and spatial relationships that correspond to the *Pengurip Lembu Agung* typology. This design confirms that *Asta Kosala Kosali* remains a relevant guideline for creating dwellings that are proportional, functional, and capable of preserving the cultural, spiritual, and architectural identity of traditional Balinese houses amid contemporary development.

Index Terms— Anthropometry, *Asta Kosala Kosali*, *Pengurip Lembu Agung* Typology, Traditional Balinese Houses.

I. INTRODUCTION

Traditional Balinese architecture is one form of ethnic architecture that constitutes part of the rich architectural heritage of the Indonesian archipelago [15]. Traditional Balinese houses serve not only as dwellings but also as representations of life values passed down from generation to generation. Therefore, their design process is not carried out arbitrarily but follows various principles and guidelines established in traditional lontar manuscripts.

One of the guidelines used in the construction of traditional Balinese houses is *Asta Kosala Kosali*. *Asta Kosala Kosali* is a traditional architectural knowledge system rooted in Hindu traditions that contains guidelines on construction methods, spatial layout, and the arrangement of buildings for residential and sacred purposes in Bali [4].

This concept is closely related to the philosophy of *Tri Hita Karana*, which emphasizes the harmonious relationship between humans and God (*Parahyangan*), humans with one another (*Pawongan*), and humans with the environment (*Palemahan*) [14]. Through this concept, traditional Balinese houses are designed not only to fulfill the physical needs of their occupants but also to create psychological, social, and spiritual comfort.

In addition to *Tri Hita Karana*, the spatial layout of traditional Balinese houses is also influenced by the concepts of *Tri Mandala* and *Sanga Mandala*, which divide spaces according to their levels of sacredness [1]. This division results in each building having a distinct position and function according to its respective values. Therefore, traditional Balinese houses have a distinctive spatial arrangement pattern that differs from that of modern residential houses.

Although *Asta Kosala Kosali* is still recognized as a primary guideline in traditional Balinese architecture, its comprehensive application in the design of contemporary residential houses is becoming increasingly uncommon. The development of modern housing has led many designs to place greater emphasis on functional and aesthetic aspects, while guidelines concerning spatial layout, building orientation, anthropometric measurement systems, and traditional residential typologies are gradually being abandoned. This condition highlights the importance of documenting the application of *Asta Kosala Kosali* in the design of a traditional Balinese house as a means of cultural preservation and as a reference for the future development of traditional Balinese architecture.

This spatial layout study adopts the *Kasta Satria Wesia* typology, specifically the *Pengurip Lembu Agung* category, with the occupant's profession classified as a homeless individual. Homeless individuals referring to individuals who do not have a permanent residence or stable place to live. The selection of this typology is relevant to the study

because the spatial organization and dimensions prescribed by *Sikut Satak* are not limited to specific building forms but also consider the social status and intended occupants of the dwelling. Therefore, the *Pengurip Lembu Agung* typology provides an appropriate case for examining how traditional Balinese spatial principles accommodate individuals with limited residential resources. The typology was not selected to stigmatize homeless individuals, but rather to understand how the *Sikut Satak* system organizes residential space according to the social classification associated with *Pengurip Lembu Agung*. This typology was selected because, according to *Asta Kosala Kosali*, each caste and profession has different requirements regarding the dimensions of the residential compound, types of buildings, spatial layout, number of buildings, and spatial proportions to be applied. *Pengurip Lembu Agung* is one of the residential typologies intended for the *Kasta Satria Wesia* group with the profession of a homeless individual, and therefore has distinctive spatial layout characteristics and building dimensions. Accordingly, the application of this typology is important for demonstrating how the principles of *Asta Kosala Kosali* are practically implemented in the design process of a traditional Balinese house based on the occupant classification established in traditional lontar manuscripts.

This study adopts the *Kasta Satria Wesia* typology, specifically the *Pengurip Lembu Agung* category, with the profession classified as a homeless individual. The entire design process is based on the body measurements of the head of the household as the primary basis for determining the dimensions of the buildings and the spatial layout of the residential compound.

II. LITERATURE REVIEW

A. *Asta Kosala Kosali*

According to Balinese Hindu beliefs, buildings embody the values of *Bhuana Agung* as the macrocosm and *Bhuana Alit* as the microcosm. Harmony between the occupants and these two aspects is essential for maintaining balance in life [8]. To achieve this balance, the construction of a house must follow the guidelines outlined in the *Lontar Asta Kosala-Kosali*. *Asta Kosala Kosali* is a traditional architectural knowledge system rooted in Hindu traditions that contains guidelines on construction methods, spatial layout, and the arrangement of buildings for residential and sacred purposes in Bali [4]. The concept of *Asta Kosala Kosali* includes the use of human body measurements as the basis for determining dimensions, regulations concerning suitable and unsuitable types of *karang* for residential construction sites, as well as spatial arrangements based on the *hulu-teben* concept [2].

