

PRELIMINARY INVESTIGATIONS OF PRECOLUMBIAN MAYA TERRACING IN THE DOS CHOMBITOS AREA, BELIZE, CENTRAL AMERICA

Introduction

This is a summary of dissertation research focused on pre-Columbian agricultural terracing in the Dos Chombitos area of Belize, Central America, carried out by L. Theodore Neff. The research was implemented as part of the Xunantunich Archaeological Project (XAP) under the direction of Richard Leventhal and Wendy Ashmore with a permit granted by the Department of Archaeology, Belize, Central America. The research was funded by a National Science Foundation (NSF) Dissertation Improvement Grant (SBR97-03989) to Wendy Ashmore and L. Theodore Neff. The research compliments and builds on, respectively, the Xunantunich Settlement Survey (XSS) funded by NSF grant (SBR93-21503) and a pilot project funded by a University of Pennsylvania Field Funds grant.

An important aspect in the study of Prehispanic complex societies in the Americas concerns the question of how intensive forms of agriculture relate to the population and socioeconomic dynamics of these societies. In many parts of the Americas, high population levels were sustained in part by intensive agriculture (Donkin 1979; Doolittle 1992; Whitmore and Turner 1992). A common theme in many of the reconstructions examining the role of intensive agriculture, including terracing in the Maya Lowlands, is that it is a response by farming households to life in the context of high population densities (e.g. Boserup 1965; Dunning and Beach 1994; Fedick 1989; Sanders 1972; Smith and Price 1994; Turner 1983). A related, and often contentious, issue is the degree to which social units above the household are involved in intensive agriculture. This is a topic of debate for scholars working in Mesoamerica and South America (e.g. Sanders 1979 versus Harrison and Turner eds. 1979 concerning Lowland Maya agriculture and Stanish 1994 commenting on the debates about intensive agriculture in the Lake Titicaca Basin, Peru). The 1997 Field Season aimed to gather the essential baseline data on terracing in the Dos Chombitos area to evaluate extent models, formulate new models, and engage in debate concerning intensive agriculture in Maya Lowlands and elsewhere.

My research primarily focuses on examining the following four general themes regarding prehistoric intensive agricultural systems: 1) the relationship between agricultural intensification and demography; 2) the relationship between agricultural intensification and labor investment; 3) and 4) the socio-economic significance of and the activities associated with different social contexts of agriculturally-intensified space. Terracing strategies are an archaeologically-visible form of intensive agriculture by which to study the latter research questions. When you think of terraces you might envision the different morphological and geographically-defined types such as, cross-channel terraces, gentle slope terraces, border and house-lot gardens that are all supported by a terrace retaining wall -- an irregular rock alignment serves as a soil retaining feature or water control device. By addressing the latter four themes, this research deviates from previous terrace research that has generally focused on the functional morphology of soil retention and water control rock alignments -- answering the basic questions of how do they work, how do they differ in function, and what are the different intensive farming strategies employed. Moreover, previous research that examines the social contexts of agriculturally-intensified space typically focuses on infield versus outfield strategies -- how they compliment each other for maximum farming optimization, and what activities are associated with each. This research recognizes a spatial continuum defined by varying degrees of intensification, differences in the relationships of architectural units with different types of terracing strategies, as well as differences in the activities associated with each. Following, I provide a preliminary summary of the 1997 Field Season.

Setting

The Dos Chombitos Center is situated in the hills overlooking the Macal river near Negroman/Tipu in the Cayo District. The Dos Chombitos center was originally defined, mapped and test pitted by the Xunantunich Settlement Survey over the course of the past 3 years. Dos Chombitos was a minor pre-Columbian center situated in the hills overlooking the Macal river near Negroman/Tipu in the

Cayo District. The original construction of the center dates to the Preclassic period, however, it was one of several small sites to thrive during the Late Classic period. Architectural layout and _____ suggest the center had strong ties with Xunantunich during the Late Classic period. I chose to examine in greater detail two terrace sets in the Dos Chombitos immediate vicinity in order to not only better understand terrace chronology and subsurface morphology but to also address the above research topics. Field and laboratory work were carried out from February to June 1997. Excavations were conducted at two terracing loci located to the east - southeast (Terrace Set 191-192 area) and north - northwest (Terrace Set 110 area) of the minor pre-Columbian center of Dos Chombitos.

