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Spiritual Landscape Characterization of Muara Takus Temple Compound and Surroundings Area
Karakterisasi Lanskap Spiritual Kompleks Candi Muara Takus dan Kawasan di Sekitarnya

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Abstract

Muara Takus Temple Complex is one of the Buddhist monuments in the middle of Sumatra which is still mysterious. Until now, scholars have not been able to ascertain the span of its establishment because of very minimal historical sources. The landscape around the enshrinement has also changed drastically due to the construction of the hydropower dam in early 1990's, making it difficult to trace the context of the surrounding area. This study seeks to reveal the spiritual landscape character of the Muara Takus Temple and surroundings using an ethnohistorical and geoarchaeological perspective. The people living around Muara Takus Temple are inhabitants who have lived in the area for generations, at least since the 19th century because of reports by European explorers. These people still remember how the landscape was before the hydropower dam was built. This ethnohistorical data is very important to be recorded before the memory gradually fades. The correlation between the temples and the meaning of the landscape by the people for generations is a key that can help explain the position of Muara Takus Temple is in the context of its landscape.

Kompleks Candi Muara Takus merupakan salah satu monumen berlatar Budha di tengah Pulau Sumatra yang masih misterius. Sampai saat ini, para ahli belum dapat memastikan rentang masa pendiriannya karena sumber sejarah yang sangat minim. Lanskap di sekitar percandian ini juga telah berubah drastis akibat pembangunan bendungan PLTA pada awal 1990-an, sehingga konteks dengan kawasan sekitarnya sulit untuk dilacak kembali. Penelitian ini berupaya untuk mengungkap karakter lanskap spiritual kompleks Candi Muara Takus menggunakan perspektif etnohistori dan geoarkeologi. Masyarakat di sekitar Candi Muara Takus merupakan penduduk yang telah turun temurun mendiami wilayah tersebut. Setidaknya tercatat sejak abad ke-19 dalam laporan para penjelajah Eropa. Masyarakat ini masih mengingat bagaimana kondisi lanskap sebelum bendungan PLTA dibangun. Data etnohistori yang cukup penting untuk segera direkam sebelum ingatan tersebut lambat laun memudar. Penjelasan mengenai korelasi antara percandian dengan pemaknaan lanskap oleh masyarakat secara turun temurun tentu merupakan kunci yang bisa membantu menjelaskan bagaimana kedudukan Candi Muara Takus dalam konteks lanskapnya.

Keywords: Muara Takus, landscape, geoarchaeology, ethnohistory | Muara Takus, lanskap, geoarkeologi, etnohistori

Introduction

The Muara Takus Temples is the only Buddhist archaeological site found in the Kampar watershed. This site is in Muara Takus Village, District XIII Koto Kampar, Kampar Regency, Riau Province (Soedewo 2013). The discovery of this enshrinement was first reported by Cornet de Groot in 1860. He wrote a report in an article entitled *Koto Candi* (Bataviaasch Genootschap van Kunsten en Wetenschappen 1860). After de Groot, several experts from the Netherlands were getting interested to visit this site. Among them in 1879 carried out by G. Du Rij van Beest Holle (Bataviaasch Genootschap van Kunsten en Wetenschappen 1879) then in 1880 by W. P. Groeneveldt and Rogier Verbeek and Van Delden (Bataviaasch Genootschap van Kunsten en Wetenschappen 1881). Nine years later, from 1889 to 1890, J. W. Ijzerman conducted research to make measurements and descriptions of the temples (Ijzerman 1893) In 1935, F. M. Schnitger conducted deeper research at Muara Takus and concluded that the temples were thought to have originated from the 11th to 12th century CE (Schnitger 1937, 1939).

So far, no primary historical sources have been found, either inscriptions or ancient texts, which allude to the establishment of the Muara Takus Temples. The historical narrative about the temples is based more on interpretations from Chinese written sources. One of the foreign records that is often used as an analogy is the travel record of I-Tsing which was translated to English by Takakusu in 1896. I-Tsing's journey was carried out between 671-695 CE. When he was on his way to and from India to study Buddhism, he stopped at several places such as *Shih-li-fo-shih* and *Mo-lo-yu*. According to Takakusu, when I-Tsing visit those places in the middle of the eighth month and mid-spring, there were no shadows seen at these places during the days. It is often interpreted that the location is located around the equator, just like Muara Takus Temples (Takakusu 1896; Utomo 2010)

The name *Mo-lo-yu* mentioned by I-Tsing was later associated with Malay Kingdom within the Muarajambi area and several archaeological sites in the Batanghari watershed (Atmodjo 1992, Saudagar 2013). One of the reason is because there are several inscriptions found in this area that mention the same name, using the word *Malayu* or *Malaya*. The first is Padang Roco inscription dated around 1286 CE. This inscription wroted on the base of Amogapasha statue given by Śrī Mahārājadhiraja Kṛtanāgara (1268-1292), king of Singhasari – Java, to the people of Bhūmi Mālayu in Dharmmāśraya (Reid 2001, Utomo 2007). Later, in 1347 CE, another inscription are written behind this statue by the new king, Śrī Mahārājadhiraja Adityawarman (1347–1374 CE). In this inscription, the name of the kingdom is Malayapura (Kusumadewi 2012). Another name which was identical to Malayu and Malaya also found in Tanjore Inscription (1030 CE). This inscription was discovered in the ancient city of Tanjore, that today known as Thanjavur, southern part of India. It was written in the period of Rajendra Chola I (1014-1044 CE) who is famous for his expedition to conquer the important city of Sriwijaya in Southeast Asia (Kulke, et.al. 2009). Tanjore inscription mentioned some location name, including *Malaiyur* (probably Malaya or Malayu which is described as a city that surrounded by fortress and located on top of a hill (Arokiaswamy 2000).

According to Minattur (1966), the terms *Mo-lo-yu*, *Malayu*, or *Melayu* are absorption from the word Malaya which is a word in Sanskrit and means mountains. This word is a development of *mala* which means mountain or hill. The vocabulary of terms regarding hills and mountains is likely to have entered the archipelago along with the development of the Hindu-Buddhist religion, so that the

mention of locations that are identical to mountains was later referred to as *Malaya*, *Malayu* or like what I-Tsing wrote *Mo-lo-yu*. The name also has another form like Bhumimalayu or Malayapura (Minattur 1966).

