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THE LOCAL WISDOM FORM OF SUSTAINABLE ARCHITECTURE IN PENGLIPURAN VILLAGE

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Abstract:
Penglipuran Traditional Village is a traditional landscape that places the element of nature as the basic concept of its design and has a local wisdom form of sustainable architecture. The village is located in Bali, at a distance of 45 km from Denpasar and 5 km from Bangli. This research is done by qualitative descriptive method and with case study approach. The purpose of this research is to find out the local wisdom of sustainable architecture applied in Penglipuran Village, as a foundation to study Balinese traditional architecture. Penglipuran village as a settlement has a spatial pattern which is divided into 3 (three) spatial divisions based on Tri Mandala concept consisting of: 1) Main Mandala (Pura); 2) Madya Mandala (Residence); 3) Nista Mandala (Tomb). Traditional House Penglipuran Bali is a form of cultural mindset of ancestors Penglipuran people of a region with a good and uphold the ancestral customs and strive to maintain the order well, neatly organized conceptual and sustainable nature and the environment.

Keywords: *Local Wisdom; Sustainable Architecture; Penglipuran Village.*

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1. Introduction

In Bali there are several traditional villages, one of which is Penglipuran Traditional Village. Among the many custom villages scattered throughout Indonesia, Penglipuran Traditional Village is one of indigenous villages that still survives by having ecological principles in the customs and culture of its people. Penglipuran Traditional Village is administratively located in the area of Kubu Village, Bangli District, Bangli Regency of Bali Province. The location of the village is located at a distance of 45 km from the capital of Bali Province and 5 km from the capital city of Bangli regency. Penglipuran Village can be reached from the east side through the Bangli-Kintamani highway, after arriving at Kubu Village turn left and from the north side through Kintamani-KayuambaBangli road. The boundaries of Penglipuran Village are as follows: 1) Northside is bordered by DesaAdatKayang; 2) Regency of AdatKubu in the east; 3) Regency of Cempaga in the south; 4) The western borders of Cekeng Traditional Village. The traditional village of Penglipuran is connected with collector road to Bangli Town center, making it easier for villager access to the city which is about 5 km away.

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Penglipuran Traditional Village is a traditional landscape that places the element of nature as the basic concept of its design and has a local wisdom form of sustainable architecture. In order to achieve sustainable conditions, new ideas and approaches in design, such as ecological design (ecological design), ecologically sustainable design, green design, etc. are terms that describe the application of principles -the principle of sustainability in designing buildings and landscapes (Kibert 2008).Located 45 km from Denpasar City has an area of 112 ha consisting of moor, bamboo forests, settlements, and various facilities such as temples, schools, etc. Located in an altitude of 700 m sea level above makes Penglipuran Village quite cool air, free from vehicles.

According Parimin (1986) Penglipuran Traditional Village is one of the traditional villages in Bali called Bali Aga (Bali Mula/Bali Kuna). In general, Bali Aga is a traditional village whose people do not embrace the caste system as in general society in Bali. The highest priest does not perform the ceremony of padiksan and village leadership generally embrace the pattern of twin or collective, based on *huluapad*system or seniority. The interesting thing from Penglipuran Traditional Village is in the pattern of space and custom house which has Bali Aga village there is wide open space extending from north to south to divide the village into two parts. The open space is generally coated with stones, a high part approaching mountains or hills. The result of field observation shows that the area of Penglipuran Village is divided into three major sections, namely the settlement / residential area located in the middle, the agricultural area in the form of tegalan (gardens and fields), and the area of bamboo forest and natural forest. The agricultural area is mostly located in the central and southern part of the village outside the village core area. The location of Penglipuran Traditional Village located close to the mountainous area causes the village's landform to slope down to the south with an average slope of 10-45% with sandy loam soil, which is suitable for agricultural areas. (Hudyana, 2002).

2. Materials and Methods

This research was conducted by qualitative descriptive method with case study approach. This descriptive qualitative research method was made with the intention to know the concept of spatial pattern and custom house planned in Penglipuran Village Bali. A case study approach is used to understand a particular phenomenon in a particular place and at a certain time. Methods of data collection used by conducting survey on the location of research and observation, namely to interact with the object / subject in the field, view and read the archive, as well as: reading the map, view photos, read books / journals, and others. While the data analysis method used to uncover the findings is a qualitative data analysis.

