

Study of the Application of Asta Kosala Kosali and Sikut Satak in the Planning of Traditional Balinese Houses with Pengurip Gajah

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Abstrak Traditional Balinese houses represent a form of the architectural heritage of the Indonesian archipelago, having evolved in accordance with the cultural, religious and philosophical values of Balinese society. The design of traditional Balinese dwellings is guided by the Asta Kosala Kosali, a system of rules governing spatial layout, orientation, dimensions and the relationships between buildings within a natah (compound). One of the key elements of this system is Sikut Satak, a traditional measurement method that uses human body dimensions as a reference for determining the size of spaces and buildings. This study aims to examine the application of the principles of Asta Kosala Kosali in the planning of traditional Balinese houses, particularly regarding the determination of plot area, building orientation, the placement of entrances, the spacing between buildings, and the layout of the compound's landscape. The method employed was descriptive qualitative research through a literature review of various sources relating to traditional Balinese architecture. The findings indicate that the application of Asta Kosala Kosali serves not only as a technical guideline for house construction but also reflects a harmonious relationship between humans, the environment, and spiritual values. Body-based measurement systems, such as depa, hasta, kilan, musti, nyari, and atampak, result in building dimensions that are appropriate for the occupants. Furthermore, the division of space into the Utama Mandala, Madya Mandala and Nista Mandala reveals a spatial order that carries philosophical significance. Consequently, the Asta Kosala Kosali plays a vital role in preserving the identity of traditional Balinese architecture and must be safeguarded amidst the advance of modern development.

Index Terms—Traditional Balinese Houses, Asta Kosala Kosali, Sikut Satak, Pengurip.

I. INTRODUCTION

Traditional Balinese architecture is a form of ethnic architecture that constitutes an important part of the architectural heritage of the Indonesian archipelago. As a cultural product, traditional architecture is inextricably linked to religious norms, local customs, and the natural environment in which it is situated [1]. The development of

Balinese architecture can be grouped into three categories: heritage (ancient) architecture, traditional Balinese architecture, and non-traditional architecture that adopts the traditional Balinese architectural style [2]. Traditional Balinese architecture is a cultural heritage passed down from generation to generation and built according to traditional principles, whether documented in writing or passed down orally. The continued application of this architecture in Balinese society demonstrates that the values it embodies are

still considered relevant, good, and correct [1]. More broadly, traditional Balinese architecture reflects a continuous process of development throughout the history of Balinese society, as well as its ongoing adaptation and preservation across various dimensions of space and time.

In the design of traditional Balinese houses, Asta Kosala Kosali serves as the primary guideline governing spatial planning, building layout, orientation, dimensions, and spatial composition based on the philosophical and spiritual values of the Balinese Hindu community [3]. The application of Asta Kosala Kosali is based on concepts such as Tri Hita Karana, Tri Angga, Tri Mandala, and the Kaja-Kelod and Kangin-Kauh orientations, which determine the hierarchy and function of spaces based on their level of sanctity. Within Asta Kosala Kosali lies the understanding that buildings are part of the system of life and are connected to Bhuwana Alit (the Microcosm) and Bhuwana Agung (the Macrocosm). This is reflected in spatial planning based on wind directions, building dimensions, the locations of mountains and the sea, and the elements within them. Therefore, spatial planning is not carried out haphazardly but is based on rules that have been passed down through generations via the Asta Kosala Kosali lontar manuscripts.

One of the key concepts in Asta Kosala Kosali is the use of a traditional measurement system known as sikut. Sikut is a unit derived from parts of the human body, such as depa, hasta musti, tampak, and others. One type of sikut widely used in the planning of traditional Balinese homes is the sikut satak, which is used to determine the size and proportions of a building so that they align with the philosophical values embraced by Balinese society.

As times have changed, the application of Asta Kosala Kosali principles in residential construction has begun to evolve. Many modern construction projects prioritize land efficiency and functional needs, leading to a diminishing understanding of traditional systems such as the sikut satak. This situation risks the loss of local knowledge that defines the identity of Balinese architecture.