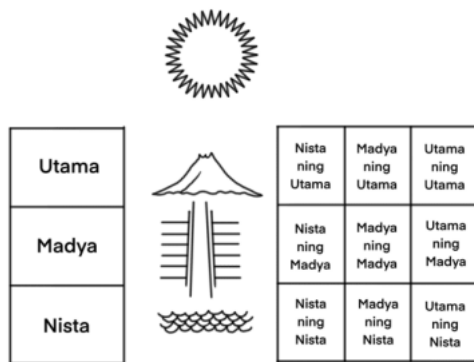


Figure 1. Orientation Patterns and Spatial Division Based on *Asta Kosala Kosali*

Source: Sitinjak *et al.*, 2020

B. Tri Hita Karana

The *Bhagavad Gita III.10* contains a philosophy of life that underlies the concept of *Tri Hita Karana*. This concept does not merely regulate spatial planning but also encompasses broader meanings [6]. *Tri Hita Karana* is a concept that emphasizes harmonious relationships between humans and God (*Parahyangan*), humans and one another (*Pawongan*), and humans and the environment (*Palemahan*) [14].

The concept of *Tri Hita Karana* plays an important role in achieving sustainable development by harmonizing spiritual, social, and ecological dimensions [3]. The concept of *Tri Hita Karana* consists of *Parahyangan*, which encompasses sacred places; *Pawongan*, which refers to residential areas or dwellings; and *Palemahan*, which includes the *natah* (house courtyard) [11]. Through this concept, a house serves not only as a place of residence but also as a means of maintaining the balance of its occupants' lives. In architecture, this harmonious relationship is analogized to a fetus (*manik*) residing within its mother's womb (*cecupu*), reflecting interconnectedness, protection, and a balanced process of development [18].

C. Tri Mandala

Etymologically, *Tri* means three, while *Mandala* refers to space, place, or area. Spatial planning based on the *Tri Mandala* concept is determined by the mountain–sea orientation (*kaja–kelod*) and the direction of the sunrise and sunset (*kangin–kauh*), which carry profound religious significance and serve important functions in the lives of their users [1].

Tri Mandala is a concept of spatial division in Traditional Balinese Architecture that organizes an area into three zones: *Nista Mandala* as the front or foot section, which is utilized for daily activities; *Madya Mandala* as the middle or body section, which functions as a family space; and *Utama Mandala* as the rear or head section, which is used as a place of worship [19].

The application of the *Tri Mandala* concept aims to create spatial organization that aligns with the cultural and

spiritual values of the Balinese people. In addition to assigning clear functions to each zone, this concept also helps establish a spatial organization that is easier for residents to understand and use.

D. Sanga Mandala

Sanga Mandala is a concept of spatial division into nine sections, each of which possesses its own level of sacredness. These levels are arranged hierarchically, from the most sacred to the most profane, namely *utama ning utama*, *utama ning madya*, *utama ning nista*, *madya ning utama*, *madya ning madya*, *madya ning nista*, *nista ning utama*, *nista ning madya*, and *nista ning nista* [16].

In the value system based on the earth axis, the *kaja* or mountain direction is considered the *utama* (sacred) zone, while the *kelod* or sea direction is regarded as the *nista* (profane) zone. Meanwhile, based on the solar axis, the *utama* value is associated with the direction of sunrise, while the *nista* value is associated with the direction of sunset. The *Sanga Mandala* spatial concept originates from the nine manifestations of God who play a role in maintaining the balance of nature to create a harmonious life, known as *Dewata Nawa Sanga*. This spatial concept is then applied in the form of a *natah* pattern [16]. The application of the *Sanga Mandala* concept produces a structured spatial layout and is one of the distinctive characteristics of Traditional Balinese Architecture.

E. Sikut Satak

Sikut Satak is one of the fundamental concepts in Traditional Balinese Architecture that regulates the spatial layout, dimensions, and arrangement of buildings within a residential compound. The term *Sikut Satak* is associated with traditional measurement units used in the design of Balinese houses and is based on the human body as the primary reference. This measurement system uses the dimensions of the homeowner's body, such as *depa*, *hasta*, and the length of the foot, resulting in building dimensions that are proportional to the occupants. In addition to regulating building dimensions, *Sikut Satak* also serves as a guideline for determining the placement of various residential elements based on the principles found in *Asta Kosala Kosali* and *Asta Bhumi* [5].

