

The Ambiguous Feasibility of Borobudur Temple

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This study used secondary economic data to evaluate the financial and economic feasibility of the construction of Borobudur temple in the context of 9th century civilisation. The study used high-level theory based on the post-processual paradigm to apply social criticism to an ancient society, and it implements a cost-benefit analysis (CBA) to extend this archaeological study and make it more flexible in the context of managing collective life. Financial illustrations are demonstrated from simple CBA simulations covering the 100 years following the temple's construction, which demonstrate a negative net cash flow. The results indicated that the construction of the Borobudur temple was not economically feasible. Although the existence of Borobudur Temple offered non-financial benefits such as strengthening social cohesion and instilling pride and admiration in the people, it reflected the sufferings borne by the community; particularly the tax burdens and the negative impacts of slavery and associated *shima* practices.

Keywords: *Collective Memory, Post-Processual, Cost-Benefit Analysis (CBA).*

Background

A monumental building serves as a form of collective memory management embodied in material culture, as it provides a large-scale, publicly visible embodiment of the ideology, beliefs and power of its builders (Dark, 1995: p. 205; Thomas & Kelly, 2007: p. 26; Roossenop. 1-3). The phenomenon of monumental buildings has existed in human societies for at least the past five millennia, in the form of sacred buildings (places of worship and tombs), as well as secular buildings such as palaces, forts and public facilities (Duruy, 1898: p. 10-18; Pollard, 2011: p. 6-7). During the last millennium, monumental building construction has accelerated in terms of their number, scale, variety and geographical spread.



The phenomenon of monumental buildings in the development of human civilisation is very important and interesting to study for several reasons. Firstly, the phenomenon shows the dynamics of the transformation of the metaphysical dimension in the form of material culture, which provides an overview of the dynamics of the economic development, power, technology and ideology of the civilisation concerned (Dark, 1995: p. 191-195; Koentjaraningrat, 2009: p. 184-210; Trigger, 1990: p. 119-120). Secondly, the establishment of monumental buildings in principle involves the allocation of scarce resources, which has consequences on the development of social welfare. It is important to evaluate the financial and economic feasibility of allocating these resources (Campbell & Brown, 2003: p. 1; Stiglitz, 2000: p. 272-274), as the misallocation of resources has a great potential to reduce the level of social welfare.

One of the most remarkable monumental buildings representing ancient Javanese culture is the Borobudur temple in Central Java, Indonesia, built by the Shailendra dynasty during the Hindu-Buddhist period of the 9th century AD (Coedes, 1964: p. 134; Soekmono, 1976: p. 46). Borobudur is the largest Buddhist site in the world and it remains in use today. Borobudur Temple was once designated as one of the Seven Wonders of the World and is now a UNESCO world cultural heritage building. Pollard (2011: p. 176-179) argued that Borobudur was among the 40 most fascinating heritages of the ancient civilisations in the world.

A major attraction of Borobudur lies in the mystery that surrounds it (Miksic, 2010: p. 29). There are no records that enable people living in the world today to know exactly who constructed it and why it was constructed. Likewise, questions arise about how the extravagant costs incurred in its construction were handled and what benefits were derived by people living at that time. These issues raise the intriguing question: Was the decision to construct Borobudur financially and economically viable? The purpose of this study is to evaluate the financial and economic feasibility of the construction of Borobudur temple in the context of Central Javanese civilisation in the 9th century.

Methodology and Analytical Framework

This is an archaeological study that makes use of secondary economic data and applies theory based on the post-processual paradigm (Thomas & Kelly, 2007: p. 36-47). This study also implements a cost-benefit analysis (CBA), which extends archaeological studies and makes them more flexible; in order to better manage understandings of the dynamics of collective life (Magetsari, 2016: p. 491-505). The analytical technique applies a combination of qualitative and quantitative methods. A qualitative approach is used for the archaeological analysis, whereas the quantitative analysis makes use of the CBA method.