3. Results and Discussions

3.1. Balinese Spatial Concept

In the spatial concept of Balinese, the arrangement of the environment and the placement of the parts of the house is always oriented towards the north, this is influenced by the Old Gogohan (old culture) which places the north as the highest and holy place, so the pattern of placing the village buildings always transverse from north to south, with the north as a sacred part. While in the layout of buildings living in Bali in general has a concept sanga mandala, where a building is divided into main parts, madya and nista. This concept refers to two things: 1) The direction of

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the sun (east-west), where the eastern part of the building is nobler than the west; 2) Axis kajakelod (sea mountain), where the direction of the mountain is more noble than the direction of the sea.

3.2. Penglipuran Village Spatial Pattern

In the village of Penglipuran, to organize all the development procedures there is an architectural rule adopted and called by the name of awig-awig. Awig-awig this is the embodiment of local wisdom that became the strong foundation in the management of natural resources and a good environment. This awig-awig is basically an adat law in the form of rules or laws that are composed and stipulated by members of the village, banjar, and subak community on the rules of community life in religion, culture and socio-economic in Bali. Settlements of Penglipuran Village located in the middle of the region, consists of 76 yards with the direction of the north-south transect (kaja-kelod) that is on the west and east lines.

The embodiment of traditional Balinese spatial patterns and structures is backgrounded by the religious minds, especially Hinduism, namely: 1) Tattwa (philosophy); 2) ethics (ethics); 3) Ceremony (ritual). With the concept of the concept, the orientation of space in the aspects of ethics (ethics), separating the spaces that are sacred / sacred with the functions of non-sacred activities, the spatial pattern of settlements Penglipuran traditional village consists of two main, namely: the concept of orientation direction, angina eye direction and religious axis concept, Tri Mandala. The value of the main space on the axis of the earth is in the northern region (mountain) and the value of nista space in the south (sea), while the value of the main space on the axis of religion is in the eastern (sunrise) and the value of space nista is in the west). As a result of the application of the concept of the axis of the earth and the solar axis in the settlement arrangement of the village adat, then the morphology of Penglipuran Traditional Village in the form of linear by the way.

Linear pattern on settlement of Penglipuran Village with spatial system of horizontal spreading of mountain and sea with orientation of wind direction with the axis of Kaja (north) or Mount, and Kelod (south) or sea. In the distribution of land use (spatial planning), Penglipuran Village adheres to the concept of Tri Angga which in bhuanaagung is often called Tri Loka or called Tri Mandala (Dwijendra; 2008) .Tri Mandala, which is a spatial arrangement system that is divided into three zones of designation. The term is derived from two words, namely Tri which means three and Mandala which means space. The spatial distribution based on the concept of Tri Mandala is composed of: 1) Main Mandala (Ulu); Main Mandala, the northern part of the most sacred part of the sanggah. This zone is a place that has the highest value among other zones. Located in the closest part to the Mountain (in Penglipuran Village, Main zone is in the North). In this zone there is a temple as a center of worship from all villagers Penglipuran Village. According to Tribinuka (2017: page 73) Pura in Sanskera means 'city', in its development the term temple is used for worship place. In the Main zone of Mandala there is a holy place consisting of PuraPenataran, PuraPuseh, PuraDukuh, PuraRambutSedana, PuraEmpuAji and PuraEmpuNalwah. 2) Madya Mandala (Middle); Madya Mandala, the center of the village where activities and daily family activities. Is a zone that has a value in the middle. Located between the Main Zone and Nista zones. In Madja Mandala zone this is a residential community where the establishment of a residence for its inhabitants. The main house located in this zone

