

PHENOMENOLOGICAL INTERPRETATION OF CONTEMPORARY BAMBOO ARCHITECTURE IN INDONESIA

Tony Sofian^{1*}, Iwan Sudradjat¹, Baskoro Tedjo¹

¹ *School of Architecture, Planning and Policy Development, Institut Teknologi Bandung, Indonesia*

ABSTRACT

The pace of modernization followed by a physical development in line with massive natural resources exploitation has resulted in environment degradation. As a result, a physical development needs to consider environment sustainability to preserve the ecosystem. Green and sustainable construction refers to the process of physical construction development that should be based on eco-friendly principal. Architects nowadays have been doing a number of inspiring works by using bamboo as their main construction material.

The factors of using bamboo as the main material are due to its fast growth, cheap price, easy accessibility, and its ability to absorb carbon. Bamboo-based constructions can be an eco-friendly building that supports sustainable development. This study was conducted in Ubud, Bali and Tentena, Poso. The use of bamboo as the main building material enables the user to have some different experiences when living in a bamboo building. This study was conducted to determine how the bamboo building can give a special sensory experience to each individual, dependent upon the socio-cultural condition in the area. By using phenomenology method, it can describe the meaning of human interaction with a bamboo-based construction. This meaning can be obtained with in-depth interview with some participants to attain through the sensory sensation of the people living in the bamboo-based construction.

Keywords: Bamboo; Green construction; Materiality; Sensibility; Sustainable development.

1. BACKGROUND

In the architectural world, the use of appropriate and eco-friendly main material is able to give a great contribution to reduce the environmental damages. This research aims to observe how architects can give an inspiration by using an integrated eco-friendly material. The use of local material is very important in the means of empowering the local natural resources. This might lead to the great benefits economically and ecologically to all actors involved in the project; those are visitors, local communities, and investors. Indonesia's climate, which consists of two seasons; summer and rainy season, makes it to the growth of bamboos in all Indonesia's regions. Bamboos can be harvested only in three years and can directly be used as the main material for buildings. The bamboo buildings used as the object of this research are located in Ubud, Bali, and

* Corresponding author's email: tonysofian@me.com

Tentena, Poso. Both are buildings with a green and eco-friendly concept building. This research aims to observe how bamboo buildings are meant for every person has the indoor activities. This research was conducted in different buildings in two different locations. The first building is the Bamboo Koenig in Ubud, Bali by Effan Adhiwara, the second building is the Fivelements Puri Ahimsa by Ketut Arthana also located in Ubud, Bali, and the third building is Dodoha Mosintuwu in Tentena, Poso by Effan Adhiwara. The location of the first bamboo building is in Ubud, Bali, characterized with the cool and chilly weather with the full of people who respect and carry the Bali tradition on their head proudly. The Bamboe Koenig building is located in the main street to the centre of Ubud. However, this building is not located right on the side of the road positioning it in a great location far from the crowd and near to nature. The second building is the Fivelements healing centre located in the traditional village of Baturning near Ayung River. The building puts many respects toward the local traditions by applying the concept of Tri Hita Karana from the Hindu teaching as its main basic concept of the healing centre in this building. This location not only serves a quiet and green concept to the visitors, but also serves a great learning point in the healthy way of life through the organic foods available. Meanwhile, the third location of the bamboo building is in Tentena, Poso, and Central Sulawesi. This area also has a very cool and chilly weather for being located on the highland or plateau and facing directly to the Poso Lake. The quiet and desolated condition of the Tentena area makes this bamboo building not much known even by the local people. There is a social community service working on education and women empowerment in this building. This women school is held regularly in this bamboo building to help the women in the area of Tentena and Poso to able to read, write, and create art commodities from the unused goods and recycled things. Despite the different background of culture and custom where these three bamboo buildings are located, three of them have the same building concept of eco-friendly and Green infrastructure. It is because of the shape of the building applied an open concept and to be one with nature. Hence,, it is able to save the energy and electricity for the exposure and air circulation because the building still uses the natural energy right from the nature. The use of bamboo as a a building material created a different story and meaning towards the bamboo building itself and it gives them an impressive feeling. This is the main purpose of this research.