Deconstructive Analysis

Deconstruction is a radical criticism of modernist social theory, which tends to be structuralist and positivist in its emphasis on the existence of universal truth. Deconstruction is one of the main components of the postmodernist school of thought, which epistemologically accepts the presence of multiple cultural forms and their associated ideas (Thomas & Kelly, 2007: p. 39-43; Hodder, 1991: p. 7-10). Postmodernism rejects absolute truth, which is structured and able to be perfectly translated in the form of a text (Lyotard, 1996: p. 61-67; Cahoone, 1996: p. 14-19). According to Derrida (1996), a text is not able to express a universal truth, because it is a special, limited and local representation (Derrida, 1996: p. 6-10). Signs always precede presence; signs appear before objects. The focus of Derrida's textual analysis was not on seeking objective meaning, but rather uncovering other meanings through the freedom of interpretation (Lubis, 2014: p. 71-114). Deconstruction offers to change understandings that seem definite and familiar, according to tradition or the message itself, such that it becomes open to new perspectives; it is a movement against philosophical ambitions to master meaning and the construction of meaning. Mastery of meaning desires to arrive at absolute knowledge; however, deconstruction is a rejection of the metaphysical hierarchy attached to binary logic. Language is not only a means of communication or a bridge between experience and the world, but is also ideological, after revealing the metaphysical hierarchy, reversing and neutralising it (Haryatmoko, 2016: p. 213-228).

Deconstruction does not always have a negative meaning. It can also be positive because it adds or expands the understanding of a text. Deconstruction even provides new insights and builds new matters, because it opens up thoughts that are closed (O'Donnell, 2003: p. 58). For example, in the field of archaeology, the ideas of postmodernism have stimulated studies that expand and enhance the ability to construct past lives. Deconstruction-based analysis offers an instrument that is able to reintegrate metaphysical aspects with positive empiricism. Artefacts and other forms of material culture can be seen as texts, which are freely interpreted to add and produce new understandings of past cultures and their consequences for the present and preparation for the future (Magetsari, 2016: p. 274-299). The principles of deconstruction have endowed archaeology with a greater and broader ability to give new meanings to human actions in the past from the perspective of contemporary value systems.

In this study, deconstruction analysis allows an alternative interpretation of the construction of Borobudur temple in the 9th century AD from the point of view of the current 21st century value system. This new understanding results in a constructive social criticism.

Cost-Benefit Analysis

The construction of a monumental building involves an unusual allocation of resources that desperately needs economic analysis, which will give us a better and more comprehensive understanding of past civilisations. One useful analytical tool for the evaluation of resource allocation in archaeology is CBA. The management of cultural heritage, museums, tourism activities, industries and services based on cultural resources are examples of archaeological fields requiring CBA.

Campbell & Brown (2003) defined CBA as a series of processes for identification, measurement and comparison of the benefits and costs of resource allocation plans in projects and programmes (or a series of multiple projects) (1). The output of CBA is a recommendation of the feasibility of the proposal for the analysis of a single project unit. In the analysis of more than one project plan, CBA is useful for identifying viable and non-viable proposals, and then establishing a feasibility rating. These results form the basis to determine which projects can be immediately undertaken and which should be postponed or even rejected. The use of CBA enables adjustments to be made to the allocation of resources in order to generate resource savings.

Economic analysis can also be applied to the evaluation of public or private investment plans by expanding the scope of costs and benefits (Gabay, 2008: et al., p. 212-214; Stiglitz, 2000: p. 272-274). The application of CBA in the private sector focuses on the financial benefits for investors; however, the application of CBA in government projects is broader, as the calculated costs include those to be borne by other stakeholders beyond the investors (external costs), such as noise, pollution and environmental damage. The calculated benefits also include those enjoyed by a wider circle of stakeholders (external benefits), such as improvements in the quality of the environment, or the social or community benefits conferred by the presence of the completed project. Thus, external benefits and costs are both monetary and non-monetary. Monetary costs and benefits can generally be calculated in terms of money, whereas non-monetary costs and benefits cannot be calculated using the value of money.

