

Rereading the Relationship between the Architecture of the Bima Temple and the Enshrinements in North India

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ABSTRACT : This research attempts to study the relation between Javanese old temples and India. Dieng is a place that has functioned as a sacred place since the 7th century, perhaps even longer. Experts hold that the temple building in Dieng has been influenced by the architectural style of temples in South Indian-Dravidian Style, such as encountered in the Arjuna temple group and North India-Nagara Style in the Bima temple. Previous research has shown that the old Javanese temples have a special peculiarity in the tectonic of ceiling corbel which differs from the temples in South India. This study can strengthen the role of local architecture in building an identity that can be reflected for the present and the future. This research has been conducted with a qualitative approach by making a comparative analytic study to understand the architectural design of the Bima temple and its typological and morphological correlation with enshrinements in North India such as Bhitargaon. The variables considered are the figure, spatial layout and mass, and tectonic corbel. The results of this study indicate that although the figures seem similar, the tectonic corbel of the Bima temple shows similar differences in the processing of the details. The independent creativity of the Indonesian people in adapting to the existing

KEYWORDS: Bima, Bhitargaon, Corbel, Tectonics, Rereading

I. INTRODUCTION

local context is related to the estimated construction technology that makes a difference. Thus, the tectonic

corbel of temples in Java has a different uniqueness from South or North India since the 7th century.

Dieng is one of the places that according to estimations has served as a sacred place estimated since the 7th century and maybe even longer. This is evidenced by the existence of a temple building that can be connected with Hinduism and the ancient Mataram kingdom or even before the ancient Mataram was founded. The temple buildings are located in the central plains of Dieng and some are scattered on the surrounding hills [1]. Thomas Stamford Raffles claimed that there are literally hundreds of ancient temples in Dieng. This Lieutenant-Governor of the Dutch East Indies (1811–1816) visited Dieng in 1815 AD. In his report, he said the temples and ancient sites in Dieng numbered around 400 [2]. This site is believed to have been built by a highly sophisticated civilization, judging by its design and architecture. Of the temple buildings in Dieng there are currently only a few buildings left. They can be divided into four zones, namely the Arjuna Zone consisting of the Arjuna Temple, Semar Temple, Srikandi Temple, Sembadra Temple, and Puntadewa Temple; The Gatutkaca Zone comprising the Gatutkaca Temple, Setyaki Temple, Nakula Temple, Sadewa Temple, Petruk Temple, and Gareng Temple; the Dwarawati zone consisting of the Dwarawati Temple, Abiyasa Temple, Pandu Temple, and Margasari Temple; and the Bima Temple zon [3]. The names of these temples take the names of characters in the Mahabharata story. Who has actually given these names is anybody's guess, but this is reminiscent of the temples in South India in the Mahabalipuram area which took their names from the Mahabharata figures. In addition to the temple building in Dieng, there were found the remains of the Dharmasala or a fairly large dwelling for the rishis. The function of this residence is of course closely related to these temples, especially in terms of maintenance and worship[4].

According to experts, the temple building was influenced by the architectural style of temples in India, both South and North India. The influence of South India, according to Dutch experts, is visible in most of the building temples such as the Arjuna temple, Semar temple and others, while the impact of North India appears in the Bima temple alone[4]. Bima temple is indeed located separately from other groups of temples, so it becomes a question whether it was built by rishis of different ideals from others. The impression of Bima Temple is the only temple that has its own style apart from the others. This is most likely because other temples, which may have the Bima style, have collapsed so that they cannot be recognized again. This raises the suspicion that other temples such as the Bima temple style actually also existed but had collapsed so that they have not been rediscovered, considering that Raffles reported that there were 400 sites in the 18th century at Dieng.



Fig 1 Group candi Arjuna-Sembadra (left-centre) and Candi Bima (right) [5].

However, in the 2019 our research it can be seen that the relationship between the Arjuna temple (which is thought to be the oldest in Dieng) and South India shows another interpretation, that the influence from India to Java must be reread, because there are certain specificities such as architectural tectonics. Temples in South India such as in Kanchipuram are thought to have been built together with the Arjuna Temple. They have a tectonic space in a flat corbel-shaped roof with a post-and-lintel system, while the Arjuna temple has a triangular stacking corbel system. In addition, in southern India, old temples such as in Mahabalipuram still use the rockcut system, while in Dieng, a brick-like pile system has been implemented. It cannot be denied that the origin of temple architecture can be found in India, so its traces in ornamentation can still be recognized in the temples at Dieng such as the use of various Kudu motifs also found in Mahabalipuram, South India [5], [6]. Based on this study, the Bima temple also needs to re-read or re-interpret its relationship with India, especially North India or perhaps South India. This study aims to understand the architectural design of temples in Indonesia in relation to India by recognizing the peculiarities of its architecture. This particularity is important in building architectural identity in Indonesia during the Pre-Modern era. A connection with the past is a prerequisite for the appearance of a new and self-confident tradition [7]. This strong self-confidence is of capital importance in building Indonesia's existence amidst the strong global influence. The ancestors of the Indonesian nation are thought to have had a strong and superior architectural tradition, one of which is reflected in architectural works such as the temple building