2. RESEARCH METHODOLOGY

This research used a phenomenological method, emphasizing on the human who stay and interact with the building designed by the inspirational work of the bamboo architect. It used the concept from Cresswell (2013), which points to the Moustakas approach because it had a number of systematic steps in its analytic data procedure and guidance to arrange a textual and structural description. The main procedure steps in this process included as follows:

- The researcher decided that the best way in formulating the research problem was by using the phenomenological approach. It was important to tell and share experiences from a study of phenomena as the most precise type of the problem in this research. The researcher identified a study from the phenomena of anger, professionalism, or even the meaning in the loss of weight, for example. Van Manen (1990) identified phenomena as an experience of learning, riding a bicycle, or the beginning in caring a baby for a father.

- Then, the researcher developed the cluster of meanings from those significant questions to be the topics. For the advanced step, these significant questions and topics were used to write a description from what have been experienced by the participants (textural description) and from the contexts or colour that influenced the way of the participants experiencing those phenomena which by Moustakas is called as imaginative variation or structural description.
- From this structural and textural description, the researcher drew a collaboration presenting the essence from the phenomena named as essential, in variant structures or essence. This essence was a descriptive explanation, a long phenomenological paragraph that should be able to give a feeling to the reader. “I know better than the person who experiences those life experiences” (Polkinghorne 1988, p: 46).

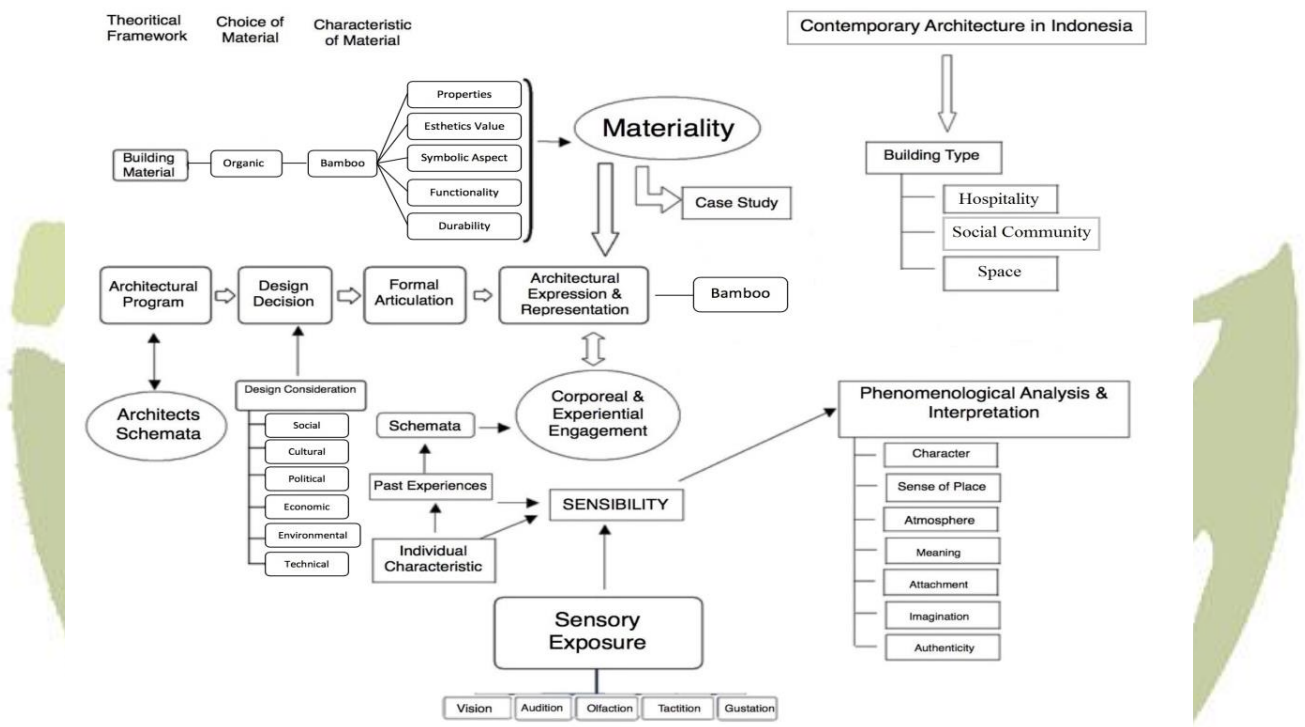
A phenomenological approach provides an understanding from a deep phenomenon as experienced by some individual bodies. Phenomenology can involve a data collection in a slender form by attaching some interviews with the participants. The chosen participants who have experienced the phenomena can also find some difficulties in relation to the research topic. As stated before, *bracketing* the personal experience can be difficult for the researcher to do because the interpretation from the data is always related to the topic assumption brought by the researcher (Van Manen, 1990). We might need a new definition from *epoch* or *bracketing* for pending our understanding in a reflective action awakening our curiosity (LeVasseur, 2003). Then, the researcher needs to decide on how he/she can introduce his/her personal understanding. Table 1 below presents the results using the phenomenological approach.

