

# Ancient Cambodian city's intensive land use led to extensive environmental impacts

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Soil erosion and vegetation change indicate approximately 400 years of intensive land use around the city of Mahendraparvata in the Phnom Kulen region beginning in the mid 9th century, with marked change in water management practices from the 12th century, according to results published January 8, 2014, in the open access journal *PLOS ONE* by Dan Penny from the University of Sydney and colleagues from other institutions. The main historical and geographical significance of the Phnom Kulen plateau lies in its role as Angkor's source of water, and the 12th century changes may have had implications for water supply to Angkor.

The authors examined soil cores and vegetation samples from one of the ancient reservoirs in the Phnom Kulen region of Cambodia for evidence of intensive land use during the occupation and abandonment of Mahendraparvata. These data were analyzed within the context of archeological data about extensive settlement in the area.

The results suggest that the valley was flooded in the mid to late 8th century, but the age of the reservoir remains inconclusive. The results from the [soil](#) and vegetation samples suggests that the reservoir operated for about 400 years and that settlements were intensive enough to trigger extensive [soil erosion](#) within the reservoir over a span of approximately 250 years beginning in the middle of the 9th century. The last and largest episode of erosion occurred in the late 11th century, and this event reflects a change in reservoir operation and management. The results also suggest a change in [water](#) management practices from the 12th

century. This is the first indication that settlement in Mahendraparvata was not only extensive, but also intensive and enduring, with a marked environmental impact.

**More information:** Penny D, Chevance J-B, Tang D, De Greef S (2014) The Environmental Impact of Cambodia's Ancient City of Mahendraparvata (Phnom Kulen). *PLoS ONE* 9(1): e84252. [DOI: 10.1371/journal.pone.0084252](https://doi.org/10.1371/journal.pone.0084252)

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