The emergence and ultimate decline of the Khmer Empire was paralleled with development and subsequent change in religious ideology, together with infrastructure that supported agriculture.

**Introduction**

The Angkorean period of Khmer history commences with the reign of Jayavarman II in 802 CE, who was able to unify competing chiefdoms of the pre-Angkorean period into a single ‘kingdom’. He adopted Hariharalaya, the first of the capitals in the Angkor area, an area extending from the northern shores of the great lake Tonle Sap to the Kulen Plateau in the northeast, as shown in Figure 1. At least seven capital cities in the Angkor area were built by Khmer rulers during the period. The Khmer Empire expanded to cover most of Indochina in the twelfth and thirteenth centuries. The Khmers built extensively throughout Angkor, making it the world’s largest preindustrial settlement complex. (Evans et al, 2007). The end of the rule of Jayavarman VII in c.1218 CE marks the commencement of the decline of Angkor and the area was largely abandoned around 1432 CE.
Khmer society was polygamous and rulers frequently married into elite families to build alliances with potential competitors. Succession was not automatic and periods of instability occurred as competitors, generally sons and nephews, vied for supremacy after the death of a king. Moreover, during a reign, there were sometimes challenges that, if successful, resulted in seizure of the throne. Twenty-seven rulers are identified during the period and a chronology is provided in Appendix 1. Of these, four are recognized as usurpers and seven were distant relatives of the king with weak claim to the throne. (Stark, 2006 p.162) Periodic instability was not enough to prevent the regeneration and growth of the Empire during the Angkorean period. As well as
occasional civil war, the Khmers also suffered defeat and invasion by the neighbouring Chams between 1177 to 1181 CE, and yet the Khmers recovered and the empire expanded under Jayavarman VII.

What factors contributed to this resilience, and what changes undermined it, contributing to the fall of the Khmer Empire? This essay examines developments in religious ideology, economic structures and infrastructure that supported agricultural productivity as factors that supported the emergence and growth of the Khmer Empire. It also discusses further changes in these areas which were significant in the decline of Angkor.

**Religious Ideology: Hinduism and Mahayana Buddhism**

Even today, Hindu influence is apparent in Angkor’s temples, art, statues, Sanskrit inscriptions, the architecture of temples and their moats. The water is thought to symbolise the ocean surrounding the sacred Hindu mountain Mt. Meru, while the pyramid temple symbolised the sacred mountain itself.

Archaeological evidence suggests that both Hinduism and Mahayana Buddhism had been embraced and integrated with indigenous superstitions and practices of ancestor worship after the fifth century CE. Pre-Angkorean rulers adopted Hindu names. Vishnu and Śiva were commonly worshipped as in the Angkorean period. (Stark, 2006) Hinduism may have been adopted by individuals with the underlying purpose of tapping the religion’s associated cosmic power for personal power or gain. (Wolters, 1979)
At the commencement of the Angkorean period Jayavarman II became the first of many rulers to adopt the Devarāja rite, whereby the king became a divine universal ruler and his Śaivite cult became the state religion. (Stark, 2006 p.156) Śiva, symbolised by the linga, a phallic idol in the shape of a cylindrical stone, was the most common deity. Śiva was associated with fertility and a divine family, through whom the king’s powers were extended. Some kings adopted Vishnu, who was usually represented in human form. (Knott, 2000). As High Priest, the king included Buddhist religious ascetics, as well as Hindu gurus among his advisors. (Briggs, 1951) One of his important roles was to perform religious rituals in support of ancestor worship and to encourage the rain needed for agriculture on behalf of his people. (Chandler, 2008)

Day (1996) discusses ancestor worship as seeking to control ancestors. Ancestors could bring great harm as well as strong assistance to a king and his people. Every new king operated in the context of an expanded and more powerful set of ancestors, given that his predecessor had been a divine ruler. The adoption of the Devarāja rite gave the king the ability to act as a mediator between the living and the dead, an important way of enabling him to seek good outcomes from ancestors and maintain dominance over his living competitors.

“In Angkor, cults to deceased members of the royal family who were deified as Indic gods provided the most important motive for public building and ceremony. ... Temple construction in the reigns of the most powerful Angkorean kings always followed a set pattern: first, irrigation works were built; next shrines for the Indic deities associated with the king’s deceased parents and important ancestral
relatives were constructed; lastly, the king established a temple-mountain...dedicated to the worship of the king himself once he had become an ancestor.” (Day, 1996, p.388)

When the founder of the pyramid-temple died, it became his mausoleum. (Briggs, 1951).

