URBAN LAYOUT AND SOCIOPOLITICAL ORGANIZATION IN SICÁN, PERÚ

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The Sicán polity (AD 750 - 1375) developed in the middle La Leche Valley on the north coast of Peru. This dissertation presents the results of a comprehensive program of full-coverage high-resolution pedestrian survey, with systematic surface collections and architectural mapping, covering 50 km^2 in the capital city of the Sicán polity located in the current-day Bosque de Poma Historical Sanctuary in the La Leche Valley. My research was designed to address the urban and architectural layout of the Sicán city, its size and population density, the socioeconomic differentiation and economic activities of its residents, and continuity and change through time in residential patterns in the area.

The results provide new evidence about the layout and sociopolitical organization of the Sicán city. The city was formed by the Sicán Core, a civic- center formed by the Platform Complex and Pyramid Complex with a central plaza, and a much larger surrounding area of low-density urban occupation I call Greater Sicán. Greater Sicán surrounds the Sicán Core and its formed by several demographic districts, each with its own civic-ceremonial nucleus of monumental architecture, and engaged in diverse economic activities such as craft production. Unlike other well-known centralized Andean cities, Sicán is a dispersed city with several separate nuclei that I propose corresponds to a segmentary form of sociopolitical organization. Sicán's layout resembles the sprawling outline of a dispersed or garden city as originally defined for the Maya area and southeast Asia.

Widespread distribution of wealth consumption objects such as finewares, metals and beads show that the Sicán city had a large middle class population. Evidence suggests that craft production, particularly metallurgy, was the critical source of wealth, prestige and power in the Sicán city. Finally, this research provides a complete social trajectory of the research area spanning the Formative, Moche, Sicán, Chimú/Late Horizon and Contact/Colonial periods.

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PREFACE

This dissertation is the result of the generous support of many individuals and institutions. At the University of Pittsburgh, I have been fortunate to work and learn from professors and friends who have guided my ideas and challenged me to develop intellectually and professionally, while at the same time supported me since I first arrived to the city that became my second home, Pittsburgh.

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1.0 INTRODUCTION: URBANISM, SOCIOPOLITICAL ORGANIZATION AND RESEARCH QUESTIONS

The study of cities and urbanism adds to our knowledge of the varied nature of social and political organization and integration in different societies of the past. Among the different axes of variation is the relationship between commoner s and elites, specialization and craft production, and the distribution of power, as well as ritual, performance and experiential urban views. Cities are the home of elite and commoner residents where daily interaction, social segmentation and economic differentiation are manifested.

This research investigates the sociopolitical organization of the Sicán city by studying the urban layout and residential characteristics of the Sicán site, inferred capital of the Sicán polity (AD 900 – 1375), in the La Leche valley, located in the Lambayeque region on the North Coast of Peru. Chronologically, the Sicán polity flourished between the Moche civilization of loosely-tied ceremonial centers, and the later, highly complex, bureaucratic Chimú Empire. Thus, Sicán has been viewed as an important transitional society between these two very different political systems. To date, our knowledge of Sicán is based largely on the excavation of monumental and funerary contexts, and on the study of agriculture and craft production of metals and ceramics. We might expect that, as successor to the Moche, the Sicán city capital would continue a centralizing trend seen in the previous city of Pampa Grande and in the later north coast capital of Chan Chan. However, as will be seen later, centralization and density at Sicán are relative, giving as a result a very different urban and social scenario.

My research shows that Sicán has an urban layout and organization of scattered monumental architecture and dispersed residential mounds. I argue that this pattern resembles the sprawling layout of “low density” Mayan cities, with their dispersed mound/patio/plaza groups, spreading over several square kilometers (Isendahl 2012). The basic layout of such cities is a civic-ceremonial core with elite residences and regal-ritual and public functions surrounded by an extensive, low density urban sprawl with clustering around subsidiary civic complexes or higher-ranking households.

My research addresses: (1) the urban and architectural layout of the Sicán city, (2) the size and population density, (3) socioeconomic differentiation and economic occupation of its residents; and (4) continuity and change through time in residential patterns in the area. The results of my research provide an initial understanding of Sicán urbanism, social organization and political structure and statecraft, and they expand our view of urban variability and social trajectories in the ancient Andes.

1.1 TRADITIONAL AND CURRENT STUDIES AND DEBATES: THE CITY AND THE STATE

The concepts of cities and states are used frequently together in the archaeological literature. In this section I provide a brief history of concepts and definitions as well as current debates and views about the city and the state.

The relationship between cities (urbanism) and states (political centralization and power) has a long history in archaeological research. States have been proposed as the final step in the evolution of complex societies (Sanders and Webster 1978; Spencer 1990; Trigger 1993). Classic neoevolutionary approaches to the study of cities were focused on looking at their origins and the correlation between the emergence of state level polities and cities (Adams 1966; Childe 1950; Fox 1977; Trigger 1972), favoring topics such as power, social hierarchies, centralization, and market economies. Proposed prime movers leading to the formation of states are defense and protection (Flannery and Marcus 2004), agricultural surplus production (Childe 1950) and religion and cosmology (Whitley 1971).

Cities have been an important theme in archaeological inquiry almost since the beginning of the discipline. In 1950 Gordon Childe published “The Urban Revolution,” a work that has greatly influenced the studies of urbanism, cities and states ever since. Childe understood urbanization as a process that had a generative role in social change leading to the appearance of cities and states. This publication was not so much about cities per se, but about the interrelated social, economic, political and cultural changes that led to the appearance of early states and cities (M.E. Smith 2009: 10). Inspired by Childe’s ideas, Adams (1966) stated that political centralization was the result of urban development and growth, using evidence from his settlement patterns study in Mesopotamia.

Childe (1950) identified ten archaeologically recognizable criteria that a site should meet in order to be considered as a city; many of these are still very useful and continue to be used by archaeologists today. These are: large settlement size, full-time economic specialists, the existence of taxation, monumental architecture, a recording system, a ruling class, science and arts, long-distance exchange, an economy based on agricultural surplus and thus supported by farmers, and an economy not based on kinship (Childe 1950:9).

One of the most commonly used approaches to the study and definition of cities is the **functional** approach, which highlights the variety of functions concentrated in a single place. Eric Wolf emphasized the variability of activities developed within a city, by stating that a city is a “settlement in which a combination of functions is exercised, and which becomes useful because in time greater efficiency is obtained by having these functions concentrated in one site” (Wolf 1966:11). Trigger mentions that "It is generally agreed that whatever else a city may be it is a unit of settlement which performs specialized functions in relationship to a broad hinterland" (1972:577). Fox developed a typology of cities based on its functions that included regal-ritual centers, administrative centers, and mercantile centers (Fox 1977). Another widely used approach is the **demographic or sociological** approach (Smith 2016:154).

Wirth states that: "for sociological purposes a city may be defined as a relatively large, dense, and permanent settlement of socially heterogeneous individuals" (Wirth 1938: 8). As noted by several researchers, population nucleation and size are widely recognized as a social complexity driver (Carneiro 2000).

These approaches have been largely influenced by the view of the city as a producer, consumer, and center of commerce (Weber 1968) with a strong emphasis on class over kinship. These models have since been criticized for being more descriptive than explanatory of urban developments. Traditional urban studies, like those of the Chicago school of urban sociology, approached cities as spatially coherent, centralized phenomena or products. More recent urban studies, such as those of the Los Angeles school of urban sociology, focus on the fluid networks that constitute contemporary urbanism (Janusek 2015). Like urban subjects, cities are processes and products (Janusek 2015: 229).

Other definitions involve **emic** attempts using native terms and meanings such as the concept of *altepetl* for the Aztec city (Hirth 2008), *cacab* for the Maya city (Marcus and Sabloff 2008) and *calpolli* for the Aztec districts and neighborhoods (M. E. Smith 1993). In these cases, the concept of city includes the people who inhabit it, and the political and economic landscapes surrounding it. Some approaches focus on **religion** as a social driver for the formation and maintenance of cities. If we understand Cahokian religion as a dynamic component of urbanization, reinvented or reimagined during performances that ultimately altered the political, social, and economic lives of people in distant lands, then the extensive and immediate sub-continental effects of New Cahokia may argue for the need to more closely examine religion as the basis of governance and the reason for the rise and fall of cities (Pauketat 2015:453).

While some researchers study commonalities among cities, others focus instead on their differences. Egyptian cities are studied as arenas of performance (Baines 2015), while Maya and Inka cities (Law 2015, Urton 2015) are studied as places for the exchange and development of information technologies such as writing and record-keeping. For a detailed history of the study of early cities see Yoffee and Terrenato (2015).

For Yoffee and Terrenato, cities evolved as “collecting basins” in which long-term trends toward social differentiation and stratification crystallized independently all over the planet (Yoffee and Terrenato 2015:3). Urban centers are not static, but are social formations manifest in a changing physical surrounding (Smith 2003). They are not just the reflection of political and economic organization, but also reproduce and re-create such organizations.

Importantly, researchers have recently highlighted the need to change the focus of study from what a city is, to **what a city does** (McIntosh and McIntosh 2003; Pauketat 2015). By focusing on how space is socially constructed and the social generative aspects of the city, Monica Smith (2003) explains that cities are the result of a limited range of configurations that are only possible when people are concentrated in a particular space. Cities then, are internally coherent population centers with internally driven trajectories, where urban form attracts a large variety of inhabitants as they seek to build economic and social networks for themselves; these networks are created and maintained at the household and neighborhood levels, illustrating how and why cities can exist before the development of states and how they survive when these political systems collapse (M. L. Smith 2006:98).

In this dissertation, I use this last approach to the study of Sicán, since I am interested in reconstructing the social trajectories formed by the inhabitants of the Sicán city, and the ways in which social interaction and political power were created and maintained before and after the rise of the Sicán polity.

Finally, the archaeology of urbanism has allowed a vibrant contemporary dialogue about the role of concentrated population centers in the development and maintenance of social complexity (M.L. Smith 2006:98). Monica Smith proposes that urban centers were the product of negotiation, compromise and consensus among different individuals and groups. Urban centers, the author argues, are the physical locus of social and economic networks (M. L. Smith 2006:109). As Yoffee mentions, cities are not things or essences but points of entry into modern archaeological, general anthropological, and historical topics of what changed in the ‘‘urban revolution,’’ a revolution that is far from over (Yoffee 2009:282).

1.2 THE CITY AND THE STATE: SOCIOPOLITICAL ORGANIZATION

Some researchers argue that the relationship between states and cities should be analyzed as separate dynamic trajectories that may or may not correlate. In her Dynamic Model of Peaks and Valleys of ancient states, Marcus (1998) analyzes the repetitive cycles of formation, expansion and breakdown of such polities in several areas of the world including Mesopotamia, Egypt, Andes, and Mesoamerica, among others. In all the cases shown, a state formed when a competitive chiefdom was able to dominate its rivals, and expanded until reaching its maximal territorial size, ultimately to start fragmenting and losing peripheral provinces and territories, even when capitals continued to have high population densities, becoming "city-state" like polities. In these cases, cities like Copán that had a long developmental cycle were already functioning before the Early Classic Period (Maya state), continued functioning and growing during the Late Classic and well into the Post Classic after the state collapsed, when different and "new" state-like polities in the form of "city-states" appeared (Freter 1998, Marcus 1998).

Lately, researchers have highlighted the importance of looking at cities as functioning population centers apart and independent from state-level ties, to evaluate why and how urban centers grow and thrive (M. L. Smith 2006:98). Monica Smith highlights the archaeologically demonstrated longevity of cities in opposition to the changing and cyclical characteristics of political power systems (M. L. Smith 2006). For example, in the Middle Niger River, McIntosh and McIntosh (2003) find that cities existed without the appearance of the state and without involving a centralized authority. In India in the Ganges River basin, Smith finds that the lack of administrative and bureaucratic mechanisms in the Harappan period points to self-organized cities with internally driven propensity for ritual, social and economic cohesion (M.L. Smith 2006:130). In the Indus civilization, Possehl (1998) finds that large urban settlements functioned without state organization.

There are some cases, however, when cities and larger sociopolitical organizations present a strong relationship. I consider that traits and characteristics that are used for analyzing states or polities can be used to study cities as well. The ultimate example where these traits are applicable to both cities and states are of course city-states, but this approach can be useful as well for the study of cities that are also capitals of states. As home to a society's leaders and central institutions, capitals provide unique information on political organization and the nature of rulership. Political structure, for example, can be visible in the number, size, composition and location of elite residences. A city may be dominated by a single ruler's palace (as in Mesopotamian cities, or at Pampa Grande), or, at the other end of the spectrum, may contain relatively equivalent, elite residential units, suggesting a more segmented form of political centralization (as has been suggested for Chan Chan and Teotihuacan, respectively; Topic 2009, Manzanilla 2009). The investigation of capitals has recently seen a revival of interest, stimulated by new concerns with residential patterns (Baines 2006; Chapdelaine 2009a, 2009b; Cowgill 2004; Janusek 2009; Manzanilla 2009; Marcus 2009; Marcus and Sabloff 2008; Pillsbury and Evans 2004; Rice 2006; Storey 2006), by post-processual "experiential" approaches (M.L. Smith 2003), and by theories and methodologies drawn from political science, urban studies, economics, and other fields (M. E. Smith 2003b).

Although the study of Sicán political structure and organization is not in itself the main objective of this dissertation, the fact that the Sicán city is the inferred capital of the Sicán polity leads consequently to reflections on Sicán political structure. In the past, authors have had varied opinions as to the characterization of the Sicán polity. While Shimada (1981, 1990, 1995, 2000) states that it should be considered a state, other authors consider that it is a confederation of residential centers (Jennings 2008; Tschauner 2001), or a non-state society composed of dispersed ceremonial centers (Conlee et al. 2004:211).