This research aims to examine the application of Asta Kosala Kosali in the planning of traditional Balinese houses with a “pengurip gajah” layout, including the determination of sikut references based on the occupants, their professions, site orientation, placement of the main door, calculation of site area, building dimensions, number of saka, building layout, and landscape arrangement within the grounds of a traditional Balinese house.

II. LITERATURE REVIEW

A. Traditional Balinese Architecture

Traditional Balinese architecture is a spatial planning system that accommodates the lives of the Balinese people and has evolved over generations based on rules and values passed down from one generation to the next. Its existence is inextricably linked to various Hindu manuscripts and lontar palm-leaf manuscripts, which serve as guidelines for spatial planning and traditional Balinese architecture. Nevertheless, with the passage of

time and the influence of globalization, some members of Balinese society have begun to adopt development concepts that emphasize efficiency and productivity over the traditional principles that have been passed down [1]. In the context of traditional Balinese architecture, buildings are viewed as having similarities to human beings, in that they consist of both physical and non-physical elements. The non-physical elements are analogized as a soul that gives life and meaning to a building, while the physical elements are the manifestation or expression of that meaning. Therefore, spiritual and philosophical aspects play a crucial role in Balinese architecture, as they form the foundation for the shape, character, and image of a building [4].

B. Traditional Balinese Houses

Traditional Balinese houses are examples of vernacular architecture that have evolved alongside the Hindu religious values, customs, and culture of the Balinese people, passed down from generation to generation. The shape, layout, and dimensions of the structures within a traditional Balinese house are determined by their respective functions and the activities carried out within them. Therefore, each structure within a single compound serves a distinct function according to the residents' needs, including the bale meten, bale adat, pawon (kitchen), jineng, and merajan, which serves as a sacred space for the family [5]. Traditional Balinese houses serve not only as dwellings but also as venues supporting the various social, cultural, and religious activities of the Balinese Hindu community.

C. Traditional Measurement System (Sikut)

The traditional measurement system or sikut, is a method of determining dimensions in traditional Balinese architecture that uses the dimensions of the human body as the primary reference for establishing the size and proportions of a building. The use of these body measurements aims to ensure that the building aligns with the owner's characteristics, thereby creating comfort and spatial balance [5]. In practice, the sikut system includes sikut karang for determining the size of the compound, sikut natah for regulating the distance between buildings, and sikut gegulak, which serves as a unit of measurement in the construction of building elements. Beyond its technical aspects, this system also embodies philosophical values, as its measurement process follows the principles of Asta Kosala Kosali through Astawara calculations, which are believed to imbue buildings with meaning and vitality [6]. Therefore, the sikut system serves not only as a measurement system but also reflects the integration of ergonomic, cultural, and spiritual aspects in traditional Balinese architecture [7].

D. Asta Kosala Kosali

Asta Kosala Kosali is a fundamental guideline in traditional Balinese architecture that rules the planning, layout, orientation, dimensions, and construction process of buildings based on Hindu principles and the cosmological views of the Balinese people [7]. These guidelines direct the placement of each structure, such as the merajan, bale, kitchen, and entrance based on the

orientation of mountains, the sea, and the cardinal directions, as well as the use of human body measurements as the basis for determining building dimensions [6]. Asta Kosala Kosali not only contains technical construction rules but also embodies philosophical values manifested through the application of the concepts of Tri Angga, Tri Mandala, and Padma Bhuwana, ensuring that each space possesses interrelated functions, positions, and meanings [3]. In line with this, the values contained in the Asta Kosala Kosali reflect religious, ecological, aesthetic, and cultural aspects that play a vital role in preserving Balinese architectural identity as times change [9]

E. Tri Mandala

Tri Mandala is a spatial planning concept in traditional Balinese architecture that divides an area into three zones based on their level of sacredness: Utama Mandala, Madya Mandala, and Nista Mandala [7]. The Utama Mandala is designated for sacred activities, the Madya Mandala serves as the main activity space, while the Nista Mandala is used for service and support functions [6]. The Tri Mandala concept is an implementation of the Tri Angga concept, which is applied in spatial planning based on the mountain-sea orientation (*kaja-kelod*) and the direction of the sun (*kangin-kauh*), thereby creating a spatial arrangement with a clear hierarchy and distinct functions [3]. This spatial division embodies the concepts of Tri Hita Karana and Dewata Nawa Sanga, which imbue each zone with religious, cultural, and philosophical significance [8]. From an ecological perspective, the Tri Mandala layout promotes environmental comfort through building orientations that account for the sun's path, wind circulation, and local climatic conditions [4].