Hills, mountains, and high place were the essential parts of Hindu-Buddhist religious sites because they represented Mahameru, a sacred mountain which is also the centre of the world where all physical, metaphysical and spiritual universes (Gopal 1990). They also play a role in religious rituals to reach spiritual experiences. In Buddhism, the journey to perfection in nirvana can be reached if someone is at the top of the temple and sees through the surroundings (Hersh 2016). Unfortunately, the current condition of the landscape around the Muara Takus Temples is difficult to envision an image of a religious site that fits the concept of nirvana. The creation of the Koto Panjang hydropower dam has submerged most of the area which is thought to have been associated with the archaeological context of the Muara Takus Temples. Several old settlements such as Koto Binamang, Koto Tengah, Batu Bersurat, Koto Intan, Koto Dalam were completely submerged. In fact, from the toponyms containing "koto", these settlements are assumed to have a correlation with the temples[1]. Koto Panjang hydropower project began in 1991, with the physical preparation of the location, land acquisition and relocation of residents to new residential areas. Dam construction was carried out between 1992 and 1995, while inundation was carried out in 1996 to 1997 (Akbar 2004). The inundation of the reservoir resulting from this project is 124 km^2 in area with a storage capacity of 1,545 million m^3. The maximum inundation height of the reservoir is 85 meters above sea level or around 30-40 m above the old, flooded settlements (Mulyadi 2003).

Based on the description above, the problems that arise are how to model the ancient landscape of the Muara Takus Temples and surroundings area and how to characterize it. The reconstruction model that will be used in this paper is based on two aspects. First of all is the physical landscape in the perspective of geoarchaeology and historical maps. The second is toponyms and the landscape meaning in people's memory. These two aspects are considered as the main principles for making an overview of the past conditions around the Muara Takus Temples, so that a complete picture of the concept behind the location of the Muara Takus Temple placement can be obtained. Including the correlation with landscape characteristic of other Buddhist temple sites which have not changed much from the past.

This article uses the basic concept of landscape from a physical perspective and from a spiritual perspective. The landscape in a physical perspective has an important role as a provider of resources for human life needs. However, various cultures around the world then developed their own concepts. All of these concepts certainly aim to maintain a balanced relationship between humans and the environment. Consequently, humans have philosophical concepts and beliefs related to the physical environment around them (Fahmi 2017, Ode et al., 2001). Based on this, it can be said that physical landscapes always have a certain meaning for human life (Fitrahayunitisna 2019, Puspawati 2016). The meaning of the physical landscape can be reflected in myths about physical environmental elements such as mountains, rocks, trees or water sources (Fahmi et al.

[1] The term "*koto*" probably came from Sanskrit word *kotta* (कोट्ट) which means a settlement surrounded by a wall or fortress. Old settlements of Muara Takus Village in 1990's are surrounded by dike which still can be seen today when the hydropower dam water is lower. The same dike is also found surrounding Muara Takus temples.

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2017). At this stage, the understanding of the landscape in a physical perspective then moves on to the landscape in a spiritual perspective (Tanudirjo et al. 2019).

The position and important role of a region towards a society in a broader cultural framework can be determined from its landscape characteristics. Landscape characteristics in an area can help explain the influence on the distribution of archaeological remains as a result of past human activities (Amato et al. 2018, Christiansen et al. 2016, Contreras 2017, Giaime et al. 2019). These landscape aspects can also be used to determine resource potential, both land resources, water resources and mineral resources contained in an area (Amato et al. 2018, Key et al. 2020, Storozum et al., 2019). This potential resource is the main factor for humans to be active in a certain area and within a certain period of time, leaving archaeological remains in it (Bachofer et al. 2018, Kelley & Sanger 2017, Storozum et al. 2019).

Significant changes in the landscape have occurred over the last few decades. The main causal factors are the expansion of land for agriculture and plantations, the industrial revolution, and the growth of urban areas (Bürgi et al. 2004, Martin et al. 2006). It is very important to trace changes in the landscape in order to explain and compare past and present conditions, and their role in making projections of future changes (Danese and Gioia 2021). From an archaeological perspective, changes in landscape have a role in seeing the development of a culture. The present condition of the landscape can be the key to explaining the condition of the landscape in the past. Of course, equipped with a framework of thinking about the type and character of change, the phase of change, as well as the time span of the change. The description of landscape conditions in the past is clearly an interpretation, but this interpretation has a scientific basis that can be justified (Crumley et al. 2017). Furthermore, the depiction of landscape conditions in the past will be able to present a conservation design scheme in archaeological areas that is more local knowledge-oriented. So apart from protecting the archaeological remains, the cultural values contained therein will also remain sustainable (Fairclough & van Londen 2010).

Describing the characteristics of the physical landscape of the past can also help the interpretation process regarding the meaning of the landscape from a spiritual perspective. The relationship of three aspects between physical existence, religious practice, and spiritual experiences in forming the level of immanence and enlightenment can be traced in more detail (Dewsbury and Cloke 2009). Temple sites with Buddhist background are part of a monk's spiritual journey in achieving enlightenment. Pilgrimage and spiritual journey had already become an important part of Buddhist community life (Ditthisampanno et al., 2022). In this case, Muara Takus Temples considered to be an important object for those pilgrimage in the context of Buddhism in Sumatra. The location is very far from the east coast of Sumatra, which is the main access to ancient trade routes as well as the main travel route for monks as told by I Tsing (Takakusu 1896). Unlike Muarajambi and the Buddhist sites in Palembang which are close to the coast. The character of the landscape is also different because it is in the hills, while Muarajambi and Palembang are in the lowlands. The spiritual experience of Buddhists who make the sacred journey to Muara Takus will be different from journey to other sites. This experience will guide a person's immanence to interpret it in a broader form, such as in religious and even political aspects (Corten and Doran, 2007). On a religious level, immanence will refer to the relationship between life in the world and life after death or *moksa*. Immanence at the political level will be seen from how social life autonomically operated in the past. For example, the conceptualization of *devaraja*, giving names to kings, place names (toponyms), identical locations, forms of material culture, and legitimizing political power.