A discussion of political structure in ancient polities needs as a start a conceptualization. Polity refers to a broadly autonomous political entity (Renfrew 1986:2) with a complex state-like sociopolitical structure. In archaeology, discussions are oriented either toward societal typologies or bundled continua of variation. Societal typologies require categorical (polar) thinking, which is a limiting way of conceptualizing what many times can be a continuum of variable values between polar extremes (Easton 1959; De Montmollin 1989). Bundled continua of variation is an approach that involves evaluating a polity in terms of the position it occupies along a series of thematically related continua of variation (Easton 1959). Here, I draw on several continua of variation provided by De Montmollin (Montnollin 1989:17 Table 1). For the analysis of the Sicán polity and city, the segmentary-unitary continuum is particularly important. Unlike other well-known cities like Pampa Grande, I contend that Sicán leans towards a segmentary organization. The **Segmentary-Unitary** continuum deals with the nature and interrelation of a polity's constituent territorial units or districts and their leaders. This continuum relates to the degree to which constituent territorial units (districts or provinces) and their inhabitants are differentiated and bound into a network with a central hub (De Montmollin 1989:19). Three sub-continua concern degrees of centralization, differentiation and integration (De Montmollin 1989).

Centralization is an indicator of hierarchical organization and centralized leadership and power. Different aspects of socioeconomic life -such as craft production, ritual, surplus management, etc. - can be organized around different households and individuals. When these different centers did not coincide, multiple parallel hierarchies and leaderships are observed (Crumley 1995). However, the correspondence of several hierarchical arrangements around the same households and groups is a strong indicator of centralized power.

Integration and **differentiation** derive from Durkheim's contrast between mechanical and organic solidarity (Durkehim 1993). Following De Montmollin's explanation about how this can be seen spatially, in a segmentary polity authority is somewhat concentrated at the center, with a number or nearly equivalent and competing sub-centers, while in a unitary polity authority is clearly concentrated at the center and this authority has a strong projection and distribution over the entire polity (De Montmollin 1989, Southall 1956). An important aspect of political organization is the way that contractual (*civita*s) versus ascriptive (*societas*) relations manifest in a given polity. Political anthropologists suggest that the principles that govern political relations within and among districts in a segmentary polity are based on ascription or kinship (*societas*), while in contrast principles governing relations in unitary polities are contractual in nature (*civitas*) (De Montmollin 1989:20).

To illustrate these concepts, it is useful to consider some concrete examples of degrees of centralization, integration and differentiation and how these are manifested in different kinds of political power such as unitary and segmentary polities.

Unitary or territorial polities (Hassig 1999; Trigger 1972, 2003) have direct control over territories and population and would have close to 80% people living in the countryside and the remaining living in cities. Cities hosted rulers and specialists with a limited relationship with the countryside based on centralized controlled of market exchange. City-states present the opposite configuration, with 80% people living in the city, and the remaining living within a small periphery (Charlton and Nichols 1997; Trigger 1993) such as in the case of Sumeria (Adams 1981) and Greece (Hansen 1998). The city not only hosts rulers and specialist but also “city farmers” that live in the city and commute to the agricultural fields every day (Hansen 1998).

A **segmentary** or hegemonic polity has a loose aggregation of districts which are replications of one another in their political structure, with low degrees of centralization, differentiation and integration (DeMontmollin 1989:19; Hassig 1999). In these cases, there is no strong distinction between heartland (urban) and hinterland (rural). The Maya has these characteristics, since small polities were not part of a single overarching political system, explaining its crowded countryside with centers of relative higher density but much dispersed pattern (Rice 2006; Storey 2006). Other scholars have also pointed to the fragmented nature of state society such as in the Aztec state (Hassig 1999), and South East Asia (Junker 2006, Stark 2015).

The ways that people distribute themselves in the landscape, concentrated or dispersed, in small villages or large villages, are related to the different ways in which society is organized. Different factors can have the effect of pulling people together or pulling people apart from each other. Interaction patterns and spatial and social constraints condition and shape the distribution of population in the landscape (Peterson and Drennan 2005). Among those varied factors are socioeconomic interdependence (Stone 1993), information flow (Alden 1979) and warfare and conflict (Wilson 1988). In a bottom-up approach, a basic assumption is that households decide in a rational way where to live. In a top-down approach, higher ranked individuals (elites) or overarching institutions may affect, condition or direct the loci of residence of the population and their proximity to political centers (DeMontmollin 1987).

A spatial manifestation of this segmentation is the "multiple nuclei" pattern of certain Maya centers such as Seibal or Uaxactun (Marcus 1983:206). Their dispersed residential layout and the intensification of agriculture has led archaeologists to characterize Maya centers as "garden cities" (Tourtellot 1993:222). The existence of open space separating residential architecture is seen as indirect evidence of spatially restricted "infield" systems (gardens and orchards) located within walking distance of residences (Rice 2006:252-276). The dispersed or garden city is then characterized by an extended, relatively low-density population, and space between urban houses for agriculture (Fletcher 2011).

People organized in low-density agrarian communities created settlements of highly varied size and form, characterized by extremely homogeneous spatial patterns spread over vast areas. Examples include rural Copan and Tikal in the Maya area and Anuradhapura and Angkor in Southern Asia (Fletcher 2011), cities that were also heartlands of their polities (Smith, 2011). Redundancy in the residential layout is indicative of self-sufficiency and the lack of economic specialization differentially organized and separated in space (Chase et al. 1990). Fletcher (2011) argues that these polities' settlements are self-similar as a product of a lack of variety in daily practice, and a commitment to large infrastructural projects that have made extensive modifications to landscape for agricultural production to mitigate risk. In a scenario of unstable environmental conditions, these garden cities would suffer greatly from ecological stress leading to political demise. Feinmann and Nicholas (2012) propose that political fragility is also an indication of self-sufficiency of the people and the distance between leaders and the masses (Isendahl and Smith 2013).

1.3 THE ARCHAEOLOGY OF CITIES: WORKING CRITERIA

As seen in the previous sections, definitions of cities are varied, and scholars do not agree on a single definition. Back in 1950 Gordon Childe in his Urban Revolution writings stated: "The concept of 'city' is notoriously hard to define" (Childe 1950:9). Classifications are partial, since they favor certain aspects instead of others. Classification, however, is a necessary first step in understanding scientific phenomena that enables researchers to compare data sets, structure research, and identify common aspects at which change occurred in long term diachronic sequences (M.L. Smith 2006: 101).

Nomothetic approaches to typologies and definitions have the advantage of having categories that are clearly defined in advance, resulting in unequivocal groupings that were preferred in earlier studies of cities. However, polythetic approaches evaluate cities on a series of attributes and criteria that can have combinations of those attributes (M. E. Smith 2016:158). As mentioned by Cowgill, a polythetic attribute-based approach is better since variation among ancient cities is too high to apply a single definition (Cowgill 2004). I consider that among the most valuable polythetic approaches available are the ones developed by Monica Smith and Michael Smith.

Monica Smith proposes a triaxial model for studying cities based on archaeological remains, grounded on different types of quantitative and qualitative criteria. The author proposes a combination of three criteria: demographic, internal specialization (based on Childe's traits) and external specialization (function) (M. L. Smith 2006: 107). Hutson (2016) follows this model for his study of urban Maya but separates the demographic criteria into two separate ones: size and density. Hutson states that large settlements need to meet at least three of these four criteria in order to be considered as cities: large size, high density, social differentiation and specialized function (Hutson 2016:16).

Michael Smith proposes an archaeological attribute-based approach or protocol for the study of cities (M. E. Smith 2016:159, Table 10.1). The archaeological urban attributes are: Settlement Size (in population and area), Social Impact (Civic architecture, palace, craft production and markets or shops), Built Environment (fortifications, roads, canals; also, Intermediate-order temples that are more abundant and more widely distributed at the level of a neighborhood), and finally, Social and Economic Features (including neighborhoods, non-class social diversity such as evidence for ethnic, religious or occupational variation residents, agricultural cultivation). This would give as a result a typology of major urban functions: religious, economic and political (Smith 2016:164 Image 10.4).

I agree with Michael Smith when he states that there is no single best definition of urbanism nor a singular best approach for analyzing early cities (M. E. Smith 2016: 166). For this dissertation I use the following working polythetic criteria: **specialized functions, demography, and social differentiation.** These criteria have been touched on by several authors, as seen above. Next, I focus on these criteria and their operationalization.

1.3.1 Specialized Functions

Specialized functions refer to the relationship of the city when compared to the local, regional and supra-regional scale, resulting in a "functional definition." Specialized functions and services provided by a city to a broader hinterland are the most important features established by Trigger while defining a city (Trigger 1972). Specialized function refers to the fact that cities provide services not found in villages (Hutson 2016:12). Cities have a monumental core or center for political, religious and/or administrative institutions or government. This is discussed for the Sicán city in **Chapter 4**, focusing on civic-ceremonial architecture.

1.3.2 Demography

Demography refers to both population size and population density. A discussion of the demography of the Sicán capital is developed in **Chapter 5**.

Population size, growth, and distribution are considered major forces in the emergence, development and change of complex societies. Population distribution in the landscape has been studied in detail, for example in explaining increasing pressure on natural resources (Freter 1988), the appearance of conflict (Carneiro1970, Webster 1999), and long-term sociopolitical and economic change (Drennan 1987; Johnson 1982; Sanders et al. 1979). In terms of political economy, population is the source of labor, whose control and management are key for the political economy of certain polities (Bauer and Covey 2002). Larger populations can support larger economies, while reducing the burden of tax (or surplus) extraction.

Density refers to the spacing of people. Density is important since the more people are aggregated, the greater the social interaction and thus, political, and economic organization (Hutson 2016:10). Hutson operationalizes the large size criterion stating that it refers to a relatively large number of people that live in a given city; settlements with 5000 people might meet this criterion (Hutson 2016:9-10). The author uses Weber's criterion that a settlement counts as large when personal reciprocal acquaintance of the inhabitants is lacking (Hutson 2016:9). Cities have a relatively large number of people living in them and tend to occupy a large area when compared to other contemporaneous settlements.

Population can be aggregated in different scales. At a smaller scale, communities are constituted in the patterned interactions between households that are fundamental to everyday life in societies, with this matrix of interaction being the milieu where the forces that generate social change are produced (Drennan and Peterson 2012:72). At a higher-level regional scale, with increasing population densities, interaction becomes less costly because more people are available to interact at shorter distances and the costs of interaction of any kind increase sharply with distance. In this sense, higher population density encourages higher social interaction (Drennan and Peterson 2012). Supra-local communities are considerably larger in a spatial and/or demographic scale and may be referred to as polities or districts (Drennan and Peterson 2012) and it is here where central place activities and interaction are manifested involving economic, political, social, ritual, among other aspects.

1.3.3 Social Specialization

According to Smith, social specialization criteria meet Childe's list of ten abstract criteria deducible from archaeologically recovered material (Childe 1950:9). In this sense, Childe's list is useful as a heuristic device for cross-cultural comparisons (M. L. Smith 2006:102). Most of these criteria are met in terms of internal social differentiation. Social differentiation refers to how different or heterogeneous people are in terms of their wealth, authority, ethnicity, and economic occupations (Hutson 2016:11). In this dissertation these criteria are analyzed in **Chapter 6**.

1.4 INTERMEDIATE URBAN ORGANIZATION

A city can be studied as formed by several communities or intermediate social units such as neighborhoods and districts.

While studying how people organize themselves daily, scholars have defined intermediate social units as a proxy to understand social organization. Neighborhoods are an intermediate size unit between the house and the city, and constitute a spatially discrete urban zone (M. E. Smith 2010, 2011). Neighborhoods are residential, social landscapes that serve to integrate multiple households without homogenizing residents (Pacifico and Truex 2019). As Stone points out, the term neighborhood should refer to identifiable face-to-face communities existing within larger settlements, because such groupings of communities played important structuring roles within the ancient settlements we study (Stone 2019). In short, neighborhoods are discrete residential zones with considerable face-to-face interaction and are the building blocks of cities (Smith 2003; Stone 1995). In urban areas, they are the basic unit of social integration and labor (Manzanilla 2009). As a subdivided cell of interaction within a larger mass, neighborhoods were an essential component of populations larger than villages, whether their physical configurations were generated through bottom-up or top-down initiatives (M.E. Smith et al. 2015). The residents of neighborhoods often share one or more social attributes such as race, ethnicity, class, religion, occupation, or political affiliation, thus resulting in similarities in material culture (M. E. Smith 2010:146).

Social drivers for neighborhood formation include defense, group preservation, sociality, convenience, administration and control/surveillance (M.E. Smith et al. 2015). Neighborhoods would have played an important if not defining role in the transition from rural to urban life, and the mechanisms of social integration into larger urban centers (M. L. Smith 2019). The development of neighborhoods as physical and social entities allowed people to manage the complexities of individual and household life at an optimal (intermediate) scale and still benefit from the array of opportunities that only exist in cities (M.L. Smith 2019).

A feature of this approach is the “bottom up” focus on the social construction of the city, including the nature and relations among the constituent “building blocks” of cities, whether elite compounds, houses, neighborhoods, districts, plaza groups, ethnic groups, interest factions, “social houses” or “small worlds” (Arnauld 2012; M. L. Smith 2003a; Smith 2007, 2010, 2011; Stanley et al 2012; Wallman 2011; York et al. 2011). The resultant neighborhoods, intertwined with the physical world, can be characterized as “assemblages” that include people, objects, animals, plants, and the landscape itself (Harris 2013:177 mentioned in M. L. Smith 2019).