II. METHOD

This research has been conducted with a qualitative approach by conducting a comparative analytic study to understand the architectural design of the Bima temple and its correlation with the enshrinements in North India. Previous research has found a correlation of its architectural patterns with South India. The variables that are considered in the analysis process are figure, spatial layout, facade-ornamentation, and corbel tectonics [8]. The analysis of this research was carried out in a descriptive argumentative manner to examine the relationship between the typology and morphology of Bima temple (candi) and North India. In general, the research steps taken are:

- 1. Assessing matters related to the architectural background of the Bima and North Indian temples through historical studies through literature studies, observations, data collection on the object of study (observation and interview methods). It examines the relationship between history and phenomena that affect its architectural form, such as the architectural style used.
- 2. Assessing the architectural designs of the temples of North India and the Bima temple to find the type of architecture through typology and morphology studies. The variables used are architectural elements, namely, spatial plans, mass layout, figures-façades-ornamentation-decoration, and tectonic ceiling corbel.
- 3. Examining the relationship between the architecture of the Bima temple and North India includes its design elements through a comparative study.
- 4. Identifying potentials that can be developed to build new architectural theories in Indonesia related to building temples.

III. THEORETICAL BACKGROUND

The experts have stated that the Bima temple was identical to the style of the ones encountered in North India, namely the Nagara Style. The shape of the figure of the Bima temple shows a real difference with other temples in Dieng such as the Arjuna temple and its surrounding groups. The Bima temple has a shape that resembles the Nagara Style in North India unlike other temples in Dieng that seem related to South India, namely the Dravida Style. What needs to be underlined is the relationship between the Bima temple and the Nagara Style in North

India [9]. In a statement at the Dieng Museum, it is said that the Bima temple is identical to the Bhubaneswara temple in North India. To be perfectly honest, it can be said that the figure of Bima temple is not identical with Bhubaneswara which resembles a bullet shape with a crown or amalaka resembling a circular disc.



Fig.2 Mahabalipuram temple – 7th AD (eft above-centre)-Dravida Style and Bharateswar Odisa – 6th AD (right above)-Nagara Style, kudu ornament at Mabhalipuram and Bima Temple (below) [8],[9].

Based on its figure, the Bima temple is more similar to the Bhitargaon temple, not Bhubaneswara. The Bhubaneswara Temple is located in the eastern part of North India due to the Odisa heritage[9]. This Bhitargaon is a legacy of Gupta dating back to the early years of the Common Era or AD. Historians align the Gupta dynasty with the Han dynasty, Tang dynasty and Roman Empire as models of classical civilization[10] Basically, the Bima temple has more to do with Gupta architecture which is the early style of the later Nagara Style that later developed in North India, so that its shape is more similar to the old Gupta temple compared to the Nagara Style such as in the Bhubaneswara temple.



Fig.3 Bhubaneswar, Bhitargaon, Bima Temple [8].

Gupta was the first dynasty to build Hindu temples with the type of free standing or independent and permanent standing, so they started the long tradition of Indian temple architecture. This type of old temples in India can also be a rock cut type, namely making a temple by carving a rocky hill into a temple like this is an early example of a Hindu temple built entirely of brick, dating back to the end of the 5th century AD. Although damaged at the top, the shikhara section is on all four sides and is curved showing the presence of shallow Gavaksha and pilaster recesses which decrease in size as the tower rises to the top. This Gavaksha niche is one of the peculiarities of Gupta architecture and generally of Hindu temple architecture. If in this Gavaksha there is a carving of a human head then this is called the Kudu motif that is widely used in South India, namely the Palawa-Dravidian style[11], [12].



