

The Transformation of Bali Aga (Ancient Balinese) Housing Dimension System in Modern Hospitality Houses Using Proportion and Scale Approach

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Abstract

The dimension system in a building can create a specific character in different eras. The order in the role of proportion and building scale as parts of the dimension system, is highly dependent on the comparison of elements that forms the building. In the development of Balinese architecture, the dwellings in *Bali Aga* period also have different dimension system compared with other periods. It becomes a certain issue when the concepts of *Bali Aga* dwellings which dated from about 700 years ago have reappeared in modern times as a source of inspiration, especially for the concept of hospitality houses. This raises a question whether dimension system as a part of its concept also applied. This study uses mixed methods with analysis of mathematical-anthropocentric and perception-philosophy. The aim of the study is to determine the approach of the dimension system used in *Bali Aga* dwellings, in terms of the proportion and scale, and then compared it with the transformation today especially in modern hospitality houses. The result of the research shows that each dimension system used in these different eras has some similarities in terms of ideas, but also has significant changes that resulted the loss of the philosophical meaning.

Keywords: building dimension system, proportion, scale, *Bali Aga*, hospitality houses

1. Introduction

The character of a building can be created by ordering the elements that form the building through the systems of architecture and interior, one of them is the dimension system. The order of mathematical relationship between the size and shape (or space) as well as how an observer looks at the magnitude of the elements of a building towards the other forms, both of which is termed the proportion and scale (Wicaksono, 2014;81), are also crucial in the realization of a character building. However, making a perception of a building character through the dimension system can sometimes be inaccurate due to the weakness of perspective, visibility which is not optimal and even because of different cultural background of the observers (Ching, 2011;123). According to Ching, determining the dimensions of a building is profoundly anthropocentric depending on human's structure dimension and function dimension which impact on the need for the facility and its arrangement to support the activities (structure dimension in humans are the dimension of the parts the human body, while the function dimension is the dimension of space needed by humans to perform their activities). The dimension or proportion of the human body is an element to determine scale as it is compared with some parts of the building, so it result a relative measurement (Wicaksono, 2014;81).

A person who visually observes a building character from a certain era must be able adjust his perception to the era in which the building came from to make it very contextual. This leads to another question. What will happen when there is an effort to transfer a character building from an era to another different era? This is what happened in the development of Balinese architecture, where there is a character transfer phenomenon of the buildings from the past, i.e., the *Bali Aga* dwellings, which is adopted as a source of inspiration for the concept of modern buildings, especially hospitality houses. Now, a lot of hospitality houses can be found in Bali as a result of the rapidly growing tourism sector in Bali. Picard (2006;101) mentions that the highly developed tourism centers in Bali, such as Ubud, Sanur, Kuta and Nusa Dua, are now surrounded by various types and classes of hospitality houses. These buildings always use the style of Balinese traditional architecture as it has been stipulated in the Provincial Regulation no.5 in 2005 in Bali that the face of the buildings in Bali must hold on to Balinese traditional architecture as an effort to conserve the traditional architectural style. Thus, there have been attempts to bring back the architectural style of the past into the eclectic modern design. Now, the source of the idea references is not only from the architectural styles of *Bali Madya*, but also from *Bali Aga* architectural style which is the second oldest architectural style in the development Balinese architecture (after the primitive era ended).

It became an interesting phenomenon to study when the style and concept of architecture from the period of nearly 700 years ago came back at around the 20th century. The *Bali Aga* dwellings were created with a very simple technique by the people in that era based on the need for activities. Then the *Bali Aga* style is tried

to be represented back in the modern hospitality houses that mostly are designed with mathematical consideration so that they can be more varied in terms of use of building materials, shapes and structures that support them. With the similarities and differences of their civitas, this study compares the dimension system of architecture and interior elements of hospitality houses with *Bali Aga* concept. Can the *Bali Aga* dimension system be maintained completely or on the contrary, it causes changes that might create new problems?