Table 1 Collecting Data in the Phenomenological Approach
 (Adapted from Cresswell, 148-149, 2013)

Data Collecting	Phenomenology
How is normally learned in the traditional way? (Certain sites or individual body)	Individual multiplicity who experiences the phenomena in BamboeKoenig, Fivelements in Ubud, Bali, & DodohaMosintuwu in Tentena, Poso
How do the typical access and the issues create the relation with the place or individual body? (Access and Relation)	Finding the selected bamboo building that is suitable for research, then the architecture network give the PIC of the bamboo facility.
How does someone choose a place or person to be learned? (Sample of its purposive strategy)	Finding the people who experience the phenomena appropriate to the criteria which are staying in the bamboo building for more than three months.
How does the typical information collected look like? (Form of the data)	In this case we did in-depth interview with 17 people.
How is the information noted or recorded? (The problem's recording)	Some of the interviews have been repeated often with the same people.
How do people generally collect the problem data? (Problems in the field)	<i>Bracketing</i> the experience of the participant and the interviewer, doing preparations and actions needed for the interview.

Data Collecting	Phenomenology
How do people generally save the information? (The data's saving)	Processing the interview's data recorded as voice record or video record, then doing transcription and coding the data using the NVIVO program.

From Table 1 above, collecting data in the phenomenological approach helped this research to find the participants who experienced the phenomena inside the bamboo building for more than three months. 12 participants participated in the interview. *Bracketing* the participants' experiences was one of the difficulties faced by the researcher when doing the interview. Information given by the participants was properly kept in the form of voice and video recording later continued with the transcript processing and coding using the NVIVO program. Collecting data in a phenomenological method resulted in the following research framework.



Research Framework

Bamboe Koenig, Ubud – Bali

BamboeKoenig Restaurant is an area located in BanjarKelingkung village, Ubud, in the district of Gianyar, Bali. This restaurant uses bamboo as its main material, designed by an architect EffanAdhiwara. This BamboeKoenig Restaurant is located in a relatively quiet area, far from the crowd and surrounded by rice field area. The position of this BamboeKoenig is in a block of Lotunduh Main Road. To reach the restaurant, the visitor will pass through a security post near to the main road. From the parking area, we have to pass through the gravel roads to reach the restaurant's main building. The BamboeKoenig Restaurant consists of two floors where both of the floors are functioned as a restaurant. The building is made in the shape of almost a full circle with two building's edges that are almost connected to each other at one point. There is an

amphitheater in the middle of the restaurant for a dance performance or opening ceremony in welcoming the visitors coming to the restaurant. The shape of the second floor is like a “Bubu” which is a traditional tool for catching fishes used by people in Bali. The concept of the restaurant is just like the concept of the “Bubu” itself which is able to catch fishes or shrimps. Philosophically, with this “Bubu”-shaped building, the restaurant is also able to catch many visitors.