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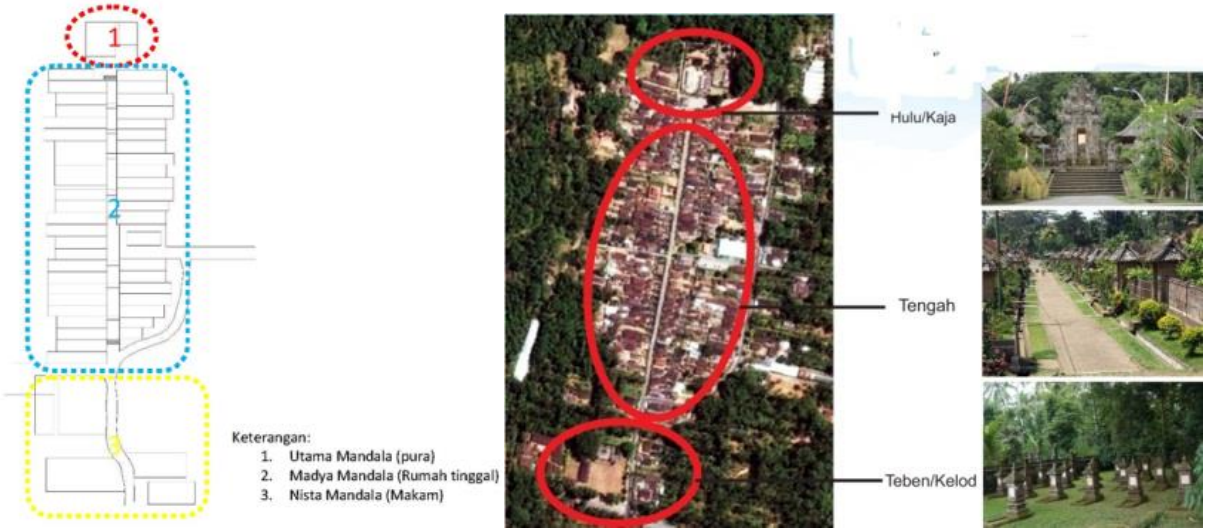
amounts to 76 houses divided by main road to 32 houses on each side of the road. House numbering uses a modern system, odd number is on one side ie on the east side of the road and even number is on the other side ie on the west side of the road. In Madja Mandala zone there are several temples belonging to the village and dadia, such as PuraRatuPingit, PuraBalaiBanjar, PuraDalemTampuagan, TuguPahlawan. 3) NistaMandala (Teben); Nista Mandala, the southern part of the back (teben) yard. This zone is the place that has the lowest value among other zones. Located in the closest part to the sea (in Penglipuran Village area, the Nista zone is in the South). Therefore, in this zone there is a burial complex. In Nista Mandala zone there are several temples like PuraDalem (PuraPelapuhan), PuraDalemPingit, Pura Mas AyuManikMelasem and PuraRatuTungkup.



Picture 1: The Space Pattern of Panglipuran Village

Penglipuran village is oriented to the mountain "kaja" and to the sea "kelod" which forms a linear pattern that divides the occupancy into two parts. This linear village mass follows the axis of north-south axis and follows the existing leveling (transis). The ultimate values of the madya and nista are using the analogy of the human body called Tri Angga. Tri Angga or Tri Loka is the concept of balance of cosmological equilibrium concept initiated by EmpuKuturan (Arrafiani, 2012). Tri Angga that is head, body, and leg at the same time that formed at Penglipuran Village which incidentally including relics of Bali Aga era that is mount and sea pattern.

3.3. Traditional Village of Penglipuran

Penglipuran village has 76 lots of yard and houses where the residents are divided into two ranks, namely in the West 38 houses and in East 38 houses. The many types of house composition in a house unit in Penglipuran village, each one building unit can have 4 main buildings, and the rest can be more dependent on the number of family members. The difference is the position of the West and East houses for each entering the front gate. For the Eastern part of the house if entering the gate will immediately meet with omah, while the West when entering the gate we will immediately meet the temple praying place. Here are the parts of Penglipuran

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Traditional House Bali and its functions are: 1) Merajan; The place of family prayer, consisting of several pelinggih (sacred buildings), its function for places of worship and ancestor worship. 2) Bale Sakenem; Sakenem means of: pole and six: six (six-sided bale), an open hall with bales, also called bale of sorrow because of its various functions starting mepayas (wedding ceremony), death ceremony, mepandes (cut teeth) , and places to do everyday activities such as crafting. 3) Paon (kitchen); The place of cooking and preparing food, its shape is similar to traditional Javanese kitchen which still use firewood, during paon wedding ceremony also used for bridal bridal eating place together. 4) Bale Dangin; The residence of the head of the family, and those who are married, consists of a closed building and an open terrace section. 5) Angkul-angkul; Is one of several forms pamesuan / gate entrance home in Bali, which is a unit of house or door yard for building units.

Picture 2: 1) Merajan; 2) Bale Sakenam, 3) Paon; 4) Bale Dangin, 5) Angkul-Angkul

3.4. Buiding Material of Traditional House in Penglipuran

Penglipuran Traditional Village uses natural building materials that can be taken from their environment as the main building material. Natural materials are widely seen in traditional buildings in the village (Dwijayasastra, 2013). Traditional Balinese Houses are mostly made from organic materials such as wood, bamboo, weeds, and plant fibers (Julian, 2014). The results of field observations on residential and library studies concluded that uniform material selection was found in their dwellings. According to Prijotomo (2008: page 71), Indonesia's traditional architecture is based on materials, tools (technology) and the way of connecting (construction) in presenting formations. Stage house in Bali house has been replaced by a court of brick, similar to the yard of the temple (Sopandi, 2013).