III. METHOD

This study employs a descriptive qualitative approach, utilizing primary data in the form of anthropometric measurements of the occupants and secondary data obtained through a literature review of *Asta Kosala Kosali* and the concepts of Traditional Balinese Architecture. The study applies the principles of *Asta Kosala Kosali* as the

basis for designing Traditional Balinese houses. The study is conducted based on the occupants' body dimensions, which serve as the primary reference in the traditional Balinese measurement system. This approach was selected because *Asta Kosala Kosali* not only regulates the physical aspects of buildings but also considers the relationship between humans, space, and the environment, as well as the underlying cultural and spiritual values.

The data used consist of primary and secondary data. Primary data were obtained through direct measurements of the individual serving as the design reference, including traditional units such as *depa*, *hasta*, *tampak ngandang*, *nyari*, and *kilan*. Meanwhile, secondary data were obtained through a literature review discussing *Asta Kosala Kosali*, *Tri Hita Karana*, *Tri Mandala*, *Sanga Mandala*, as well as various references related to Traditional Balinese Architecture as a theoretical foundation for the design process.

The design process begins with the selection of an individual as the measurement reference, followed by determining the position of the *angkul-angkul*, calculating the site area, and arranging the layout of the main buildings. Subsequently, the distances between buildings, as well as the size and form of the buildings, are determined according to the requirements of the *Pengurip Lembu Agung* typology, followed by the arrangement of vegetation within the residential compound.

IV. RESULT AND DISCUSSION

A. Selection of Measurement Reference and Occupant Typology

The initial stage of the design process involves selecting an individual to serve as the measurement reference. In this design, the individual with the largest body dimensions among the other family members was selected. The selection of the largest body dimensions aims to ensure that the designed building can comfortably accommodate the needs of all occupants.

TABLE 1
BODY MEASUREMENT UNITS USED IN THE DESIGN

No.	Body Parts	Measurement (cm)
1.	<i>Limang Nyari</i>	10
2.	<i>Sedeme</i>	10
3.	<i>Hasta Agung</i>	45
4.	<i>Hasta Madia</i>	40
5.	<i>Hasta Alit</i>	30
6.	<i>Tampak Ngandang</i>	26
7.	Lebar Jari Kaki	10
8.	<i>Depa Madia</i>	170

9.	<i>Depa Alit</i>	155
10.	<i>Amusti</i>	15
11.	<i>Ahasta</i>	30
12.	<i>Depa + Hasta + Musti</i>	200
13.	<i>Ape Nyujuh</i>	215
14.	<i>Adepagung</i>	220
15.	<i>Kilan</i>	20
16.	<i>3 Nyari</i>	5

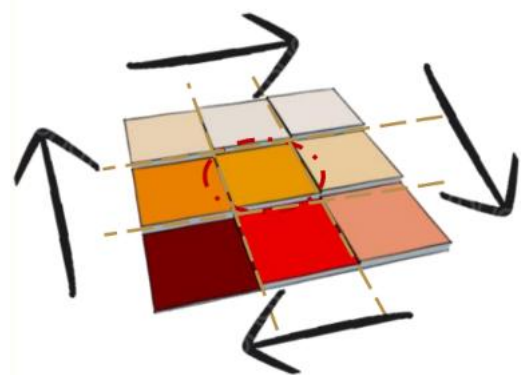
These measurements are then used to determine the distances between buildings, building dimensions, and various other elements within the site.

The use of human body measurements as the basis for measurement demonstrates that the Balinese people have applied anthropometric principles in the building design process. This system allows each house to have different dimensions according to the characteristics of its occupants.

B. Determination of the Entrance Location

The first stage of the design process is to determine the position of the main entrance. Based on the provisions of *Asta Kosala Kosali* regarding the placement of entrances, the planned position is located on the southern side of the site. To determine the appropriate location, the site is first divided into nine sections. Subsequently, one of the columns on the southern side is further divided into nine equal sections. Each section is then numbered from 1 to 9, with the calculation sequence proceeding from west to east.

Based on the spatial guidelines of *Asta Kosala Kosali*, position number 8 on the southern side is categorized as favorable. Therefore, this section was selected as the location for the main entrance, in the form of an *angkul-angkul* or *kori*, in the designed Traditional Balinese house. The guidelines for the placement of the entrance or *angkul-angkul* can be seen in the following figure.