2. Dimension System of Balinese Architecture

2.1. The Dimension System Of *Bali Aga* Dwellings

Bali Aga or also known as ancient Bali is an era which covered the period from the 8th century BC to the 13th century before the emergence of *Bali Madya* or an era before Bali influenced greatly by Majapahit Kingdom (Bappeda Province of Tk. I Bali, 1975;5-15). The *Bali Aga* dwellings can be categorized as vernacular building created from a very long process of trial and error without any advanced mathematical consideration (no mathematical consideration in *Bali Aga* era). The buildings and the elements in them, at first were only made as the shelter to support simple daily activities at that time, such as growing crops. As Frank Lloyd Wright said in Paul Oliver's book (2003:9) that buildings like this arose as a response to the real basic needs.

Unfortunately, until now there is no written guide about the knowledge of how to build in *Bali Aga* period (different with *Bali Madya* period which its guidance on how to build was written on papyrus). The written evidences found in some *Bali Aga* villages are mostly in the form of inscriptions that discussed more about the domain of the ancient Bali Kingdom, also the taxes, rights and obligations of the citizens. While the papyruses that contain the rules of *Ashta Kosali* and *Ashta Bumi* had just appeared at the end of *Bali Aga* period (the end of the 13th century). Thus, some dwellings in *Bali Aga* villages that appeared in the end of the 13th century, had implemented a dimension system called *gegulak* in the building process, as written in the papyruses of *Ashta Kosali* and *Ashta Bumi*.

From the early period until now, the people of *Bali Aga* always view the earth as a life. Such views brought subservience to nature for the primitive societies; respect for nature for the vernacular and traditional societies. In Bali, mountains are considered as a holy place that is filled with tranquility; housing estate is the place to do human activities; and the sea is the final place to dispose and wash away all the remains of the earth. It is similar to the division of the parts of human body, namely the head as the center of the five senses, the body as the center of activities and the legs as the support of the body weight. The division of *Bali Aga* dwellings is likened to the division of the human body, i.e., the roof as the head, the pillars and walls as the body, and the floor or *bebaturan* as the legs.

Mountains with 800-1700metres height from the sea superficies, which are considered sacred for the majority of Balinese, can still be found in most of *Bali Aga* villages (Reuter, 2005;22). Deep respect towards the universe is shown by looking at the world as *Bhuana Agung*, and brought the purity of nature in the form of the building. In the dwellings found in some *Bali Aga* villages today, the philosophical values of respect for the nature can still be seen. There is always one space in the building used a special room that is purified by the occupant. Some dimensions are also made by intuition with philosophical meaning behind the building process. For example, *Bali Aga* dwellings always have door with the dimension of width about 60cm and height about 120-150cm. The width and height of the door are then compared to the dimension of human body structure, e.g., the height of Asians about 160-175cm. With the height of the door opening that is less than the height of the body, Asians have to bend down when they pass through the door, both going in and out of the house. It is said that this contains the philosophy that when a guest comes to visit, he/she must bend to respect the owner of the house and what lives in it (for there is a space in *Bali Aga* dwellings that is consecrated). When the guest comes out, he/she also has to bend down to respect the natural environment outside. Thus, in the initial period, the *Bali Aga* building that is relatively small (when it compared to the size of the buildings today), was considered as a building with a sacred character.

Remember that the *Bali Aga* era is the period after the primitive Balinese that were nomadic and lived in caves they found in the wild. Therefore, in most of *Bali Aga* dwellings, *bebaturan* (lower part of the building) can still be found. The height of *bebaturan* is around 60-70cm and it was made as an attempt to protect its occupant from wild animals. Similar effort can also be found in other appearance in other regions of Indonesia, such as the tree house (a ancient dwellings built on large trees) and houses on stilts (a dwellings built with pillars, where the lower part is left as an empty space).

Originally, *Bali Aga* dwellings tended to be closed. There was only one opening, i.e., a hole for a small-sized door. If calculated, the proportion of the door with the size about 60x150cm against the wall with the size about 350x150cm, then the opening hole is only about 17% of the area. In the early period of the *Bali Aga*, they only took advantage of the small holes in the walls of woven bamboo for ventilation, and bamboo shingles for the roof or covering. As time changes, the material used for walls also began to change. This is a result of globalization and also the depletion of the natural materials supply. Then, there are windows with the size that is not too big, only about 80x60cm. With the addition of windows, it can be calculated that the proportion of the

opening towards the area of the wall is around 27%. The small result of comparison between the opening towards the wall indicates that the people of Bali Aga tends to be closed, even until now. According to the writer, during the observation in some *Bali Aga* villages, because until now most of them still reside in the mountains, the access to modernity is still small. However, it does not mean that there is no influence of modernity at all. Now, there is an indication of the emergence of modernity in *Bali Aga* villages. The influence of modernity was mainly brought by the people who migrated to big cities (especially for education and trading crops).



