

Beyond Rice Agriculture: The Garden Agriculture of Angkor Wat
Project Grant Summary Report
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Introduction

The *Beyond Rice Agriculture* project has focused on exploring the potential garden spaces within and around the enclosure of the 12th century CE temple of Angkor Wat, a major state temple of the Angkorian Empire. Recent LIDAR aerial survey over the Angkorian region has identified a regular pattern of paths, depressions, and mounds within the temple enclosures, including Angkor Wat (Figure 1). Two archaeological field seasons by the Greater Angkor Project (GAP) have found evidence for occupation on the house mounds within the Angkor Wat enclosure¹. The recent June-July 2015 field season focused on intensively excavating a single mound (Figure 1) in order to better understand the timing and nature of occupation within the enclosure. The *Beyond Rice Agriculture* project built upon this work by investigating areas around the mound, especially a depression to the north of the mound, as potential garden plots associated with these households (Figure 1). Our three-pronged approach included:

- a) gathering macrobotanical remains from excavation trenches in order to identify plant species found in and around the mound that were likely part of the subsistence regime
- b) collection of soil samples from excavation contexts on the mound and in the depression for identification of phytoliths and pollens from locations where plants were grown and where parts of plants were intentionally moved for processing, cooking, storage, and disposal

¹ M. Stark, D. Evans, R. Chhay, P. Heng, and A. Carter, “Residential Patterning at Angkor Wat,” *Antiquity* 89 (2015): 1439-1455.

- c) collection of soil samples from excavation contexts on the mound and in the depression for identification of site formation processes, and especially activities related to water management.