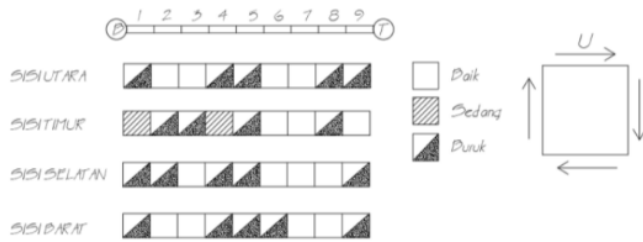


Figure 2. Entrance Placement Guidelines
Source: Kadek Edi Saputra (2026)

C. Site Area Planning

The site used for the *Pengurip Lembu Agung* typology with the homeless individuals (*Wreksaayu*) profession has a main land area measuring 9 cm × 8 cm on paper, while the *Merajan* area measures 6 cm × 5 cm on paper. Since the floor plan is drawn at a scale of 1:200, each measurement (in cm) is multiplied by 200 to obtain its actual dimensions.

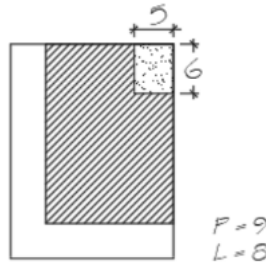


Figure 3. Land Area of the *Lembu Agung* Typology for Homeless Individuals (*Wreksaayu*)
Source: Bagus Oka (2005)

The following formula is used to determine the site area.
 Site Dimensions = (Land Length + *Merajan* Length) × (Land Width + *Merajan* Width)
 Site Dimensions = (9 + 6) × (8 + 5)
 Site Dimensions = 15 cm × 13 cm
 Site Length = 15 cm × 200 = 3000 cm or 30 m.
 Site Width = 13 cm × 200 = 2600 cm or 26 m.

The results indicate that the site has sufficient area to accommodate all the main elements of a Traditional Balinese house. An adequate site area allows for the creation of an open space or *natah* as the center of family activities. In addition to functioning as a space for interaction, *natah* also plays an important role in providing good air circulation and natural lighting for all surrounding buildings.

D. Determination of Distances Between Buildings

Before determining the distances between buildings, each building is first positioned based on the provisions of *Asta Bhumi*. *Asta Bhumi* is a guideline for spatial planning on the ground surface, used to determine the zoning and layout of buildings within a residential compound. Its measurement system uses traditional units known as *tampak* or *tapak*, which are based on the dimensions of the feet. This system

consists of *tampak*, which refers to the length of the foot, and *tampak ngandang*, which refers to the width of the foot. These measurements are taken from the hand and foot dimensions of the oldest occupant who is the owner of the residence [9].

Through *Asta Bhumi*, each building is positioned in an appropriate location based on Balinese cosmological concepts, creating an organized spatial arrangement that is in harmony with the cultural and spiritual values of the Balinese people. At this stage, the locations of the main buildings, such as *Merajan*, *Bale Kaja*, *Bale Kangin*, *Bale Kauh*, and *Paon*, are determined according to the applicable provisions for the typology of the designed residence.

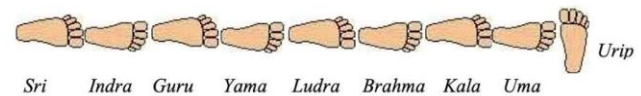


Figure 4. *Ashta Bhumi's Tampak*
Source: Bagus Oka (2005)

The distances between buildings are determined using a *Tampak Ngandang* measurement of 26 cm and an *Urip* value of 10 cm. This system aims to create harmonious spatial relationships in accordance with the provisions of *Asta Kosala Kosali*. The calculation is based on the provisions of *Asta Kosala Kosali* using the following formula.

$$\text{Measurement} = (\text{Tampak Ngandang} \times \text{Tampak Multiples}) + \text{Urip}$$

TABLE 2
SAKA SPACING CALCULATION BASED ON THE SIKUT SATAK FORMULA

Buildings	Tampak Multiples	Calculations	Results (cm)
<i>Meten -Paon</i>	11	$(26 \times 11) + 10$	296
<i>Bale Kaja - Bale Kangin</i>	26	$(26 \times 26) + 10$	686
<i>Bale Kaja - Bale Kauh</i>	7	$(26 \times 7) + 10$	192
<i>Bale Kauh - Paon</i>	22	$(26 \times 22) + 10$	582
<i>Paon - Bale Kangin</i>	9	$(26 \times 9) + 10$	244
<i>Bale Kangin - Land Wall</i>	48	$(26 \times 48) + 10$	1.258

Based on the calculated distances between buildings, it can be seen that each building has a different distance according to the provisions of *Asta Kosala Kosali*. These variations in distance indicate that spatial organization considers not only functional aspects but also the relationship between buildings as part of an integrated residential compound.