Figure 1. The building dimension of *Bali Aga* dwellings tends to be small with a very small proportion of opening. (a) Dwellings with the concept of Bali Aga in the initial period (b) *Bali Aga* dwellings that have been affected with modernization. (c) Proportion dimension of the opening hole towards of the wall

Source: the author's documentation (2015-2016)

In further development of *Bali Aga* period, particularly near *Bali Madya* period, the influence of Majapahit kingdom was quite strong. Therefore, to create buildings with aesthetic quality, *Bali Aga* dwellings does not simply rely on intuition alone in taking a decision, but seek consistent guidance through measures of body parts. In this section, there are some terms of traditional Balinese measurement called *gegulak* as contained in the rules of *Ashta Kosali* and *Ashta Bhumi*, using names of human body parts as the guidance to determine the size of the building, both interior and exterior. The people of *Bali Aga* who always believe that between human and the place where he/she lives is like the Great World (*Bhuana Agung*) and the Little World (*Bhuana Alit*) which are a harmonious unity (Bidja, 2012;32). It is believed that referring to *gegulak* in *Ashta Kosali* and *Ashta Bhumi* can prevent the occupants from negative things.

According to Remawa (2015;69), *gegulak* was also created to meet the demands of Balinese towards the desirable measures in designing a building. He also adds that the measures of architectural and interior elements were searched by using the comparison of human body dimension proportion (anthropocentric). Measurement with *gegulak* system uses the size of the occupant's body, usually taken from the body size of the man who served as head of the family. As shown in Figure 2, each measure of *gegulak* is made into international units, i.e., centimetres. Men who became the head of the family have been selected as the role model in the measurement of houses in Bali because Balinese still adopt the patrilineal system that considers men as the highest position in a family. However, in the anthropocentric view, the size of a male body is mostly larger than the size of a female body. Thus, using the size of a male body, will create a building and its elements with the dimension that can include all the occupants and can be used by the wife and children.

The dimension system in a dwellings will of course be different from the dimension system on other dwellings that are measured from different head of family. Although *gegulak* dimension can be interpreted in centimetres, but this dimension cannot be standardized because it depends on the dimension of the body structure of the head of the family. What can become the standard is just how to get the size/measure. Is it along the index finger; the palm of the hand; the distance from the base of the arm to the end of the hand a fist and so on. Thus, the way to measure *gegulak* creates oriental characters in the building that really differ it with the building character of the west.

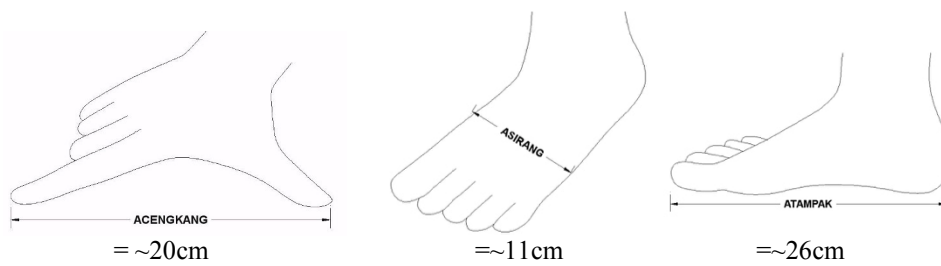


Figure 2. Some examples of ways to measure using human body parts (interpreted in centimetres; using the body size of a Balinese man, aged 33 years old with his height about 172cm)

Source: modified from Bidja (2012;34-46)

For example, the distance between buildings in a dwellings of a head of family with a big-sized body will be different from the dwellings of a head of family with a small-sized body. As found in an interview with one of the local builder in Pengotan village (2015). The local builder says that the distance between the buildings is 9 treads (or other odd number, such as 7,11,13 etc) added with the size of *angandang* (in Balinese language, the prefix 'a' is as one). In centimetres as found in Figure 2, the result is $(9 \times 26\text{cm}) + 11\text{cm} = 245\text{cm}$. Surely, it will be different if the foot size (*atapak*) of head of the family is 30cm and the *angandang* is 15cm, by using 9 treads so the distance between the buildings 525cm.