The social composition of neighborhoods can tell us about religion as in Near Eastern cities (Marcus 1989), economic specialization as in Teotihuacan (Cowgill 1992; Manzanilla 2009) and wealth and status through a central or preferable location as in Galindo (Bawden 1982). Feasting in noble houses (intermediate elites) in certain neighborhoods served to reinforce identity formation (Hendon 2009). By contrast, redundancy in neighborhoods is a reflection of self-sufficiency, as in rural Maya and Angkor Wat (Fletcher 2010). Segmentation is found in Xochilalco, with its fourteen zones, each one with a temple (Hirth 2009). Other examples include the multiple nuclei center in Seibal (Marcus 1983), multiple cores with temples and palaces in rural zones in Africa (Kusimba) and the several ciudadelas at Chan-Chan (Kolata 1983; Pillsbury and Leonard 2004). Neighborhood organization can also tell us about the nature of family organization and its changes, as in Teotihuacan, ranging from single-family houses to multifamily apartment compounds (Manzanilla 2009). In this way, neighborhoods are a useful analytical unit for the analysis of intra-site configuration and variability, especially in urban contexts. They make possible a bottom-up approach that moves away from an emphasis on centralized and planned elite organization and power and allows the analysis of local dynamic social formations and responses.

Monica Smith proposes a phenomenology of the neighborhood, which should not be thought of as built environments, but rather as “in-the-process-of-being-built environments,” where people purposefully create their landscapes through several distinctive everyday actions, such as building houses and using courtyards for work and play (M. L. Smith 2019). For this author, neighborhoods are a social concept that can be materialized in a variety of permanent arrangements, as well as temporary configurations such as refugee camps, pilgrimage venues and army camps (M.L. Smith 2019).

1.4.1 The Archaeology of Intermediate Urban Units: Neighborhoods and Districts

Neighborhoods are discrete residential zones with considerable face-to-face interaction and are distinctive based on physical and/or social characteristics (M. E. Smith 2010:139). They are the building blocks of cities (M. L. Smith 2003). Manzanilla (2009) states that neighborhoods are the basic unit of social integration and work.

Districts, on the other hand, have been defined as larger than neighborhoods. The interpretation of a residential zone as a neighborhood versus a district will depend on the size and architectural composition of the zone (M. E. Smith 2010:146). Michael Smith identifies two types of districts. The first is an administrative district, also called a ward (Hutson 2016:72), that is created in a top-down fashion for administrative purposes (Smith and Novic 2012:2). The second one is a social district, which is a large residential zone that includes many neighborhoods, but that is not necessary an administrative unit (M. E. Smith 2010:140).

In this dissertation I use Smith's notion of **social district**, as being a large residential area including several neighborhoods that may or may not be an administrative unit (M. E. Smith 2010:140). This definition coincides with the one provided by Hutson, where a district is a division within a city that is larger than a neighborhood but whose members still share something in common (Hutson 2016:72).

In order to identify these intermediate social units in the archaeological record, archaeologists have recognized several archaeological correlates: the physical features that bound them (canals, avenues, and ravines), their social distinctiveness as translated into shared patterns of material culture (house form, foodways or material possessions) and their spatial clusters of buildings or spaces (M. E. Smith 2010:146). This latter aspect is particularly important for low density urban patterns such as those found in the Maya area like Copan and Tikal, Anuradhapura in Sri Lanka and Bagan in Southeast Asia (Fletcher 2011; Smith 2010). Hutson uses similar criteria for the identification of these intermediate social units: spatial clustering, focal nodes (large buildings or temples), stylistic clustering, and craft specialization (Hutson 2016:73).

Next, I explain the main archaeological correlates of intermediate urban units and the way they have been operationalized and used for the identification of districts in this dissertation.

1.4.1.1 Spatial Clustering

This has been the main criterion used for the identification of intermediate social units, since the closer people live, the more social interactions there will be. The interpretation of spatial clusters of buildings or spaces relies on the assumption that distance is inversely correlated with social interaction (M. E. Smith 2010). Spatial clustering can vary depending on several factors including topography, vacant spaces, distance measures, transportation routes and walls and other built boundary features (Hutson 2016:73).

1.4.1.2 Stylistic Assemblages

Different stylistic assemblages of ceramics, architectural features, and adornment can be used to identify intermediate social units or neighborhoods (Hutson 2016:87). Stylistic assemblages have shared patterns of material culture. As Janusek (2002) mentions for Tiwanaku, different groups had different ceramic assemblages and preferred cuisines, an expression of their different social identifies. In Teotihuacan, ethnic enclaves were identified based on their stylistic assemblages (Cowgill 2008).

1.4.1.3 Economic Occupation and Differentiation

Economic occupation can be studied through craft production. Households located next to each other may have participated in the same craft production activity (Hutson 2016:90). Craft based neighborhoods would show spatial clustering in crafting; this crafting proximity might have presented advantages such as procurement. Craft based intermediate social units have been identified at Teotihuacan in the Tlajinga district (Widmer and Storey 2012). In the Andes, craft based social intermediate units have been identified in Tiwanaku (Janusek 2002) and Huacas de Moche (Uceda and Armas 1998).

1.5 THE ARCHAEOLOGY OF CITIES: WORKING CRITERIA IN THE ANDES

The study of Andean cities can add to our knowledge of the varied nature of Andean social organization. They were also the home of elite and commoner residents where daily interaction, social segmentation and economic differentiation were manifested and negotiated.

Unlike urban studies elsewhere, traditional studies of Andean urbanism have usually highlighted Andean uniqueness following a particularistic point of view. For instance, Kolata (1983) has suggested that cities as characterized for Mesopotamia did not exist in the Andes; this idea was developed by Makowski, who proposes that the Andean system was anti-urban (Makowski 2012: xx, xlix), meaning that Andean urbanism's principles oppose the essential characteristics of the urban system, as it is manifested in Mesopotamia (Makowski 2016, 2012: ii).

Two major traditional models have been used to explain cities in the Andes. The first is the "Empty/Pilgrimage Ceremonial Center model." This model has especially been applied to large coastal sites. Cahuachi in the Nazca region was characterized as such by Silverman (Silverman 1988). Pacatnamu in the Jequetepeque valley of the north coast was also characterized as such by Keatinge (Keatinge 1982). In this view, a city like Cahuachi was occupied permanently by only a few residents, elites or ritual specialists, and periodically swelled in size when pilgrims visited for large-scale ceremonies.

The second model for Andean cities is the "Oikos Model" proposed by Kolata (1983). The oikos model highlights the economy and political influence of the ruler's household, that extended far beyond the city's hinterland (Kolata 1997). The city then, was an extension of the elite household and the public expression of its religious and secular authority. The oikos city will not have a large "middle class," and had little in the way of residential architecture intermediate in scale and quality between the elite compounds and houses of commoners. Using this model Kolata states that the Inka and Chimú states did not have "true cities" as in Mesopotamia (economic, political, and social hubs around markets). In this model Huánuco Pampa and Chan

Chan were oikos cities that focused around the royal household. Kolata states that the characteristics of Andean capitals that distinguish them from non-Andean capitals are the lack of administered markets, a relative lack of social heterogeneity, low urban population size and intense development of instruments of social control within the urban environment (Kolata 1996:223). Further, Kolata states that “Andean cities were centers for elite cultural definition and self-expression; a large resident population of commoners was inimical to their purpose and function. Apart from commoners incorporated into the cities in a retainer capacity, the masses rarely participated in urban culture, except on ritual occasions. Not surprisingly, several – perhaps most – Andean capitals were focal point for pilgrimages” (Kolata 1997: 247). In a similar vein, Swenson (2003:247) mentions that north coast Andean cities were “arenas of socially restricted, consumptive violence where asymmetrical power relations were naturalized and materialized through performances of ritual violence and sacrifice.”

In the models of these authors, the main variable taken to analyze cities has been public architecture. Lately, there has been an increase in research in cities in the Andes, which can be addressed following the city criteria explained in the earlier section. In contrast to what these authors believe, that Andean cities are not really cities, I contend that Andean cities fit several definitional criteria of cities discussed above. They are cities and thus, can be compared with any other cities elsewhere. Below, I use these definitional criteria to explore several characteristics of the best-studied cities in the Andes.

1.5.1 Specialized Functions

Civic-Ceremonial Structures are generally of a monumental character and were used as centers of power, religious activities and ritual.

At the center of Pampa Grande was the massive Great Compound containing the Huaca Fortaleza palace. Lesser elite platform compounds clustered to the north of the Great Compound (Shimada 1994:147-8). To the east and west are expanses of high density, agglutinated lower class residences, lacking mounds. Shimada (1994:149) distinguished at least 17 smaller huacas or mounds, each over 3 m high, and ranging in volume from 500 – 13,000 m3, all within residential compounds, and most lying along a north-south *axis mundi*. These range 50 - 500 m in distance from one another (Shimada 1994: Fig. 7.3). Shimada's (2004) reconstruction of the Pampa Grande urban economy emphasizes the degree of craft-specialization, redistribution, and central management, with non-residential workshops for metal and textiles (Sector H), the concentration of storage structures in Sectors D and H, and elite control of cotton textile production (Johnson 2010; Shimada 1978).

The most significant monumental ceremonial architecture at Galindo, Pampa Grande, and Chan Chan was located within elite residences, reflecting the ruling families' close control of public ritual and labor mobilization. There is little public architecture at Chan Chan outside of the massive burial huacas in the ciudadelas (Moore 2003). At Galindo, huacas included the ruler's burial pyramid (Huaca de las Abejas) in the Galindo Enclosure. Four platforms outside of residential contexts lie in the southeastern edge of the site. At Pampa Grande, platforms were located within elite residences, ranging from the Huaca Fortaleza in the Great Compound, to platforms in lesser elite compounds (24, 13, 11, 15, 14 [Deer House]). Shimada (1994) distinguished at least 17 smaller huacas or mounds, each over 3 m high, and ranging in volume from 500 – 13,000 m^3, all within residential compounds. The scattered platform mounds in the western portion of the site Shimada (1994:149) interprets as representing the locations of local elite households. The uses of the mounds are not clear.

Moche and Tiwanaku had an intense focus on monumental architecture that served as stage for ceremonial performance and mortuary ritual, but had no formal bureaucratic infrastructure. On the contrary, Chan Chan and Wari present planned bureaucratic infrastructure.

Tiwanaku's importance is largely based on its ritual prestige. The city was a pilgrimage destination (Isbell 2008) or "ritual-political" center with ubiquitous ash pits yielding large amounts of ceramics (cooking, storage/fermentation and serving) and food (camelid, guinea pig, maize and quinoa) (Wright et al. 2003), the product of recurring feasts and rituals. Its central location made it an economic hub for large-scale caravan trade (Janusek 2009). Janusek considers that the development of Tiwanaku's importance starts as part of a distributed network of Late Formative centers including Khonko Wankane. Since early times Tiwanaku was both process and product (Janusek 2015:229). For the author, Andean urbanism animated and sanctified natural forces, cycles and features, where political authority materialized as a strategy of the mediation of relationships between human and non-human arenas (natural forces) (Janusek 2015: 230).

Civic-Ceremonial Structures in Andean cities have played an undeniably important role, particularly in regard to the development of elaborate rituals and religious aspects.

1.5.2 Demography

Andean cities did have dense populations and clear urban/rural boundaries. Galindo, Pampa Grande, and Chan Chan all display very compact, high density residential occupations, giving each city capital a clearly bounded edge.

Moche (also known as Complejo Huacas de Moche), the capital of the Southern Mochica state (Moche III AD 300-450 and Moche IV D 450-700), is located in the Moche Valley of the north coast of Peru. Originally considered to be a civic ceremonial center with religious and ideological activities held in the Huaca del Sol and Huaca de la Luna mounds, recent research has revealed a city covering 60 ha of densely occupied urban settlement with at least 6000 people (Chapdelaine 2009) and evidence of long-term occupation and modification of residential structures (Van Gijseghem 2001). The urban core presents an organized layout with streets dividing sectors, large residential compounds, small plazas and specialized workshops.

The 6 km2 site of Pampa Grande exhibited aggregated residential compounds and strong social zonation, with higher status compounds in the center of the site, and expanses of high density, agglutinated lower class residences, lacking mounds, to the east and west (Shimada 1994:149). At the 6 km^2 site of Galindo, occupation consisted of aggregations of house compounds (130 – 190 m2 in size) and lower status dwellings (45 m^2 in size; (Bawden 1982a; Lockard 2005:87). The site further exhibited neighborhood class divisions, with distinct zones composed of residences of the same status (Bawden 1982b).

Chan Chan was a densely populated metropolis, estimated at 30-40,000 residents, with a core area of 6 km2 and outlying residential areas covering another 14 km2 (Kolata 1983, 1997;

Moseley and Mackey 1974; Pillsbury and Banks 2004). The site's elites lived in residential compounds, while everyone else occupied small, irregular, agglutinated rooms (SIAR). Most SIAR areas were divided into self-contained barrios, each with its own elite compounds, wells, and walled cemetery. Topic (2009:232) suggests that each barrio may have represented a *parcialidad* (a group of subjects under the control of a lord; Netherly 1977). Moore highlights the "exclusionary ideology" of the elite walled compounds and their restricted access to non-elite members of the city (Moore 1996, 2003).