Temple Architecture in the Gupta Period was a five-stage development process. The first stage is a Temple with a flat roof, a square Temple, then pillars are built in front of the temple. An example of this stage is the 17th Temple in Sanchi (Madhya Pradesh). In the Second Stage the flat roof and square temple were continued and so

was the use of the pillars. The shrine is now on the high platform/ raised platform. There is a closed ambulatory around the holy place. An example of a two-story temple is also seen. The Third Stage includes a square temple, pillared, high platform. The Nagara style is the successor to the third stage of making the temple. The fourth stage introduces the rectangular Temple while all other features continue. The Fifth stage includes the circular temple with shallow rectangular projections while everything else is continued. This Gupta style later developed into Nagara [13],[14].



Fig 5. The development from Gupta until Nagara, Dravida, and Vesara Style [14],[15].

IV. DISCUSSION AND RESULT

Shape : The Bima temple shows the division of figures that are identical to Bhitargaon, namely Sikhara (only the Amalaka at its peak in the form of the stupi in Bhitargaon has collapsed), Varandhika, Jangha, Vedibandha, and Pitha. The amalaka of the Bima temple is more round-shaped than round-flattened like a plate. This round pattern resembles a small dome egg like the Vesara style in Galaganatha Temple. Galaganatha Temple located in Karnatakha is a mix of North and South Indian styles. Based on the analogy of Gupta's enshrinement, Bhitargaon's amalaka is thought to be round but whether it is balled or flattened is unknown. However, this patterned form actually appears in the Dravidian Style.



Fig 6. Shape comparison between Bima and Bhitargaon Temple [9].



Fig 7. Crown of Galaganatha-Patadakal – Vesara Style, Kailasanathar – Dravida Style, Bima Temple [9],[13].

If the Bima temple uses this pattern, it is estimated that there will be influence from South India as well, such as the Kailasanathar temple in Kancipuram. In the figure, the temple of Bima can be compared with elements such as other temples in Dieng such as the division of 7 namely Stūpi, Śikhara, Gala, Prastara, Pada, Adhiṣthāna, Upapīṭha, which refers to the division in the Manasara Silpasastra book. There are several disguised elements such as the Shikara Bima temple showing similarities to the existence of a rounded peak [9].



Fig 8. Comparison between North and South India (above), Comparison between Manasara - Dravida style and Javanese Temple (below) [5].

Thus, it can be understood that the Bima temple is one that uses a unique style in Dieng. If it is related to India, there are two interpretations, namely:

1. The Bima temple is identical to the ones in North India but the temples before the appearance of the Nagara Style belong to the Gupta era. One of the temples whose figure is identical to the Bima temple is a Bhitargaon temple in the region of Central to West India. This style is very different from the temples in Odisa or North India on the East coast, such as Bhubaneswara. Bhubaneswara temples are Nagara Style temples. Bhitagaon is located in the hinterland of India which is far from the coast, so if this style has reached Indonesia it becomes a

topic of interest, although on the other hand history shows that King Balaputradewa (from ancient Indonesia) exerted influence as far as Nalanda which was also located in inland India.

2. The Bima temple has been influenced by Vesara or mixed style temples. This can be seen from the use of Amalaka which is rounded and identical to the temples in Karnataka or South India, namely Kanchipuram. This phenomenon shows that the Bima temple was not purely influenced by North India but also involved the South Indian style, especially in processing some of the details. This mixture shows that there is creativity in experimental designs because it produces a new look, even though there are traces of North and South, the results represent a new form that is different from the North and South India.

Corbel's Tectonics : Another interesting study is Ceiling Corbel's Tectonics on. When compared to North India, the arrangement of the roof space corbel shows a significant difference at all. The Bhitargaon or other temples in North India use a corbel pattern that is curved sharply, while in Bima temple it is not curved. The curved shape is reminiscent of pointed arch in Gothic architecture 6 centuries later. Bhitargaon perhaps using this curved pattern is thought to have had an influence from Mesopotamia tradition, which tended to be close to its location or other opinions were influenced by residential architecture such as the curved pattern in the caves in Ellora and Ajanta.



Fig 9. Pointed Arch and Arch [16],[17],[18].

This arch pattern is not used in old South Indian temples. Old temples in South India use post-and-lintel patterns like Greek architecture. Greece is closely related to the possible influence of Hellenism entering India. The temples in Karnataka also still show this post-and-lintel pattern. These temples in Karnataka are known for their Vesara style. In terms of the processing and arrangement of the construction of the temple roof corbel, the Bima temple shows no relationship with North India which is curved even South India which is post-and-lintel or Vesara. The Bima temple uses a corbel pattern that is triangular in shape.