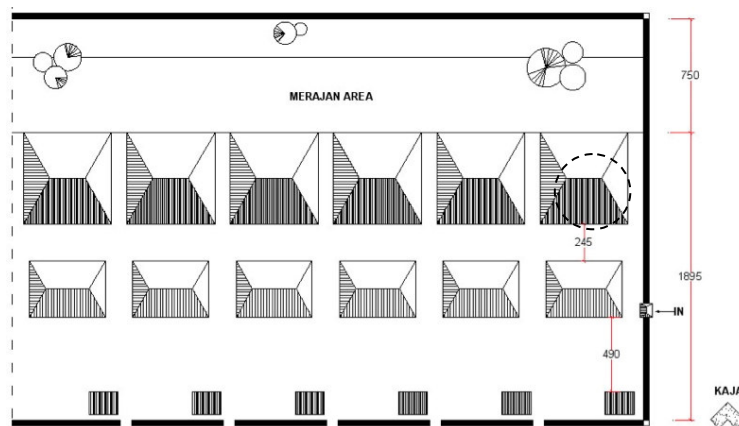


Figure 3. The distance between the buildings in one of *Bali Aga* villages in Bangli district, Pengotan village

Source: the author's documentation (2016)

But not all parts of *Bali Aga* dwellings use *gegulak* system. As mentioned earlier, the builders of *Bali Aga* dwellings do not rely only on intuition in making a decision. They also do not rely only on *gegulak* system that uses human body parts as the benchmark of the measurement. The end of *Bali Aga* period is still a transition towards *Bali Madya* period. Thus, *gegulak* in the rules of *Ashta Kosali* and *Ashta Bhumi* have not been 100% implemented. Sometimes the dimension of an element also depends on the type and size of the building materials used. The example can be seen in *Bayung Gede* village, as a result of an interview with the local *Jero Kabayan Pemucuk* (2015). He said that the determination of the distance between *saka* (pillar) also depends on the dimension of the materials used. The way to calculate it is the distance of a pillar (*saka*) to the *bale* (Balinese traditional bed) is similar to the distance of a *saka* in the kitchen added with *duang saka* (in Balinese, *duang* means two, so it means twice the width of the pillar). Often, the materials used for the *saka* are bamboos or wood with the dimension of 9x9 cm or 10x10 cm. So, if the kitchen area is 175 cm and the width of the *saka* is 10 cm, then the width of the *bale* is $175\text{cm} + (2 \times 10\text{cm})$.