Description of Candi Borobudur

Religious Background

The shape, structure and spirit of Borobudur can only be understood from the perspective of Buddhism, which originates in the *Sutras* and *Tantras*. It can be said that the reliefs carved on the walls of the Borobudur indicate the existence of distinctive Buddhist teachings, which were a subtle integration between Mahayana and Tantric teachings of Buddhism, particularly from the



Sanskrit and Ancient Javanese book *Sang Hyang Kamahayanikan*. This distinctive blend of indigenous Javanese and Indian Buddhism is also evidenced by the selection of *sutras* and *tantras* that can be practised in harmony, with no apparent cosmological conflict. This implies that the monasteries in Java already had comprehensive religious libraries, thus allowing the integration of religious teachings in a unified and holistic manner (Magetsari, 2016: p. 85-110).

The predominance of these two Buddhist schools affecting the Borobudur temple does not mean that the other streams did not have any influence on its form and uses. Archaeologists have identified many Buddhist streams in the Borobudur reliefs. The similarity among the various schools of Buddhism is evinced in their agreement that life is suffering, that the cause of suffering can be eliminated, and that there are ways to eliminate it. Thus, the way (*yana*) of eliminating the cause of suffering was developed by the various schools of Buddhism (Magetsari, 2016: p. 111-122).

The Social Context of Politics and Culture

Borobudur was built at the peak of the Shailendra dynasty's reign during a period when the system of government was highly feudalistic and rulers were selected through conquest and lineage. At that time, there were two competing forces in the region, namely the Hindu Sanjaya dynasty and the Buddhist Shailendra dynasty. The only written evidence of the existence of the Sanjaya dynasty in Central Java is the Canggal inscription, which is dated to 732. After that, the Sanjaya dynasty was suppressed by the Shailendra dynasty, and the area was dominated by inscriptions from the Shailendra family. Nevertheless, it appears that the Sanjaya dynasty still retained some power, albeit limited (Soekmono, 1976: p. 44). The geographical area of the kingdom contested by the Shailendra and Sanjaya dynasties is the part of present-day Central Java then known as the Mataram kingdom (Miksic, 2010: p. 29-30; Munandar, 2015: p. 164).

Because the temples in southern Central Java are mainly Buddhist, whereas those in northern Central Java are Hindu, it has been concluded that the Sanjaya dynasty came to power in the latter area, whereas the Shailendra dynasty dominated the former. In the middle of the 9th century, the two dynasties were united through the marriage bonds between a prince of Sanjaya, Rakai Pikatan and Pramodawardani, a daughter of the Shailendra dynasty. Nonetheless, the two dynasties appeared to have competed with each other to build temples. The Sanjaya dynasty constructed Hindu temples, the largest of which was the Prambanan temple in Yogyakarta. Meanwhile, the Shailendra dynasty constructed Buddhist temples, of which the largest was Borobudur, also known as Kamulan (Soekmono, 1976: p. 42-49).



The technology used to build temples is believed to have been obtained from the South Indian region; however, differences in form indicate that this knowledge was combined with local wisdom and ingenuity. The construction of the temples was also supported by the development of stone carving, sculpture and the performing arts (Dumarcaay, 2003: p. 21-45; Haryonop. 159-163; Joesoef, 2015: p. 46-56).

The Economic Development Context

The dominant economic activities of the 9th century in Java were agriculture and commerce. The major agricultural product of Central Java and Java in general was rice and thus Java Island came to be known as the Rice Island (Jawadwipa). There are no records of the extent of rice cultivation, the number of harvests per year or the rice productivity per hectare of that time. There are also no records of the population size, thus, it cannot be estimated whether the people of the area were able to live decently from rice farming. However, surviving reliefs of market scenes being visited by officials or nobility riding elephants show the availability of a well-developed infrastructure, made possible the exchange of goods and services. Moreover, a relief depicting a sailboat on one wall of the Borobudur temple indicates that overseas trade had already been established at that time, particularly with overseas nations such as India, China and the kingdoms of the Indochina region (Church, 2009: p. 41-43; Coedes, 1964: p. 56-66; Harjono, 2000: p. 140-187; Lombard, 2005: p. 4-13).