Figure 1 BamboeKoening

The open-shape of this BamboeKoening building makes the visitor feel more comfortable because the sound that is produced inside the building is not echoed and ricocheted just like occurred inside the building made of a solid wall. The voice produced in this building is not echoed because the design of the bamboo building has an open-concept building, and makes it possible for the building to still be in the quite condition even though there are more than 300 visitors. Even the sound of the rain sounds so smoothly. To reach the second floor of the building, we have to pass through the bamboo stairs. Every step we take on the stairs creates a sound and we can also hear the sound of our footsteps when reaching the second floor with the floor and wall made of bamboo. The visitors who step on this bamboo floor must feel anxious with its strength. It is because the floor creates a sound of ‘kreot’ like a small shake, and a small bounce when people are stepping on it. However, the feeling of anxiety will not last for long. It occurs for the first time when they are stepping on the bamboo floor. Soon, they will feel more comfortable and believe in the strength of the bamboo floor. The haptic system informed us about the light, palm, and grip surfaces as explained by Joy M. Malnar when he cited FreledensrelchHundertwasser stating that:

“Therefore, it can be explained that when kinesthesia is combined with the active touch, the information is increased. It made us possible to be aware of the quality of the surface in the path where we are.” (Malnar 2004: 146)

This BamboeKoening building is located near the rice field area of Ubud, Bali which has made it possible for the breezing wind to coolly blow in this building. The feeling on the second floor of the building is different, even the weather is hot at the day. People staying in this second floor will not feel the hot weather. The open-design of the building has made many birds fly around the restaurant. These birds create such a nice harmony sound that makes the building more natural. However, the dirt created by the birds and their nests in the building are difficult to clean. They only clean dust and dirt using a broom. They also make the bamboo in this building shiny by wiping them with chemical finishing once in two or three months.

This bamboo building creates such a happy feeling for whoever having interacted with it because it might give inspirations to make such a bamboo building in their home

village which also produces bamboo. The participants who have ever stayed at this BamboeKoening building said that they feel homy and it made them to come back again to this bamboo building. They feel comfortable and get more spirits to work when they are inside this building. People said that sensed the smell of dust which actually was the bamboo flakes blown by the wind when the first time they stayed at this bamboo building. However, not everyone is able to sense the smell of the bamboo flakes. The participant who touches the bamboo in this building feels like they really want to sleep, as the bamboo gives the natural, cool and calm feeling, just like in a natural forest where we can also hear the sounds of birds. Those people said that it feels like they are coming back to the past time of their home village where many bamboos are available. The visitors of this bamboo building can feel the natural feeling because of the sound of the birds and the beautiful natural scenery surrounding. Philosophically, this BamboeKoening design also gives an inspiration to the visitors that bamboo materials can be made into an amazing and beautiful building. The bamboo materials can be modified, crooked, and united to each other; and turned into such a big and beautiful building. The bamboo plant can be used from its roots to its leaves; all parts are useful. It is also strong and can bear the power of wind. Bamboo can grow very tall even though it is empty inside. The character of this bamboo plant has motivated the participants to learn and live like the philosophy of bamboo.

Fivelements, Ubud, Bali

FivelementsPuri Ahimsa is a resort and spa whose priority is on the healing treatment to the visitors. Located in the traditional village of Baturning, Mambal, Bali and not far from the excursion area of Ubud, FivelementsPuri Ahimsa has been designed by an architect named, KetutArthana. It applies the principle of eco-sustainability by using bamboo materials. Besides, this building also uses raw food, organic material, and has its own place to make natural compost. It is in corresponding to the vision of FivelementsPuri Ahimsa to love and respect life. The values that are available inside the FivelementsPuri Ahimsa are adopted from the Hindu teaching of Tri Hita Karana, which is a relation with the God, relation with humans, and relation with nature. This resort has a horizontal area with some separate buildings consisting of the reception and office building, restaurant, spa, separated bamboo building for meeting room named Mandala Agung and Mandala Alit. This building also has seven units of bamboo buildings used as the rooms separated to each other. There is a restaurant made of bamboo built in the shape of banana leaves. Its philosophy comes from the habit of food sellers in Bali who often serve the food with two pieces of banana leaves. The natural, cool and shady atmosphere will directly come to you right after entering this restaurant. Fivelements has Mandala Agung, functioned as a meeting room with ceiling towering high like a cone and with a small circle of light coming to the building on its peak. The two entrances of this Mandala Agung make the air circulates properly, comes in and out from each of the door. This kind of air circulation creates relaxation to the people who stay inside the building because this air circulation in this building is indeed designed by taking a benefit from the natural air circulation to circle around inside the building. It gives a feeling of surrounded by energy while being inside it, especially when people stand in the middle of the building where the sunlight comes right on us. The participants' feel like there is an air touching their skin and there is the sound of 'hiss'

from the blowing wind when they are closing their eyes, it makes them feel sleepy, calm, and relax.