F. Tri Hita Karana

Tri Hita Karana is a Balinese philosophy of life that teaches the importance of maintaining a balanced relationship between humans with God (*Parhyangan*), humans with each other (*Pawongan*), and humans with the environment (*Palemahan*) as the foundation for a harmonious life [7]. In traditional Balinese architecture, this concept is embodied through spatial arrangements that provide sacred areas for religious activities, living spaces for social interaction, and open spaces and environments that foster a harmonious relationship with nature [6]. The application of Tri Hita Karana also shapes an environmentally friendly landscape through the adjustment of building orientation, the use of vegetation, the regulation of air circulation, and the wise use of natural resources [10]. The values of Tri Hita Karana form the basis for religious, ecological, aesthetic, and cultural values in building design based on Asta Kosala Kosali [8].

G. Landscape Design in Traditional Balinese Backyards

Landscape Design in Traditional Balinese Backyards
Landscape design in traditional Balinese backyards is a spatial arrangement that integrates functional, cultural, and spiritual aspects based on the Asta Kosala Kosali

guidelines. The design takes into account the *kaja-kelod* and *kangin-kauh* orientations, as well as the division of space based on the Tri Mandala concept, so that each element has a distinct function and level of sacredness [7]. Landscape elements, such as vegetation, circulation paths, boundary fences, and supporting structures, are arranged in an integrated manner to create a comfortable, harmonious, and sustainable environment. This layout also reflects the principles of ecological architecture through the use of vegetation, building orientation, and the optimization of natural lighting and ventilation [4]. Furthermore, the landscape design embodies the application of the Tri Hita Karana concept, which supports the creation of balance among humans, God, and nature, while maintaining harmony between Bhuwana Alit (the microcosm) and Bhuwana Agung (the macrocosm) [8].

H. Depa

A “*depa*” is a traditional unit of measurement derived from the span of a person's outstretched arms. To measure it, one extends both arms straight out parallel to the shoulders, then measures the distance from the tip of the middle finger of the right hand to the tip of the middle finger of the left hand. Because it uses the human body as a reference, the length of a *depa* varies from person to person. In the Asta Kosala Kosali, the *depa* is used to determine the area of a yard and the distance between buildings [3].

I. Sedema

Sedema is a unit of measurement based on the span of a clenched hand. It is measured from the back of the little finger to the index finger, with the thumb tucked inwards.

J. Kilan

Kilan is a unit of measurement based on the distance between the tip of the thumb and the tip of the little finger when both fingers are stretched as far as possible.

K. Musti

Musti is a measurement based on the length of a clenched hand. The measurement is taken from the tip of the thumb to the back of the little finger when the hand is clenched into a fist.

L. Hasta

A hasta is a unit of measurement based on the length of the arm, the distance from the elbow to the tip of the middle finger, with the arm held straight and the hand open.

M. Nyari

Nyari is a unit of measurement based on the width of a finger. This measurement is derived from the span of the fingers as defined in the Asta Kosala Kosali and is generally used to determine the size of small objects.

N. Atampak

Atampak is a unit of measurement based on the length of the sole of the foot, the distance from the heel to the tip of the longest toe. This measurement is used to determine specific distances in buildings and outdoor spaces.

O. Tampak Ngandang

Tampak Ngandang is a unit of measurement derived from the span of the foot, the distance between the big toe and the little toe.

P. Rai

Rai is a unit of measurement derived from the distance between the tip of the thumb and the tip of the index finger when the two fingers form the letter L. This unit is used to measure architectural details.