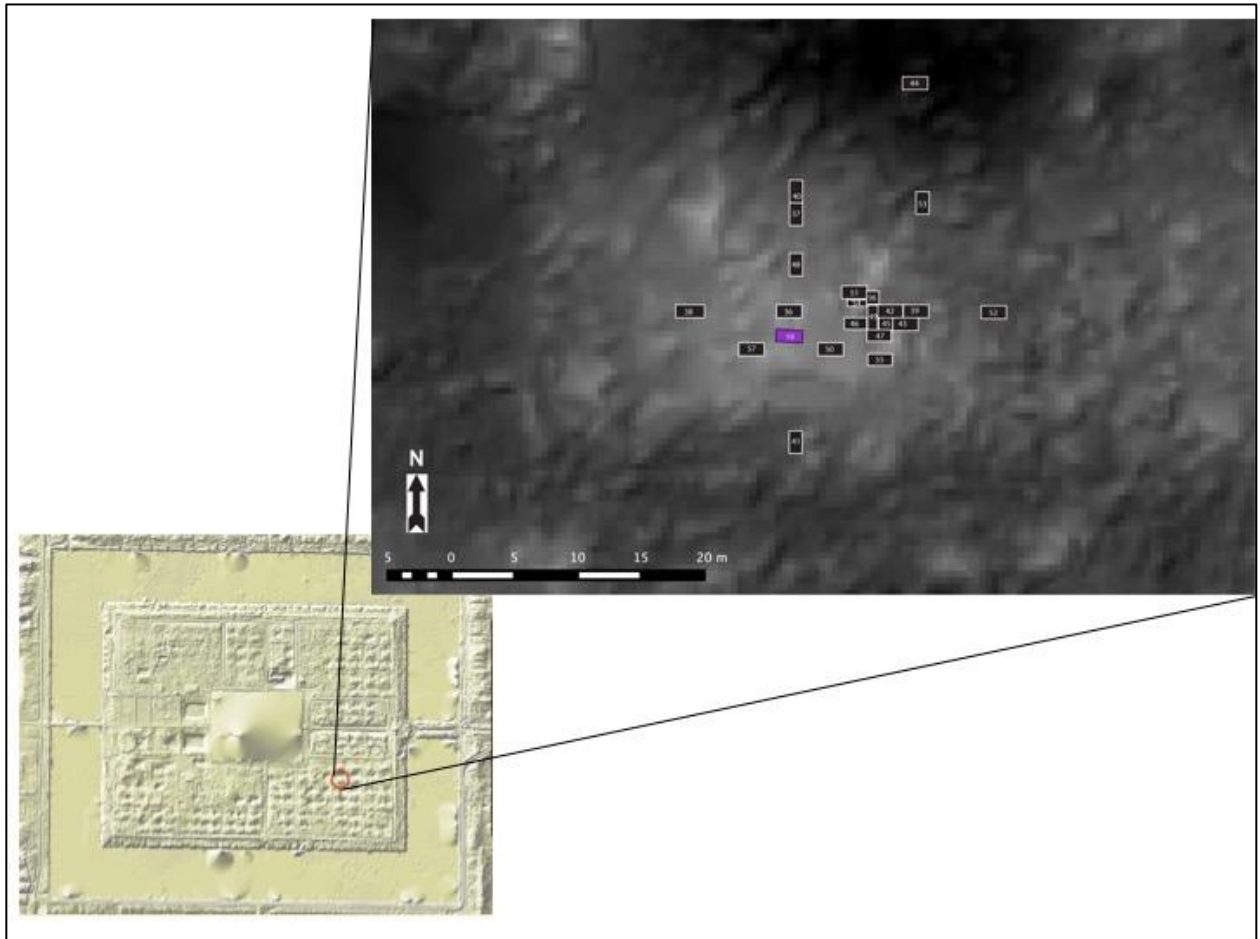


Figure 1: Lower left -LIDAR hillshade image of Angkor Wat showing the series of mounds and depressions seen throughout the Angkor Wat enclosure. The red circle denotes the mound excavated during the June-July 2015 field season. Upper right – close-up view of the mound (lighter grey color) and depression (black area along the north edge of the mound) showing the locations of the excavation trenches. Black rectangles are trenches excavated during the 2015 field seasons, with the purple trench marking the location of the 2013 excavation. LIDAR image courtesy of the Khmer Archaeology Lidar Consortium (KALC).

Fieldwork

Excavations on the mound began in June 2015 and were directed by Dr. Alison Carter. In July 2015, Drs. Cristina Castillo and Yijie Zhuang from the University College London and Tegan McGillivray, a PhD Student from UW-Madison, joined the project to begin collecting samples (Figure 2). The project was fortuitous in that we were also invited to collect samples from a unique square spiral feature located to the south of Angkor Wat, which may have served as a large public garden space (Figure 3).² Several trenches within this feature were excavated by our Cambodian colleagues in the APSARA Authority earlier in the year and had been left open for future study. We were able to collect samples from these trenches, which will serve as a valuable comparison to the samples from the house mound site. We hope to determine if this large spiral feature was in fact a garden space, and compare the use of this likely state-controlled feature to the activities within the enclosure, which we hypothesize were privately managed house gardens.

² D. Evans and R. Fletcher, "The Landscape of Angkor Wat Redefined," *Antiquity* 89 (2015): 1402-1419.



Figure 2: (From left to right) Tegan McGillivray, Dr. Cristina Castillo, Gary Marriner, Dr. Yijie Zhuang, and Rachna Chhay inspect an excavation trench within the square spiral feature.