Fig 10. Comparison Bima Temple 7th AD. (left) and South and North Indian Temple, 6-7th AD [9],[19].

The arrangement of the corbel cannot be separated from the vertical arrangement of the temple stones. When compared to India, the arrangement of temple stones in Indonesia shows the uniqueness of each, even though they are equally stacked. [20]. Temple buildings in India are divided into two types, namely the rock-cut technique or scraping which is the oldest technique and stacking technique. This rock-cut technique uses a solid

stone and subsequently engraves it into a building so that it is monolithic, while another method is to arrange the stones. Stone arrangement techniques in India are irregular in size so that there are large and small ones.



Fig 11. Profile moulding on stone and brick arrangement – India Temple [21].

This differs from the temples in Java. Temples in Java are more dominated by stone stacking techniques. The difference with the ones in India is that the stones used to arrange the temples are processed so that they have relatively the same size for each layer. Processed stones are cut according to the layers to be stacked so that they look tidier. The idea of processing this stone into relatively the same size is thought to have been inspired by brick material[9]. The use of this brick material has been known since the early AD era, namely in the heritage of the enshrinements in Batujaya in the 3-4 century AD, long before Dieng era. Brick is thought to have been used as a temple material in in the early days of temple architecture, apart from wood[22].



Fig.12 Stone Arranggement Arjuna Temple Dieng (left), Reconstruction of wooden building at Dieng and brick temple at Blandongan Temple Batujaya (right below) [5].

However, in its development, temples in Java also utilized stones. Stone is considered a more durable material than brick and wood so that it became the main material for a temple building [23]. When stone is used, ideas such as processed bricks are carried on so that the stones are then processed into materials that seem to resemble bricks even with a larger size. The use of this stone is basically not a new material, because the ancient Austronesian culture before the entry of Hindu-Buddhism also used it for building punden terraces. Religious buildings in the ancient Austronesian context were open spaces, stones were arranged to form an open staircase punden pattern, so that if the stones were arranged into buildings that had deep space, new technology was needed to build them. This technology is used as if it were a wooden and brick building.



Fig 13 Triangle Corbel at Javanese Temples[5]

The influence of North India and South India does not appear to have been strong at all with regard to the use of space corbel tectonics in the enshrinements in Dieng, especially with regard to seismic and material factors. In material terms, the ancient Mataram temples used small stone materials arranged in steps while the old temple materials in southern India were made of large stones or whole stones, while bricks were also used for old temples in North India, such as Bhitargaon. The technology of making temples in the ancient Mataram era from the 7th to the 10th century has gradually shown a novelty in building technology. This technology then developed as observed in the Bima temple and subsequently continued to develop rapidly so that the people of that era were able to build high and large temples such as the Prambanan Temple, Sewu Temple, and the like. The knowledge of building high rises for temples that are hollow or deep-space basically started on the island of Java because in the same year in India there were no buildings as tall and as big as Prambanan to be found.



Fig.14 Temple of Arjuna at Dieng, Bima at Dieng, Prambanan at Yogyakarta[9].

Spatial Planning and Mass : The study can also be seen from an angle based on the layout and mass. The mass arrangement of the ancient Mataram Hindu temples is known as the 1-1 and 1-3 patterns which are commonly used, but there are single-standing temples. It is possible that this single standing was single or the temple in the past could be made of wood, so that now it has been destroyed. This single building is reminiscent of a Gupta style building, which is like the Bhitargaon or early Nagara style. Do the Bima and Bhitargaon temples show whether the single building has the same mass system relation? This can be studied further, because it looks the same as singular. If there is no Perwara temple in front of it, then it is safe to conclude that these two temples are singular and different from other Mataram temples. The pattern of the temple arrangement in the ancient Mataram era forms a solid-void composition.



Fig 15. Comparison between the temple in Ancient Mataram era (above) and Indonesian Tradisional House (below) at Batak Toba, Toraja, and Lombok – The similarity placing the buildings facing each other [8],[24],[25],[26].