III. METHOD

In this research paper, an exploratory qualitative method was used with the aim of understanding and describing the concept of Asta Kosala Kosali and the application of sikut satak in traditional Balinese houses based on a literature review. The exploratory qualitative method is an approach used to delve deeply into a phenomenon, particularly on topics that still require preliminary exploration and have not been extensively studied, so that researchers can discover concepts, patterns, and meanings more openly [11]. This approach does not aim to test hypotheses but rather to generate a broader and deeper understanding of the research subject. Data collection was conducted through library research by reviewing various written sources, such as scientific journals, books, and previous studies related to traditional Balinese architecture. The data were then analyzed qualitatively to gain a deeper understanding of the application of the Asta Kosala Kosali principles and the sikut satak in the design of traditional Balinese houses.

IV. RESULT AND DISCUSSION

Traditional Balinese architecture has a fundamental framework known as Asta Kosala Kosali, which consists of rules regarding *niyasa* (symbolic) forms, as well as the dimensions of houses and shrines. These dimensions include length, width, height, *pepalihan* (levels), and ornamentation [9]. In addition to structural aspects, Asta Kosala Kosali also regulates the area and division of spaces within the compound according to their respective functions. In the concept of traditional Balinese housing, spatial planning is carried out meticulously, including determining the distance between sacred shrines (*pelinggih*) and living areas, so that every architectural element is positioned according to established rules [9]. Therefore, the shape and dimensions of a building are not determined arbitrarily but are essential elements that must be applied in the construction of traditional Balinese residential architecture. This precision reflects the Balinese people's efforts to create buildings that not only meet functional needs but also possess high aesthetic value and spiritual significance, particularly in structures related to religious functions.

Asta Kosala Kosali is not only a technical guideline for building design but also serves as a foundation that connects

the physical aspects of architecture with divine concepts [4]. Thus, the teachings of Asta Kosala Kosali can be understood as an architectural concept that embodies theological values. The uniqueness of traditional Balinese houses is reflected in the various philosophical and religious meanings inherent in each of their structural elements. This is evident in the measurement system used, in which the dimensions of a building are determined based on the body measurements of the head of the household, such as *nyari*, *hasta*, *depa*, *musti*, *kilan*, and others. This measurement system demonstrates the close connection between humans, space, and the spiritual values that form the foundation of Balinese society.

Asta Kosala Kosali also mentions construction techniques and materials known as *Tri Angga*, which consist of: *Nista*, representing the lowest level of a building, embodied by the foundation or the base of the house that supports the structure. The raw materials are typically bricks or natural stone. *Madya* is the middle section of the building, represented by the walls, windows, and doors. *Utama* symbolizes the uppermost part of the building, represented by the roof, which is believed to be the holiest place in a residence and is thus also depicted as the dwelling place of the gods or their departed ancestors. For this roof section, the materials used in traditional Balinese architecture are *ijuk* and *alang-alang* thatch.

The types of Balinese houses, as described in the Asta Kosala Kosali text, consist of several structures: *Pamerajan* is a sacred place used by the family; in traditional villages, each family typically has a *pamerajan*, which is generally located in the northeast within the nine-block spatial layout. *Umah/Bale Meten* is a building typically used as the head of the family's bedroom, so its position must be one of honor, situated next to or near the *Merajan*. *Bale Sakapat* is typically used as a sleeping area for children or other young family members. *Bale Tiang Sanga* is typically used as the venue for the *Pitra Yadnya* religious ceremony, which in Hinduism signifies a sincere and selfless offering or sacrifice dedicated to ancestors, parents, and the deceased, as well as the *Manusia Yadnya* ceremony, which is a sincere and selfless offering dedicated to fellow human beings. The *Bale Dangin* is typically used for relaxing, creating art, or knitting clothes for her children and husband. The barn is used to store the harvest, including rice and other garden produce. The *Paon*, or kitchen, is where meals are prepared for the family. The *Aling-Aling* is an entrance structure designed to divert the path so that the entrance does not lead straight inward but instead turns to the side. This is intended to prevent a direct view from the outside into the interior. The *Angkul-angkul* is an entrance structure that functions similarly to the *candi bentar* at a temple, serving as a gateway.