The anthropometric measurements were conducted using Ahmad Faizal Ramadhani, a student of Udayana University and a member of the research group, as the measurement subject. He was selected because he had the largest body dimensions among the available group members, providing a conservative reference for determining spatial dimensions in the *Sikut Satak*. This approach was intended to ensure that the resulting dimensions could accommodate individuals with larger body proportions. The measurements were conducted directly using a measuring tape for larger body parts and a ruler for smaller body parts. Only one subject was used because the purpose of the measurements was to obtain a practical anthropometric reference for applying *Sikut Satak*, rather than to represent the statistical characteristics of the general population.

Closer distances are generally applied to buildings with highly interconnected activities, while greater distances are used to create functional separation, provide open spaces, and improve environmental comfort. Therefore, the determination of distances between buildings is not arbitrary but follows a traditional measurement system aimed at creating a harmonious and functional spatial arrangement that is in accordance with the principles of Traditional Balinese Architecture.

E. Determination of the Number and Dimensions of Saka

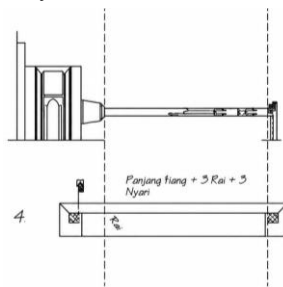


Figure 5. Calculation of the Distance Between Saka
Source: Bagus Oka (2005)

Saka is a primary structural element that supports Traditional Balinese buildings. In addition to functioning as roof supports, the number of *saka* also indicates the size and function of a building.

It should be noted that 1 *rai* is equivalent to 10 cm, 3 *nyari* is equivalent to 5 cm, and the length of the posts is set at 21 *rai*, or 210 cm.

The following formula is used to determine the distance between *saka*:

Distance between *Saka* = 3 *Rai* + 3 *Nyari* + 21 *Rai*

Distance between *Saka* = 30 cm + 5 cm + 210 cm

Distance between *Saka* = 245 cm

This distance (245 cm) is applied consistently across all buildings, resulting in uniform proportions and creating

visual unity throughout the designed Traditional Balinese residential compound.

F. Building Division and Determination of Building Dimensions

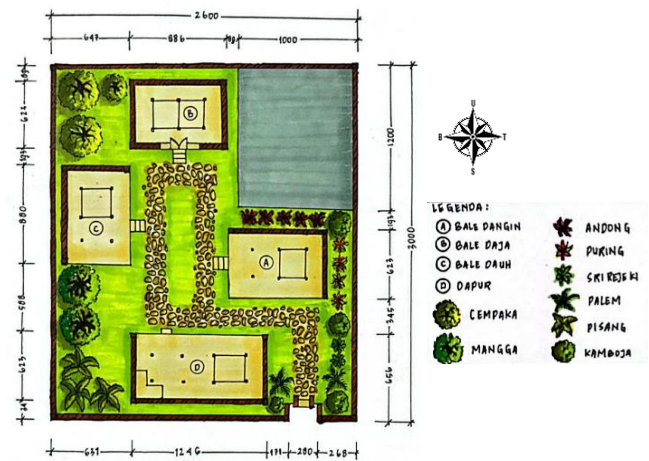


Figure 6. Floor Plan of the Pangurip Lembu Agung Typology for Homeless Individuals

The building dimensions are determined based on the *saka* configuration that has been established. The height of the *saka* base is 30 cm, the height of the *saka* is 210 cm, and the distance between *saka* is 245 cm.

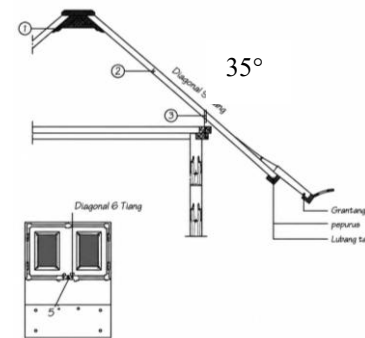


Figure 7. Detailed Design of Building Areas
Source: Bagus Oka (2005)

The building lines are determined based on the diagonal lines formed between the *saka*. These diagonal lines are then projected horizontally to form straight lines. Subsequently, 3 *rai*, or 30 cm, is added to their length. The resulting extension is then inclined again at an angle of 35°. The length of the diagonal line from left to right after the addition of 3 *rai* serves as the reference for the building line, including the roof structure.