Geographical Condition of Muara Takus and Surroundings

Muara Takus Temples is located at 0° 20' 10" N and 100° 38' 32" E. The topographical conditions in this area and its surroundings are varied. Around the temples, the topography tends to be plain with flat to gentle slopes. The elevation ranges from 85 – 100 meters above sea level with a slope between 0% – 3%. This plain area is part of the valley where the Kampar River flows. On the north and south sides of this plain, it is interspersed with hills with smooth to moderate relief with elevations ranging from 100 – 200 meters above sea level and slopes between 4% - 10%. Rows of hills with moderate to rough relief are found to be a barrier to the area on the northeast and southwest of this area so as to form a distinctive landscape character. The Muara Takus Temple area is a large basin surrounded by hills. The elevation of the hills with moderate to rough relief ranges from 200 – 800 masl with the highest peak being on Suligi Hill (812 masl). The slope of the slopes on these hills is between 11% and 60%.

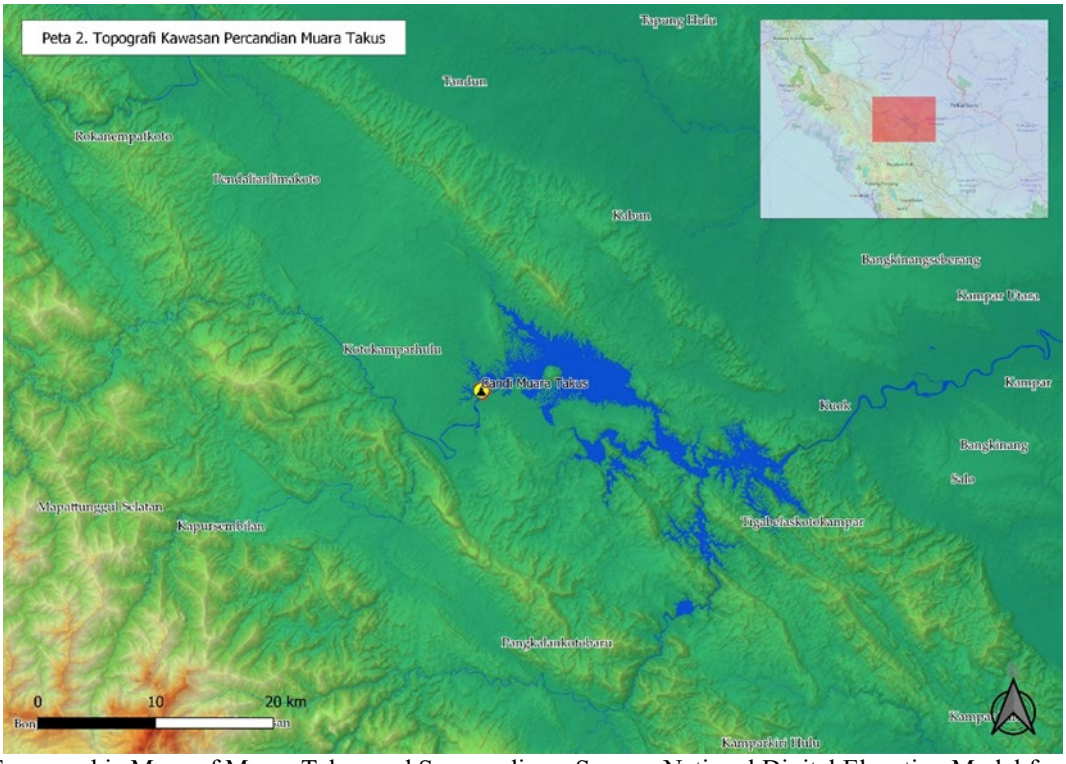

Fig. 1 Topographic Maps of Muara Takus and Surroundings. Source: National Digital Elevation Model from Badan Informasi Geospasial (Indonesian Geospatial Agency) https://tanahair.indonesia.go.id/demnas/#/demnas

Such topographical forms cannot be separated from the geological and geomorphological processes that take place in the area. Referring to the geological map of the Pakanbaru sheet, the Muara Takus Temples area is located in the Muaratakus Graben which is between two large faults, namely the Balung Fault on the southwest side and the Rokan Fault on the northeast side. This Graben Block is oriented northwest - southeast and is part of the Central Sumatra Basin. The Central Sumatra Basin is a basin on the Sunda Shelf which is located at the back of the volcanic arc formed due to the interaction between the Indian Ocean-Australian Plate and the Eurasian Continental Plate so it is referred to as a back-arc basin. The interaction of these two plates also forms a northwest-southeast oriented parallel physiographic unit, in the form of island arcs along the southwest coast of Sumatra, namely the Nias-Enggano fore arc ridge, the Barisan volcanic arc, the back arc basin and the Sumatran fault zone (Sumatra fault zone). Great Sumatra Fault Zone) or better known as the

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Semangko Fault. The geometry of the Central Sumatra Basin is asymmetrical in shape with the deepest part in the southwest sloping towards the northeast (Barber et al. 2005, Mertosono and Nayoan 1974).

The regional geological structure of the Central Sumatra Basin is characterized by fault blocks. This fault block system has a north-south alignment orientation forming a series of horsts and graben. This basin also has shallow Pre-Tertiary bedrock, so that the sediments covering it are very easily influenced by bedrock tectonics. Therefore, in this area there are many geological structures such as faults and joints. In general, the geological structure in this basin has wrench tectonic characteristics. Therefore, faults have large dip and form structures such as upthrust and flower structures. These structures have a north-east dip direction and a north-west dip direction, thus forming a large angle to the convergent vector (Mertosono and Nayoan 1974, Metcalfe 1996; Pulunggono and Cameron 1984).

