

Characteristics Adaptation of Traditional Sundanese Architecture for Development of Educational Building Design

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Abstract—This research aims to explore the characteristics of traditional Sundanese architecture to be adapted and adopted into the development of educational building designs. Physical development of educational buildings is needed as an effort to improve the quality of education and academic culture. The development of building designs considering the local context by exploring the rich local cultural heritage of traditional Sundanese architecture. This research uses a descriptive qualitative method. While data collection carried out through documentation, literature, and observation. Then Data analysis performed using the architectural characteristic transformation technique. The results of this research are the adaptation and adoption of traditional Sundanese architecture characteristics, including typical shapes of buildings, and ornamental variety in educational building designs.

Keywords—*adaptation, adoption, traditional sundanese architecture, educational building design*

I. INTRODUCTION

Universitas Pendidikan Indonesia (UPI) is a tertiary institution that adheres to a multicampus system. UPI has a main campus in the city of Bandung or better known as the Bumi Siliwangi Campus. UPI also has several branch campuses or better known as regional campuses that are spread across several cities, one of which is the UPI Purwakarta Campus. UPI campuses in the regions, have hardly experienced significant physical development [1]. Limited government budgets, both through APBN and UPI funds themselves, have caused the physical development of UPI campuses in regions to be very left behind. One of them is UPI Purwakarta Campus which is experiencing physical development which is very behind when compared to the Bumi Siliwangi Campus. The difference in the development of physical facilities between the Bumi Siliwangi Campus and the UPI Purwakarta Campus, contributes greatly to the quality of graduates and the academic culture that grows at the UPI Purwakarta Campus. So, the physical development of the UPI Purwakarta Campus is an

important step to improve the quality of education in the regions.

To improve the quality of education, lecture facilities must be supported. For example, with the construction of a new lecture building, and renovation of facilities and infrastructure that can support academic and student activities.

The physical development of UPI Purwakarta Campus must consider the context of the area itself, by exploring the richness of local cultural heritage, particularly Sundanese architectural culture. In this era of globalization, many local architectural values have been lost in Indonesia. Therefore, local and traditional Sundanese architecture must become the identity of a cultural supporter and must be preserved to remain sustainable. Based on the description above, it is very important to adopt the characteristics of Sundanese traditional architecture in the architectural design development of the UPI Purwakarta Campus.

II. REVIEW OF RELEVANT LITERATURE

A. Traditional Architecture

Traditional architecture is a form of cultural elements that grow and develop together with the growth of an ethnic group so that it is used as an ethnic identity [2]. Therefore, traditional architecture is one of the identities of a cultural supporter.

B. Traditional Sundanese Architecture

Traditional Sundanese Architecture is the architecture that is influenced by the traditions or customs of the Sundanese people [3]. Besides the influence of customs, natural factors also influence the architecture of Sundanese houses. Different topographical conditions affect the placement of houses by the state of function and the needs of the Sundanese people.

1) *Settlement patterns*: The villages in Sundanese land have a settlement pattern [3], the traditional Sundanese village pattern is divided into three parts, namely:

- Linear pattern (continuous), is a group of settlements where each house stands in a straight line, the shape is flexible, according to natural conditions such as topography and prevailing community systems.
- A centralized pattern is a group of settlements that surround a centralized area that is straight and dominant, such as a square, village hall, open field, etc.
- The radial pattern is a radial pattern that combines linear and centered residential groups. This settlement group places the house like spokes.

Analysis of the general characteristics of the natural environment Tatar Sunda gives the idea of naming the village [1], namely: (1) *Galudra ngupuk* (2) *Pancuran emas* (3) *Satria lalaku* (4) *Kancah nangkub* (5) *Galagah katunan* (6) *Gajah palisungan* (7) *Bulan purnama*.