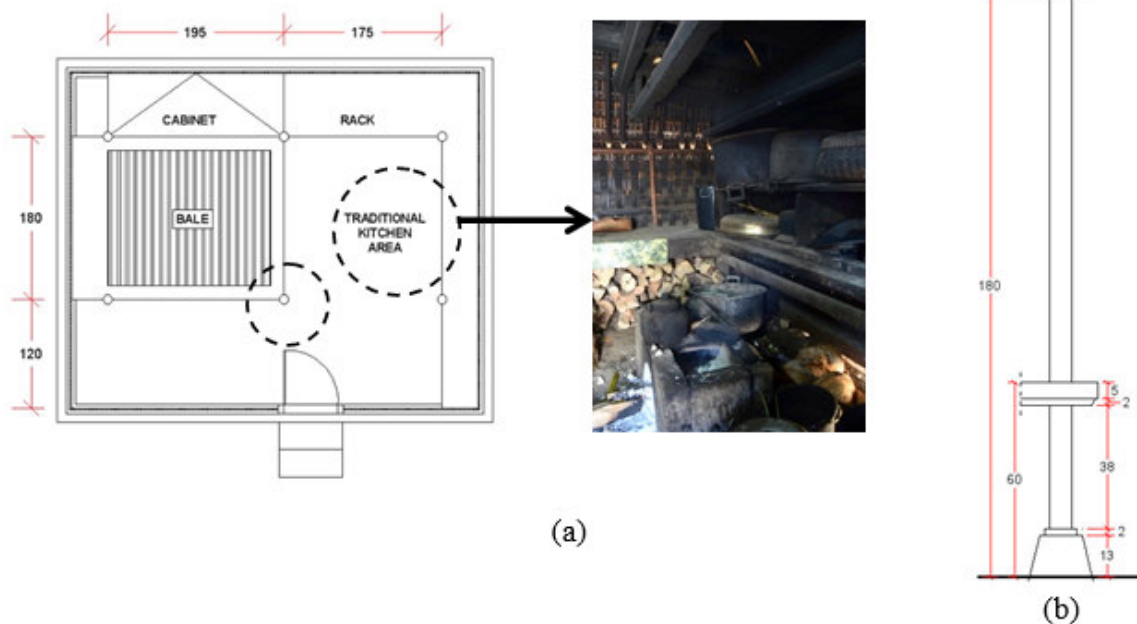


Figure 4. (a) The distance on the layout of the pillars in the room inside. (b) Determination of the height of the bed from the floor in *Bali Aga* dwellings
 Source: the author's documentation (2016)

The result is 195 cm (see Figure 4a). To determine the height of the room inside the house (the distance from the floor to the ceiling), is *selikur rai* added with *pengurip* (in Balinese, *selikur* means 21). It means, 21x the width of *saka* plus *pengurip*. If *saka* with the size of 9x9cm is used, then the height of the room inside is approximately $21 \times 9 \text{ cm} = 189 \text{ cm}$. To determine the height of complementary elements such as the height of the *bale*, then the total height of *saka* is divided into two parts: one third of it becomes the dimension of *bale* height, which is measured from the floor (about 60cm), and 2/3 of it is the upper part of *bale* to the ceiling (see Figure 4b).

Thus, from the explanation of dimension system used in most of *Bali Aga* dwellings, it can be seen that the system mostly uses the dimension structure of the human body as its guidance. As the people of *Bali Aga* believed that the human body is a microcosm which is similar to the universe but in the smallest scale, this is also an effort to get closer to the universe. Although the observations made by the people in the present show that the *Bali Aga* dwellings looked small and simple, but the people of *Bali Aga* as the occupants consider their home as the simplified form of the universe, which is sacred and full of meaningful philosophy. But then, the public's understanding in *Ashta Kosali* and *Ashta Bhumi* of Balinese, including *Bali Aga* especially from the end of the 13th century until today was varied and produced different compositions. As expressed by Remawa (2013;157-168):

Occurrence in difference, assortment and changes in aesthetic....from idealism (appropriate with the philosophy in lontar Ashta Bhumi dan Ashta Kosali) to pragmatism (based on the implementation of Sulinggih, Undagi, Sangging/juru and Tukang) caused by variety of understanding in lontar ashta bhumi and ashta kosali until it cause various actions, reflected in assortment of composition causing inconsistency, disharmonize and disorder within the interior-architecture on dwellings...

2.2. The Dimension System In Modern Dwellings (Hospitality Houses)

At the same time with the final period of *Bali Aga* heading to *Bali Madya* period in the 14th century, the development of architecture in Western countries entered the Renaissance period. During this period, everything created in a rational way (Scholfield, 1958;33-36) and thoughts about the anthropocentric dimension system which used humans as the center of its measure, began to appear. The prominent thinkers in the Renaissance period are Leonardo da Vinci, Vitruvian, Albert Durer and so on (Krier, 1988;192-196). Initially, before the 14th century or before entering the Renaissance period, the dimension system was very theocentric (similar to *Bali Aga*). In Greece, it was dominated by the presence of buildings with large scales that made the man inside the building felt small. However, it was during the Renaissance period that the dimension system became very anthropocentric, almost the same as the *gegulak* system. But what differs the Western dimension with *gegulak* system is that in its development, the Western dimension system began to create the function dimension containing human needs to have a space to do their activities. Robert Sommer in Suptandar (1999;53-54) observed various functions of space based on the behavior patterns of the users, which resulted a conclusion that

individuals always need a space with different levels of security depending on each individual; the domain; the needs of private space; the desire to show social status through space; and the pleasure of having a space to make friends or groups with the same interest. Further, the function dimension of the Western countries developed into the measure standard used in the works of architecture and interior designs in the world today. However, it raised a question for the autonomy of the human body in western countries and in Asia is very different. Wicaksono (2014;81), then puts it that the international standard dimension can be used by Asians after it is reduced by 10%.