This is probably due to the influence of traditional local residential architecture – ancient Austronesian (as reflected in the relief picture) which has a division of outer space, intermediate space, and inner space. The layout of the buildings of the Ancient Mataram era being composed in a void-solid composition, it is estimated that due to climatic conditions and reasons for the surrounding environment, traditional houses were made facing or close to each other to protect each other, while in India this is obviously not the case [5]. This composition is identical to the mass structure of the temples. Ritual functions in Javanese temples are carried out not only inside, because the climate allows them to be carried out outside. In India, ritual activities tend to be used only in the inner space, while in Indonesia these can take place inside, in the space between/terrace, or outside. [27], [28].If it is associated with India, the mass structure of the old temples seems to be identical to North India, in single temples such as the Bima, Selogriya, Gebang temples (it is still suspected that the Perwara temples (part /sub-temple) were made of wood so that at this time its traces have been destroyed), while the influence of South India is not recognized in the temples of the Ancient Mataram era which uses the pattern of 1 main temple nd 3 ancillary temples. The pattern 1 - 1 is actually known in South India but has been modified so that this pattern is lost; this can be seen in the Kailasanathar temple in Kanchipuram which was originally identical to the Arjuna-Semar temple in Dieng.



Fig.16 Javanese Hindu Temple- Single : Gebang, Selagriyo, Sembadra (above); Arjuna temple; Kailasanathar (in the past) temple and Kailasanatar today (below) [5].

The floor plan or lay-out of the old temple of Early Ancient Mataram era shows that there is a spatial pattern influenced by North India and South India, but the statues placed in the interior are different[9]. The Ancient Mataram Hindu temple is filled inside with statues that are always the same, namely Shiva, Durga, Agastya, Nandiswara, Mahakala, and Ganesha [27],[29], while in the North Indian and South Indian temples, these statues can stand alone (not as a unit) and are placed in each of the temples. This shows that in the Ancient Mataram era, there was a unique and accommodative worship that was different from India. The shape of the plan between Java and India looks similar, and this can be seen in the Bima and Bhitargaon temples. The difference lies in the thickness of the walls of the temple. Temples in Indonesia have thinner walls than the ones in India, and this is possible because the construction system in Indonesia is more progressive, namely by using a triangular corbel pattern which is then directly supported by the wall. The walls are thinner because the force is transmitted directly from the top of the roof. In India the walls are thicker because they have to support the roof due to the post-and-lintel system so that the load on the walls becomes heavier because they have to gradually support the structure above them. This is what distinguishes the temples in Indonesia and in India, because the temples in Java are already familiar with a newer construction system based on the tectonic point of view, namely the triangular corbel, not the post-and-lintel system.



Fig.17 The Plan of Bima and Bhitargaon Temple [8], [21].

V. CONCLUSION

• The relationship between the Bhitargaon architectural style can be seen only in the Bima temple, while in other buildings in Dieng it does not appear to show such a relationship. The relationship is limited to the division of figures and silhouettes and some of the ornaments. This curved silhouette is also reminiscent of the younger Prambanan temple. The patterns of mass arrangement and floor plans show an identical pattern in the form of a single building in the middle with a cruciform floor plan. This arrangement pattern looks different from other temples in Indonesia, which are very distinctive and possibly strongly correlated with the ancient Austronesian culture and climate context. The corbel tectonics of the construction of the ceiling-roof of the temple does not show a relationship even though the figures look identical, namely using a triangular hollow/space stacking system, while the Bhitargaon in northern India uses curved, stacked corbels. This spatial arrangement pattern is thought to be typical of Indonesia, namely the use of stone materials with small dimensions - such as arranged bricks. Thus, it can be said that although at first glance the figures are similar, the tectonics (especially corbels) show differences as well as in the processing of details. This shows the creativity of the Indonesian people who are independent in adjusting to the existing local context, which is related to construction technology. Thus, in terms of space, temples in Indonesia such as the Bima temple are able to present an inner space with a ceiling that rises upwards, in contrast to Indian temples with a flat ceiling. This arrangement technique made the temple technology developed towards larger temple buildings such as Prambanan, Sewu, Kalasan and so on. This pattern allows the space in the temple to be wider compared to India. In terms of interior space tectonics, the temples in Java have different characteristics from South or North India. This is highly possible because of local creativity in using local materials.



Fig.18 Temples in India (left) (bounded by horizontal stretches and indentations of material so the walls are thick and temples in Java (right) allow the interior space to widen and the walls rise to adjust to be thinner than India [8]

This research is only the initial stage of identifying spatial-mass and tectonic patterns, especially in relation to North India. The Bima temple is always associated with Bhubaneswara in the North-East region, even though on closer inspection it is more similar to Bhitargaon in the North West region. Research can be developed and continued by making in-depth comparisons with the temple buildings so that the continuity and discontinuity of the elements and their mixtures can be recognized. There are new allegations of relations with the Pakistan region which in the past was part of the kingdoms of North-West India.



Fig 19 Bima, Bhitargaon, and Katas Raj temple-Pakistan [8]

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