Figure 2 Fivelements

The bamboo building in this Fivelements is a unique type and is able to inspire those people who interact with this building. Previously, they said, the bamboo plants growing in their home village were somehow unusable. But once they came to this Fivelements bamboo building, it has inspired them to make a building made of bamboo. The participants in this Fivelements bamboo building also feel that there is a missing piece when leaving this building for home. Sometimes, when it is time to go home, they will choose to stay longer in the Fivelements area. It makes them feel to be united with nature and feels surrounded by positive energies. This is what makes the workers here love this place. This is also explained by Joy M. Malnar:

“There are humans commonly experience three kinds of sensory response: first, an immediate physical response to stimulus; second, a response conditioned by prior knowledge of its source; and third, a response to stimulus as it has become identified in one’s memory with a particular time and place.” (Malnar 2004: 21)

It is the unforgettable memory of a place explained by Malnar that is also felt by the participants with an experience to stay in this bamboo building. This memory has stimulated the participant senses so that they are able to experience the feeling of peacefulness, comfort, and happiness while staying in this bamboo building. The use of electricity in Fivelements is quite minimal because of the eco-friendly concept applied by its management. Most of the lighting system use the solar power of the natural sunlight. The use of the sunlight is part of the sustainability energy program applied by the management of Fivelements. What is unique is that the utilization of this sunlight is creating such an artistic effect. The reflection from the light coming to this bamboo building creates an abstract painting that can make those who see the abstract painting feel happy and relaxing when seeing the reflection of that sunlight. It is just like what Malnar said, as cited from Rudolf Arnheim stating that:

“Hunger pangs, the chills of winter, the fear of violence, the disturbance from noise are on equal footing with the need for peace, privacy, space, harmony, order, or color are all facts of human consciousness.” (Malnar 2004: 27)

The open structure of the bamboo building makes it possible to create a balance physiologically for those people inside the building. They preserve the harmony with nature and God by keeping the balance of nature; and the way of eating healthy food and utilizing the natural energy resources such as sunlight and raindrops. The eco-

friendly concept applied by the management of the Fivelements creates a comfortable feeling. Being inside the bamboo building makes them feel like they are part of nature. It is a different feeling from what they feel when they stay inside the concrete building with many long corridors that make them feel stuffy and stertorous. Being inside the bamboo building makes them feel relax physically and psychologically. Bamboo is a unique creation in both its strength and softness because it is able to be crooked but is not easy to be broken. As a human being, it is a must for us to wisely utilize what nature gives us and preserve what God has given to us. Hence, by making a building made of bamboo, we also contribute to preserve the nature. To adopt the local natural resources like bamboo it means to revive a traditional local wisdom, which has mostly been forgotten. The use of a material available around their living area makes them aware of the potential of their area which can be an economic value for their environment. The use of bamboo as the main material in the Fivelements makes the participants more aware in which the bamboo is a potential material and great to be made as building materials.

Dodoha Mosintuwu, Tentena, Poso, Central Sulawesi

DodohaMosintuwu is located in the district of Tentena, Poso, Central Sulawesi at the edge of the Posolake and was designed by an architect named, EffanAdhiwara. The building of DodohaMosintuwu stands on the edge of Poso Lake with bamboo as its main material and concrete as a dam to anticipate if the Posolake has a tide. This bamboo building faces right to the Posolake and has an open concept enabling people to directly see the Posolake from the building. The air circulation of this building is in a great condition because it is located in the highland and near Posolake. This building is used as a facility for many social activities such as women school, 'Sofia' library for children, and many activities aimed to empower women and children. The front side of this building facing to the Posolake is also used as a restaurant. The middle side of the building is used as a library fully completed with children books where there is a hole at the top of the building for the sunlight to come inside and shine directly through the tree planted in the middle of this building, and the upper side of this building is used as the office. Besides, this social institution also holds a Poso Children's Storytelling Festival in collaboration with a community in Jakarta; "*Ayo Dongeng Indonesia*" community. The structure of this building is composed by bamboos designed as crossing to each other so that the ceiling shapes a dome with a hole for the sunlight to come. The lighting system in this building is not so bright even though the shape of the building is open and not so dark even though the shape of its ceiling is like a dome. There is sufficient sunlight coming to the building, not too gloomy even without turning on the light from morning till afternoon because the bright colour of the bamboo also helps the room looks brighter. The people staying in this DodohaMosintuwu bamboo building feel that the sunlight which comes in the morning makes such a feeling of being in the middle of bamboo plants.