The rock formations that make up the Muara Takus Graben at the top are the Telisa Formation which was formed in the Early Miocene to Middle Miocene. This formation was deposited in an environment ranging from inner to outer littoral with greater upward sea influence. The Telisa Formation deposits are characterized by a brownish gray color consisting of carbonate shale, siltstone and limestone in certain places. Local compression is characterized by the formation of faults and folds at the inversion stage which occurred simultaneously with the decline in global sea levels 28 million years ago. The Telisa Formation dominates the entire Muara Takus Graben. A layer below this formation, there is the Sihapas Formation which both cover the graben and are both members of the Kampar Group. The Sihapas Formation itself is a monotonous sequence of shale mudstone containing a small amount of sandstone and siltstone alternating which indicates upward progressive shallowing and sea conditions. Outcrops of the Sihapas Formation around Muara Takus Temples can be found at several elevations such as the Bukit Langgai row on the north side of the temple, Bukit Tunggal, and the southwest side of Selegi Hill (Julikah et al. 2021; Suandhi et al. 2013).

Under the Sihapas Formation, the Kuantan Formation is unconformably found which is one of the oldest rock formations in Sumatra. This formation was formed simultaneously with the Tanjungpauh Member, Pawan Member, and the Bohorok Formation. The ages of these formations are Late Carboniferous to Early Perem or around 300 million years ago. In the Sumatra pre-tertiary geological scheme, these four formations are included in the Tapanuli Group which is part of the West Sumatra Plate. The lithology of the Kuantan Formation consists of shale and phyllite with inserts of slate, quartzite, siltstone, chert and lava flows. Outcrops of this formation can be found in a row of hills on the southeastern side of Muara Takus Temples. Some of the hills that are part of the outcrop of this formation are Round Hill, Batu Hill, Bukit, Lintabung and Partupangan Hill. Another dominant rock formation from the Tapanuli Group is the Tanjungpauh Member. The lithology is muscovite, chlorite, carbonate schist with strong linearization. Its outcrops can be found in a row of hills on the southeastern side of Muara Takus Temples such as Cubadakgumpal Hill, Tarpanggang Hill, Sipadamapi Hill and Rangau Hill. This row of hills is also a barrier to the southwest and south sides of the Kampar River so that it turns right through the Bohorok Formation (Julikah et al. 2021; Suandhi et al. 2013).

Although the estimated age is the same, the lithology of the Bohorok Formation is somewhat different because it consists of wake malihan, slate, quartz malihan sandstone, conglomerate malihan siltstone. According to Barber et al. (2005), there are traces of permafrost sediments in this formation. Therefore, this lithology is thought to have been deposited in a marine environment near

the south pole before the West Sumatra Plate separated from the Pangea Supercontinent. This outcrop of the Bohorok Formation is found extending to the northeast of the hills of the Kuantan Formation and fortifies Graben Muara Takus. The hills of the Bohorok Formation are penetrated by the Kampar River where the Koto Panjang hydropower dam is currently located. Until now, the flow of the Kampar River between Rantauberangin and the Koto Panjang hydropower dam has formed a canyon whose orientation is perpendicular to the strike direction of the Bohorok Formation. This canyon was also used as a strategic location to dam the Graben Muara Takus basin to become a reservoir.

Apart from the several rock formations above which are quite dominant, the geological conditions around the Muara Takus Temples area also consist of young alluvium formations. This formation consists of gravel, sand and clay which are often found around the Kampar River and the Koto Panjang hydropower reservoir. This alluvium formation was deposited above the Telisa Formation which borders the Sihapas Formation on the southeast side. There is also an irreducible minor intrusion of volcanic rocks between these formations which forms the Katangka Hill structure. Other intrusions are also found to the southeast in the form of granite intrusions, such as Bukit Basar and Bukit Parhantian Bunian. This is quite reasonable because the Central Sumatra Basin has the characteristics of faults and tight joints as stated above. These hills can still be seen even though the water in the hydropower reservoir is high. The joints that are found around this area also form several fracture structures and rock fissures which the community calls caves.

The geomorphological processes that occur in the Muara Takus Temples area are currently more dominated by the existence of the Koto Panjang hydropower reservoir. The high reliefs whose genesis are structural hills and some volcanic intrusion hills are seen to be experiencing lateral erosion processes on the slopes. This erosion depends on the water level of the reservoir which is always fluctuating. The fluvial terraces resulting from this process can be clearly seen. The material resulting from this erosion process is deposited locally, so that during low tide, the bottom of the fluvial terraces contains a lot of material, ranging in size from clay, silt to sand. In addition to the fluvial process, community activities in the form of the process of opening new land for the needs of resettlement settlements and plantations, both oil palm and rubber, also have an influence on changes in topography and land use in this area.

Physical Landscape Traces Before Hydropower Dam

In understanding the spatial pattern of the temples and its relation to the supporting community of culture and the surrounding environment, the most important aspect that must be known first is the cultural landscape of the classical period. The temples are a holy place for the gods that was built on Hindu and Buddhist concepts, which govern several aspects such as architectural design, building materials, directions faced, and even site selection. Therefore, the temples that were built in the classical period must be located in places that are considered sacred. In these places, the gods are believed to reside. Referring to the opinion of Kramrisch (1976: 3-7), humans must make a pilgrimage to these places in order to achieve the purity and perfection of final release (*moksha*). As a manifestation of the gods that are worshiped, statues are placed in these places and even temples are built as the house of the god.

The limitations caused by the inundation of the Kotopanjang hydropower reservoir make it difficult to trace traces of past cultural landscapes. The aspects to be investigated are quite diverse, starting

from toponyms, transportation access networks, subsistence spaces, residential spaces, as well as other traces related to past human life. All these traces must have been tens of meters below the level of the reservoir now, like a sunken city. Therefore, one method used in this research is to trace traces of the cultural landscape from old maps and satellite images before the inundation occurred. The old map used in this study is a geological map made by R. D. M. Verbeek in 1880, maps produced by the Topografische Bureau 1894-1897; maps produced by the Topografische Dienst 1926-1928; and printed RBI maps produced by Bakosurtanal published in 1984 (see Figure 2).