Unlike earlier characterizations of the Tiwanaku capital as a vacant ceremonial center (Bennett 1934), recent work has demonstrated that it was a long-term densely populated city (up to 30,000 people by AD 800) covering an area of 4 to 6 km^2 with differentiation in status, economic occupation and social identities (Janusek 2008, 2009; Janusek and Blom 2006). The city has a monumental center with the Akapana megalithic pyramid, walled sunken plazas, palaces (Multicoloured Room) and a complex canal system. Janusek argues that Tiwanaku was a cyclically pulsating ceremonial urban center to which people from multiple localities came for important ritual events involving intensive commensality (Janusek 2015:235). The city incorporated several neighborhoods with multiple walled compounds, each compound formed by one or more households (Janusek 2015:234). There were several structures built to house visitors during key ceremonial occasions; 40-50% of Tiwanaku's urban periphery consisted of abandoned residential structures (Janusek 2015:235).

Wari was a densely populated center with up to 40,000 residents in an area of 2.5 km^2 with a long-term occupational sequence (Isbell 2008). Unlike Tiwanaku, Wari did not have megalithic pyramids, but had megalithic tombs, from which social status has been reconstructed to include three tiers of elites: royal burials (Monjachayuq), high elite (Cheqo Wasi) and administrative elites (Moraduchayuq) (Isbell 2008). A fourth tier would have been occupied by commoners. By the Moraduchayuq phase (AD 650-800), the city layout shows a secular character with ubiquitous planned compounds with residences in the form of repetitive modular cells within rectangular blocks or "orthogonal cellular" house apartments, each with an open courtyard and surrounded by rooms used as habitations or storage, likely inhabited by nuclear families (Isbell 1991, 2008). D-shaped structures were ceremonial spaces. The elite administrative sector of Moraduchayuq was highly constrained by its walls, had orthogonal cellular apartments, luxury goods and large quantities of food serving vessels for feasting (Isbell 2008, Isbell and Vranich 2004).

1.5.3 Social Specialization

Internal social differentiation is strong in all these cities, with royalty living in palaces (Chan Chan, Tiwanaku and probably Galindo), elites living in well-made residences, a working middle class with craft specialists, and a lower class or commoners in all cases.

In the Complejo Huacas de Moche investigators (Chapdelaine 2002, 2009; Pozorski and Pozorski 2003) have identified larger compounds (such as 5, 8, and 35) as "elite residences," but none have the scale or attributes to be called a palace (Chapdelaine 2010). Compound 9 is one of the few to have been completely excavated. It is a walled compound measuring 17 x 32 m, and contains within it some 45 rooms, originally housing four families, and a small, funerary platform. In fact, there is a continuum in compound size, rather than sharp divisions. The larger (wealthiest) compounds are not grouped together and are surrounded by smaller compounds. Somewhat confusingly, Chapdelaine (2009) has argued that most of the compounds represent a middle class not engaged in agriculture (2009:190), while also suggesting that the core was occupied only by "privileged people" of the upper class, and that the residential sector represents a "nobility class surrounded by a middle class" (Chapdelaine 2010:38).

The lack of centralized storage facilities, and the presence of storage within the compounds, suggests that staple storage was dominated by the elites rather than the state or a single ruling family (Chapdelaine 2009). Little can be seen of domestic occupation beyond the core site area because of the destruction caused by floods and modern agriculture.

The ruling families at Galindo, Pampa Grande, and Chan Chan all lived in central palaces. In Pampa Grande however, most economic specialization was separated from residential areas and was sponsored by the state, as seen in dispersed loci of low-output metal and textile craft production. Sector H was the labor force that commuted from the low-class habitation sector and was fed by spatially segregated kitchens (Sector D) (Shimada 1978). Commodity and labor control are further attested in the "formal storage complex" (Anders 1975, Shimada 1978) and in a network of corridors that controlled access to them. There were three walled palace compounds at Galindo, the largest (the Galindo Enclosure or Huaca de las Abejas) representing the paramount ruler's palace and burial pyramid (Bawden 1982b:317). Outside the walls of each compound is an associated cluster of low status dwellings (resembling the SIAR alongside the *ciudadelas* at Chan Chan), suggestive of attached households serving the elite family. At the southeastern margin of the site (Plain B) are four civic-ceremonial *huaca* platforms. Several non-elite residences in this zone have been excavated (Lockard 2005).

Internal specialization is also found in craft production. Craft production took place within residences in Moche, Galindo and Tiwanaku, but only became a full-time specialized occupation in Pampa Grande and Chan Chan. In Moche (Complejo Huacas de Moche), the middle class had a strong emphasis on craft production, such as ceramic workshops in a "potter’s' barrio complex" (Uceda and Armas 1998:107), metalworking activities (Chapdelaine et al. 2001, Rengifo and Rojas 2005) and lapidary work (stone and marine products). Lower class residences held nuclear families with lower quality and quantity of artifacts. In Galindo, craft production was present in many parts of the site within residential areas, except for the lower-class sector (Bawden 1977).

At the center of Chan Chan lay the 10 great ciudadelas, the huge palace compounds of the ruling dynasty, each containing a court, residence, and burial pyramid. Thirty-five elite, high-walled compounds have been identified, of five different types (Klymyshyn 1982). The largest (Type I) share the layout and components of a ciudadela (minus the pyramid), while the smaller compounds (Types III, V) display such features as courts, u-shaped structures, wells, and/or storeroom complexes. Chan Chan’s commoner residents lived in barrios made up of SIAR (Small Irregularly Agglutinated Rooms) inhabited by craftsmen and artisans (metal smiths, ceramists, weavers) whose labor was dedicated to fulfilling the needs and affairs of the elites (Kolata 1983; Topic 1982, Topic 2009). Topic (2009:232) suggests that each barrio may have represented a *parcialidad* (a group of subjects under the control of a lord; Netherly 1977, 1993). Additional clusters of SIAR (estimated at 3000 residents) were spatially associated with both ciudadelas and elite units. Excavation in these indicated communal food preparation and craft activities, such as weaving and metal working, in Unit BM, (Topic 2009:226). These areas are interpreted as housing retainers for elite households (Topic 2009:223). *Arcon* structures (a variant of the *audiencia*), an administrative feature, are associated with workshops and wells, suggesting a high degree of central management of production (Topic 2009:237).

Tiwanaku had walled residential compounds that held several households and were a “unit of spatial segregation and social differentiation” as seen in the presence of diverse ceramic assemblages, diet and burials exemplified in the central “pure Tiwanaku” groups (Akapana, Putuni and Akapana East) and the Ch’iji Jawira sector outside of the outer channel dedicated partially to ceramic production with “Cochabamba Tiwanaku” wares (Janusek 2009).

While all these Andean cities fit several criteria for comparing cities in a global sense, they also show a wide array of variability. They vary in size, density, control and management of civic-ceremonial architecture, and internal social differentiation and economic specialization.

In the following section I focus in particular on north coast cities, their social trajectories and differences through time.

1.5.4 Urban Trajectories in the Andes: The North Coast of Peru

The north coast of Peru is the ideal place to investigate social organization through urban trajectories, because it has the longest documented sequence of urban centers and cities in the Andes, corresponding to the rise, and fall of Moche (AD 600), Sicán (AD 850-1375), and Chimú states (AD 1350). Thus, it provides us the archaeological information needed to analyze cities and their social trajectories.

Unlike Sicán, the urban organization of both Moche and Chimú cities have had significant study (Bawden 1977, 1982; Chapdelaine 2009, 2002; Johnson 2010; Moore 2003, 1996; Shimada

1978, 1994; Uceda and Armas 1998; Van Gijseghem 2001), and the major differences between these cities seem to indicate a linear development over time. Chimú and, to a lesser extent, late Moche cities show greater social stratification than earlier capitals and stricter residential segregation according to social status, more centralized control of storage and administrative roles in royal residential compounds, and a shift towards a more secular organization, with less investment in monumental temples and public plazas.

In terms of centralization, highly centralized cities such as Pampa Grande, Galindo and Chan Chan reveal a strong control over the population, with highly demarcated social segregation evidenced in walls and moats separating and restricting access.

During the Moche V (AD 600-800) phase two capitals emerge: Galindo, the capital of the Southern Moche state (Moche valley) and Pampa Grande, the capital of the Northern Moche state (Lambayeque valley). Both are located strategically in the valley necks controlling water and major canal irrigation intakes and coast-highland interaction. The evolution of these capitals through time is marked by a fast period of construction with a planned urban layout, and relatively short occupations. Population increase and irrigation expansion up to a prehistoric maximum are possible explanations for their rapid growth and abandonment (Shimada 1978, 1994). Both share a shift towards a more secularly oriented organization, with smaller platform mounds (the big exception being Huaca Fortaleza in Pampa Grande). Both had a highly centralized and tightly controlled urban layout with strong socioeconomic differences evident in residential location, architecture and artifact assemblages.

In Galindo, the most important aspect in terms of internal social segregation is the presence of a massive adobe wall and parallel moat that divides the elite sector from the hillside identified as the lower-class sector. Regardless of social distinctions, the general layout of residential structures consists of a 3-4 room complex (kitchen, living room, and storage) occupied by a nuclear family (Bawden 1982:169). Wealth and status resulted in better materials and construction, larger rooms and more storerooms. The “huaca compound” is the highest elite residence or palace, home of a paramount ruler (Bawden 1982:317. Lesser elites resided in *cercaduras* (large enclosures with domestic, administrative, and burial functions) located at the center of the site that resemble Chimú *ciudadelas* in their administrative role (Bawden 1982). Most of the population lived in four sectors representing different socio-economic statuses: high status residences with evidence of craft production (sector D), a large area of middle-class dwellings (Sector A) and the lower class in unplanned, crowded domestic structures (Sectors B and C) (Bawden 1982). The presence of large storage infrastructure (1/5 of the site area) located in the most inaccessible part of the site on hillsides is evidence of centrally controlled infrastructure.

Pampa Grande covers 6 km^2 of alluvial pediment with central public architecture including Huaca Fortaleza, one of the largest pyramidal mounds on the north coast. The layout of the site presents a three-level administrative hierarchy seen through a concentric distribution of walled enclosures and compact residential structures away from the central enclosure. Residences typically contained a kitchen, living room and a storeroom with a single entrance (Shimada 1994). High status residences are located in the central area and were constructed of plastered adobe bricks, whereas low status residences (Southern Pediment) are smaller and poorly constructed, with narrower and less formal streets (Shimada 1994). Some opportunistic independent craft production took place in the low-class sector within multihousehold compounds inhabited by corporate groups (Domestic Complex 1 and 2 in the Southern Pediment) (Johnson 2010). Storage infrastructure at Sectors D and H contained staples (corn and beans), suggesting a special concern with agricultural risk in the context of environmental stress and demographic increase, and pointing to a redistributive economy (Shimada 1978).

What the Moche region capitals above all share are: (a) a compact, high-density residential occupation with clearly demarcated boundaries, (b) one or more dominant households in segregated palaces, clustered at the center of the community, and (c) the enclosure of the most important civic-ceremonial structures in elite residential contexts.

Finally, the twelfth-century AD Chimú imperial capital of Chan Chan was a densely populated oikos metropolis, surrounded by huge palaces or ciudadelas of the ruling dynasty (Kolata 1983). Chan Chan is located in the lower Moche Valley with a population ranging between 30-40,000 inhabitants in a core area of 6km2 and associated areas up to 20km2 (Kolata 1993, Moseley and Mackey 1974). Ethnohistorical information describes a royal dynasty headed by a king perceived as a divine figure with property rights to land and labor. The needs of the king and his lineage (oikos) created the economy that maintained Chan Chan (Kolata 1983). Three social strata existed: the royalty associated with the ciudadelas, the lesser nobility linked with elite compounds, and the commoners (Moseley and Day 1982). Ten palaces or ciudadelas belonged to Chimú rulers in an uninterrupted succession (Conrad 1982; Rostworowski 1961). Ciudadelas had a quadripartite layout, with corridors, plazas, courts, audiencias (U shaped rooms with bureaucratic functions), standardized storeroom facilities, and burial platforms. Access was restricted by very high perimeter walls and labyrinthine routes within the ciudadelas, showing very rigid social hierarchies and strict separation between classes (Day 1982; Klymyshyn 1982;

Moore 2003; Moseley and Day 1982; Pillsbury and Leonard 2004). In addition to the ciudadelas, there are thirty-five elite compounds with wells, plazas, courts, audiencias and storage rooms (Klymsmyth 1982).

Remarkably, there were no public monuments or public plazas at Chan Chan; the spaces for religious ceremony are all located within ciudadelas or elite compounds. Chan Chan thus, was very hierarchical, with extremely rigid social categories as seen through walled-off royal residences that contained the administrative architecture of governance (storage, bureaucracy, ritual space, royal tombs), allowing little interaction between elites and commoners. The possibility of public spaces or public religious spaces in the surrounding areas cannot be entirely ruled out, however, since there is a lack of research in those areas.

When compared with other cities such as the ones just described, Sicán has not received equal attention. One major reason is the confusion between Chimú and Sicán ceramics. Until quite recently the Late Intermediate Period on the north coast was associated exclusively with Chimú. While there have been important regional surveys identifying residential sites and monumental areas (Hayashida 2006, 2014; Montenegro 2010; Shimada 1981; Tschauner 2001, 2014) and while monumental architecture received important attention (Cavallaro and Shimada 1988; Shimada 2014, Shimada et al. 2004), based on the published literature, long-term archaeological projects did not have the study of Sicán urbanism as a priority on their research agenda.