The history of Bali noted that the first contact between the Balinese and the Western world is when the Dutch merchants stopped at the island in the 16th century to seek supplies of food and water, although before that Sir Francis Drake had stopped in Bali. Then, in the 19th century, the Dutch troops conquered the kingdoms located on the North Bali, i.e., Buleleng and Jembrana (Picard, 2006;23-24). Their existence brought modernity influences in Bali, such as in terms of technology, the introduction of new materials, the measure standard, the type of buildings that never exist in Bali before and so on.

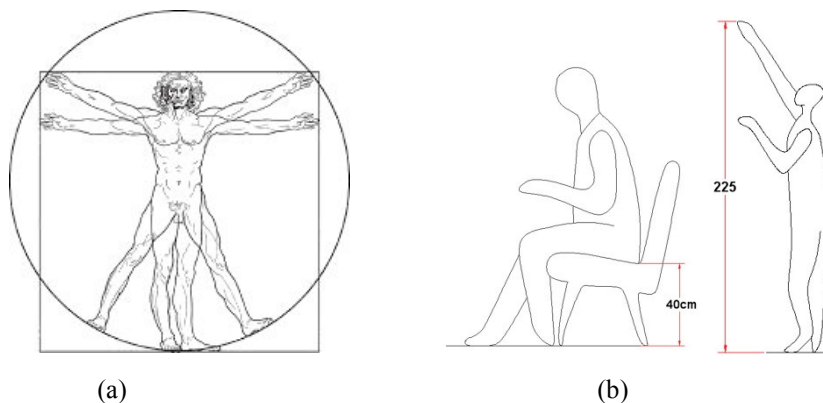


Figure 5. (a) Initially, the dimensions of the human body structure was created by Leonardo da Vinci. (b) The Western dimension system that took the function dimension into account now has developed into the international measure standard

Source: (a) Krier (2001;192) and (b) modified from Ernst (2000)

Until now, the contiguity between Bali and the Western influences, still continues through modernization that is mainly brought about by the tourism industry. Picard (2006;188-189) states that the emergence of cultural tourism appears as a variety of tourism to preserve the sources. One of the sources is Balinese traditional architecture. In this era, there are many commercial buildings with eclectic Balinese architecture style that sometimes only become a mirror of naivety (Danes, 2003;99-108). What differs Bali with other major cities, such as Jakarta, Bandung and Surabaya, is that the architecture of Bali still has an identity in each of the design. This can be implemented because of the Bali Provincial Regulation no.5 in 2005, which confirmed that the face of buildings in Bali must hold on to the traditional Balinese architecture. Therefore, there are efforts to sustain the identity of the Balinese traditional architectural, such as what can be seen in some hospitality houses. Sometimes, the impersonation of Balinese traditional architecture forms (i.e., *Bali Aga* architecture), especially on modern buildings related to the tourism industry, can cause problems in the embodiment of *Bali Aga* architecture image because it is not preceded by more rigorous research process. Various hospitality houses are built with the concept of modern *Bali Aga* architecture in order to meet the people's demands for efficiency and effectiveness. Then, it raised a question. How to transform the dimension system in *Bali Aga* dwellings, which are still using a very simple measurement, to be used in hospitality houses?

Since the hospitality houses are inhabited by different people (mainly by foreign tourists from western countries), these buildings ignore the use of *gegulak* system as the local dimension. Although the buildings are also used as dwellings, they have differences in character and use. The dimension system used in the hospitality houses with *Bali Aga* architectural concept is still using the international standard measurement system determined by the standard measure of the facilities, the interior layout, the type of structure and the building materials used in the building. For example, a villa located in Taman Bebek located at Sayan, Ubud, Bali¹, is designed using the concept of *Bali Aga* dwellings, but the architectural elements and the interior use the international dimension system. The standard size beds are available in the international standard size (double, queen, king, super king size). In the past, the size of beds in *Bali Aga* dwellings was only determined by the