Cost and Benefits Structure

This section discusses a very simple simulation to show whether the decision to construct the Borobudur temple was financially rational. The simulation will indicate whether the financial benefits derived from the construction of the temple were greater than the financial costs. To perform such a financial analysis, the basic questions include: 1) how much initial investment was incurred? 2) what were the maintenance costs? 3) what was the price of entrance to Borobudur temple at that time? The challenge is that this data is not available; therefore, logical estimates were made.

Cost structure

Construction costs of the Borobudur temple

As mentioned above, due to the limited information available, estimation of the construction costs of Borobudur temple could only be performed through indirect means. There are two kinds



of information that can be used as a basis for estimating the construction costs of Borobudur. The first is the time and labour needed to build the temple and the second is the cost of renovations carried out in 1983.

The time required to build the Borobudur temple was between 50–70 years (Joesoef, 2015: p. 7) or more than half of the total reign of the Shailendra dynasty (Soekmono, 1976: p. 47). If the total manpower employed consisted of 5000 people over a period of 70 years, then the cost in labour wages would amount to about USD 1.3 billion in today's terms. Manpower was needed to: remove the soil carved from the hill to be used as the foundation of the temple; carry 77,500 m³ of andesite stones; chip off the slopes of the hill to form an anchor for the foundation; the main structure and the roof of the temple; as well as other construction work. Artisans and artists were also required to create hundreds of Buddha statues, hundreds of stupas, thousands of metres of relief carvings, 504 Buddha statues and other works. Considering the breadth and complexity of the work undertaken, the number of workers deployed per day would have been greater than 5000 people and the labour costs would have been higher than USD 1.3 billion. The funds estimated to obtain building materials and other materials would have reached more than USD 2 billion.

The second type of information that can be used to estimate the construction costs of Borobudur temple is the restoration costs incurred during the period 1973–1983, which amounted to USD 24 million and were borne by UNESCO and the Indonesian government (Joesoef, 2015: p. 17). The present value of USD 24 million spent in 1983 was calculated by adjusting it to the inflation rate from 1983–2017 in Indonesia. Data from Indonesia's Central Statistics Agency (BPS) shows that the rate of inflation in Indonesia was as follows: 13.7% per year in 1983–1996, 13.3% in 1997, 74.2% in 1998, 15.2% in 1999, 19.5% in 2000, 9% per year in 2001–2013, and 5% per year 2014–2017. Based on this data, the value of USD 24 million in 1983 is equivalent to USD 1.1 billion in 2017.

With reference to Joesoef's description (2015: p. 10-17), it can be concluded that the cost of renovation was much less than the total cost of construction of the Borobudur temple. If the cost of renovation was approximately only half the cost of the construction of Borobudur, then it could be estimated that the total construction cost was about USD 2.2 billion. Prior to the renovations carried out in 1973–1983, the Dutch colonial government had already carried out partial renovations in the early 20th century, which used up considerable amounts of money. For example, partial renovations were done with a budget of 48,800 guilders in 1902 and partial renovations were also carried out with a budget of 34,600 guilders in 1910 (Soekmono, 1976: p. 43-44). Therefore, as the cost of the construction of Borobudur would have been several times the renovation costs, its value was much greater than USD 2 billion.



Based on the two sources of information described above, the estimated construction cost of the Borobudur temple of USD 2 billion USD is likely too small. As a preliminary study, these assumptions can be temporarily accepted until more complete information is obtained. Thus, the construction cost of Borobudur temple is estimated at USD 2 billion.

Borobudur Maintenance and Operational Costs

As a monumental building, Borobudur was built in an area surrounded by mountains, including the famous and still very active Merapi volcano. The risk of damage due to day and night temperature differences, high rainfall causing the growth of mould, as well as damage caused by volcanic ash would require enormous maintenance costs. Furthermore, as a magnificent building of worship and the pride of the rulers of the time, the demands for high-level, extensive and luxurious religious rituals would have been enormous. All of these factors naturally required a very large budget.