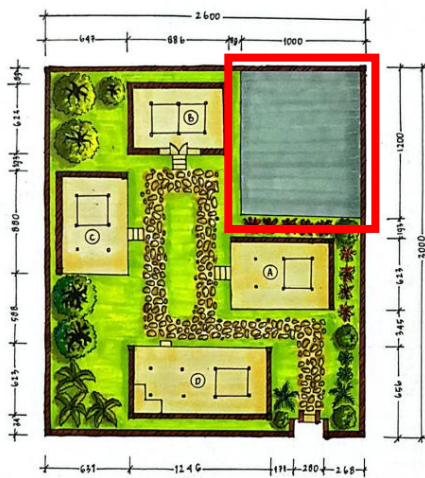


Figure 8. Floor Plan of the Merajan Focus Area

Sanggah is a sacred place that serves as a means of establishing a relationship between humans and God. Because it has the highest level of sacredness and function compared to other buildings within a Traditional Balinese residential compound, its placement must be located in the zone with the highest level of sacredness. In the *Tri Mandala* concept, the *sanggah* is placed in the *Utama Mandala*, while in the *Sanga Mandala* concept, it is positioned in the *Utamaning Utama Mandala*, specifically in the northeast direction (*kaja-kangin*) [13]. In this design, the *sanggah/merajan* has building dimensions of 1.000×1.200 cm, or 10×12 m. These dimensions are determined based on the traditional Balinese measurement system, which refers to the occupants' anthropometric measurements, resulting in a proportional building in accordance with the provisions of *Asta Kosala Kosali*.

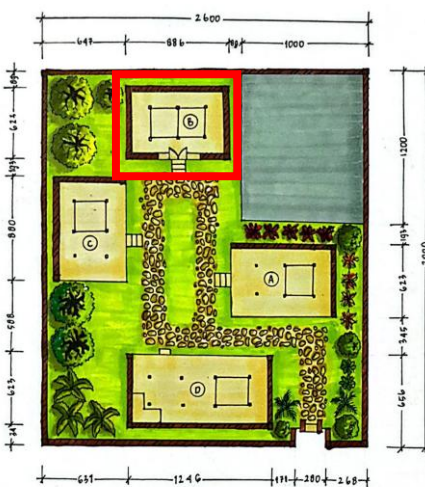


Figure 9. Floor Plan of the Bale Kaja Focus Area

In addition to the *Merajan*, there is the *Bale Kaja*, a term used to refer to a bale whose placement follows the cardinal directions, as commonly referred to by the Balinese people.

The term *kaja* or *daja* refers to the higher region, namely the direction of the mountain. In southern Bali, *kaja* refers to the north, while in northern Bali, it refers to the south. Initially, the *Bale Kaja* functioned as a sleeping area and was therefore often referred to as *Bale Meten*. In addition to serving as a sleeping space, this building is also used for other profane functions, such as a birthing room and a bedroom for unmarried daughters. Furthermore, the *Bale Kaja* has a sacred function as a place for storing heirlooms or sacred objects and is also used in the implementation of *Manusa Yadnya* ceremonies, for example, as a place for *ngekeb* during the *menek daha* ceremony. If the building is used solely for storing heirlooms, the *Bale Kaja* is known as *Gedong Simpan* [10]. In this design, the *Bale Kaja* uses six *saka* with a distance of 245 cm between each *saka*. The number of *saka* was selected based on the building's function and the requirements of the *Pengurip Lembu Agung* typology, resulting in a stable structure and balanced building proportions. The *Bale Kaja* measures $880 \text{ cm} \times 637 \text{ cm}$. All dimensions are determined based on the *Asta Kosala Kosali* measurement system, thereby maintaining functional, aesthetic, and cultural values.