The oldest map that describes the Muara Takus Temples Area in sufficient detail was obtained from a geological map made by R. D. M. Verbeek in 1880 entitled Geologische Kaart van Sumatra's Westkust Blad VIII Paja Koemboeh. This map was published by the Dutch East Indies geological and mining institute named Mijnwezen with a scale of 1:100,000. Although the focus is on depicting rock formations from a geological point of view, this map also depicts river channels, roads, settlement locations, toponyms, and of course the location of the temple's buildings. The map shows that the settlement in Muara Takus was quite dense and is located at the confluence of Ajer-Takoes (Sungai Takus) and Ajer Kampar (Sungai Kampar). The Muara Takus Temples on this map is depicted as Hindoe Ruine, as the Dutch called other archaeological remains of that period. Access to Muara Takus Temples from this settlement appears to be a footpath because it is depicted in the form of a dotted line. Several other settlements around the temples that have been described include Tandjoeng (Tanjung), Goenoeng Boengsoe (Gunungbungsu), Kotta Toea (Kototuo), Pongkai, Benamang (Binamang), Batoe Besoerat (Batu Bersurat), Silakut, Tandjoeng Alei (Tanjung Alai), and Moeara Mahi (Muara Mahat). These settlements are located on the Kampar River, as are the traditional settlements of people in Sumatra in general. Roads are also described as having connected these settlements.

The maps made in the later period were those made by the Topografische Bureau on sheets of Boekit Gandoeng, Goenong Amas and Koto Baharoe. These three maps were made between 1894 and 1897 and published in 1900 at a scale of 1:80,000. Another map from around the same period was made by Topografische Dienst between 1926-1931 and published in 1932. It consists of three maps with the codes Blad 18/XVI, Blad 19/XVI and Blad 19/XVII. These maps by Topografische Dienst have a scale of 1:100,000 and depict the same elements as previous maps.

The most recent map that can describe the condition of the cultural landscape before the inundation of the Kotopanjang hydropower reservoir is the Topographical Map of Indonesia which was made in 1977 and published in 1984. The map showing this area consists of four sheets, namely the Tanjungbalit Sheet, the Kuok Sheet, the Batubersurat Sheet, and the Kotobaru Base Sheet. The scale of the map issued by Bakosurtanal is 1:50,000, and so it can display landscape elements in more detail. The method of making the map was much more modern compared to the previous maps because it used aerial photogrammetry, which improved the accuracy and precision of the map.

Based on these maps, the cultural landscape of Muara Takus Temples is likely to be closely related to the existence of old settlements and natural features around the Kampar River. The busiest activity centers during the Dutch East Indies period until the 1970s were probably around Binamang City to Katangka Hill. This can be estimated by looking at the settlements depicted on these maps. In addition, these settlements support elements such as large rice fields consisting of wetland rice fields and dry land rice fields. The existence of this paddy field is influenced by the high density of tributary rivers originating from the hills on the north side, such as the Pematang Gambir to Suligi Hills. The extent of this rice field has a relationship with the culture that was

developed from generation to generation. This is because the tradition of rice farming, both dry rice fields and wet rice fields, emerged from the Neolithic culture and then developed further in the classical period and persisted until that period.

Serial observations on the old maps also show changes in the placement and pattern of residential spaces. In general, this case is often found in traditional settlements in Southeast Asia. Locations of traditional settlements have always been made on the banks of rivers to facilitate access, both access between residential areas and access to their subsistence resources. The houses are generally made of wood with a stilt house architecture that uses a knock-down system so that they can be disassembled and moved. The orientation of the house was also always facing the river. However, with such a settlement pattern, of course it will be directly influenced by the winding process.

As stated above, the geological structure around the Kampar River is an alluvium which also acts as a meander belt. The river channel is always changing, because there is an erosion process in the outer bend and there is a sedimentation process in the inner bend. Generally, people call this outer bend the bay, while the inner bend is called a cape. This name is still embedded in one of the toponyms near Muara Takus, where the winding process produces extreme bends. When the residential space is in the erosion zone (bay), the river walls will gradually be eroded so that the structure of the house will be disrupted. And vice versa, the sedimentation process that occurs in the deposition zone (cape) will cause the house to move further away from the river. Therefore, residential spaces are always moving along with this winding process. And the remaining traces are in the toponyms, so that in the Sumatra region many toponyms use the terms *tuo* (old), *mudo* (young), *baru* (new), *lamo* (old), behind them. Although winding occurs, the flow pattern of the Kampar River is considered more stable because there are no traces of oxbow lakes or horseshoe lakes which are traces of a winding river.

One example of this case of displacement of residential space occurred around the Muara Takus Temples. The Koto Dalam settlements in 1880 and 1894 appear to have dense residential spaces and are in an erosion zone. In the same year, the Muara Takus settlement opposite it was in the sedimentation zone and the number of residential spaces was not too dense. In the 1920s and 1930s the number of houses and the size of residential space in Koto Dalam began to decrease, while in Muara Takus it increased. There seems to be a process of resettlement from Koto Dalam to Muara Takus. This movement was increasingly visible in 1977 because as a whole, the settlements in Koto Dalam were not described, even the name Koto Dalam itself was not found. Searches in the field indicated traces of occupancy in the Koto Dalam settlement, such as the presence of an Islamic tomb with the character of a Malay tombstone made of granite.

Fig. 2 Settlement of Koto Dalam and Muara Takus circa 1890s (left); Koto Dalam and Muara Takus in 1930s (middle); Koto Dalam disappeared and Muara Takus 1970s. Source: Topografische Bureau 1894-1897, Topografische Dienst 1926-1928, Bakosurtanal 1984

In addition to the pattern of residential space, changes can also be seen in access between regions. As depicted on the 1894 – 1897 map, there are many boat symbols depicted on the Kampar River. This shows that the people's main access at that time was the river with the main means of transportation being boats. However, with the opening of land roads and the increasing number of motorized vehicles, access has become more dominant on land. The orientation of the house also of course changes to facing the street. Even so, currently people around Muara Takus Temples are also found using boats to go to the location of the garden or just looking for fish.

Landscape Characterization of Muara Takus and Surroundings

When the spatial patterns and spatial changes in the area described above in the 1900s are then drawn to the time when the Muara Takus Temples was still in a systemic context, it would certainly be interesting. Temples as religious monuments are very natural if placed in areas that are relatively more stable than the process of meandering rivers, such as having a more stable rock structure and soil type. Conversely, settlements for the community certainly do not have to be in the same area as the temples, but instead are placed in locations close to rivers or agricultural land. This assumption can be proven by observations from geological maps and conditions in the field that the Muara Takus Temples was built in an area included in the Telisa formation. Although no in-depth research has been carried out, the community settlements are probably located in the alluvial plains around the Kampar River. One of them is the boundary between the Telisa formation and the alluvium formation found on the north side, where currently there are areas that have lower topography and are always inundated when the hydropower water discharge rises. This area is also included in the scope of the embankment surrounding Muara Takus Temples, so it is thought to have a role as a community residential space at that time, because the location is relatively closer to the river.