Assuming that maintenance and operational costs were 1% of the cost of construction, then the budget required per year would have been USD 20 million or Indonesian IDR 280 billion, at the current exchange rate of about IDR.14.000/USD. The above estimates might be considered too high; however, Borobudur's maintenance and operational costs reach tens of billions of rupiah per year. If the Shailendra dynasty had continued to rule, then Borobudur's maintenance and operational costs would have continued to increase with the ageing of the temple and the rulers' growing desire for self-expression. For the time being, the maintenance and operational costs are assumed to have been USD 5 million per year, which is much lower than the ideal requirement, particularly for the costs of organising religious rituals.

Financial benefits

The revenue from rent can be predicted more accurately than costs. Because the Borobudur temple is a sacred building, its establishment was not intended to earn a profit. Accordingly, the revenue from entrance fees at that time is assumed to have been zero. There might have been voluntary contributions from pilgrims, because Borobudur was visited by many during its heyday; however, such value was certainly not significant and likely to have been unpredictable. Therefore, the overall financial benefits of establishing Borobudur temple are estimated to have been zero.

Again, in contrast for the time being, the maintenance and operational costs are assumed to have been USD 5 million per year, which is much lower than the ideal requirement, particularly for the protocol costs of organising religious rituals.

Fund Flow Management Structure of Borobudur Temple

Based on the information and assumptions elucidated above, the flow of funds for 100 years could be estimated if the Shailendra dynasty had continued to rule. The nominal fund flow is translated into the present value by using the discount factor, i.e., the number representing the expected productivity of the resources allocated to a particular project or programme. The discount rate factor used is 5%, which indicates the social productivity of money allocated in the economy. This figure makes sense for an agrarian society. As shown in Table 1, this fund flow structure is used to evaluate the financial feasibility of the construction of the Borobudur temple.

Table 1: Hypothetical structure of Borobudur temple benefit cost analysis

Year	Benefit	Initial Investment	Operations & Maintenance	Total Costs	Discount Factor	Present Value of Benefits	Present Value of Costs	Present Value of Net Flow	Accumulated Present Value of Net Flow
0	0	2000	0	2000	1.000	0	2000.0	-2000	-2000
10	0	0	5	5	0.744	0	3.72	-3.7	-2040
20	0	0	5	5	0.377	0	1.88	-1.9	-2066
30	0	0	5	5	0.231	0	1.16	-1.2	-2080
40	0	0	5	5	0.142	0	0.71	-0.7	-2090
50	0	0	5	5	0.087	0	0.44	-0.4	-2096
60	0	0	5	5	0.054	0	0.27	-0.3	-2099
70	0	0	5	5	0.033	0	0.16	-0.2	-2101
80	0	0	5	5	0.020	0	0.10	-0.1	-2102
90	0	0	5	5	0.012	0	0.06	-0.1	-2103
100	0	0	5	5	0.008	0	0.04	0.0	-2104
Accumulated Present Value of Net Flow =								-2104	

The figures in Table 1 (columns 2–5) show the nominal value of benefits received and costs incurred over 100 years. By using the discount factor, the nominal figure translates into the present value (columns 6–9). If in year 10, the discount factor figure is 0.744, meaning that every USD 1 million received or spent in the 10 years to come, then the present value would be USD 744,000. In year 10, the nominal fee would be USD 5 million from the current value of USD 3.72 million.



Table 1 shows that up to year 100, the deficit suffered would be USD 2.104 million or IDR .29.5 trillion. The deficit is determined by the total cost of construction of the Borobudur temple and the operational costs of maintenance. If the values of the initial investment and maintenance operations are great, then the deficit will be greater.

The financial infeasibility of the construction of the Borobudur temple is evaluated based on the rationality of resource use. Table 1 above shows that the net flow of funds would have always been negative from the beginning to year 100. This means that additional financial costs for construction and maintenance would have been greater than any financial benefits. The flow pattern shows that the construction of Borobudur temple was financially irrational or unfeasible.