One important aspect of Asta Kosala Kosali is the use of a traditional measurement system known as *sikut*. *Sikut* is a system of measurement based on the anatomy of the head of the household or the homeowner. The body parts used as reference points include the fingers, palms, arms, and feet. The process of determining these measurements is carried out with the assistance of an *undagi*, a traditional building

expert or figure who possesses the knowledge and authority to design and oversee the construction of homes and temples. The involvement of the undagi is believed to result in a proportionally balanced spatial layout while fostering a sense of connection between the occupants and the building they inhabit. Thus, the layout and measurements of a building are based on the characteristics of the homeowner, ensuring that each dwelling has unique dimensions tailored to its occupants. Consequently, Balinese people do not rely on modern measuring tools as their primary reference but instead employ various traditional units of measurement derived from human body dimensions.

PENGURIP			SUKAT			DEPA			KETERANGAN			SIMPULAN		
Posisi	Posisi	Posisi	Posisi	Posisi	Posisi	Posisi	Posisi	Posisi	Posisi	Posisi	Posisi	Posisi	Posisi	Posisi
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			Posisi 5 Posisi 6	$P = 1 + 1$	1/16 1/16	DEPA 5 DEPA 6								
			Posisi 7 Posisi 8	$P = 1 + 1$	1/16 1/16	DEPA 7 DEPA 8								
SUKAT SUKAT		SUKAT	Posisi 9 Posisi 10	$P = 1 + 1$	1/16 1/16	DEPA 9 DEPA 10		DEPA 9 DEPA 10	DEPA 9 DEPA 10	DEPA 9 DEPA 10	DEPA 9 DEPA 10	DEPA 9 DEPA 10	DEPA 9 DEPA 10	DEPA 9 DEPA 10
			Posisi 11 Posisi 12	$P = 1 + 1$	1/16 1/16	DEPA 11 DEPA 12								
			Posisi 13 Posisi 14	$P = 1 + 1$	1/16 1/16	DEPA 13 DEPA 14								
			Posisi 15 Posisi 16	$P = 1 + 1$	1/16 1/16	DEPA 15 DEPA 16								
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			Posisi 29 Posisi 30	$P = 1 + 1$	1/16 1/16	DEPA 29 DEPA 30								
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			Posisi 35 Posisi 36	$P = 1 + 1$	1/16 1/16	DEPA 35 DEPA 36								
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			Posisi 51 Posisi 52	$P = 1 + 1$	1/16 1/16	DEPA 51 DEPA 52								
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			Posisi 99 Posisi 100	$P = 1 + 1$	1/16 1/16	DEPA 99 DEPA 100								
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			Posisi 115 Posisi 116	$P = 1 + 1$	1/16 1/16	DEPA 115 DEPA 116								
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SUKAT SUKAT		SUKAT	Posisi 121 Posisi 122	$P = 1 + 1$	1/16 1/16	DEPA 121 DEPA 122		DEPA 121 DEPA 122	DEPA 121 DEPA 122	DEPA 121 DEPA 122	DEPA 121 DEPA 122	DEPA 121 DEPA 122	DEPA 121 DEPA 122	DEPA 121 DEPA 122
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SUKAT SUKAT		SUKAT	Posisi 129 Posisi 130	$P = 1 + 1$	1/16 1/16	DEPA 129 DEPA 130		DEPA 129 DEPA 130	DEPA 129 DEPA 130	DEPA 129 DEPA 130	DEPA 129 DEPA 130	DEPA 129 DEPA 130	DEPA 129 DEPA 130	DEPA 129 DEPA 130
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			Posisi 133 Posisi 134	$P = 1 + 1$	1/16 1/16	DEPA 133 DEPA 134								
			Posisi 135 Posisi 136	$P = 1 + 1$	1/16 1/16	DEPA 135 DEPA 136								
SUKAT SUKAT		SUKAT	Posisi 137 Posisi 138	$P = 1 + 1$	1/16 1/16	DEPA 137 DEPA 138		DEPA 137 DEPA 138	DEPA 137 DEPA 138	DEPA 137 DEPA 138	DEPA 137 DEPA 138	DEPA 137 DEPA 138	DEPA 137 DEPA 138	DEPA 137 DEPA 138