1.6 STUDYING URBANISM AND SOCIAL ORGANIZATION IN THE ARCHAEOLOGICAL RECORD FROM SICÁN: RESEARCH QUESTIONS

Sicán lacks the dense built environment, centralization, or massive residential compounds of the late Moche cities such as Galindo and Pampa Grande, or the Chimú capital at Chan Chan. Nor is there evidence for monuments enclosed within residential contexts. As will be seen from the research presented in this dissertation, Sicán's layout - - with scattered monuments and numerous dispersed residential mounds, perhaps each at the center of a residential cluster - - may in fact more closely resemble the sprawling layout of "low density" Mayan cities, with their dispersed mound/patio/plaza groups. The basic organizational model of such cities is a civic-ceremonial core with elite residences and regal-ritual and public functions surrounded by an extensive, low density urban sprawl with clustering around subsidiary civic complexes or higher-ranking households.

Among the questions my research addressed in studying these issues are:

1. **What was the layout of the city? What was the distribution of public-civic spaces and monumental architecture? (Chapter 4)**

This question addresses the city criteria of specialized functions regarding a broader hinterland in terms of different kinds of services. Civic-ceremonial architecture was already well known in the Sicán core of the site. Civic-ceremonial architecture outside the Sicán core was known but had never been mapped or studied before this project.

2. **What does the distribution of archaeological remains suggest about: (a) population size and residential density; (b) the nature of intermediate social units and social segmentation? (Chapter 5)**

One of the expectations of the survey was to reveal variability in residential density, for example, clustering of residences (possibly higher status) around the public huacas or within Sicán's core. If so, this pattern would support Shimada's multiple cooperative lineage model for Sicán leadership (as opposed to a single centralized one; see Chapter 2). Finally, examining spatial densities in domestic debris and residential mounds reveals something of the city's urban-rural relationships. An expected pattern in cities is for a fall-off in residential density moving from the site center into rural hinterland.

3. **What socioeconomic differentiation (in terms of wealth/status, stylistic preferences, and economic occupation) was present among site residents? (Chapter 6)**

This question addresses the city criterion of social specialization. Artifact assemblages reveal whether there were status/wealth differences between the city residents. The distribution of high-status residences would reveal either the residential zonation pattern seen at Pampa Grande or Galindo, with elite versus commoner neighborhoods or barrios, or the pattern common to low-density cities in which elite households are scattered throughout the settlement. In addition, intra-assemblage proportional comparison of pottery forms (types, sizes, and ratios) can indicate whether some households were differentially involved in serving or storage activities.

A second line of investigation was to explore the distribution of economic activities across the city at the household and district levels. Inter-assemblage comparison revealing relatively higher proportions of items related to craft production allows me to assess: (a) the characteristics of district craft specialization; and (b) the production context (residential, non-residential) of activities such as metal working or pottery production. A particular goal was assessing the involvement of elites at the city in craft production, and serving/feasting activities. At the other capitals discussed previously, elites dominated craft production activities (metallurgy, pottery).

To evaluate wealth/status among assemblages, I focus on proportions of finewares, since decorated pottery (*paleteada*) is quite common during Sicán. If elites were differentially involved in exchange, we would expect their assemblages to display relatively higher proportions of trade items such as *Spondylus* shell or beads. To assess district differences in economic activities, I compare residential loci in terms of craft production (ceramic wasters and molds for pottery production, slag for metal production (Shimada and Craig 2013; Tschauner 2001).

4. How did the site change through time? What was its social trajectory? (Chapter 5)

While the occupation of the Sicán site was thought to be limited essentially to the Middle Sicán Period (AD 900-1000) (Shimada 2000, 2014), this proposition had not been tested for the entire site and its surroundings. Using the existing ceramic chronology, it was possible to distinguish earlier versus later occupations and determine its social trajectory. The past excavations of trenches in multicomponent sites and ongoing excavations at the pyramids and major plazas provided dates to establish the chronology of the civic-ceremonial core of the site.

1.7 STRUCTURE OF THE DISSERTATION

In Chapter 2, I discuss the geography and culture history of the north coast and the Lambayeque region. Then, I describe the history of research of Sicán and current studies. These provide a starting point for the present study.

In Chapter 3, I draw on the material correlates for the research questions discussed previously. I outline the strategy chosen to answer these questions and the methodology used for data collecting, both in terms of field and laboratory procedures.

The remainder of the dissertation presents the results of my work at Sicán answering the research questions.

Chapter 4 presents an overview of the urban organization and spatial layout at Sicán, including both the Sicán Core and Greater Sicán. Information on urban layout, architectural style and monumentality are provided.

Chapter 5 discusses the demographic patterns of the study area, its change through time and its implications for Sicán social organization. Although my focus is on the Sicán period, I include a complete demographic trajectory of the research area that includes all the periods that had human occupation.

In Chapter 6 I present patterns of socioeconomic organization in terms of wealth/status and craft production of ceramics and metals.

Finally, in Chapter 7 I present a discussion of all evidence found addressing the research questions and the conclusions reached. Recommendations are presented for further research.

2.0 ENVIRONMENTAL SETTING, HISTORICAL CONTEXT, AND THEORIES: THE LAMBAYEQUE VALLEY COMPLEX AND THE SICÁN POLITY

The Lambayeque region of the Peruvian north coast was the scenario of a dynamic and creative interplay between land and culture. These complex human-environment interactions led to complex social trajectories that span the time from early developments in the Archaic until the Inka occupation disrupted by the Spanish conquest, and subsequent Spanish colonization of the region.

This chapter provides an overview of the environmental characteristics and the cultural developments that took place in this region. To accomplish this, the chapter is subdivided into four main parts. The first reviews the environmental settings of the north coast of Peru with special emphasis on the Lambayeque Region. The second summarizes cultural developments and their historical context. The third presents current understandings of the Sicán polity followed by an overview of the Sicán site.

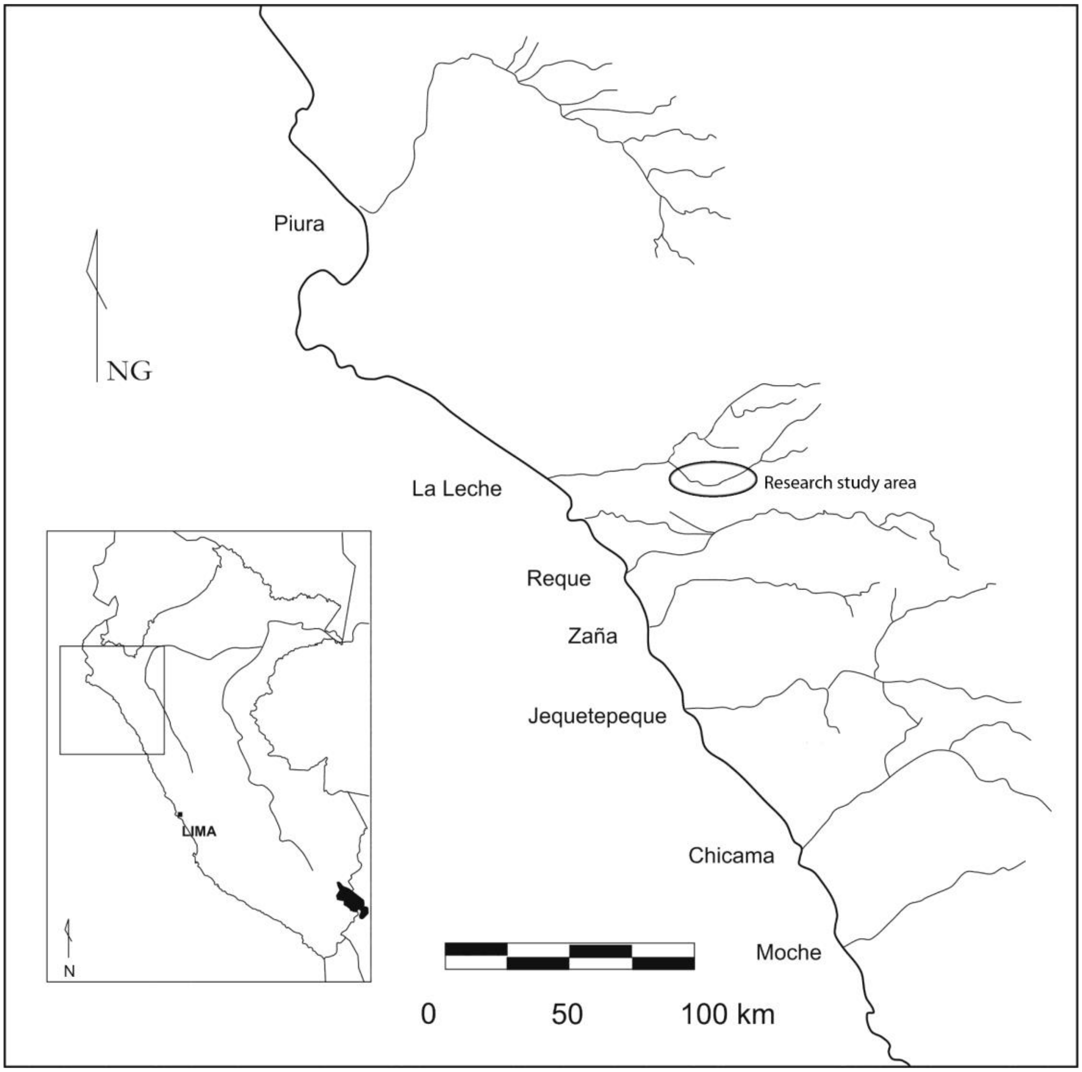


Figure 1. Research area in the north coast of Peru.

2.1 ENVIRONMENTAL SETTING

2.1.1 Geography and Ecology

The north coast of Peru is the largest flat coastal area of the country, formed by alluvial river valleys that run east-west from the highland Andes to the Pacific Ocean. Most valleys are separated by desert plains and mountain patches. From north to south, the rivers are as follows: Olmos, Motupe, La Leche, Lambayeque, Reque, Zaña, Jequetepeque, Chicama, Moche, Virú, Chao, Santa, Nepeña and Casma. The total area spans 400 km of coastline.

Of special importance for the present study is the Lambayeque region, also known as the Lambayeque Valley Complex, which is formed by a system of five rivers: from north to south, Motupe, La Leche, Lambayeque, Reque and Zaña (Kosok 1965). The area is located between large deserts to the north (Sechura desert) and circumscribed V-shaped valleys to the south. The topography of the region is dominated by a triangular pediment with 8% inclination of alluvial plains with low relief and undulations. Mountains lie towards the east, delimited by the Cordillera Occidental, with one hill range on the north, Chongoyape and Pátapo, and a southern range at Cerro Reque (Shimada 1976:24). Soils are arid with a tendency towards sandy, saline, clayish soils. The weather is tropical, warm and dry with an average temperature of 23°C. Analyzing cis-Andean transects from this region, one can observe that the foothills are lower and farther inland when compared to regions farther to the south, and the Andean slope is more gradual, reaching a highest elevation of 4,500 masl (Shimada 1994:41). In terms of overall geomorphology, this region is wider and flatter than valleys farther to the south, which makes it an exception to the well-known circumscribed valleys of the Peruvian coast.

The middle and lower part of the Lambayeque Valley Complex has particular ecological settings. According to Brack's division of ecoregions (where the author takes into account geography and ecological systems), it belongs to the wider Dry Ecuadorian Forest ecosystem that starts in the Santa Elena Peninsula in Ecuador in the north and runs south until the Chicama valley in Peru, with a coastal plain up to 150 km wide (Delavaud 1984, Brack 2004, 2008). According to

Holdridge's climate and vegetation model based on rainfall, latitude and evapotranspiration (Delvaud 1984, ONERN) corroborated by Southern Ecuador radiocarbon-dated lake diatom strata (Shimada 1994), it belongs to the *Desierto superárido Tropical* (Ds-T) and *Desierto superárido Premontano Tropical* (Ds-PT) (SERNANP 2011). It is a very specialized ecosystem that relies on a small number of tree species to preserve soil structure and water retention, bringing shelter to the other plants and animals on which forest regeneration depends (Goldstein 2007). The high water table allows for the presence of xerophytic trees, shrub vegetation and cacti (Goldstein 2007). These three vegetation groups are adapted to an extremely dry environment with 10 mm or less annual precipitation. The biodiversity of tree vegetation is manifested in the presence of *algarrobo* (*Prosopis spp*. with its three species *P. pallida, P. juliflora,* and *P.affinis*), *faique* (*Acacia macracantha*), *vichayo* (*Capparis ovalifolia*), *zapote* (*Capparis angulata*), and *palo verde* (*Parkinsonia aculata*) (Brack 2008, Goldstein 2008, 2007:49-51, Shimada 1994:43). Goldstein finds that the three first kinds of trees mentioned were present in the archaeological assemblage of Huaca Sialupe in the middle La Leche valley (Goldstein 2007:65)

One of the few current areas of mature full-stature forest (an indication of forest health) is the National Historical Sanctuary of Bosque de Poma in the middle La Leche valley (Proyecto Algarrobo 1997). In the valley area outside the sanctuary, there are patches of forest in regeneration, though human forces prevent the forest from achieving full canopy height (Goldstein 2007:44).

Prosopis spp.(algarrobo) is perhaps the most important species of the area, contributing to soil fertility by fixing nitrogen, contributing additional nutrients through its leaf litter or *poña* (Nordt et al. 2004), and retaining water through its lateral root system (Goldstein 2007).