This raises the question of whether the funds allocated to construct the Borobudur temple were the cause of the collapse of the Shailendra dynasty. The need for funds to complete the construction of the Borobudur temple was IDR 28 trillion, which in the present context is still a very large amount of money. If the Shailendra dynasty currently still had control over the area of Central Java, then building Borobudur would require additional tax revenues greater than IDR 28 trillion. The target additional tax revenue would not be possible to achieve, as the current total tax revenue of Central Java province is only IDR 10 trillion per year.

Given that rice cultivation was the main agricultural activity in the 9th century in Java, the economic carrying capacity for the completion of Borobudur temple would have been inadequate. Central Bureau of Statistics of Central Java 2015 data shows that up to the 21st century alone, the total area of paddy fields was approximately 992,000 hectares. Only 340,000 hectares are technically irrigated to enable them to be harvested twice a year. The yield of rice fields in Central Java is relatively low, i.e., approximately five tonnes of grain per hectare per year. Due to inefficiency, the profit margin of rice cultivation is not large, only 20%. If the price of one tonne of grain is IDR5 million, then one hectare of rice fields will only provide a profit of IDR5 million. To generate IDR.28 trillion would require 5.6 million hectares of rice fields that produce 28 million tonnes of rice, or six times the current capacity.

Lombard (2008: p. 22) estimated the population of Java in 1850 to have been 9.5 million people. Referring to the data of world population growth, which during was 0.53% per year in the 19th century, 0.45% per year in the 18th century, 0.29% in the 17th century and 0.04% per year earlier centuries (Todaro & Smith p. 262), then the population of the island of Java in the 9th century is estimated to have been approximately 2.5 million inhabitants. If 30% of the population was living in Central Java, then there would have been 850,000 inhabitants. Considering the very young age of people at marriage during ancient times combined with the shorter life expectancy, the portion of the productive age population would not be dominant, likely totalling only



approximately 400,000 people. If the entire workforce was used to cultivate rice fields, then the maximum tillable land would have been 100,000 hectares, which would only produce 2% of the funds needed to construct the Borobudur temple.

The projection of 2.5 million for Central Java's population in the 9th century could be too high. Some estimates of the population of Central Java in the 18th century at the time of the Islamic Mataram Sultanate indicate that the maximum population during this period would have been 1,035,000, excluding people living in the Dutch-controlled coastal areas (Ricklefs, 1974: p. 114). Based on the growth assumptions conveyed above, the population of Central Java in the 9th century is estimated to have been about 600,000, of which only two-thirds would have been economically productive. Surely the extent of cultivated paddy fields would have been much smaller than 100,000 hectares.

Economic Analysis of the Construction of Borobudur Temple

External Benefits of the Construction of the Borobudur Temple

The external benefits of the construction of Borobudur temple would have been the pride of the people in their kingdom. Additionally, the Borobudur temple strengthened the cohesion between groups of people during the time of the ancient Mataram kingdom. Borobudur also fostered a sense of friendship and mutual understanding between local and outer communities through interaction and integration of values (Joesoef, 2015: p. 90-93; UNESCO, 2005: p. 21-23). Furthermore, as Magetsari(2016) declared, Borobudur was a symbol of the integration of Buddhist schools of perfect and coherent Buddhism, which had never been achieved anywhere else during Hindu-Buddhist times. These matters would have been very influential in improving domestic and international political stability, which in turn would have strengthened the dignity of the state. Ultimately, stability, growth and economic development would have increased, thus contributing to the improvement of people's welfare (Magetsari, 2016: p. 10).

The problem is that most external benefits were perceived as intangible and subjective. Most of these external benefits were enjoyed by a handful of people, namely rulers and other political and religious elites. It can be assumed that the mass population did not enjoy these coveted external benefits, specifically the expansion of employment opportunities, freedom from poverty and an improvement in the dignity of individuals. Another problem is that even while the Borobudur temple enhanced social cohesion, the additional sacrifices that the people had to make were greater than the additional benefits.



External Costs of the Construction of Borobudur Temple

In terms of the scale and structure of the building, the impact of the construction of the Borobudur temple on environmental damage can be assumed to have been limited. Likewise, there was likely zero negative impact of the Borobudur temple construction on land function because it was built on a small hill that was not suitable for rice fields. The external cost of the Borobudur temple construction that is most important to be discussed is the decline in people's welfare due to non-democratic practices, particularly slavery and additional tax burdens as well as non-tax burdens that had to be borne by the people.