![Map of Angkor](image)

**Figure 2** Development of Angkor over time, using the chronology and dates for rulers as indicated in Stark (2004) p 104-5, based on Angkor map from Higham (2001), p122

While the initial dynasties of Angkorean rulers adopted the Devarāja cult, Mahayana Buddhism continued to be tolerated and several notable Buddhist kings emerged later in
the period, including Suryavarman I, Rajendravarman II and Jayavarman VII. Mahayana Buddhism places emphasis on rituals and requires elaborate temples, as it teachers that one can achieve nirvana through appeals to incarnations of Buddha called bodhisattvas. (Tully, 2005) These rulers were not seen, and did not see themselves, as divine. Instead, they sought to ease the sufferings of their people by building better roads, improved water storages and other structures including hospitals. As part of their devotion, they supported the growth of the religion through construction of temples and sponsoring Buddhist teachers and foundations. Jayavarman VII, for example, engaged in a massive building program of public works; however, he did not dismantle the Hindu institutions already in place, and made significant efforts to accommodate Hindu worshippers in his Buddhist establishments. (Coe, 2003)

It could be argued that the adoption of the Devarāja rite enabled early Angkorean kings to unify competing factions within their kingdom. The practice of ancestor worship fuelled the proliferation of temples at Angkor. Buddhism had co-existed with Hinduism in Khmer society from early times and Mahayana Buddhist kings emerged later in the period. Whilst not operating as divine rulers, they continued with building projects for their subjects. Regardless of religious ideology, kings depended on a prosperous economy through taxation to engage in such massive projects.

**Social and economic organisation**

Khmer society consisted essentially of three social classes, the elite, workers and slaves. The elite included advisors, military leaders, courtiers, priests, religious ascetics and officials. Workers included agricultural labourers and also a variety of craftsman for construction projects. Slaves were often captives from military campaigns or distant villages. (Mabbett, 1983)
The concept of ‘merit’ arises in both Buddhist and Hindu doctrines and it is used by some scholars to explain how the Khmer economy operated. (Chandler, 2008 and Higham, 2001) Merit can be thought of as a type of spiritual capital, whereby accumulation of merit can help reduce sufferings in the next world. Merit is earned through doing one’s duty, performing good deeds and making sacrifices, donations and gifts to support others. (Keown, 1996)

As the ‘chief executive officer’ of his kingdom, the king created his administration by conferring responsibilities, such as leadership roles in his government, drawing principally upon the elite class. He made merit through gifts of land and slaves to religious foundations, and bestowing privileges and honorable titles on his favorites. The recipients would wish to fulfill their responsibilities to the king to accumulate merit. The king would sponsor large scale public works by conscripting labour for his projects. (Chandler, 2008)

The shift to Angkor helped to ensure food supply for the Khmers. Angkor’s fertile land and the seasonal inundation of a large area around Tonle Sap enabled the intensive cultivation of rice beyond subsistence levels. The great lake was, and still is, an extraordinarily productive fishery. With food supply assured, labourers could be taken from the fields periodically for building projects, but capital to fund the projects was needed as well as labour.

An inscription dated to 922 CE confirmed the existence of a centralized system of taxation involving chiefly agricultural produce, that operated through provincial
temples. (Higham, 2001, p69-70) The village (or estate) temple served as a taxation collection point and thus these estates were a fundamental economic unit of Angkorean society.

Temple-estates consisted of a religious foundation, temple, clearly defined parcels of land, both residential and agricultural, associated workers who lived in the village(s) and slaves who were bound to the estate. Detailed records of estate assets were often inscribed on the temple. They enabled estimates the estate’s productivity and hence the tribute, or taxes. Priests would conduct religious rituals for the villagers. After allowing feeding the villagers, produce from the estate would be provided to the temple. While some of this tribute would sustain the temple ‘staff’, the rest would be funneled back to the king’s treasury.

Estate workers would be available for other projects. They would spend half a month, defined by the waxing or the waning of the moon, working on construction projects, then returning to their village, presumably tending their crops. (Jacob, 1978 and Stark, 2006)

Inscriptions also outline horrific punishments for transgressors of the law, so while the mutuality of the merit system was important, there was a legal base to the taxation system with harsh punishments to encourage compliance.