Additionally, it provides high protein pods that can be used to make *chicha*, *algarrobina* syrup for human consumption, fodder for animal husbandry, and its resin can be used as an adhesive or in medicinal practices (Goldstein 2007).

Fauna belonging to this ecosystem is very varied (SERNANP 2011). A total of 89 bird species belonging to 33 families have been documented within the sanctuary. Out of these, 16 species are endemic to the region such as the Cortarrama Peruana (*Phytotoma raimondii*) vultures (*Coragys atratus*), peregrine falcon (*Falco peregrinus*), Peruvian Pygmy-Owl (*Glaucidium peruanum*) Huerequeque (*Burhinus superciliaris*) and Scarlet-back woodpecker (*Verniliornis callonottus*). There are 7 mammal species including foxes (*Pseudalopex sechurae*), southern oppossums (*Didelphis marsupialis*), northern Tamandua (*Tamandua mexicana*), squirrels (*Sciurus stramineus*) and one carnivore felid (*Lynchailurus colocolo*). Among the reptiles, 20 species have been identified including lizards (*Dicrodon gluttutatum* and *heterolepis),* iguanas (*Iguana iguana, Callopistes flavipunctattus*) and *macanche (Boa constrictor ortonii).*

Analysis of marine species recovered from different sites excavated in the middle La Leche valley in 1979 such as Sapame, Cholope, Huaca El Pueblo de Batán Grande and Soledad, demonstrated the ubiquitous presence of *Donax peruvianus.* Other species identified were *Thais sp*., *Olivella sp*., *Tegula s*p., *Scutalus sp*., *Fisurella sp*., and *Spondyllus princeps* (Shimada 1981:438 Table 4) whose new taxonomic designation is *Spondylus crassisquama*. A wide variety of marine resources have also been identified at the site of Santa Rosa de Pucala in the middle Lambayeque valley; among the most important are mammals manifers: sea lion (*Otaria sp*.), shark (*Carcharhinus sp*.); fish such as *tollo* (*Mustelus sp*.), *bagre* (*Galeichthys peruvianus*), sardines (*Sardinops saga*x), *lisa* (*Mugil cephalus*), *robalo* (*Sciaena starky*), *suco* (*Paralnchorus peruanus*), *cahema* (*Cynoscion sp*.), and *lorna* (*Sciaena deliciosa*). Among the bivalve shellfish are *maruchas* (*Donax obesulus*), *almeja* (*Semele corrugata*), *choros* (*Semimitilus algosus, Choromitilus chorus, Perumitilus purpuratus*) (Bracamonte 2015:164, Chart 3).

2.1.2 Precipitation and Hydrology

The characteristic dryness of the Peruvian coast is caused by the Humboldt Current cold waters, causing cool air masses from the Pacific Ocean to warm up with the contact with land. As a result, there is an increase in the capacity of air masses moving inland to hold moisture until contacting the Andean mountains (Shimada 1994:44). The Lambayeque region, though, presents special features that increase its water availability. The Lambayeque Valley Complex is a coastal low gradient plain lacking geomorphological evidence of uplift, being a tectonically quiet area unlike southern regions. This feature is important in terms of irrigation and hydraulic planning, where shifts in gradient can have serious consequences (Craig and Shimada 1986). Constant water presence in the region is an important feature since the mountains here are lower and narrower than in the southern coastal valleys, allowing wind movement westward from the Amazon drainage. Its location is also strategic since it is not heavily affected by the cold water Humboldt Current, so its valleys receive water from rains in both the coast and highlands (Shimada 1994:41, Tschauner 2001: 66).

Precipitation occurs during the summer (December to March) being very variable and exceptionally strong when an ENSO (El Niño Southern Oscillation) occurs. Annual rainfall varies between 20 mm to 79 mm. While most precipitation falls above 2000 masl, precipitation on the coastal plains falls in the form of fog or unusual storms (Delavaud 1984). In this sense most of the water availability in the coastal plains depends on the river system formed by the Lambayeque Valley Complex. Shimada's description of the region coincides with that of Kosok's identification of a system of five valleys forming the Lambayeque Valle Complex (Kosok 1965). Shimada (1982, 1994) proposes that a coastal valley should be defined and delimited based on the Maximum Elevation Canals (MEC). The limits of the valley would be delineated by the eastern limits of the margins of the MEC to the north and south of the valley, with the Pacific Ocean as the western limit (Shimada 1982:185–187, 1994:37). Following this proposal, the Lambayeque Valley starts at 51 km east of the coast (for comparison, the Moche valley starts only 18 km inland).

This area offers an ideal place for the development of intensive and extensive agriculture, with nearly 136,000 ha. of agricultural land combined in the La Leche and Lambayeque valleys (Delavaud 1968:128); by comparison, Chicama has 15,000 ha and Jequetepeque 17,000 ha (Tschauner 2001:69). It has been calculated that during the period of highest agricultural yield in prehispanic times between A.D. 1000 – 1375, this system accounted for one third of all agricultural land on the Peruvian coast, and was occupied by one third of the entire coastal population (Kosok 1959, 1965).

One of the principal valleys that forms the Lambayeque Valley Complex is the La Leche valley. In the lower basin, near the location of the Bosque de Poma Sanctuary, the La Leche river carries 60m^3/sec of water during November through April, while the rest of the year it is dry. For comparison during El Niño of 1998 the river registered 1000m^3/sec. This valley has a system of three inter-valley canals: Racarumi or Ynalche (Lambayeque-La Leche) built during Middle Sicán (Hayashida 2006), Jayanca (La Leche-Motupe) and Taymi (Lambayeque-La Leche) built during the

Late Moche period (Shimada 1994). Nordt et al. (2004) analyzed the agricultural potential of soil from agricultural systems in the Pampa de Chaparrí in the La Leche valley. Their results show that soil fertility was generally high, even when the coarse texture of pampa soils would have required frequent and constant irrigation and nitrogen sources from fertilizer or nitrogen-fixing legumes. Macrobotanical and pollen analysis revealed that cotton (*Gossypium*) and maize (*Zea maize*) were grown in the pampa; other cultigens include squash (*Cucurbita sp*.), pepper (*Capsicum sp*.), guanabana or chirimoya (*Annona sp*.), lucuma (*Lucuma bifera*), guava (*Psidium guava*), peanuts (*Arachis hypogaea*), common bean (*Phaseolus sp*.), lima bean (*Phaseolus limensis*), jackbean (*Canavalia sp*.), pacae (*Inga feuillei*), avocado (*Persea Americana*), cucurbita or gourd (*Lagenaria sp*.), potato (*Solanum tuberosum*), and sweet potato (*Ipomoea batata*) (Hayashida 2006:251).

Central to studies of Andean political economy and access to resources has been the model of the *vertical archipelago*. The basic underlying principle is that communities took advantage of resources distributed vertically in different zones within short distances due to the rapid changes in altitude of the Andean mountains (Murra 1972, Van Buren 1996). On the north coast, where the plains extend deeper inland, coastal polities such as the Moche, Sicán and Chimú did not have direct control of these highland resources. A complement to the vertical archipelago is the horizontal archipelago model, developed by Shimada. In this model, coastal polities controlled discontinuous territories along the coastal plain, taking advantage of variations in resource availability (Shimada 1987) or patchy resource distribution (Bettinger 2009).

2.1.3 Sources of Risk – ENSO

ENSO (El Niño Southern Oscillation) events have been frequently documented and analyzed on the north coast (Moseley 1975, Craig and Shimada 1986; Hocquenghem et al. 1992; Huckleberry and Ortlieb; Kaulicke 1993; Shimada 1994; Shimada et al. 1991, Van Buren 2001). In the Lambayeque region, geoarchaeological work carried out by the Sicán Archaeological Project (SAP) found archaeological indicators of major floods in the region (Craig and Shimada 1986). Periodic inundations due to ENSO rains occurred consistently, and presented an intensity that varied widely thought the Holocene. Analysis of sediment deposits indicate consistent periods of droughts and floods during the past 1500 years (Craig and Shimada 1986). One deposit located a few kilometers northeast from the Sicán Core in the middle La Leche valley was found due to the construction of a large modern agricultural canal. Sedimentary deposits dating to AD 1100 were identified as a major flood event called "The Naymlap Flood" that covered an earlier agricultural area with agricultural furrows (Craig and Shimada 1984). It is not clear to what extent these agricultural furrows were flooded and if agricultural activities were relocated.

ENSO event discussions should also take into consideration how these events, by providing a pulse of water enabling seedlings to sprout and take root, rejuvenate the Dry Tropical Forest in a recurrent period of approximately 20 years (Goldstein 2007).

2.2 SOCIOCULTURAL TRAJECTORIES OF THE LAMBAYEQUE REGION

The north coast presents a great variety of resources that makes it the ideal place for dynamic and flexible human-land interaction. This section presents a brief summary of the general sociocultural chronology developed for the Lambayeque Region.

Exact routes of the peopling of South America remain elusive, as early remains of human activity have been found both in the highlands and coast (Chauchat 2006: 402; Dillehay et al. 2004:19-20). Permanent colonization of the north coast of Peru happened around 10000 BC (Bird et al. 1985; Chauchat 2006: 24; Dillehay et al. 2004; Lynch 1980; Rick 1980). On the north coast the Paijan tradition (B.C. 8700-5900) was formed by mobile hunter-gatherers who soon after began to settle in the ecotone between coast and Andean mountains (Chauchat 2006; Briceño 2004a; Gálvez 2004; Dillehay et al. 2003, 2004). In the Zaña valley, the shift towards sedentism has been documented by 5500 BC, with signs of early social complex organization as seen through organized settlements, social differentiation and small-scale storage (Dillehay et al. 1997).

The Final Archaic (2600-1500 B.C.) and Early Formative Periods (1700-1200 B.C.) saw the emergence of social complexity and institutions that were capable of mobilizing major labor pools to achieve irrigation infrastructure, monumental architecture and large plazas for religious/ceremonial practices (Billman 1999; Burger 1992; Ikehara 2014; Kaulicke 2010). Clear examples in the Lambayeque region are the Ventarrón temple mound with murals (Alva 2014) and the larger Colud –Zarpán complex of monumental sites displaying early iconography (Alva 2014).

During the Middle Formative, the Cupisnique-Chavín Religious Complex emerged in the north coastal communities (Ikehara 2014:27) in a region described as the Great Cupisnique Area (Kaulicke 2010:397-398). Its iconography combining predators (felines, reptiles, raptors) and humans was displayed in different media, especially ceramics and architecture (Elera 1997; Kaulicke 2010). Cupisnique burials have been reported in Huaca Facho and Huaca Corte (Shimada 1981:441), but no further information is known regarding residential or religious areas. In the coastal site of Morro Eten, an extensive residential site and cemetery with megalithic architecture corresponding to the Cupisnique tradition (1500-700BC) was identified (Elera 1998).

In the La Leche valley, the Huaca Lucia-Cholope Complex, a U-shaped platform building, belongs to the Middle Formative. Excavations at Huaca Lucia exposed the Templo de las Columnas, a monumental religious structure with columns, superimposed floors, and conical adobes and associated ceramics belonging to the Cupisnique tradition (Shimada 1981:415-416, Shimada et al. 1982).

In the Early Intermediate Period, the Gallinazo polity developed in the north coast of Peru preceding and contemporary with Moche. In the La Leche valley. Shimada and Maguina (1994) argue that Gallinazo sites were widely distributed and are better characterized as a series of independent political entities with shared ceramic styles. Lately, Sharp has argued for the coexistence of multiple craft industries with strong presence of Gallinazo and Mochica art styles in the site of Cojal, located in the Zaña valley in the Lambayeque region (Sharp 2019; Sharp and Martinez 2017).

Table 1. Chronological sequence of the La Leche valley.

	GENERAL ANDES	LA LECHE VALLEY		
1500	LATE HORIZON	CHIMU-INKA		1460-1532
	LATE INTERMEDIATE PERIOD	CHIMU		1375-1460
1000		LATE SICAN		1100-1375
		MIDDLE SICAN	late	1050-1100
			middle	1000-1050
			early	950-1000
	MIDDLE HORIZON	EARLY SICAN		750-900
500				
	EARLY INTERMEDIATE PERIOD	MOCHE GALLINAZO		0-750
0				

The Moche are known for the production of ceramic and metal objects of high technological quality and artistic value that were used as media for transferring ideological content (De Marrais et al. 1996). In this sense, Castillo (2010) refers an economy of prestige that characterized and distinguished the Moche sequence, where varied craft production and prestige goods materialized Moche elite ideology. The Moche, then, based their source of power in ideology (Castillo and Uceda 2008). In the Lambayeque valley, the discovery of the Sipán royal tombs (Donnan and Alva 1993) introduced significant knowledge about Moche craft production, ideology and social and religious hierarchies. Nonetheless, not much was known in regard to social organization in Lambayeque in the phase before the appearance of the Moche V capital at Pampa Grande. Lately, new radiocarbon dates from the Sipán Tombs (Aimi et al. 2016) put them essentially contemporaneous with Pampa Grande. This raises the possibility that the leaders of Pampa Grande might have been buried at Sipán, explaining the lack of tombs at the later site.