As a kingdom, all decisions were entirely in the hands of the rulers. And as has often occurred, the rulers' efforts to fulfil their personal ambitions put a heavy burden on the people's shoulders. As Soekmono(1976: p. 47)stated, 'Syailendra's power in Central Java for three-quarters of a century produced many sacred buildings which were all majestic and luxurious; nevertheless, they weakened the people's power and agricultural income. The consequences of the effort to prioritise the greatness of the king now suppressed the livelihood of the people'.

Slavery practices

One of the effects of the authoritarian decisions in this monumental construction was slavery. Based on historical records found in various corners of the world, slavery represented an effort to get financial gains through comparatively cheap labour. The practice of slavery is as old as civilisation and continues today. Data published by the World Labour Organization (ILO p. 9-11) shows that up to this point there are still about 45 million people trapped in slavery, 18% of which occurs in the construction sector. There is no sufficient written evidence on whether the construction of the Borobudur temple also gave rise to slavery. However, the historical data of the kingdoms in Indonesia always indicate the existence of slavery, regardless of the dominant religion or ethnicity of the rulers.

Additional Taxes Levied on the People

Another issue that can be considered as an external cost of the monumental building construction effort were the increasingly heavy taxes levied on the people. There is a difference between the concept of ancient and modern taxes. In ancient times, for example, as Stambaugh &Blach (1986: p. 8-87) stated, taxes were more of a symbol of power. Tax determination was done unilaterally without taking into consideration the interests of the people. Most of the taxes levied were used to fulfil the rulers' ambitions to live luxurious lives, wage war on mercenaries and build magnificent palaces or places of worship. However, in modern times, tax is more a rational



instrument of economic management. The taxes levied can be used to improve the welfare of the people. Because of the taxes they must pay, individuals are forced to work harder and longer and live more economical lives. Thus, tax can be used as an instrument to encourage individuals to be more diligent and efficient; however, excessive tax burdens are counterproductive to economic health (Hyman, 2008: p. 35).

The additional tax burden that had to be borne by the people due to the construction of the Borobudur temple was calculated by dividing the net current accumulated value by 100 years. The figure obtained is USD 21 million, which is equivalent to IDR 294 billion per year. This means that due to the construction of Borobudur, the public tax burden increased by IDR 294 billion per year. With a maximum working population of 400,000 people, every person in their productive age would have had to bear a tax burden of IDR 735.000 per year. This burden would certainly be very onerous for people living in an agrarian economy. If the society had a one hectare rice field that could produce three tonnes of rice and the price of rice was IDR 4 million/tonne, then the gross income would be IDR12 million per year. If their net profit could reach 50%, then they would have to set aside 13% for additional taxes; however, if the profit margin was only 20%, as in modern times, then the additional tax burden would have been 33%. This additional burden would be greater if the profit margin decreased and the land owned were less than one hectare, or even worse for farm labourers.

The Negative Impact of Shima Practice

Shima was an ancient practice of granting tax exemptions to people whose land was used for the construction of sacred religious buildings. The land for the sacred buildings and their surroundings was exempted from taxes so that income from the land could be used to maintain the sacred buildings. In two inscriptions from 824, a leader from the Shailendra period, Cri Kahuluman, inaugurated the granting of land and rice fields to ensure the maintenance of Kamulan (a sacred building to glorify ancestors) in Bhumisambhara. Kamulan is none other than Borobudur, which might have been built by Samaratungga in 824 (Soekmono, 1976: p. 46).

Similar to taxes, *shima* could be a sign of an agreement between the ruler who granted his blessings on his people and the respect of the people towards him. Unfortunately, if the burdens of the people were too great, then *shima* would be nothing more than a tool of exploitation of the people by rulers who made use of religious reasons.