2) Typical shapes of buildings

a) *Roof form*: In traditional Sundanese architecture, there are several types of roof coverings, such as: (1) *Suhunan jolopong*; (2) *Tagog Anjing*; (3) *Badak Heuay*; (4) *Parahu Kumereb*; (5) *Julang Ngapak*; (6) *Capit Gunting*; (7) *Buka Palayu*; (8) *Buka Pongpok*.

b) *Building structure*: In general, the houses in the Sundanese village apply stilt houses, which are buildings that stand on a pedestal/stone foundation, so that they are in the form of a stage [1]. In addition to the stage, there are also known as *Ngupuk* houses, which are houses whose floors are directly attached to the ground without a pedestal, and *Depok* houses, which are houses made of permanent bricks and directly attached to the ground.

c) *Layout of houses and functions*: The layout is divided into three parts [4]:

- *Tepas imah, Tepas Imah*, which is the front of the house consisting of a yard and a terrace, which is usually provided with temporary seating and a long bench. *Tepas imah* is a men's area, because men are, involved in politics and external relations, as well as men's workspace outside.
- *Tengah imah, Tengah imah* in the middle part of the house consisting of a family room, guest room, and bedroom for children. *Tengah imah* is neutral, open to men and women, they can gather with family, even with guests
- *Pawon, Pawon* is the back that functions as a kitchen, consisting of *goah* (warehouse), *padaringan* (a place to store rice), and *hawu* (fireplace). *Pawon* is a special area for women because it is the center of women's activities such as cooking, washing, and the like. *Goah* and *padaringan* are symbols of femininity, even according to custom this space is a part of the house that is forbidden for men because the place to store rice is closely related to *Sanghyang Sri Pohaci* or *Dewi Padi*.

3) *Ornamental variety*: Ornamental variety in Sundanese traditional houses usually have several motifs that are used. For example, in the form of motifs of flora, fauna, nature, and calligraphy.

III. METHODS

Research on the adoption of the characteristics of traditional Sundanese architecture for the development of educational building designs uses descriptive qualitative methods. This method aims to describe a phenomenon that is the object of research, namely, studying traditional Sundanese architecture in educational buildings.

The data collection technique used in this study is the observation method. Observations were made to determine the existing conditions of UPI Purwakarta Campus and the characteristics of traditional Sundanese architectural buildings in Purwakarta Regency, seen from the *Citalang* traditional house, *Pasanggrahan Padjarandan Park*, and buildings in the Purwakarta Regency area. Documentation studies were carried out to obtain photos as evidence of documentation of the existing buildings of the UPI Purwakarta Campus and traditional Sundanese architectural buildings in the Purwakarta district in the form as seen in the field. Literature studies were conducted to collect data on theories about traditional Sundanese architecture from e-books, books, and journals. Unstructured interviews were conducted at the UPI Purwakarta Campus to determine the existing conditions of the UPI Purwakarta Campus, the managers of the UPI Purwakarta Campus who were the speakers in this study.

The stages of the analysis carried out were as follows: (1) Searching for data on a general description of the characteristics of traditional Sundanese architecture in Purwakarta Regency and design data of UPI Purwakarta Campus. (2) Data reduction is to simplify the data obtained during a data search in the field. By analyzing the traditional Sundanese characteristics in Purwakarta Regency and the design characteristics of the UPI Purwakarta Campus. Analyzed based on local wisdom, environmental management, and building forms. (3) The conclusion of the analysis of the form and application of the design is to produce the design characteristics of the UPI Purwakarta Campus development. The results of this study are in the form of adaptation and adoption of the characteristics of traditional Sundanese architecture, including the distinctive shape of the building, and the decoration into the design of educational buildings.

IV. RESULTS AND DISCUSSION

A. Existing Data of UPI Purwakarta Campus

Data obtained when making observations at the UPI Purwakarta Campus. The facilities at UPI Purwakarta Campus are laboratories, classes, office buildings, leadership houses, halls, school labs, canteens (student cooperatives), HIMA buildings, UPI net, libraries, mosques, official houses, and dormitories.

Based on field observations, conditions at the UPI Purwakarta Campus are still inadequate in buildings and educational facilities. So it is necessary to develop the design of UPI Purwakarta Campus to improve the quality of education in terms of fulfilling learning facilities. The following is the condition of the existing academic building / educational building at the UPI Purwakarta Campus (See Figure 1):



Fig. 1. UPI Purwakarta campus (Source: research data, 2020).