Figure 3 Dodoha Mosintuwu

This bamboo building has an open space on its front side that faces to the Poso Lake. It will make the raindrops come a little bit inside the restaurant. The air circulation in this building is great, feel cold and cool because it gets the breezing wind right from the Posolake. The participants who work in this building feel that since they started working here, it is not easy for them to get sick even though they have to work overnight. It is different when they have to work in a closed building where the air circulation is not too much good, so that it is easy for them to get tired and sick. Working in this bamboo building make they feel like they are not working, and sometimes do not even realize that time passed so fast. The worker in this building uses only broom and mop with a natural cleaner made of coconut to maintain the bamboo building. The weather in this bamboo building is cold because the building has an open design and its great air circulation. Those people who stay in this room therefore are always healthy and not easy to have a cold. Standing barefoot on the bamboo-made floor also gives a great sensation. The visitors who come to visit this building said that the bamboo feels soft and cold when it is touched, but it is not a very cold feeling that pierces to your nerve and bone. The participant who works here prefers to sit on a chair made of bamboo to sit on the sofa. It is because they feel fresher and cooler when sitting on the bamboo-made chair that is also different from the cool feeling when sitting on the ceramics floor. According to Malnar it is called as:

“Phenomenal reality is therefore the result of sensory-emotional experience, suggesting an ongoing dialogue between human beings and the entities that surround us.” (Malnar 2004: 24)

The bamboo building in this DodohaMosintuwu inspires whoever interacts with it to build a room or a house made of bamboo. They hope to be able to feel the comfort like what this DodohaMosintuwu bamboo building gives them. The participants who are also a local community in Tentena are inspired to make a cottage made of bamboo in their gardens. They just need to harvest some of bamboo plants in their own gardens and make their own cottage in it. Not using a wooden material as a material for making a building is also considered a good step because it also decreases the illegal logging. People staying at DodohaMosintuwu said that they missed the bamboo building while they are in their own houses. They want to come to the DodohaMosintuwu bamboo building and relaxing their body and mind while enjoying the Posolake. According to them, this bamboo building differs from the concrete building that seems stuffy and stiff. This DodohaMosintuwu bamboo building makes them relax and comfortable for any visitors.

3. CONCLUSION

The architecture of the building, in fact, has been turned out to be an inspiration to human interacting with it. Human being will cultivate all sensory experiences with all their senses. Bamboo architecture as an objective reality is interpreted by people differently. Through their senses, humans cultivate what they perceive and then they compare it to their experiences, and the result showed different meanings. Nevertheless, the human sensory experiences are universal so that in certain context and culture, people will experience the same thing. This is what we found in our research of three different bamboo buildings in different places. A building is, in fact, capable of fetter physically and psychologically. A building which is in first a shelter for human being becomes a place socially estranged one from the other human beings, separated human from nature, and even detached their relationship with God. Nevertheless, all participants feel something different when doing their activities in a bamboo building. Bamboo buildings with its unique architecture have made people realize that they are part of nature. Bamboo architecture reminds us that modern architecture which is reflected in the luxurious building enclosed by walls, give them very bad impact and separate them with nature. The aspects of human vision give a different impression of the bamboo building compared with the building enclosed by walls. Experiencing the sense of sight about the bamboo building is later attributed their everyday experience accustomed to see the building enclosed by walls. From the sensory experience then they will realize as the surrounding environment and recall the childhood experiences or hometown. Work and accustomed to interacting in bamboo buildings to make them realize that their neighbourhood is a place where many bamboo plants grow. This raises the romance of a beautiful childhood of hometown or village beautiful atmosphere that now seems far away for them. Viewing the bamboo buildings makes them comfortable and returned to their childhood home.