This is a challenge in itself to see how the traces of community settlements have been submerged by the Koto Panjang hydropower reservoir. Does it actually have archaeological potential that is directly related to Muara Takus Temples? This should be suspected because on old maps toponyms have been found which are thought to have a strong relationship with the existence of Muara Takus Temples. Some of them are toponyms containing the terms *koto*, *batu bersurat* (inscribed stone), and *binamang*. The toponyms on these old maps refer to a continuation of names that have a correlation with names from the classical period.

One of them is the toponym which has the word *koto*. The word *koto* itself comes from the Sanskrit of *kotta* (कोट्ट) which means a settlement surrounded by a wall or fortress. Near the Muara Takus Temples, there is the toponym Koto Dalam which is located across the Kampar River. Several toponyms with other koto elements are Koto Lamo, Koto Tuo, Koto Sabar, Koto Ranah, Koto Tengah, Kota Binamang, and Koto Bagindo. All of these toponyms are found within a 10 km radius from Muara Takus Temples along the Kampar River. As is well known, the Muara Takus Temples itself actually represents the concept of a *kotta* because it is surrounded by an artificial embankment and forms a fortress-like structure. Therefore, it is possible that several toponyms containing the element *koto* also have the same finding indication. The earthen rampart and moat around are indeed man-made structures that are often found on sites from the classical period. This structure serves as a territorial boundary as well as a means to support security, both from human factors, animals, and other natural conditions. Apart from being in the form of man-made physical structures, settlement boundaries are also sometimes marked with plants, especially bamboo species planted around certain areas.

The toponym of Batu Bersurat is also thought to have a relationship with Muara Takus Temples. The same toponym is also found around Suroaso, West Sumatra, which refers to the stone inscriptions issued during the Adityawarman period (1347–1374 CE). According to the local history of the surrounding community, the name *batu bersurat* or *batu basurek* around Muara Takus refers to an event where a *datok* (king) wrote promises and curses to the area and was engraved on a rock. The stone was then thrown into the Kampar River. This story may be related to the existence of inscriptions from the Srivijaya period. Most of the Sriwijaya period inscriptions contain curses for areas that do not want to be ruled by Srivijaya (Izza 2019). Muara Takus Temples itself is also strongly suspected of having been the territory of Srivijaya in the late 900s when the Candi Bungsu was built. Based on Chinese records from the Song Dynasty period, the King of Srivijaya in that period, Sri Cudamani Warmadewa, in 1003, sent an envoy to China. This envoy reported that in his country a Buddhist temple had been completed for the emperor. The Chinese emperor who rejoiced at the offering named the temple *cheng tien wan shou* (Candi Bungsu) and sent a bell which was then installed in the temple. The offering was given by the King of Sriwijaya because the Song Dynasty had helped Srivijaya to defeat the invading Javanese army (Schnitger 1939).

Another toponym that is strongly suspected of having a relationship with the classical period is Binamang. This toponym has a close relationship with the name Minanga Tamwan which is mentioned in the Kedukan Bukit inscription (682 AD) found in Palembang City. In the inscription it is stated that Dapunta Hyang had made a sacred journey departed from Minanga Tamwan carrying two *laksa* (20,000) troops with supplies of 200 crates on boats, with another 1,312 troops on foot. Their goal is likely to attack the Wanua Sriwijaya which is thought to be in Palembang today. This is known from the name Mukha Upang written on the inscription. Downstream from the city of Palembang there is still the name of Upang Village which is located on the front side (*mukha*) when walking from the Bangka Strait. Although the location of Minanga Tamwan is still debated, at least two historians and archaeologists, namely Poerbatjaraka and Soekmono, have expressed the opinion that the location is in the vicinity of the Kampar River (Poerbatjaraka 1951; Soekmono 1973).

This opinion of course must be examined more deeply, considering the position and distance between Binamang and Palembang. The journey taken by Dapunta Hyang's group takes time from the 7th of the bright half of the Jyestha month to the 5th of the bright half of the Asadha month when they arrive at Mukha Upang. At least the trip was taken for 28 days using boats and land routes. If using a boat, of course the route is through the Kampar River, the Malacca Strait, the Bangka Strait, and then enters the Musi River. The land route taken by the other 1,312 troops was probably through routes where there were traces from the same period, such as the Padang Candi Site (Kuantan), Tuo Sumay (Muara Tebo), Karang Berahi (Merangin), Muara Sawah (Sarolangun), Tingkip (Musi Rawas) and Muara Rupit (Musi Rawas) which just enters the Musi River via Kijing Bay. Troops going through this route were likely chosen to attack from the rear. However, it can be presumed that during their journey they also gathered other forces from the areas they passed. It is known that one of the areas that Dapunta Hyang once conquered was Karang Berahi. The assumption regarding the relationship between Binamang and Minanga Tamwan also needs to be examined with the existence of other toponyms that have similarities, namely the Binanga toponym around the Padang Lawas Baths. Of course, to answer these assumptions, in-depth research is needed. Even so, it can at least provide an alternative explanation for these toponyms. Binamang itself was the center of community activity in the 1880s to 1970s. This can be seen from the old maps that described the area. So, it is not impossible that the Binamang area was developed since the classical period or when the Muara Takus Temples was in the context of its system.

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What is no less interesting when talking about Muara Takus Temples is the character of the physical landscape around it. If the activity centers and settlements were around Binamang and Batu Bersurat, then Muara Takus Temples would have been a relatively high area compared to these residential areas. The height of the triangulation point around Batu Bersurat is recorded at 63.1 m. This figure is depicted on maps of the 1890s, 1930s, and 1977. The elevation is much deeper than the elevation at Muara Takus Temples which is around 100 m. The difference in height ranges from 35 to 40 m. Therefore, if you imagine the condition of the landscape in the period before there was inundation, it will undoubtedly be very different from the current conditions. The concept of the temple as the embodiment of Mahameru will be very visible at that time. Moreover, it is supported by the presence of heights, such as Katangka Hill and Suligi Hill. The character of this landscape will provide additional spiritual experiences for people who visit it from downstream by boat via the Kampar River. The journey through the big river, the deep gorge around the current dam, closes with a view of the expanse of the mountains which are the backdrop of the temples.