The problem faced by the people in the Bhumisambhara region is that the greatness and grandeur of the temple demanded very expensive maintenance costs. Referring to the information submitted by the Head of Borobudur Heritage Conservation Center (Tempo.co, November 1,

2016, 16: p. 35), the maintenance fee of Borobudur temple amounted to IDR 1 billion per year in 2011. Considering the inflation rate during the period 2011–2017, the cost of maintaining the Borobudur temple in 2017 is equivalent to IDR 1.7 billion. However, this maintenance was only partial, as it only covered the replacement of a few building materials that had been damaged. Surely the overall maintenance cost would be even greater.

The weight of the burden carried by people whose village received the *shima* because of the presence of the Borobudur can be described as follows. As stated earlier, in the context of 9th century agrarian society, the *shima* expense of IDR 1.7 billion per year was equivalent to a net profit of 750 hectares of paddy fields. Did the rice fields in the village cover an area of 1000 hectares? If so, then the *shima*'s burden would have been 75% of the economic potential of the village. That burden would have been too heavy, given that even until now the risks involved in cultivating rice is very great. If the rice field area were less than 750 hectares, then the *shima* for Borobudur would have been an unbearable burden for the villagers.

Deconstruction Analysis

Construction of the temple began around 750 AD and ended in the early decades of the 9th century. As noted above, if the Syailendra people had been in control of the Central Java region today, then building Borobudur would have required additional tax revenue greater than IDR 28 trillion. Therefore, the target of additional tax revenues could not have been achieved, as currently the total provincial tax revenue of Central Java is IDR 10 trillion per year. We have already calculated that the carrying capacity of the economy, as well as the available working population was not nearly sufficient to support the completion of the Borobudur temple. Moreover, by the mid-9th century, relations had deteriorated severely between the Shailendra and Sanjaya dynasties. The ending of the Shailendra dynasty in Java is generally dated to around 852, when the Sanjaya ruler Pikatan defeated Shailendra's ruler Balaputra. Although the dynasty continued, its presence had moved on Sumatra, where they endured until 11th century (Soekmono, 1973:54-55). This sequence of events indicates that far from strengthening the Shailendra dynasty, the construction of the temple might have imposed an untenable burden on the population, possibly weakening their support for their ruler and increasing their vulnerability to invasion and defeat.

Conclusion

This phenomenon of the Borobudur temple is a representation of the general pattern of ambiguity of monumental religious building construction. Seen in a broader context, what occurred during the 8–10 century in ancient Mataram was a reflection of how the competition for power had even



entered the territory of religion. The rulers of Sanjaya built many magnificent and luxurious Hindu temples in the northern region of Central Java, the largest of which is the Prambanan temple. Meanwhile, the Shailendra dynasty built Buddhist temples that were also magnificent and luxurious in the southern region of Central Java, with Borobudur being the largest temple there (Soekmono, 1976). A house of worship that should represent divine presence, a place where truth, freedom, peace and prosperity flourished turned into a place rampant with the struggle for power and influence. The house of worship became a representation of conflict rooted in the thirst for power.

Even the position of the temples reflected the mindset and structure of the society. The temples of Shailendra were arranged in such a manner that the main temple stood in the middle and its subsidiary temples were neatly built in rows around it. On the other hand, the temples of the Sanjaya monasteries in the northern part of Central Java were built in irregular clusters which stood alone. Soekmono(1976) interpreted this as reflection of the feudal and centralised feudal state in the Shailendra dynasty and a decentralised federal government under the Sanjaya dynasty.

Our analysis indicates that the price that had to be paid to achieve the personal ambitions of the rulers resulted in a decline in the people's welfare, due to the heavy financial and non-financial burdens they were obliged to bear in the temple's construction and maintenance. There were times when those ambitions became so great that the people were forced to shoulder a burden that ultimately became untenable. Competition is a social phenomenon, rooted and spread by the thirst for power and recognition of certain social groups who want their interpretation of the real world to be the only and universal one (Mannheim, 1952: p. 192-198). Conflicts of ideology and power can even cause beautiful and magnificent cultural creations to become nothing more than a by-product of the social process of competition. The price paid for is far too costly for the future of humanity.

Disclosure Statement

No potential conflict of interest was reported by the author.



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