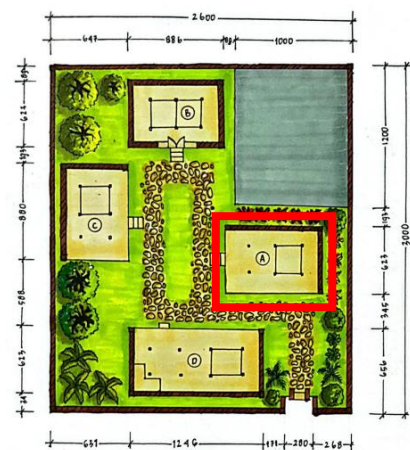


Figure 10. Floor Plan of the Bale Kangin Focus Area

The *Bale Kangin* functions as a place for conducting and preparing various religious ceremonies, particularly *Manusia Yadnya* and *Pitra Yadnya* ceremonies. This building is located on the eastern (*kangin*) side of the residential compound or *natah*. As its name suggests, the *Bale Kangin* has six supporting posts (*saka*), consisting of four posts in the *bale-bale* section and two posts in the *teben* section. The building has two enclosed sides and two open sides facing the *natah*. Its roof construction is in the form of a *limasan* with a *dedeleg* ridge, while the roof covering generally uses thatch or clay tiles [17]. In this design, after calculating the number and dimensions of the *saka*, it was determined that the *Bale Kangin* also uses six

saka, with a distance of 245 cm between each *saka*, while the dimensions of the *Bale Kangin* are 880 cm × 637 cm.

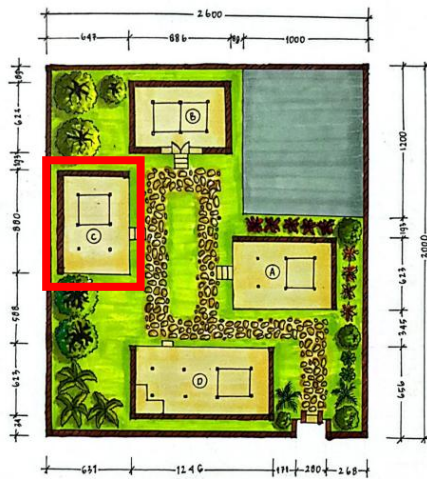


Figure 11. Floor Plan of the *Bale Kauh* Focus Area

The *Bale Kauh* is a building located on the western (*kauh*) side of the *natah* or residential compound. This building is also known as *Bale Loji* or *Tiang Sanga*. The primary function of the *Bale Kauh* is to receive guests, while also serving as a sleeping area for teenagers or younger family members. The building contains one *bale-bale*, which serves as the main space for occupants' activities. Physically, the *Bale Kauh* has a rectangular form and uses a post structure (*saka*) generally made of wood. Based on the number of posts, the *Bale Kauh* can be classified into several types: *sakenem* when it has six posts, *sakutus* or *astasari* when it has eight posts, and *sangasari* when it has nine posts. As a residential building, the *Bale Kauh* uses *bebaturan* with a floor elevation lower than that of the *Bale Kangin* and *Bale Meten* [9]. In this design, the *Bale Kauh* also uses six *saka*, with a distance of 245 cm between each *saka*. This number of *saka* provides adequate structural strength while maintaining proportional harmony with the other buildings. The dimensions of the *Bale Kauh* are also 880 cm × 637 cm.

The *Paon* is a building that functions as a place for cooking and, under certain circumstances, can also be used as a sleeping area. The facilities within it include one *bale-bale* in the interior and a traditional stove used for cooking activities. As part of a Traditional Balinese house, the *Paon* uses *bebaturan* with a floor elevation lower than that of the *Bale Kauh*. The term *paon* originates from the Javanese word *pawon*, meaning kitchen. This building is generally located on the southern side of the residential compound and has traditionally served as a place for food preparation for the occupants. In addition to its domestic function, the *Paon* also carries religious significance, as in Balinese Hindu belief, it is considered the *stana* (abode) of Lord

Brahma, the manifestation of God associated with the element of fire [7]. In this design, the *Paon* uses 8 *saka*, with a distance of 245 cm between each *saka*. The greater number of *saka* indicates that the building is larger than the other buildings, in accordance with the requirements of homeless individuals. Unlike the other buildings, which use only six *saka*, the *Paon*, with its 8 *saka*, measures 1.246 cm × 623 cm. The greater number of *saka* in the *Paon* reflects its larger dimensions compared to the other buildings, as prescribed for homeless individuals.