¹ Architects: Michael White, an Australian who already has Balinese name as Made Wijaya. He is also the founder of PT Wijaya Tribwana International

height of its occupants and the width of *saka*. The length, width and height of buildings, including the thickness of the wall are now also dependent on the standard size of the building materials used, such as the standard size of bricks and including how to set them. Often, the standard height from the floor to the ceiling used is 280cm or more. This means that between a man with the standard height 180cm, there is still 100cm space between the top of the head with the ceiling. In addition, *Bali Aga* dwellings only have 10cm space above the head to the ceiling. But what is important to remember is that the *Bali Aga* dwellings can be found plentifully in the mountains, so the distance from the floor to the ceiling tends to be short and can make the occupants feel warm, both their senses and their taste value. It is very different from the hospitality houses (with the object of study: *villa Taman Bebek*) that are found more in the lowlands. The height of the bed is usually a calf-length or about 50 cm from the floor. It is calculated based on the anthropocentric view, similar to the height of the bed in Bali Aga dwellings. However, in modern *Bali Aga* buildings, it emphasises more on the comfort of the user

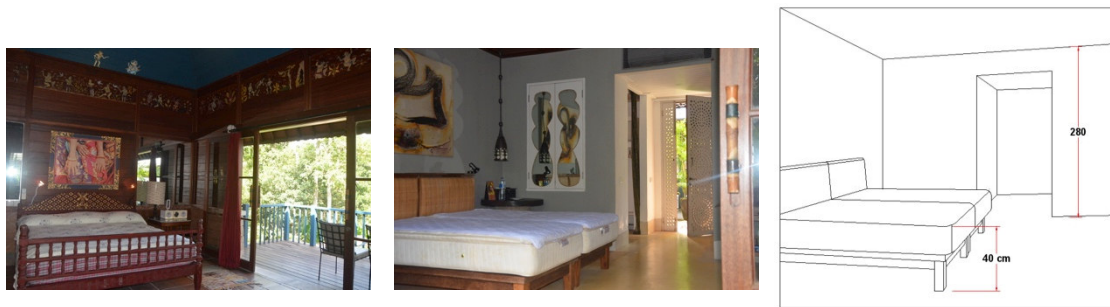


Figure 6. The using of international dimension system on the architectural and interior elements in hospitality houses with *Bali Aga* concept (object case: villa Taman Bebek located at Sayan, Ubud, Bali)

Source: the author's documentation (2016)

The structure of modern buildings is no longer calculated by the addition of 2x the width of the pillar, but it has used a modular system. According to Steven (1990;175-176), this system was introduced by Le Carbusier. The distance between pillars as props in a modular building depends on the type of roof structure that is used. If a wooden structure is used, usually the distance between modules used is about 300-350cm. If steel or concrete is used, the distance between pillars is more than 300cm. The standard height for the door is 210cm. With the height of men around 170-175cm, they do not have to bend down to get in or out of the room.



Figure 7. The layout of the building column structure in villa Taman Bebek

Source: PT Wijaya Tribwana International (2016)

3. Conclusion

Some dimension systems in the *Bali Aga* period have three ways to measure in accordance with the respective development in *Bali Aga* period. First, the initial period where the *Bali Aga* dimension system was made with philosophical meaning behind its creation. In addition to the dimension system, there are layouts, both the architectural and interior elements which also have philosophical values. Second, the dimension system used also depends on the type of materials available in nature and used at that time (in fact in recent times there are also considerations on the dimension system that depends on the strength of the building materials used). In the early period of *Bali Aga*, the dominant building materials used were wood and bamboo, which were taken from the surroundings. With the technology that was still very simple at that time, the form of the dwellings was also very simple. Third, the final period of *Bali Aga* heading to *Bali Madya* period, *gegulak* dimension system was known. In *gegulak* system, the measurement is based on the body size of the male as the head of the family. *Gegulak* is actually similar to the anthropocentric view as it uses humans as the center of the measurement. In

this system, the measurement depends on the size of the body.