Fieldwork consisted of clearing and excavations to gather information concerning terrace surface and subsurface morphology, stratigraphy, and artifact assemblage variation. Test units were placed so as to sample the spatial continuum of agricultural contexts. Thus, we tested areas not directly associated with domestic architecture (_____ m from architectural units) -- "pure" agricultural space, intermediate areas between domestic architecture and pure agricultural space, and areas directly associated with domestic architecture. In addition to artifact recovery via screening through 1/4" wire mesh, soil, pollen, phytolith, and flotation samples were also taken. The washing and general sorting of the artifacts and the processing of flotation samples were carried out at the XAP project laboratory. Linda Neff carried out and completed the ceramic and lithic descriptive analysis. The light fractions from flotation samples, as well as the soil, pollen, and phytolith samples were exported to the United States under permits from the Department of Archaeology, Belize, and the United States Department of Agriculture.

Brief Summary of Excavations

Current Analysis and Write-up Efforts

Since returning to the United States work has continued on analysis and write-up of the Belize terracing material. Four wood charcoal samples derived from flotation light fractions have been submitted to the University of Arizona Accelerator Mass Spectrometry facility for radiocarbon dating. All soil samples collected have been sent to the Rock River Laboratory in Watertown, WI, for analysis. Efforts are currently underway to secure analyses for the pollen and phytolith samples. Following, we provide the preliminary results of the ceramic and lithic material programs.

Ceramic Analysis

The purpose of the ceramic analysis was to address three primary research questions: (1) depositional history, (2) chronology, and (3) ceramic use and activity distribution. First, through multiple lines of evidence we reconstructed the depositional history of the terrace deposits. Second, ceramic ware/type classifications in conjunction with absolute C-14 dates contributes to a chronological interpretation of the terrace construction episodes. Finally, to address ceramic use and activity distribution we plan to examine vessel form and raw material diversity across the agricultural space continuum. Overall, the results will provide an interesting view of the variation between different intensive agricultural contexts.

We divided the analysis into two primary phases: Descriptive and Quantitative. Here, I provide the results of the descriptive analysis and preliminary results of the Quantitative Analysis.

Descriptive Analysis

All ceramics collected during the 1997 test excavations were examined. Following LeCount (1996) and Amy (1997), the following variables were recorded: Provenience (Op/Subop/lot), Frequency, Weight (g), rim diameter, neck height, ware, group, type, time period, primary form, secondary form, primary decoration, secondary decoration, and size (to the nearest .5 cm) (See LeCount 1996 for further details). All the diagnostic sherds were drawn to scale and few were photographed. The results are presented by *Descriptive Units* (DU's) -- arbitrary and often interpretive units defined in the field during excavation. The DU's directly correlate with the Op/Subop/Lot designations and we present them as such.

A total of 5426 ceramic artifacts were examined. Seven operations were defined: 261, 275, 277, 278, 285, 286, and 287. The following table summarizes how many sup/ops were defined within each operation, and ceramic frequency and weight from each (Table 1).

Table 1. Descriptive Unit Sample Size

Operation	# of Suboperations	Ceramic Frequency/Weight
261	85	2708/6011
275	10	256/1315
277	9	413/802
278	16	142/2845
285	3	32/182
286	4	260/498
287	4	676/1483

Preliminary Summary of the Quantitative Analysis

Prior to using exploratory data analysis to examine the research questions, we defined our *analytical units* (AU's). The AU's represent a significant interpretive unit composed of one or more *descriptive units* (DU's). Thus, in addressing our first research question, we sorted out the depositional history of each DU using several lines of evidence. The interplay of stratigraphic interpretation, macrobotanical remains, phytoliths, soils, lithic and ceramic artifacts played a key role in the identification of ancient planting surfaces, terrace beds, terrace wall construction fill, natural colluvium and alluvium. The macrobotanical, phytolith and soil analyses are in progress. Consequently, we sorted out primary versus secondary deposits using the remaining evidence and analyzed them accordingly. For purposes of this report, we chose to restrict our comparisons to the ancient planting surfaces for each agricultural context. Each agricultural context is an interpretive unit placed along the intensive agricultural continuum: domestic, intermediate, and pure agricultural space.