B. General Description of the Characteristics of Traditional Sundanese Architecture in the Purwakarta Area

The understanding of the characteristics of Sundanese traditional architecture in the Purwakarta area must be examined and the researcher chooses the Citalang Traditional House and Taman Pasanggrahan. As a reference in understanding the characteristics of Sundanese architecture in the Purwakarta area (see Figure 2).



Fig. 2. Traditional Sundanese architecture in the Purwakarta area (Source: research data, 2020).

C. Adoption of Sundanese Traditional Architectural Characteristics in the Development of the UPI Purwakarta Campus Building Design

1) Typical shapes of buildings

a) Roof form: [1] [5] and [6] form the building is traditional: Suhunan Jolopong (Suhunan Panjang), Tagog Anjing, Badak Heuay, Parahu Kumereb , Julang Ngapak, Buka Palayu, Buka Pongpok.

From the results of observations, Purwakarta Regency dominantly has the characteristics of the traditional Sundanese roof coverings, namely jolopong, julang ngapak, and parahu kumureb types (figure 3).



Fig. 3. Characteristics of traditional Sundanese roof covering in Purwakarta (Source: Anwar and Nugraha [3]).

The form of the roof used for the development of the UPI Purwakarta campus building design adopted and adapted the shape of the julang ngapak roof. The shape of the julang ngapak roof is the shape of the roof that extends on both sides of the roof plane. When viewed from the front of the house, the shape of the roof resembles the wings of a "sprawling bird".

The adoption of the rooftop shape for the development of the UPI Purwakarta Campus building design was used based on the Purwakarta area contextual considerations. The shape of the julang ngapak roof was adopted for the development of the UPI Purwakarta campus building design so that it has character in achieving high goals and ideals (figure 3).

The shape of the julang ngapak roof was adopted and adapted to the transformation technique so that the shape that was designed did not have to be the same as the original form.



Fig. 4. The adoption of the rooftop shape for the development of the UPI Purwakarta Campus (Source: research data, 2020).

1) Building structure: The building structure used for the development of the UPI Purwakarta Campus design adopts and adapts the structure of the house on stilts. A house on stilts is a building that stands on a pedestal/stone foundation so that it takes the form of a stage. The structure of the building on stilts is adopted using a transformation technique so that the shape designed does not have to be the same as the original form (figure 5).



Fig. 5. The adoption of the building structure for the development of the UPI Purwakarta Campus (Source: research data, 2020).

2) *Ornamental variety*: Ornamental variety in Sundanese traditional houses usually have several motifs that are used. For example, in the form of motifs of flora, fauna, nature, and calligraphy.

The adaptation and adoption in the development of the UPI Purwakarta campus building refer to the batik decoration. In this case, it examines the typical Purwakarta batik, namely Kahuripan batik for the development of the exterior building design of the UPI Purwakarta Campus (Figure 6).



Fig. 6. Batik Kahuripan (Source: research data, 2020).

Adoption and adaptation of exterior elements, namely: Ventilation, Walls, and Landscape. Adoption and adaptation refer to the typical Purwakarta Batik Kahuripan.

V. CONCLUSION

The UPI Purwakarta Campus Design Development is an effort to improve the quality of education in fulfilling learning facilities. In its design concept, this campus development adapts and adopts the characteristics of traditional Sundanese architecture. This was proposed with the aim that the development of educational building designs on this campus would still consider the contextual environment and identity of

the city. Traditional Sundanese architecture is adapted and adopted in the exterior aspect of the building, namely the campus building, in this case, the lecture building and the outside, namely the landscape element.

In the part of the building, the characteristics of Sundanese traditional architecture are adapted and adopted in the form of the roof, building structures, and ornamental variety.

The form of the roof used for the development of the UPI Purwakarta campus building design adopted and adapted the shape of the *julang ngapak* roof. The shape of the *julang ngapak* roof is the shape of the roof that extends on both sides of the roof plane. When viewed from the front of the house, the shape of the roof resembles the wings of a "sprawling bird".

The structure of the house on stilts is adopted and adapted to the technique of transformation and stylization so that the shape designed does not have to be the same as the original form.

Ornamental variety in the development of the UPI Purwakarta Campus building has adopted and adapted the typical Purwakarta batik, the Kahuripan batik. Adoption and adaptation of exterior elements, namely: Ventilation, Walls, and Landscape.

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