Picture 3: ole and Beam

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The structure and construction and building materials used by most people in Penglipuran Village are as follows:

1) Bebaturan; Traditional Balinese Building which has the principle of head-body-foot (Main, Madya, Nista) So the parts on every building is the start of the bebaturan, ie the bottom or foot of the building. Bebaturan consists of squatting asu as the foundation of poles and tapa sujan as pavement edges bebaturan. But it can also be said, the bebaturan is the floor of the building, undag, or ladder trajectory up and down to the floor of the yard. According to Wijaya (2002), the presence of bebaturan politely will separate the level between buildings with parks, animals, or other things that are dirty and free to roam.
2) The Wall; Walls for simple building side border areas used gedeg wall bamboo or woven coconut leaves are arranged with the framework of uger-ugerterampa. Coconut leaves can be woven on both sides so as to get a thicker and sturdier webbing of teratub called kelangsah. Installation of wall coverings on the wall frame tied with a bamboo rope or fiber rope in a matching composition.
3) Brickwork; The brickwork and pillars are constructed with a head-leg-body pattern, emblazoned with bamboo and ornament of certain parts. Traditional brickwork was built without any ties to the construction of the building frame. Emphasized with a gap between the head of the brickwork and the underside of the roof so that the free brickwork does not bear. With the construction of a load-free brickwork is expected to avoid danger
4) Sesaka or Column; The main construction element in a traditional building is a pole, the real basic module. Poles are also called sesaka. Distance pole to pole to the long direction is along the pole plus the junk (excess). Distance pole to pole toward width 2/3 length of pole plus jars. And the material used for sesaka is wood with the quality of certain groups such as wooden king ketwel, teak wood patih, besides it is also used the king of sandalwood, patih wood menengen. Traditional buildings constructed with temporary frame construction and other frame parts relating to the structural elements are worked out with lait systems, wedges and rope ties. Such structures and constructions are earthquake resistant structures and constructions that are necessary for the earthquake-prone areas of buildings.
5) Opponents; The standard beam around a series of edge posts, in a traditional building called the symbol and above is called the sineb. The tank beam that stretches in the middle ties the middle ranks are called opponents.
6) Ribs; The obstacles of traditional Balinese buildings are also called ribs. The base of the ribs is strung with under or dedalas which is the outer edge frame of the roof. The top end blends with the roof top. The knot sticks together at the summit are called disastrous for one-pointed roofs and dedelegs for longitudinal peaks. Called the ceiling for the roof with construction kampiyah not limasan
7) Raab; Raab traditional roof cover is called raab which is generally made from natural materials, mostly reeds. In the mountains there are also made of bamboo shingle as found in this panglipuran village. Reeds are produced once a year for materials that are quite old. Disabit cleaned, processed inside a series of bonds that are the roof planes. Bunches of reeds with rope fibers and to the framework of the roof tied with bamboo straps on the ribs are also available from selected bamboo.

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Picture 4: 1) Bebaturan; 2) The Wall; 3) Brickwork; and4) Raab

4. Conclusions and Recommendations

Penglipuran Traditional Village is a traditional landscape that places the element of nature as the basic concept of its design and has a local wisdom form of sustainable architecture. This Village is one of indigenous villages that still survives by having ecological principles in the customs and culture of its people. The visual domination of village's landscape is from agricultural landscape. Other aspect that should emphasised is the green area as an open space in the village environment. Usually the open spaces in the village have natural panorama. In fact, traditional village is one of example of implementation of Hindu Philosophy, where the environmental design of traditional village is based on Tri Hitakarana Philosophy, which the relationship between human with universe cannot separated. Physically, the environmental design is based on the values of space (utama/sacred, madya/middle, nista/profane), which is based on Tri Hita Karana Philosophy.

Traditional House Penglipuran Bali is a form / result of cultural mindset of the ancestors of Penglipuran people to arrange their region with good and high up the ancestral customs and strive to maintain the order well, neatly organized concept and sustainable nature and the environment. This Traditional Village uses natural building materials that can be taken from their environment consisting of moor, bamboo forest as the main building material, which is feature Indonesian Architecture.

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