			Posisi 139 Posisi 140	$P = 1 + 1$	1/16 1/16	DEPA 139 DEPA 140								
			Posisi 141 Posisi 142	$P = 1 + 1$	1/16 1/16	DEPA 141 DEPA 142								
			Posisi 143 Posisi 144	$P = 1 + 1$	1/16 1/16	DEPA 143 DEPA 144								
SUKAT SUKAT		SUKAT	Posisi 145 Posisi 146	$P = 1 + 1$	1/16 1/16	DEPA 145 DEPA 146		DEPA 145 DEPA 146	DEPA 145 DEPA 146	DEPA 145 DEPA 146	DEPA 145 DEPA 146	DEPA 145 DEPA 146	DEPA 145 DEPA 146	DEPA 145 DEPA 146
			Posisi 147 Posisi 148	$P = 1 + 1$	1/16 1/16	DEPA 147 DEPA 148								
			Posisi 149 Posisi 150	$P = 1 + 1$	1/16 1/16	DEPA 149 DEPA 150								
			Posisi 151 Posisi 152	$P = 1 + 1$	1/16 1/16	DEPA 151 DEPA 152								
SUKAT SUKAT		SUKAT	Posisi 153 Posisi 154	$P = 1 + 1$	1/16 1/16	DEPA 153 DEPA 154		DEPA 153 DEPA 154	DEPA 153 DEPA 154	DEPA 153 DEPA 154	DEPA 153 DEPA 154	DEPA 153 DEPA 154	DEPA 153 DEPA 154	DEPA 153 DEPA 154
			Posisi 155 Posisi 156	$P = 1 + 1$	1/16 1/16	DEPA 155 DEPA 156								
			Posisi 157 Posisi 158	$P = 1 + 1$	1/16 1/16	DEPA 157 DEPA 158								
			Posisi 159 Posisi 160	$P = 1 + 1$	1/16 1/16	DEPA 159 DEPA 160								
SUKAT SUKAT		SUKAT	Posisi 161 Posisi 162	$P = 1 + 1$	1/16 1/16	DEPA 161 DEPA 162		DEPA 161 DEPA 162	DEPA 161 DEPA 162	DEPA 161 DEPA 162	DEPA 161 DEPA 162	DEPA 161 DEPA 162	DEPA 161 DEPA 162	DEPA 161 DEPA 162
			Posisi 163 Posisi 164	$P = 1 + 1$	1/16 1/16	DEPA 163 DEPA 164								
			Posisi 165 Posisi 166	$P = 1 + 1$	1/16 1/16	DEPA 165 DEPA 166								
			Posisi 167 Posisi 168	$P = 1 + 1$	1/16 1/16	DEPA 167 DEPA 168								
SUKAT SUKAT		SUKAT	Posisi 169 Posisi 170	$P = 1 + 1$	1/16 1/16	DEPA 169 DEPA 170		DEPA 169 DEPA 170	DEPA 169 DEPA 170	DEPA 169 DEPA 170	DEPA 169 DEPA 170	DEPA 169 DEPA 170	DEPA 169 DEPA 170	DEPA 169 DEPA 170
			Posisi 171 Posisi 172	$P = 1 + 1$	1/16 1/16	DEPA 171 DEPA 172								
			Posisi 173 Posisi 174	$P = 1 + 1$	1/16 1/16	DEPA 173 DEPA 174								
			Posisi 175 Posisi 176	$P = 1 + 1$	1/16 1/16	DEPA 175 DEPA 176								
SUKAT SUKAT		SUKAT	Posisi 177 Posisi 178	$P = 1 + 1$	1/16 1/16	DEPA 177 DEPA 178		DEPA 177 DEPA 178	DEPA 177 DEPA 178	DEPA 177 DEPA 178	DEPA 177 DEPA 178	DEPA 177 DEPA 178	DEPA 177 DEPA 178	DEPA 177 DEPA 178
			Posisi 179 Posisi 180	$P = 1 + 1$	1/16 1/16	DEPA 179 DEPA 180								
			Posisi 181 Posisi 182	$P = 1 + 1$	1/16 1/16	DEPA 181 DEPA 182								
			Posisi 183 Posisi 184	$P = 1 + 1$	1/16 1/16	DEPA 183 DEPA 184								
SUKAT SUKAT		SUKAT	Posisi 185 Posisi 186	$P = 1 + 1$	1/16 1/16	DEPA 185 DEPA 186		DEPA 185 DEPA 186	DEPA 185 DEPA 186	DEPA 185 DEPA 186	DEPA 185 DEPA 186	DEPA 185 DEPA 186	DEPA 185 DEPA 186	DEPA 185 DEPA 186
			Posisi 187 Posisi 188	$P = 1 + 1$	1/16 1/16	DEPA 187 DEPA 188								
			Posisi 189 Posisi 190	$P = 1 + 1$	1/16 1/16	DEPA 189 DEPA 190								
			Posisi 191 Posisi 192	$P = 1 + 1$	1/16 1/16	DEPA 191 DEPA 192								
SUKAT SUKAT		SUKAT	Posisi 193 Posisi 194	$P = 1 + 1$	1/16 1/16	DEPA 193 DEPA 194		DEPA 193 DEPA 194	DEPA 193 DEPA 194	DEPA 193 DEPA 194	DEPA 193 DEPA 194	DEPA 193 DEPA 194	DEPA 193 DEPA 194	DEPA 193 DEPA 194
			Posisi 195 Posisi 196	$P = 1 + 1$	1/16 1/16	DEPA 195 DEPA 196								
			Posisi 197 Posisi 198	$P = 1 + 1$	1/16 1/16	DEPA 197 DEPA 198								
			Posisi 199 Posisi 200	$P = 1 + 1$	1/16 1/16	DEPA 199 DEPA 200								
SUKAT SUKAT		SUKAT	Posisi 201 Posisi 202	$P = 1 + 1$	1/16 1/16	DEPA 201 DEPA 202		DEPA 201 DEPA 202	DEPA 201 DEPA 202	DEPA 201 DEPA 202				