The role of the hills and stretches of hills in this area may also have been the basis for why the Muara Takus Temples was built there. Included in it is the concept of the establishment of the temples. The first thing that is quite suspicious is the direction from Muara Takus Temples itself. When measured using a compass, Muara Takus Temples has an orientation of around 75° or not straight to the east like several Buddhist temples such as Gumpung Temple and Borobudur Temple. Muara Takus Temples tends to face northeast. Although no constellation is found in its entirety, this direction does not seem to be cosmically oriented, but is more chthonic in nature, or oriented towards the dominant natural features (Kusumawati 2004). When viewed on a topographical map, the direction facing Muara Takus Temples, especially Tuo Temple, looks straight with the top of Katangka Hill. The distance between Tuo Temple and Katangka Hill is 6 km. Katangka Hill itself is a volcanic intrusion that appears in the fractures of the Telisa formation. Some of the materials for the Muara Takus Temples during the restoration were also taken from this hill. Observations on the map were further verified using oblique aerial photographs, thus showing the phenomenon more clearly.

Katangka Hill is currently not dominantly visible as a tall structure. The relief contrast is low because it is obscured by the inundation of the reservoir. Likewise with one of the hills that is between Bukit Katangka and Muara Takus Temples. Based on interviews with the people around Muara Takus, the name of this hill is not clearly stated. It's just that people often call it Penanjakan. These two hills appear to be increasingly affected by erosion from the ebb and flow of the reservoir. Even though if you look closely at the map, between Muara Takus Temples, Penanjakan, and Katangka Hill, it forms a straight line with almost the same intervals. The arrangement of these three formations is reminiscent of the imaginary axis arrangement of Buddhist temples in Central Java, namely Mendut Temple, Pawon Temple and Borobudur Temple. Although there has been no in-depth research on this imaginary axis constellation, some experts believe that the construction of the three temples in a straight line is certainly intentional. One of them is the opinion of a researcher from the Planetarium and Observatory, Widya Sawitar, who thinks that the Borobudur-Pawon-Mendut alignment is related to three stars in the constellation Orion named Alnitak – Alnilam – Mintaka. However, this opinion has not been supported by further research. Research on the relationship between the direction facing the temple and celestial objects conducted by Aini et al. (2018) is limited to stating that Borobudur Temple is aligned with the Sun, namely during the equinox, winter solstice and zenith passage, while Pawon Temple and Mendut Temple are only at the zenith passage (Aini et al. 2018).

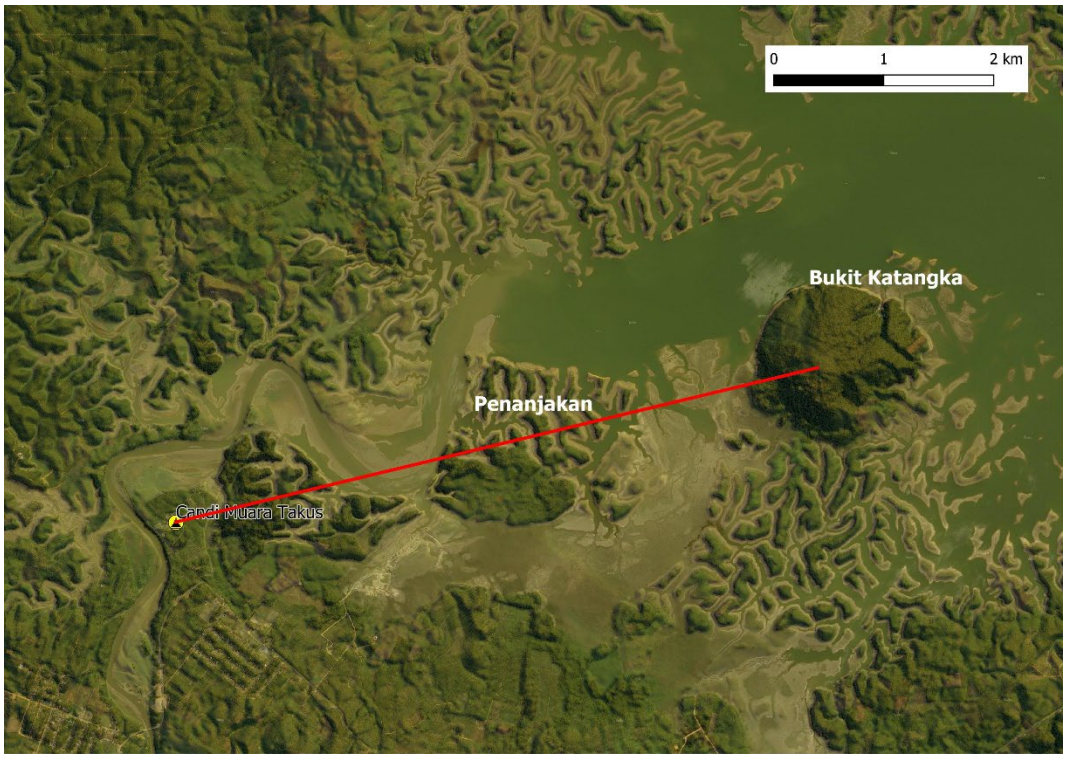

Fig. 3 Straight line between Muara Takus, Penanjakan hill and Katangka hill in low water season. Source: Airbus DS Imagery Data 2017 captured from Yandex Sattelite Imagery in QGIS

Referring to the opinion of Taylor (2003) and Fatimah (2014), the imaginary axis between Mendut Temple, Pawon Temple and Borobudur Temple represents a macrocosm diagram in the embodiment of the constellation of the temple buildings. This diagram forms a spiritual landscape heritage which is part of the worship ritual. The basic concept of worship in Buddhism is a journey to perfection in nirvana. The attainment of this nirvana is represented when one is at the top of the temple, and can see the scenery around him. The temple and the nature around it are an inseparable whole that describes the universe. The placement of the temple in the valley is considered to be able to channel cosmic energy from the surrounding mountains. This position is also likened to the flow of water from the mountains which can fertilize agricultural land in the valleys (Fatimah 2014; Taylor 2003). Therefore, apart from the imaginary axis connecting the elements of the sanctuary, the surrounding environment can also be considered as a universe on a smaller scale.