Covering $4km^2$ of alluvial pediment, Pampa Grande is one of the largest urban complexes of the coast. Alignments of the major pyramids reflect locations of two different water diversion systems (Chancay River and La Puntilla) with smaller pyramids representing leaders of local populations (Shimada 1978). The layout of the site presents a three-level administrative hierarchy seen through the concentric distribution of walled enclosures and compact residential structures away from the central enclosure. Commodity and labor control are seen in the storage complexes containing staples (Anders 1975, Shimada 1978) and in a network of corridors and controlled access to them. Storage suggests a special concern with risk in the context of environmental stress (Shimada 1994). Shimada (1994) has argued that the location of the settlement at the valley neck is strategic since it was constructed in order to control water and major canal irrigation intakes in the context of heavy ENSO impact. At the end of the sixth century a mega-ENSO occurred after decades of severe and prolonged droughts (Shimada et al. 1991a, 1991b). The development of Pampa Grande is characterized by a rapid period of construction with a planned urban layout, and relatively short occupation. Population increase and irrigation expansion up to a prehistoric maximum for the Lambayeque valley are possible explanations for its rapid growth and abandonment (Shimada 1994). In terms of political economy, considering the lack of evidence for centralized storage during earlier periods for Moche, it can be argued that major political changes in the Lambayeque area included a major shift from religious authority, ideology and wealth management as in Sipán, to major emphasis on staple finance administration to support the state system.

The Middle Sicán state flourished in the La Leche River Valley between AD. 900 and 1100 (Shimada 2014, 2000). Chronologically, it is located between the Moche civilization of loosely-tied ceremonial centers, and the later, highly complex, bureaucratic Chimú Empire both known for their impressive urban tradition. Thus, Sicán has been viewed an important transitional society between these two very different political systems. The Sicán polity will be discussed into detail in Section 2.3.

In Lambayeque, the Chimú Empire took over the Late Sicán capital at Túcume by AD 1375, building a burial platform for the Chimú royal nobility, leaving some economic preexisting structures in the hands of local lords (Mackey 2009). Nonetheless, centralized management of agriculture seems to be a hallmark of Chimú administration. Moseley and Deeds (1982) have found that Chan Chan had a direct and centralized control over agricultural fields in the Moche valley since they found evidence for very regular canals and fields. Likewise, Hayashida (2006) finds that during the imperial (Chimú and/or Inka) period, shifts in settlement pattern in the Pampa de Chaparrí in the La Leche valley suggest the dissolution of community managed irrigation and an influx of colonists as farming came under state control. Certain fields were walled in a pattern resembling the exclusionary walls that surround Chan Chan ciudadelas (Moore 2003), and roads and administrative centers were constructed, the most visible being the Chimú hilltop site of Cerro Arena (Hayashida 2006:258; Tellez and Hayashida 2004; Figueroa and

Hayashida 2004). Other efforts to increase control in the region are seen by the construction of four Chimú hilltop centers at regular intervals along the Taymi canal (Tschauner 2001).

By AD 1460 the Inkas conquered the north coast. To effectively control their subject provinces, the Inkas developed a system of subordinate political units, each relatively independent from the others but owing allegiance to the central authority at Cuzco. As a consequence of this, the staple finance economies of the provinces functioned autonomously to a great extent, and the economic management of surplus and its storage was an important focus in the provincial centers (D'Altroy and Earle 1985: 192). As part of the incorporation of the north coast region, the northern branch of the Inca Road was built. According to Ramirez (1996) the Inka first claimed the lands and then delegated them to local lords for co-governance. Special caution needs to be taken on Inka and Chimú-Inka studies, since these ceramics are very difficult to distinguish (Hayashida 2006; Hayashida and Guzman 2015).

2.3 THE SICÁN POLITY: HISTORY OF STUDIES AND CURRENT RESEARCH

2.3.1 History of Studies

Until recently, the north coast of Perú was largely known as the Chimú or Chimor Kingdom, based on sixteenth and seventeenth century colonial chronicles. It was only in the twentieth century that studies in the area allowed scholars to identify and characterize what we know today as the Sicán or Lambayeque polity.

Between 1875 and 1922 Hans Heinrich Brüning, a German engineer, collected archaeological objects and ethnographic information (such as photographs and film records) of the region. While a good part of the archaeological collection was sold to the Peruvian government during Leguía's presidency for the creation of a regional museum, the ethnographic collection was taken to Germany (Schaedel 1989). In 1922 Brüning published "*Estudios Monográficos del Departamento de Lambayeque,*" in four volumes: "*Lambayeque", "Olmos", "Jayanca"* y *"Reglamentación de las Aguas del Taimi"* as well as some photographs. This monographic series constituted the first study of the culture of the region.

In the 1920s Alfred Kroeber visited the region as part of an expedition organized by the Field Museum in search of objects for future study in museums, and he identified Sicán ceramics as "*Middle Chimú*" (Kroeber 1930). In the same decade Julio C. Tello visited the region and excavated a trench near Huaca Las Ventanas, reporting Sicán objects (Bennet 1939:121). In 1936 Bennett conducted excavations in Lambayeqye, Túcume and Chongoyape reporting typical Middle Sicán blackware bottles known as "*Huaco Rey*" and *paleteada* domestic ceramics (Bennett 1939). By the 1930s the region was known for the looting of the *Golden Tumi* among other metal objects. Since the area was part of the Hacienda Juan Aurich in Batán Grande owned by the Aurich family, it was the locus of extensive and intensive looting until the Agrarian Reform in 1969. Larco defined the "*Cultura Lambayeque*" as a ceramic style and located it within the Fusional Epoch of his formal ceramic seriation (Larco 1960). Kosok studied the Lambayeque region as part of a hydraulic and agricultural survey and proposed from a geographical point of view that five valleys (Motupe, La Leche, Lambayeque, Reque, Zaña) interconnected by large irrigation canals systems formed the Lambayeque Valley Complex during his Period C (AD 1000-

1200) (Kosok 1959, 1965). Richard Schaedel studied ancient cities in the Andes, particularly those on the north coast. He used Kosok's aerial images and did visits to several sites in the Lambayeque region including Tucume and the Sican Core (Schaedel 1951). He called the Sican period the "middle period" since it was located between the Middle Horizon and the Chimú period. For the author, the large buildings of this period were transitional buildings between the earlier Mochica and the later Chimú, and their functions would have been palaces of the ruling class along with servants and craftsmen (Schaedel 1951:23). Schaedel considered that true cities did not appear in the north coast until the development of Chan Chan, capital of the Chimu Empire.

Jorge Zevallos used the Lambayeque term to identify a long regional tradition that started before 0 C.E. and lasted until the Spanish Conquest of the region (Zevallos 1971). He based his interpretations mostly on funerary archaeological materials from museum collections. Pedersen recorded a large shaft tomb located in Huaca Menor at the Sicán site, in close proximity to Huaca las Ventanas. The tomb yielded 17 skeletons, *Spondylus crassisquama*, cinnabar, several gold and copper objects, as well as Middle Sicán hallmark black bottles (Shimada 1985:382).

2.3.2 The Sicán Polity: Current Research

In this section the sociopolitical trajectories of the Sicán polity are presented based on current scholarly research. The time frame follows the chronology developed by the Sicán Archaeological Project (SAP), an interdisciplinary research project based in the area since 1978 (Shimada et al. 1981, Shimada 2014, Cleland and Shimada 1992). This sequence is based on stratigraphic contexts that provided over 150 radiocarbon dates from *in situ* samples (Shimada

1995), architectural changes, ceramic assemblages (both domestic and fine ware) and iconographic features.

The early part of the Late Intermediate Period (AD 800-1400) follows the decline of the Wari Empire and precedes the rise of the Inka Empire, two of the largest political organizations in the Andean region. During this time, sociopolitical configurations in the Andes changed dramatically with the rise of regional autonomous polities of varying complexity. On the north coast, polities controlled larger territories, contrasting with the disintegration of large polities on the south coast and in the highlands (Dulanto 2008). On the far north coast, the Sicán polity (900-1375 AD) developed soon after the collapse of the Moche polity centered at Pampa Grande.

The Sicán polity (AD 900-1375) developed in the middle La Leche Valley, and Sicán sites are found as far north as Piura and Sullana and as far south as the Rimac valley in the central coast (Segura and Shimada 2014). The size and integration of the Sicán polity are a subject of debate. Shimada (1981, 1990, 1995, 2000, 2014a) states that it should be considered a state, rather than a "confederation of residential centers" (Jennings 2008; Tschauner 2001), or a "non-state society composed of dispersed ceremonial centers," (Conlee et al. 2004:211). The degree of Sicán social complexity, settlement hierarchy, political economy, widespread settlements and economic and religious influence is undeniable.

The Early Sicán Period (AD 750 – 900) remains little understood and receives scant attention in the archaeological literature. According to Shimada, although knowledge is restricted to few funerary remains and an iconographic style, we know that this period of time was a consequence of interregional interaction and population movements that fused the Moche from the north coast and the Wari from the southern highlands (Shimada 2014a:22). In the past few years, there have been excavations in two important sites that have occupation corresponding to this period. The authors in both cases refer to this occupation as Middle Horizon, which for this part of the North Coast corresponds to Early Sicán.

First, in the La Leche valley, is the site of Huaca Bandera, located strategically at the intersection of the La Leche and Motupe rivers, in the lower valley some 35km east of the Pacific Ocean and 18km west of the Sicán site. Huaca Bandera has three walled compounds (Conjuntos Amurallados). Conjunto Amurallado 1 consists of the largest Monumental Platform built in chamber and fill technique. Because of it, the site has been interpreted to be similar to Pampa Grande (Manuel Curo, personal communication 2015). Conjunto Amurallado 1 includes a central corridor (60m long), a residential area composed by adjacent rooms, an administrative area with three "U" shaped structures with niches, an atrium with a ramp, a pyramidal-shape platform with rooms and murals on top, and two plazas (Curo and Rosas 2014:247-250). Murals depicting anthropomorphic iconography have been found (Curo and Rosas 2014: 257 Figures 17-19). The authors classify the murals and the occupation as Moche, but I consider them to be Early Sicán (AD 750-900), although they retain some Moche elements.

Second, in late 2018 important research was conducted at the site of Huaca Santa Rosa de Pucala in the middle Lambayeque valley (5km west of Pampa Grande), with the discovery of a "D" shaped structure built of adobes (Bracamonte 2019). This is the first time that Wari-like architecture has been found on the north coast. Since the research is still preliminary, not much more is known about the associated materials and possible function of the structure. This site has a long occupational history, including Mochica, Middle Horizon, Sicán and Chimú occupations (Bracamonte 2011, 2015).

By the Middle Sicán Period (AD 900-1200), the major center and capital site of Sicán covered more than 4km2, and smaller centers (La Luya, Chotuna) and single mound sites with Middle Sicán iconography such as Ucupe (Alva and Meneses de Alva 1983) may have served as secondary centers amidst the dispersed hamlets and farmsteads (Tschauner 2014, 2001). Most of what is known of the Sicán Polity belongs to this period, and will be discussed in detail in the following subsections.

By Late Sicán (AD 1100-1375), major sociopolitical changes affected the capital, including systematic destruction and burning of central platform mounds and reduced religious iconography. Shimada (2014, 2000) interprets these changes as the social response to the inability of leaders to cope with great environmental fluctuations, including a severe drought (AD 1020-1050) followed by a major flood event (AD 1050-1100), and a reaction against the high cost of the ancestral elite cult and religion (Shimada 2000; Shimada et al 2018). With the destruction of the Sicán site around AD 1050, a new capital site was built at Túcume, occupied through the late 14th-century AD until the conquest of the Sicán polity by the Chimú Empire (Shimada 2000, Sandweiss and Narváez 1995). However, Sicán residential mounds were not burned or abandoned (see Chapter 5), metal workshops such as Cerro Huaringa continued to function (Shimada 2000), and the rural peasant population did not show any apparent impact (Hayashida 2006).

Túcume is located 10 km southwest of Sicán in the lower valley and covers 220 ha. It includes more than twenty essentially adjoining platform mounds, the largest being Huaca Larga which measures 700 m long, together forming a tight cluster of about 1 km2 at Cerro La Raya. Unlike Sicán and its dispersed Architectural Groups (see Chapter 4), Túcume presents several monumental platforms, but all located in a single cluster. Shimada (2000, 2014a) has suggested that the clustering of the Túcume monuments indicates new, more centralized political ties replacing an earlier competition among elite lineages at Sicán.

Unfortunately, little is known of residential organization at Túcume during the Sicán Period. Túcume has been argued to have been a “pyramid center without a large resident population, not an urban site by any standard definition” (Sandweiss and Narvaez 1995:191). Chimú residential occupation and workshops have been identified in Sector V to the West. The study noted that, “small mounds like the West Mound might have been residences and burial places of elite lineages from the Túcume hinterland, drawn to the site by the prospect of Chimú power sharing, and perhaps the economic gain to be had from overseeing craft workshops" (Sandweiss and Narvaez 1995:191). While this assessment refers to Chimú times, it may very well be applicable to the earlier Sicán occupation and its dispersed residential mounds. After all, no in-depth research has been done related to residential occupation in Túcume.