Bamboo architecture enables various surrounding natural phenomena recorded by the human senses. The sound of birds perched around the building; streams which feel so peaceful hand in hand with the surrounding landscape that will make people who live there calm and comfortable. The bamboo building liveable shape also allows them to feel the wind that seems to touch the skin and soothes the body. Although the day is a little bit hot, but the design of the building bamboo gaps that allows air continues to spin and it is perceived as refreshing and as a natural way which is able to keep them away from a variety of stressful thoughts, likewise, when they touch the bamboo building. Participants understand that with a proper processing bamboo building turns feels comfortable when being held, likewise, when they set foot on bamboo. Although at first they are worried of bamboo back foot will collapse because screeched when they move, but over time they realize that the bamboo buildings could sustain their weight. The bamboo building raises again senses smelling. They consider that sometimes a strong aroma bamboo is a typical natural aroma. The smell of the aroma of bamboo will evoke a sense of comfort, feeling close of neighbourhood where a natural place for bamboo plants to grow. The smell of bamboo and the wind that go into the building make people feel comfortable in it. Through the bamboo architecture individual becomes more sensitive to hear the sounds of nature around it. They become more common to hear the chirping of birds, and a stream that exists around the bamboo building. This makes a bamboo building as a shelter from natural phenomena that can interfere with their activities without alienating humans from the natural environments. By allowing the

plenty of air and the wind that go into building, the bamboo noisy voices to be muffled and carried out by the gusts of the wind that goes into the building. This makes this building will feel lonely. The bamboo buildings can make the occupants not have to be formal and stiff impressed. With bamboo building attached to the traditional image of a simple building and close to nature, it makes humans interaction in it more comfortable, not feeling confined by the strict rules or norms that restrain and feel freer like being at home. With a design that is open and not sectional, bamboo architecture enables a social interaction is more intense in it.

Bamboo building design is not insulated or aisle, living in a bamboo building makes the people in it easier to interact. The absence of a physical barrier firmly in the bamboo room enables an easier interaction to occur. This is to minimize a conflict because no limitations are expressly caused due to the rigidity of the communication between the participants. The bamboo architecture can be peaceful in a healing place for the residents. They in trouble or bearing various problems can take a rest in the certain spot in that building. They are in peace when having a contact with nature. They could be sitting in the corner of the room while listening to the sound of the river flow, sitting in a place where fresh air makes them feel close to nature. These simple activities are considered capable of removing various pressures they face in their daily life. The natural and traditional buildings also make the occupants feel closer to God. In the context of the people of Bali the relation of man, nature and God, hand in hand is in an equilibrium state, living in a good and green environment meaning to create a good relationship with God. The architectural design of bamboo which is relatively open, has made feel close to their God. Furthermore, bamboo building creates consciousness that bamboo material is able to use to create the inspiring buildings, regardless of the image of bamboo building synonymous with countryside and backwardness. It then inspires people who ever interact with the bamboo architecture builds the bamboo building for their home. They assume that the bamboo material can be obtained from the surrounding environment and they can create great, environmentally friendly and safe buildings where they live in it peacefully.

4. REFERENCES

- Creswell, John W, (2013 3rd ed., 1st. published 1997) *Qualitative Inquiry and Research Design: Choosing among Five Approaches*. ThousandOak, CA: Sage Publication.
- Creswell, John W. CLARK, Vicki L. Piano, (2007) *Designing and Conducting Mixed Methods Research*. London – New Delhi: Sage Publication.
- Moustakas, Clark, (1994) *Phenomenological Research Methods*. ThousandOaks-London-New Delhi, Sage Publications.
- Vagle, Mark D., (2014) *Crafting Phenomenological Research*. Walnut Creek, CA: LeftCoastPress.
- Van Manen, Max, (1990) *Researching lived experience: Human science for an action sensitive pedagogy*. Albany: State University of New York Press.
- Van Manen, Max, (2014) *Phenomenology of Practice: Meaning-Giving Methods in Phenomenological Research and Writing*. Walnut Creek, CA: LeftCoastPress.
- Crouch Christopher, Jane Pearce, (2012) *Doing Research In Design*. Bedford - London, CA: Berg Publisher.

Malnar JoyMonice, Vodvarka Frank, (2004) *Sensory Design*. Minneapolis, CA:
University of Minnesota Press.