There are similarities in modern dimension systems that are widely used in hospitality houses with *Bali Aga* architectural concept. First, they both use the size or measure of a human body (anthropocentric). But the difference is that the Western dimension system is has function dimension that create the dimension of human needs of space to do their activities which later became an international standard in the measurement. With the use of Western dimension system as the standard size, hospitality houses with all the facilities can provide space for the activities of humans with various body size. Sometimes this would ignore the philosophical values that existed in the original *Bali Aga* dwellings because hospitality houses are public buildings. Second, the Western and local (Balinese) dimension systems are equally dependent on the building materials used. It is just that in the present time, the building materials are varied as they are made in manufacture, so that it is possible to make them in varied structures. This is very different from the dimension system in the early period of *Bali Aga*, where the building materials depended on what was available in the surroundings.

The two dimension systems; the dimensional system in *Bali Aga* period and the modern dimension system of the Western have the same principles. But the dimension system that was adopted by the people of *Bali Aga* remains in the anthropocentric territory only with the human body dimension structure. It is inseparable from the values of transcendental philosophy. But then, in the transformation, it is represented in the hospitality houses with *Bali Aga* architectural concept. The values of transcendental philosophy was no longer applicable. Looking back at the development of Western architecture, it was since the Renaissance period, everything was created in a rational way. This continues to the modern times. The things that are related to theocentric view, has stopped to develop in the Western architecture. On the contrary, the *Bali Aga* architecture holds on to the theocentric view and its philosophical values.

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Endnotes

1. Original note: Jika proporsi bertitik tolak kepada hubungan matematis antara ukuran, bentuk, atau ruang yang sebenarnya maka skala bertitik tolak terhadap bagaimana seseorang memandang besarnya unsur sebuah bangunan atau ruang secara relatif terhadap bentuk-bentuk lainnya (translate in English: If the proportion depend on mathematical relationship between the size, shape, or the actual space, then the scale depend on how someone observe the magnitude of building's elements or space relative to other forms). Wicaksono, 2014;81
2. Original note: Persepsi kita mengenai dimensi fisik benda sering tidak akurat. Kelemahan perspektif, jarak pandang, bahkan bias budaya dapat mengganggu persepsi kita (translate in English: Our perception about the

- physical dimensions of the objects are often inaccurate. Weakness perspective, visibility, even cultural distortion can interfere with our perception). Ching, 2011;123
3. Original note: Skala umum, ukuran relatif sebuah unsur bangunan terhadap bentuk-bentuk lain di dalam lingkungannya. Skala manusia, ukuran relatif sebuah unsur bangunan atau ruang secara terhadap dimensi dan proporsi tubuh manusia (translate in English: Scale in general definition is the relative size of a building's element against other forms within its scope. Then, human scale is the relative size of a building's element or space against dimensions and proportions of human body). Wicaksono, 2014;81
 4. Original note: Ternyata keanekaragaman dari pasaran pariwisata tercermin secara jelas dalam penataan pariwisata antar resort-resort yang terbesar: Nusa Dua, Sanur, Kuta, dan Ubud (translate in English: Diversity of the tourism market is clearly reflected in the arrangement of tourism area among the largest resorts that: Nusa Dua, Sanur, Kuta and Ubud). Picard, 2006;101
 5. Recognition of the vernacular inspired others, though Frank Lloyd Wright's statement of the same year wa probably made independently. 'Folk building growing in response to actual needs, fitted into environment by people who knew no better than to fit them with native feeling' he wrote, implying like Loos, that intuition rather than intelligence guided the builders. Oliver, 2003;9
 6. Original note: Semua makhluk sudah merupakan suatu kesatuan yang harmonis dengan alam lingkungannya masing-masing, isi dengan tempatnya atau laksana Bhuana Alit dengan Bhuana Agung (translate in English: All creatures already a harmonious unity with the natural world respectively, content with his place or like Bhuana Alit with Bhuana Agung). Bidja, 2012;32
 7. Original note: Gegulak adalah panduan yang digunakan untuk menetapkan satuan-satuan modul dalam pengukuran bangunan yang terdapat pada bangunan hunian Bali Madya (translate in English: Gegulak is a guide used to assign units of measurement modules in a Bali Madya dwellings). Remawa, 2015;69
 8. Ergonomis Standar of Asian=Internasional Standar-(10%xInternasional Standar). Wicaksono, 2014;81