While small-scale, temple-based economy existed before Angkor, the creation of temple-estates as economic units accelerated significantly during the Angkorean period. It would be an honour to be asked by the king to do this and an influential family might
offer to establish a new estate, knowing that the right to serve the king by sending him revenue from it would be assured for their descendants. In this way, the settled area of Angkor and the kingdom expanded enormously as large areas of land were reclaimed from the forest. (Jacob, 1978)

While international trade continued throughout the Angkor period, coinage was never adopted and trade is not seen as a significant factor in the Angkorean economy. Unlike earlier Khmer settlements in the Mekong Delta which relied heavily on trade, Chinese records of trade with Khmers declined during the Angkorean period and it seems that Angkor did take significant part in the China-Southeast Asia trade network. (Stark, 2006)

The Khmer Empire is therefore characterised as an agrarian state operating a barter economy based on agricultural produce, principally rice, with regional trade an insignificant part of the economy.

**Infrastructure to support agriculture**

Agricultural productivity clearly underpinned Angkor’s wealth. Chinese visitor Zhou Daguan noted that rice crops were harvested four or five times a year in his account of his year-long visit to Angkor in c.1297. He described flood-retreat agriculture, made possible by the enormous difference in levels in Tonle Sap lake between the wet and dry season, as shown in Figure 3. (Zhou, 2006. p.67)
Debate has raged for many years about how such productivity was achieved in an area that experienced six months of rain followed by six months of drought.

![Figure 3: Map showing the flood area of Tonle Sap. (Adapted from Kummu 2009)](image)

Groslier’s analysis of Angkor using aerial photographs led him to theorise that the large, above-ground reservoirs (barays) and network of canals constituted an immense irrigation network. (Groslier 1979, as cited in Chandler, 2008). His idea was rejected by some because no one had found evidence of irrigation outlets from the barays (van Liere 1980 as cited in Fletcher et al, 2008). Also that was no reference to irrigation practices in Zhou’s account or any inscriptions.

After Cambodia’s recent civil war, topographic mapping of the Angkor area was completed, igniting a succession of mapping projects that have revealed new details about Angkor and its water management system.
In 1999 Pottier (as cited in Evans et al., 2007) documented low density settlement of the landscape comprising occupation mounds (that would have had wooden houses built upon them), local temples and household ponds in between the great monuments, roads and canals of Angkor. He also identified evidence of irrigation, showing that the barays had inlets, outlets and were connected to a network of channels, affirming Groslier’s proposition.

The Greater Angkor Project (GAP), involving Cambodian, French and Australian researchers extended this work. Maps from a variety of sources including archaeological, satellite, radar, conventional aerial photography, were combined using computer-based geographical information system (GIS) analysis. The enormously detailed resultant map, reproduced in small scale in Figure 4, has provided even more information about the extended Angkor region. It has revealed that low density settlement existed on between 200 and 400 km² around Angkor Thom, a much larger area than first thought. (Evans et al., 2007)

The new maps have stimulated much research. Greater understanding of the area’s topology, has resulted in the Siem Reap River being seen as a man-made channel designed to divert water from the Puok River to the Eastern Baray. Over the centuries, it has evolved into a true river with its own ecology. (Kummu and Lustig 2005)

The sophistication of the water system has been appreciated after analysis identified three distinct zones, the collection zone from the Kulen plateau down to the holding zone around the barays and moats, to the dispersal and drainage zone between that area
and Tonle Sap. Together the three interconnected zones allowed for flood control and storage of the monsoonal rains and then distribution to support agriculture when needed. (Fletcher et al., 2008)

This recent research has finally provided the evidence that supports Zhou’s observations that crops could be harvested multiple times a year, enabling the huge surpluses that would have been needed to support the building program and maintenance of the canal and reservoir infrastructure.
Figure 4: Greater Angkor archaeological map (from Fletcher et al 2008).
Decline of Angkor

After the reign of Jayavarman VII there were no more major constructions and this marks the start of Angkor’s decline. Inscriptions also become scarce, leading to speculation about causes of Angkor’s decline.

Jayavarman VII’s massive building program may have exhausted the kingdom’s financial resources. (Briggs, 1951).