Chronology Results

A variety of relative chronometric methods are available to address temporal control for terrace construction episodes. Ceramic group formulation, seriation and Christenson's (19??; modification of South's 1977) Mean Date Formula would provide the ideal cross checking necessary for an accurate portrayal of the terrace chronology. However, the lack of a significant number of diagnostic ceramics in primary deposits inhibited the use of such techniques. Consequently, ceramic ware/type classifications of terrace wall construction fill suggest a Late Classic II terminus post quem for Operations 261, 275 and 277. Unfortunately, poor preservation of terrace wall construction fill limit our ability to firmly date the remaining terrace sets.

Ceramic Use and Activity Distribution

Understanding vessel form and raw material diversity helps to distinguish between activities associated with each agricultural context. Due to the exceptionally poor preservation of the ceramic material, an examination of open (plate, dish, bowl or vase) forms and jar shapes will be compared for each context. To explore raw material diversity, we plan to examine the ash:calcite temper ratios. And finally, we will explore the ethnoarchaeological studies that examine vessel use in different contexts to aid in our interpretations of the different functional classes such as unrestricted jars versus restricted jars. We will look at the LCII jars recovered from the terrace contexts and make inferences about their function.

Lithic Analysis

The lithic analysis undertaken for the Dos Chombitos Terracing Project attempted to move beyond the typical form-function classification scheme so commonly used in Mesoamerican research. Rather, DCTP examined stone tools using a technological perspective thereby assessing how the

prehistoric people used the technology meet different needs. Hallmark Mesoamerican lithic studies focus on reconstructing the activities associated with the classic Maya obsidian ritual blades and obsidian raw material distribution. The Maya, however, used stone tools in a variety of contexts. Some tools were used for more than one activity, while other tools were more commonly used by males versus females.

Our lithic program will examine lithic technological variability across a continuum of agricultural space. Understanding that stone tools were a part of a larger technological system, we plan to address three primary research questions: (1) What is the tool assemblage of each agricultural context and how do they differ; (2) Were the tools used for more than one activity across the agricultural continuum; (3) Can we discern the gender division of labor in relation to agricultural production.

Through exploratory data analysis we will examine the variability and its significance in relation to specific research questions. More specifically, using the pre-defined AU's, we will (1) compare the different assemblages by digging tools, (hoes, trowels, and general utility bifaces), groundstone and debitage; (2) compare the nature of the debitage from each assemblage (utilization, reuse, and digging tool resharpening flakes); (3) compare the different activities associated with different types of flake utilization; (4) compare the types and occurrence of tool reuse; and, (5) compare the utilized resharpening flakes from each AU.

Brief Summary of What the other data types will tell us

Conclusion

Terraces in the Dos Chombitos area are an important part of the ancient landscape and similar features are widely distributed throughout the Lowland Maya area (Harrison 1993; Matheny 1982; Turner 1974, 1978). They contradict the notion of Lowland Maya as shifting horticulturalists (e.g. Willey and Bullard 1965; Coe 1966), but beyond that we know little about them. A terracing study was needed because few have been done and the explanation and interpretation of terraces has remained essentially unchanged for 25 years and has not received an in-depth critique (Harrison 1993: 72; Turner 1993: 79, Note 12). As B. L. Turner (1993:57) notes, " "...claims are made in excess of the evidence" concerning Prehispanic Maya intensive agriculture." Preindustrial Mesoamerican societies and their agricultures have a lot to tell us about feeding large populations, as well as about elites and oppressive political structures (Whitmore and Turner 1992: 419). My dissertation research design and data collection aim toward meeting these needs and challenges. The results of this research will provide a major contribution to local and regional culture history and aid in the process of inserting Prehispanic Maya terrace data into general debates concerning the role of intensive agriculture in complex societies.