using the formula $(21 \text{ rai} + 3 \text{ rai} + 3 \text{ nyari})$, which yielded a result of 246 cm (2.4 m). Thus, for a building using 6 saka, the length is 4.8 m and the width is 2.4 m. Meanwhile, for a building using 8 saka, the length is 7.2 m and the width is 2.4 m. The placement of the buildings corresponds to the Tri Mandala: Merajan and Meten are part of the Utama Mandala; Bale Dangin and Bale Kauh are part of the Madya Mandala; and Paon and Jineng are part of the Nista Mandala.

In Asta Kosala Kosali, site orientation is one of the key aspects that determines the spatial arrangement within the compound of a traditional Balinese house. The determination of orientation is based on the concepts of kaja-kelod and kangin-kauh, which refer to the positions of the mountains, the sea, the sunrise, and the sunset. In this study, the site is oriented toward the east (kangin), so the area considered most important is on the kaja-kangin side. This orientation then serves as the basis for the placement of sacred buildings, residential buildings, and service areas within the natah (backyard) of the house.

CHUN LIT AREA	CHUN TITUR	CHUN DUKURAN	CHUN DUKURAN	CHUN DUKURAN	CHUN DUKURAN

Fig. 3. Placement of the Entrance (Source: Bagus Oka, 2002)

In this research, the entrance was chosen to be on the east side. This choice is believed to be advantageous because it faces the direction of the sunrise. East is the direction of the sunrise and is therefore generally considered a positive and auspicious direction. By using the eastern side, the calculation divides the yard area into 9 (nine) sections, with the ideal area falling on the 7 (seven) section.

The Hindu theological calculation (sukat) for the composition of traditional Balinese buildings is Asta Wara, which is: Sri-Indra-Guru-Yama-Rudra-Brahmana-Kala-Uma. This calculation system reflects a theological concept based on the symbolic power (nyasa) of God's manifestations. The location or position of a building is determined through calculations based on the Asta Wara cycle, using the length of a foot (atampak) as the primary unit, which is then adjusted by adding a pangurip or one additional tampak ngandang [12]. Each calculation result has its own function and meaning related to the symbolic value and spiritual power intended to be embodied in the building.