There are records of a series of attacks of Siamese armies during the fourteenth and fifteenth centuries that may have weakened the Empire. The raids could have also liberated many slaves from the outlying areas, resulting in a loss of labour for large projects as well as revenue from taxes. (Briggs, 1951)

Indravaram III (c. 1295-1308) adopted Theravada Buddhism as the state religion, a practice which continued and is today Cambodia’s predominant religion. With this milder form of Buddhism, the focus shifted towards personal responsibility for accumulation of merit to achieve nirvana. Worship to higher gods was not required. Theravada’s simpler rituals and temples did not require massive building programs. Many scholars attribute the halt of the development of Angkor to the rise of Theravada Buddhism. (see Briggs,1951 and Coe, 2003)

Groslier speculated that the canals and barays of Angkor silted up. (Groslier 1979, as cited in Stone, 2006). This idea has been refined in the light of the Greater Angkor Project. A number of engineering faults in the canal network have been identified and
these would have impacted on the filling of the East Baray, There is also evidence of geological uplift that would have gradually changed relative levels and lessened the flow of water to the West Baray. (Stone, 2006). The ability to reap multiple harvests of rice diminished as the irrigation infrastructure failed.

Most recently, a study of tree rings in ancient forests in South Vietnam revealed that the Empire experienced two lengthy droughts, during c.1340-1370 and also c.1400-1425. In between these droughts were high-magnitude monsoon years. There is evidence of large floods depositing vast amounts of sand into the Siem Reap Channel and barays during this period as well as modifications to the infrastructure in response to drought. (Buckley et al, 2010)

Given these compounding problems, Angkor’s economic base in rice production was severely challenged, potentially causing people to gradually migrate towards the Mekong where trade was easier. Around 1430, Angkor Thom was besieged by the Siamese for seven months and then captured and plundered. (Briggs, 1951) The Cambodian crown prince, Ponha Yat then came to the throne and for within a year, Angkor was largely abandoned, with the capital later established at Phnom Penh.

**Conclusion**

It is contended that the elevation of the king to divine ruler through the Devarāja cult was a significant factor in unification of Khmer clans to establish and maintain a kingdom. It enabled a man who had emerged, often through superiority in battle, as most worthy of kinship to act as high priest and communicate with ancestors and the gods on behalf of his people. Although not god-kings, Mahayana Buddhist kings must
have been men of prowess to have achieved the post. These ideologies fuelled the
construction of temples, irrigation works and roads. Their ability to do this was based on
leveraging the temple-based economic structures put in place by the earlier Hindu
Rulers, and underpinned by flourishing agriculture.

Many factors are thought to have led decline of Angkor but two emerge as significant.
The change in religious ideology with widespread adoption of Theravada Buddhism,
with its simpler forms of worship no longer required the construction and maintenance
of elaborate temples. Secondly, the diminishing effectiveness of the water control
systems due to a variety of causes compromised agricultural productivity and therefore
taxation revenue. The siege and subsequent sacking of Angkor in 1430 left the treasury
empty and the Khmers with few means to repair their city. It is little wonder that the
region was abandoned in favour of settlement along the Mekong, a location which
facilitated an alternate economy based on trade.

The Greater Angkor Project has identified many new areas for future archaeological
investigation and it is hoped this will lead to discoveries which enhance our
understanding of society at Angkor.