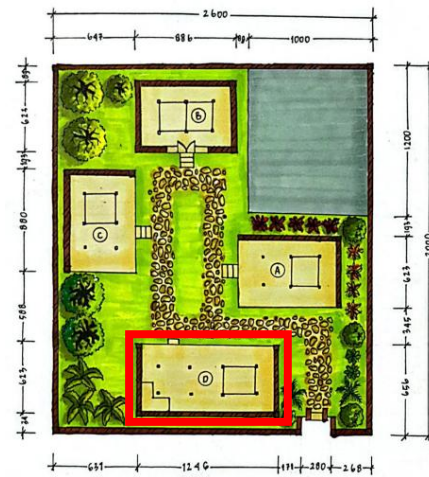


Figure 12. Floor Plan of the *Paon/Kitchen* Focus Area

Natah is an open space intentionally created and arranged according to specific rules, based on the philosophy and religious values embraced by the Balinese people. The presence of *natah* is an integral part of Traditional Balinese houses and is almost always found within residential compounds. In addition to serving as the primary open space, *natah* also plays an important role in improving the environmental quality and ecological aspects of residential areas. Furthermore, *natah* functions as a circulation space that supports various activities and movement of occupants within the residential compound [7].

This method demonstrates that Traditional Balinese Architecture employs a measured and consistent proportional system. The result is a building that is not only structurally functional but also possesses a visual balance that is characteristic of Balinese Architecture.

G. Vegetation Arrangement

As shown in Figure 6, Floor Plan of the *Pangurip Lembu Agung* Typology for homeless individuals, vegetation arrangement within the Traditional Balinese residential compound is carried out by considering the function of each space, its level of sacredness, and the characteristics of each plant. In the *merajan* area, *Plumeria sp.*, *Codiaeum variegatum*, *Cordyline fruticosa*, and *Aglaonema sp.* are used. These plants are selected based on their dominant

characteristics as ornamental and flowering plants, making them suitable for the function of the *merajan* as a sacred area. In addition to enhancing the sacred atmosphere, the presence of flowering plants also supports the need for materials used in religious ceremonies frequently conducted in the area.

In the *natah* area, *Magnolia champaca*, *Codiaeum variegatum*, *Cordyline fruticosa*, and *Aglaonema sp.* are used. As the main open space within the residential compound, the *natah* requires vegetation that provides aesthetic value while maintaining environmental quality. *Magnolia champaca* is selected because its flowers have religious significance and are frequently used in Balinese Hindu ceremonies, while *Codiaeum variegatum*, *Cordyline fruticosa*, and *Aglaonema sp.* function as greenery elements that enhance the visual character of the residential compound. The selection of plants in the *natah* area also follows traditional principles that avoid planting fruit trees in the main space of the residential compound, allowing daily activities and customary activities to take place comfortably.

Meanwhile, in the *teba* area located at the rear of the residential compound, *Veitchia merrillii*, *Cordyline fruticosa*, *Aglaonema sp.*, *Codiaeum variegatum*, *Mangifera indica*, and *Musa sp.* are used. Unlike the *merajan* and *natah*, the *teba* area has a more profane and productive function, making it suitable for the placement of fruit plants. The presence of *Mangifera indica* and *Musa sp.* not only provides produce that can be utilized by the occupants but also reflects the concept of sustainable land use in Traditional Balinese houses. Furthermore, the combination of productive and ornamental plants in this area contributes to improving the microclimate, providing shade, and strengthening the ecological functions of the residential compound.

V. CONCLUSION

The design of a Traditional Balinese house based on the *Asta Kosala Kosali* guidelines, using the *Kasta Satria Wesia* typology known as *Pengurip Lembu Agung*, successfully produced a design that complies with the principles of Traditional Balinese Architecture. All stages of the design process, from determining the residential compound dimensions, organizing the spatial layout, positioning the buildings, determining the number and dimensions of *saka*, to arranging the vegetation, have been guided by the concepts of *Tri Hita Karana*, *Tri Mandala*, and *Sanga Mandala*. The application of an anthropometry-based measurement system using the occupants' body dimensions also resulted in proportional building dimensions that comply with the provisions of *Asta Kosala Kosali*.

The results of this study demonstrate that the *Asta Kosala Kosali* guidelines remain relevant for application in the design of Traditional Balinese houses, as they are capable of producing spatial arrangements that not only fulfill functional and structural aspects but also preserve the philosophical, cultural, and spiritual values that form the identity of Balinese Architecture. In addition to serving as an implementation of traditional architectural guidelines, this study is expected to serve as a reference for readers in understanding and applying the principles of *Asta Kosala Kosali* in the design of Traditional Balinese houses, thereby helping to preserve this local wisdom amid the development of modern residential construction.

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This article was prepared following the *Asta Kosala Kosali* practical session, utilizing methods and references derived from Bagus Oka's book. The findings presented here reflect purely theoretical measurements of Balinese architecture and should not be applied to actual traditional Balinese housing construction without direct consultation from a traditional master builder (*undagi*).

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