The concept as mentioned above seems to be found in the cultural landscape at Muara Takus Temples. In addition to the lineament between the temples and the two hills to the east, the character of the hillsides surrounding Muara Takus Temples also bears a resemblance to that of Borobudur. If Borobudur is surrounded by mountains with peaks such as Mt. Merapi, G. Merbabu, G. Andong, G. Telomoyo and Menoreh, then Muara Takus Temples are surrounded by hills with the peaks of Suligi Hill on the northeast side and Malin Hill on the southwest side. It's just that the view of the hills in Muara Takus is hindered by the presence of oil palm plantations. This view can only be seen in a few locations, such as from the north side of Katangka Hill. It's just that these hills don't look high because of the effect of the inundation of the reservoir.

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Hills and hills that are considered sacred in the temple complex and sites with a Buddhist background seem to be an element that must be presented. Apart from representing Mahameru, these hills also play a role in religious rituals, such as meditation and other religious phases. When one visits the hill, one will have a spiritual experience. Because the hill is the embodiment of the center of the universe. Sometimes, the absence of hills in an area can be realized with artificial hills or other similar structures (Hersh 2016). Some examples of these hills include Bukit Siguntang in Palembang, Bukit Perak or Bukit Sengalo in Muarajambi, Awang Maombiak Hill in Dharmasraya, Dagi Hill in Borobudur, and Baturagung Hill in the Prambanan area.

According to Minattur (1966), the term *Mo-lo-yu,* which is also mentioned in I-Tsing's notes (Takakusu 1896), is an absorption from the word Malaya which is a word in Sanskrit and means mountains. Another use of names related to hills and mountains can be found in the word *śailēndra*. According to Coedes (1983), *śailēndra* is another form of writing for *śaila* (mountain) and *indra* (king or God). The word *śailēndra* first appeared in the Sojomerto inscription (circa 725 AD). The word *śelēndra* in this inscription is thought to be the first milestone in the presence of the Śailēndra dynasty in Java. This word is also later found in the Kalasan inscription (778 AD) which relates to the mention of Rakai Panangkaran as *śailēndrawamsatilaka* (jewel of the Śailēndra dynasty). This dynasty is also strongly suspected of having founded several temples with Buddhist background like Borobudur, Sari, Kalasan, Plaosan, and Sewu. One of his descendants later became the greatest king of Sriwijaya, namely Balaputradewa (856 AD). Balaputradewa ruled Sriwijaya after so long that no hstorical record of the Srivijaya king ruling in Sumatra was found. The king before Balaputradewa who was found to have ruled in Sumatra was Sri Maharaja which was written on the Ligor B Inscription in 775 CE (Coedès 2010; Coedès et al. 2014; Jordaan and Colless 2009).

The presence of the Śailēndra dynasty in Java later became a debate among historians. Some think that this dynasty originated in India, some think it is from Sumatra, some think it is from mainland Southeast Asia, and some think it is from Java which is the successor of Sanjaya (Dwiyanto 2004; Jordaan and Colless 2004, 2009; Tjahjono 2013; Wurjantoro and Djafar 1996). But at least the term *śailēndra* still has a connection with the mention of mountains (Heine-Geldern 1942; Hersh 2016). Another term that is possibly related and has the same meaning as *śailēndra* is *indragiri*. Indragiri is another name for Batang Kuantan, one of the main rivers in Riau which comes from the words *indra* (king or God) and *giri* (mountain). In the upstream area of this river there are also sites from the Sriwijaya period, namely the Padang Candi Site (Putrina Taim 2014, 2020). This site is relatively close to Muara Takus Temples. That is why the origin of Śailēndra dynasty and its relation to the classical sites in the Indragiri and Kampar watersheds are very interesting.

The etymological relationship between the terms regarding the concept of the mountains (*malaya*) leads to an assumption that Muara Takus Temples has a close relationship with the remains of the Śailēndra dynasty. One of the assumptions is the similarity of the architecture of the building. At first glance, the Muara Takus Temples, especially the Candi Tuo, and the Borobudur Temple have similarities in terms of architecture. Its basic form is a mandala and consists of three levels where the top level is in the form of a stupa (Gammon 2009). The period of development and the dynasty that developed are also strongly suspected to be related because they existed at the same period and the same architectural concept, namely during the period when Srivijaya and Śailēndra were in charge.

Fig. 4 The architecture of Candi Tuo (left) shown the similarity to the architecture of Borobudur (right). Source: Photo by Gun Faisal 2021 (left) and kemenparekraf.go.id (right)

No less interesting is the assumption regarding the concept of the landscape which is the background for the construction of these two temples. The characteristics of the landscape also have similarities because they were established in areas surrounded by hills and mountains. Hills and mountains that are considered sacred is an element that must be presented in the temple development. Apart from representing Mahameru, these hills also play a role in religious rituals, such as meditation and other religious phases (Hersh 2016). The basic concept of worship in Buddhism is a journey to perfection in nirvana. The attainment of this nirvana is represented when one is at the top of the temple, and can see the scenery around him. The temple and the nature around it are an inseparable whole that describes the universe. The placement of the temple in the valley is considered to be able to channel cosmic energy from the surrounding mountains (Fatimah 2014; Taylor 2003).

Conclusion

Based on the description and explanation above, the question that then arises is whether Muara Takus Temple has a relationship with Borobudur Temple? Both in terms of architecture, landscape characteristics and cultural landscape, the development period, as well as the dynasty that built them. The same characteristics can be seen from the architecture of the building, between Candi Tuo and Borobudur Temple have similarities where the basic form is a mandala which consists of three levels and at the top level is in the form of a stupa. The characteristics of the landscape and cultural landscape also have similarities because they were founded in areas surrounded by hills and mountains, and both have a relationship with sacred hills. The period of development and the dynasty that developed are also strongly suspected to be related because they existed at the same time, namely during the period when Srivijaya and Śailēndra were in the throne.

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