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**Appendix 1**

**Chronology of Angkor Period based on dates in Stark (2004)**

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Ruler</th>
<th>Selected Events and Construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>802 - c. 834</td>
<td>Jayavarman II</td>
<td>Founder of Angkor Empire – established city at Hariharalaya and established Devarilia cult.</td>
</tr>
<tr>
<td>c.834 – c.870</td>
<td>Jayavarman III</td>
<td>Prei Monti temple</td>
</tr>
<tr>
<td>c.877 - 889</td>
<td>Indravarman I</td>
<td>Construct monuments such as Preah Ko, and Bakong (Roluos) and the Indratataka baray</td>
</tr>
<tr>
<td>c.889/890 –c.910/912</td>
<td>Yasovarman I</td>
<td>Move capital from Roluos to Yasodharapura with Phnom Bakheng as the capital center; construction: Lolei, Phnom Bakheng, Eastern Baray</td>
</tr>
<tr>
<td>c.910/912 – c.923</td>
<td>Harsavarman I</td>
<td>Monument: Baksei Chamkrong</td>
</tr>
<tr>
<td>c.923 – c.928</td>
<td>Isanavarman II</td>
<td>No major constructions</td>
</tr>
<tr>
<td>928 – c.941</td>
<td>Jayavarman IV</td>
<td>Move capital from Roluos to Yasodharapura with Phnom Bakheng as the capital center; construction: Lolei, Phnom Bakheng, Eastern Baray</td>
</tr>
<tr>
<td>c.941 - 944</td>
<td>Harsavarman II</td>
<td>No major constructions</td>
</tr>
<tr>
<td>944 – c.968</td>
<td>Rajendravarman II</td>
<td>Consolidated reign's conquests. Construction of Eastern Mebon and Pre Rup</td>
</tr>
<tr>
<td>c.968 – c.1000</td>
<td>Jayavarman V</td>
<td>Consolidated Rajendravarman’s conquests. Construction of Banteay Srei and Ta keo</td>
</tr>
<tr>
<td>1002 - 1002</td>
<td>Udayadityavarman I</td>
<td>Disappeared after one year as king</td>
</tr>
<tr>
<td>1003 – 1010</td>
<td>Jayaviravarman</td>
<td>Civil war rages with battles against Suryavarman</td>
</tr>
<tr>
<td>1010-1050</td>
<td>Suryavarman I</td>
<td>Became king after civil war. Built Phimeanakas and Western Baray. Expands territory of the Empire towards gulf of Thailand. Established capital at Luovo</td>
</tr>
<tr>
<td>1050 – c.1066</td>
<td>Udayadityavarman II</td>
<td>Construction of Baphoun, Western Mebon</td>
</tr>
<tr>
<td>1066 – 1077/1080</td>
<td>Harshavarman III</td>
<td>No major constructions</td>
</tr>
<tr>
<td>1107-1112</td>
<td>Dharanindravarman I</td>
<td>No major constructions</td>
</tr>
<tr>
<td>1113- c.1150</td>
<td>Suryavarman II</td>
<td>Fought the Chams and the Dai Viet. Construction of Angkor Wat, Beng Melea, Banteay, Samre, Chey Say Tevoda,</td>
</tr>
<tr>
<td>c.1150 – c.1165</td>
<td>Yasovarman II</td>
<td>No major constructions</td>
</tr>
<tr>
<td>c.1165-1177</td>
<td>Tribhuvanadityavarman</td>
<td>Chams defeat Angkor in 1177</td>
</tr>
<tr>
<td>1181- c.1218</td>
<td>Jayavarman VII</td>
<td>Angkor expelled Chams and expanded the empire on east to South China Sea and on northeast into Champa; Extensive construction of roads and monuments such as Angkor Thom, Bayon, Ta Phrom, Banteay Kdei, Neak Pean, Sras Srang, etc</td>
</tr>
<tr>
<td>1219-1243</td>
<td>Indravarman II</td>
<td>No major constructions</td>
</tr>
<tr>
<td>1243-1295</td>
<td>Jayavarman VIII</td>
<td>Abdicated. Mass Destruction of Buddha statues occurred during this period.</td>
</tr>
<tr>
<td>Period</td>
<td>Ruler</td>
<td>Event</td>
</tr>
<tr>
<td>-------------</td>
<td>----------------------</td>
<td>--------------------------------------------</td>
</tr>
<tr>
<td>c.1295-1308</td>
<td>Indravarman III</td>
<td>Theravada Buddhism became state religion. Zhou Daguan visits Angkor between 1296-1297</td>
</tr>
<tr>
<td>1300-1307</td>
<td>Srindravarman</td>
<td>A contested ruler who abdicated. No major constructions.</td>
</tr>
<tr>
<td>1308 – 1327</td>
<td>Indrajayavarmon</td>
<td>A contested ruler. No major constructions.</td>
</tr>
<tr>
<td>1327 - 1431</td>
<td>A further 9 rulers identified, dates unclear and based on contradictory evidence. Angkor Sacked by Thai Army; Glory of Angkor ends in 1431</td>
<td></td>
</tr>
<tr>
<td>1432 - ?</td>
<td>Ponha Yat or Gam Yat</td>
<td>Abandonment of Angkor.</td>
</tr>
</tbody>
</table>