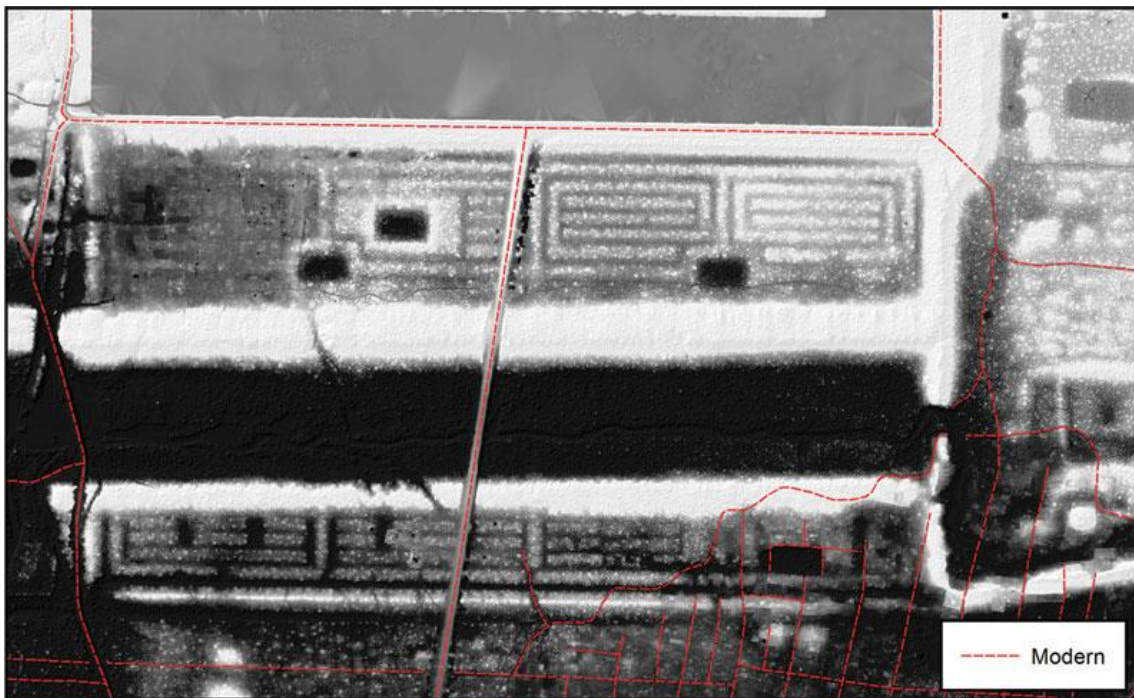


Figure 3: Hillshade and digital elevation model derived from LIDAR ground returns of the square spiral feature south of Angkor Wat. LIDAR courtesy of KALC.

Results

Preliminary results from our fieldwork are quite promising. Macrobotanical remains from two contexts have been sorted thus far and the preliminary results show that rice was present on-site. Since the contexts were located within and near to residential/ habitation areas, one would expect evidence for rice consumption. There was also evidence for several types of fruit rind, including a type of *Citrus*. More contexts need to be sorted in order to define the horticultural activity that was taking place in the Angkor Wat residential areas. However, the preliminary results show that the inhabitants were consuming plant products that were possibly being grown in the adjacent gardens.

Microbotanical (pollen and phytoliths) were collected from Trench 44 in the depression north of the mound, an area hypothesized to be where water collected at least semi-permanently. This area provides suitable conditions to collect wind-blown pollen from the surrounding mounds. Likewise, its position next to the main occupation area suggests it may be associated with small-scale gardens for household or local economic use. Samples were also taken from Trench 53, which captures a transitional area between the house-mound and pond area, as well as from hearths and occupation areas on top of the mound. These will be analyzed for phytoliths and in particular, these data will show evidence for the plants used within the household context.

Geoarchaeological samples were collected from the occupation area on top of the mound, the depression north of the mound, and the square spiral feature south of the Angkor Wat enclosure. Of note are samples from the residential layers, which include horizontal layers consisting of pure or nearly pure clay rich sediments, with sharp horizon boundaries between each other. These were most likely ground-raising layers. The sediments were probably removed from the nearby landscapes. Bulk samples were collected to test the geochemistry of the

sediments to see whether the presence/absence of trace elements will provide important information of such a huge scale of landscape modification. This in turn will help us better understand the nature of activities taking place on and around the mound and the surrounding area, including the potential for horticulture.

In the coming months we plan to finish processing and analyses of our data and will begin to synthesize our conclusions regarding the potential for household and state-level garden spaces around the Angkor Wat temple into peer-reviewed publications. We wish to thank Dumbarton Oaks for their support of this project and look forward to sending updates on our work as it progresses.