The distance between buildings is calculated using the following formula:

- From the meten to the piasan (3, 11, 19, ... atampak + tampak ngandang), the distance is 0.7 m from the wall to the meten and 2,7 m from the piasan to the meten, which falls on Guru.

- From the meten to the bale dangin (2, 10, 10, ... atampak + tampak ngandang), the distance is 4,3 m, falling on Indra.
- From the meten diagonally to the bale dauh (7, 15, 23, ... atampak + tampak ngandang), the distance is 3,6 m, falling on the Kala.
- The distance from the bale dauh to the paon (6, 14, 22, ... atampak + tampak ngandang) is 5,3 m, falling on Brahma.
- The distance from the paon and the bale dangin to the jineng (1, 9, 17, ... atampak + tampak ngandang) is 4,1 m, falling on Sri.
- The west wall toward the Bale Dangin (40, 48, 56, ... atampak + tampak ngandang) results in a distance of 13,5 m, falling on Kala.

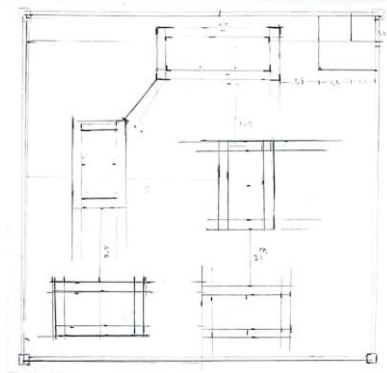


Fig. 4. Floor Plan of a Traditional Balinese House (Author, 2026)

Landscape design in this yard follows the Asta Kosala Kosali concept, in which the yard is divided into three zones, including:

- Utama Mandala is the holiest zone, located to the north. The layout of this area tends to be simple and sacred, featuring plants used in religious rituals such as the *Magnolia alba*, *Plumeria alba*, *Cordyline fruticosa*, *Hibiscus rosa-sinensis*, and *Ixora coccinea*.
- Madya Mandala is the central area that serves as a space for the daily activities of the family. This zone typically houses residential structures such as the Bale Meten, Bale Kangin, and Bale Dauh. The arrangement of softscape elements, particularly vegetation, focuses on creating comfort and fostering social interaction through the provision of open spaces, courtyards, and shade-providing plants, including: *Plumeria alba*, *Gardenia jasminoides*, *Ficus benjamina*, *Hibiscus rosa-sinensis*, and *Bougainvillea spp.*
- Nista Mandala is the area with the lowest level of sacredness, functioning as a service area. In this area, there are structures such as the paon (kitchen) and the jineng. The landscape design in this area emphasizes functional aspects, such as the placement of edible plants, medicinal plants for the family, and vegetation that helps maintain

character of traditional architecture. It also aims to preserve local knowledge that embodies philosophical, ecological, and social values that remain relevant to this day. Thus, Asta Kosala Kosali can continue to serve as a guide in creating living spaces that are harmonious, sustainable, and in line with the cultural values of the Balinese people.



V. CONCLUSION

One of the key elements of Asta Kosala Kosali is the traditional measurement system, which uses human body dimensions to determine building sizes. The use of units such as depa, sedema, hasta, kilan, musti, nyari, atampak, and tampak ngandang highlights the close connection between the inhabitants and the spaces they occupy. This system ensures that each house has distinctive dimensions that align with the owner's character, thereby reflecting local values passed down through generations.

The application of Asta Kosala Kosali in the planning of traditional Balinese homes is also evident in the layout of the courtyard. The courtyard is divided into the Utama Mandala, Madya Mandala, and Nista Mandala. Each zone has distinct functions, levels of sacredness, and landscape elements, depending on its role in daily life. This arrangement demonstrates that Balinese society possesses a deep understanding of the relationship between spatial function, spiritual values, and environmental conditions.

In the context of modern development, the existence of Asta Kosala Kosali and the traditional measurement system must be preserved as part of Bali's cultural identity. Preserving this concept is essential for maintaining the

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