2.3.3 Political Economy

a. Wealth Finance: Sphere of Interaction

The Sicán economy was based on wealth finance, as seen through the large-scale production of fine ceramics and metal products. These products were disseminated through a far-reaching exchange network that secured a collection of exotic, prestigious items from Ecuador and Colombia to the north, the central coast to the south, and Amazonia to the east. Sicán iconography spread even further (Segura 2014). Craft production has received a great deal of attention, and important research has been conducted, particularly involving fine ceramics (Cleland and Shimada 1992, Shimada and Wagner 2001, 2007) and metal products (Shimada and Craig 2013, Shimada et al. 2000). Sicán iconography shows Moche heritage, but expresses a distinct religion and canon. Sicán textiles have been found in the religious center of Pachacamac on the central coast, depicting clearly the so called "Sicán deity" with comma-shaped eyes (Pozzi Escot et al. 2014:461, Uhle 1903). Affiliation with the Sicán religion assured trading partners access to status and ritual paraphernalia, while the state controlled the production and distribution of such items (Shimada 2000). Varied prestige goods have been found in Sicán sites, especially in high elite tombs, including amber brought from eastern Colombia, emeralds from Colombia, spondylus from Ecuador, cinnabar from Huancavelica and feathers from the Amazon basin (Shimada 2014, 2000). The movement of Sicán religious imagery and the wide array of prestige goods are a clear sign of a complex and far reaching commercial network and interaction sphere with no precedent in the prehispanic Andes.

b. Staple Finance

Top-down approaches highlight the authority of a centralized system that controls production and irrigation technology, and redistributes the surplus obtained (Earle 1997). This is what Janusek and Kolata (2004) call "transformative agriculture," the hallmark of Inka agricultural production (D'Altroy 2001, 2002; D'Altroy and Earle 1985). Incorporative management, on the other hand, involves local management of agricultural production to meet state demands, and better describes Moche and Sicán states (Hayashida 2006). For the Sicán polity, the staple economy was based on large and productive agricultural systems, with an extensive inter-valley

(La Leche – Lambayeque) canal network irrigating vast agricultural fields (Shimada 2000, Hayashida 2006, Tschauner 2001). The Taymi canal predated the Racarumi canal, with the latter built during the Middle Sicán period (AD 900-1200). However, water management seems to have been autonomous and segmentary in its organization, as has been documented at the Pampa de Chaparrí (Hayashida 2006, 2014).

In her ethnohistoric study of land use patterns for the Chicama Valley, Netherly (1977, 1984) finds that canal hierarchies were associated with hierarchies of local polities or *parcialidades,* so that canals were boundaries of territories. Canals were managed by a segmentary organization with rights and responsibilities over the system. Ramirez (1996) mentions that each *parcialidad* was responsible for the cleaning of their portion of the canals, and that such events were important in social and ritual terms. So large-scale irrigation can be managed by a segmentary organization, as Hayashida (2006) acknowledges; however, it represents desirable resources for expanding polities such as the Chimú and Inka.

2.3.4 Social Organization and Differentiation

The stratification of Sicán society is best known from mortuary patterns, including the impressive elite tombs at the Huaca Loro cemeteries in the capital (Shimada 1995; Shimada et al. 2004). Shimada et al. proposes the existence of a highly hierarchical social structure subdivided in four tiers, with religious and political elites comprising the top two tiers (Shimada 2014, Shimada et al. 2004). This classification is based on the fact that the material possessions of the first and second tiers are rarer and more exotic than those of the third and fourth tiers, supporting the idea of a hierarchical social structure. Arsenical copper objects are found in commoner burials (tiers 3 and 4). Lower elites (tier 2) had access to objects made of arsenical copper-silver alloys and the ternary alloy known as *tumbaga*. High elites (tier 1) had access to all the preceding metals, plus high karat gold alloys (Shimada 2014). Gender differences were also present among elites, with a preference for golden alloys for men and silver alloys for women (Shimada 2014). Lately, I have argued that the status and gender differences in Sicán elites are not only based on the alloy types like gold for men and silver for women (Shimada et al. 2015), nor was there a strict gender division with stern religious roles as a feminine sphere and political only roles a masculine sphere (Vogel 2003; Wester 2013). I argue that for Sicán, evidence shows that both genders had access to the same types of objects that are symbols of power; the difference seems to be in the different trajectories followed for power acquisition (Cervantes Quequezana 2018: 31). The fact that individuals in the inferred higher social positions generally enjoyed the best health, as determined by examination of their skeletons, offers important independent support for these hierarchical groupings (Farnum 2002; Muno 2014). However, when health differences have been found among social classes, these seem to be minor and mostly related to the access to animal protein in diet (Muno 2014). Overall, when compared with other societies in the Peruvian coast, the Sicán inhabitants had better health, living conditions, and less exposure to violence and trauma (Farnum 2002).

2.3.5 Settlement Distribution and Organization

Settlement information for the La Leche valley was recovered during the 1978-79 Systematic Transect Survey carried out by the Sicán Archaeological Project. The archaeological remains examined were located primarily through air-photo analysis or through the aid of local guides, and as Shimada (1981:411) acknowledges, "represented the larger, more visible archaeological remains." No specific information was provided on the domestic occupation of the area, except that the 1978-79 survey "encountered an appreciable number of small, scattered, featureless low mounds (about 10m. in diameter) that cannot be readily identified on aerial photos and may prove to be house mounds in future excavation" (Shimada 1981:411). The location and extent of this occupation is not presented in the published literature.

In terms of monumental architecture, Shimada (1981, 2014c) proposes three architectural types for Sicán buildings. The first is the Isolated T-shaped platform. It is low in height, with a painted posterior wall and a solid rooftop over painted columns (Corte and El Moscon). Activities held on top of these monuments were visible to those who gathered at the bases of them. The activities held in these monuments have been inferred from the depictions of similar constructions in the famed litter "Anda Ceremonial Chimú" that is clearly Middle Sicán in style (Carcedo 1989). Since it was a looted object, the details of its context and accurate provenience is unknown, but it is thought to have been found in the site of Chan Chan (Shimada 2014b). This type of platform is also found outside the Sicán site, frequently in association with an important water course, such as Huaca Taco (located near the modern town of Eten in the lower Lambayeque valley and completely destroyed by the 1982-83 ENSO). Another example is

Huaca Chornancap located in the Lambayeque river mouth (Shimada 1981, 1985). The second architectural type is Truncated Pyramids, of higher elevation, with a long, zig-zag shaped ramp (Huaca Loro, Lercanlech, La Merced and Sontillo). On the top of the structure are perimeter walls with polychrome friezes, representing the portraits of deceased leaders belonging to the lineage the monument was dedicated to (Shimada 2014b:60, Shimada 2006, Shimada et al. 2004). The third architectural type is Platform mounds, which have a rectangular enclosure at the top (Mound II of Huaca Soledad, Huaca La Mayanga).

In the middle La Leche valley, Hayashida (2014, 2006) finds that while the intensification and enlarging of the agricultural area is inseparable from the Sicán state, water management was independent, not requiring the direct control of the state. She finds that settlement hierarchy correlates with canal organization (from main intakes to smaller canals) in a segmentary organization, and not in a single hierarchy as would be expected from a centralized organization. This segmentary organization might be the reason why rural settlements show relative stability, despite the political upheavals and the torching and abandonment of the Middle Sicán capital and the placement of the new Late Sicán capital in Tucume (Shimada 2000).

In the Lambayeque valley, important information is available as well. Tschauner (2001, 2014) made an extensive survey study of the northern bank of the middle Lambayeque valley. Based on this work he classified Sicán settlements into five tiers (Classes 1 to 5). The complex of Vista Florida is at the top of the settlement hierarchy within his survey area, and is in a central position, surrounded by a ring of second-rank sites (Tschauner 2001:611, Figure 619.624). No detailed maps or excavations have been performed in this site, so little is known about its layout and organization. Tschauner notes that the occupation of the valley floor was characterized by a solar system focused on the regional center of Vista Florida and integrating the whole valley, but highlights that not all lower ranking sites were centered around major mound centers, and that smaller habitation mounds and sites seem to be less dependent on elite centers in terms of their location (Tschauner 2001:305-313). He mentions that most of the population continued living in dispersed habitational mounds (Tschauner 2014). For the lower Lambayeque valley, Wester (2014) mentions that the Chotuna Chornancap monumental Complex is surrounded by mounds with residences, especially towards the southern and eastern sides (Wester 2014:35). However, most of the research has been done in the monumental and ritual part of the complex (Donnan 1984, 2012).

Sicán residential settlements, religious platform mounds and burials have also been documented in valleys to the south such as the Jequetepeque Valley (Castillo 2001, Cutright 2009, Gummerman 1991, Mackey 2009, 2011, Sapp 2002, Prieto 2010, Swenson 2011) and the Chicama (Franco and Galvez 2014). While Castillo (2001) and Prieto (2010) argue that the Sicán polity was imposed in the Jequetepeque valley from the northern Lambayeque region, Sapp (2011) argues that two separate but comparable polities developed and co-existed at the same time, the Lambayeque Norte and the Lambayeque Sur (Sapp: 2011:93).

2.4 THE SICÁN SITE

2.4.1 The Sicán Site

The capital of the Middle Sicán state (AD 900-1100) is formed by two components, the Sicán Core and Greater Sicán. The Sicán Core, which consists of civic-ceremonial architecture, is also known as the “Sicán Precinct” (Shimada 2014a), “Pyramid Group and Plaza” (Shimada 1981) or “Religious Planned Center” (Shimada i.p.), and is located within the central area of today’s Santuario Historico Bosque de Poma.

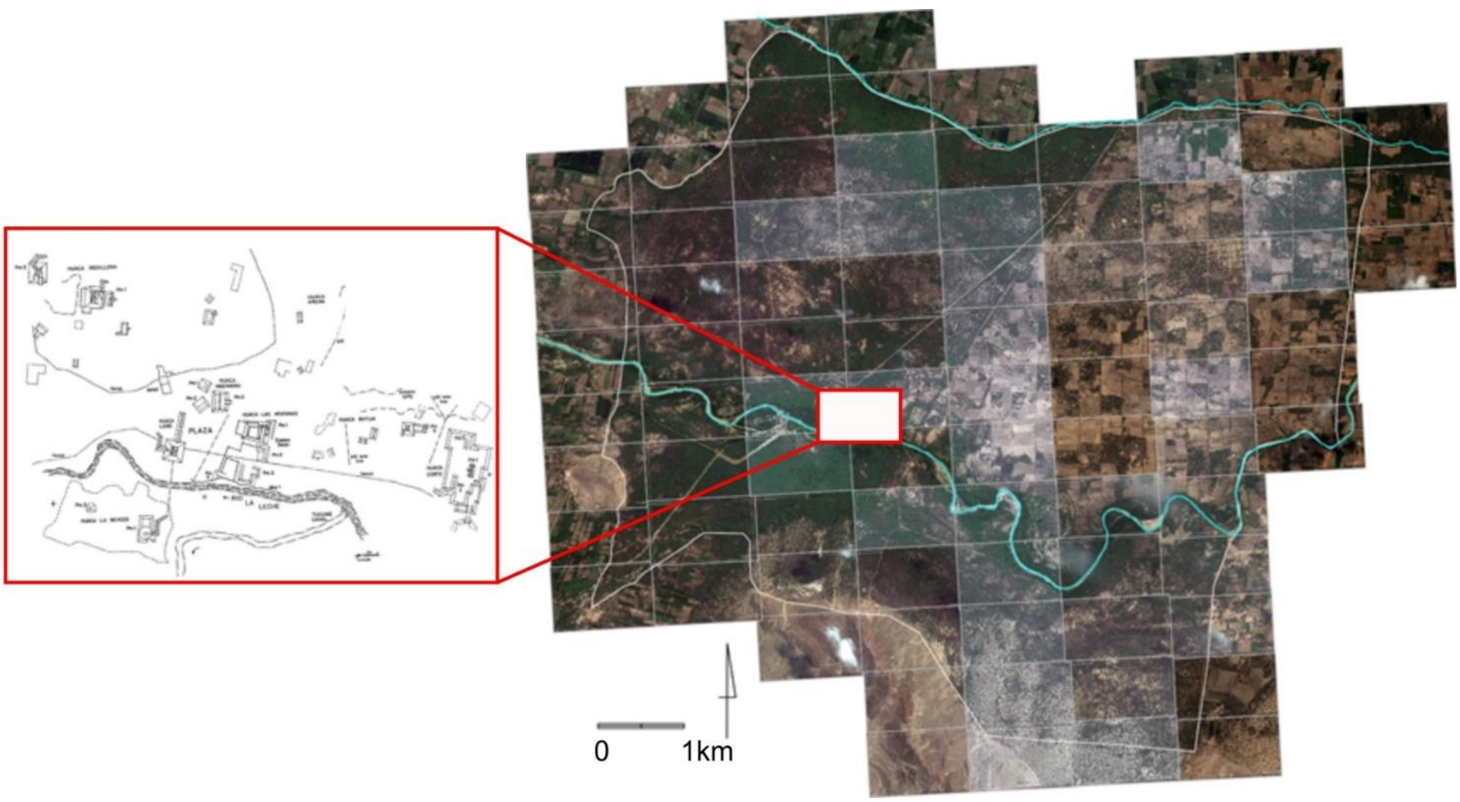


Figure 2. The Sican site (left) within the Santuario Historico Bosque de Poma (right).

The Sicán core extends 1.6 km east-west and 1 km north-south and contains six major platform mounds: Huaca La Merced, Huaca Loro, Huaca Lercanlech, Huaca Las Ventanas and Huaca Corte are placed around a large plaza, and Huaca Sontillo is located to the west of the plaza (Shimada 2014a:71). Shimada argues that the Sicán Precinct was a sacred landscape in the shape of a Tumi (or ceremonial knife) (Shimada 2014a:71 Fig. 65). Elera, on the other hand, argues that the Sicán site layout was determined by an astronomical order (Elera 2008:305).

The top of the platform mounds was presumably used for ceremonies, while outside their base were impressive royal burials of paramount rulers and their retainers, with large amounts of gilded objects, fine ceramics and exotic goods. Shimada and colleagues (Shimada et al. 2004) argue that each mound represents a competing lineage that was subdivided into two complementary moieties, led by two related lords, based on the MtDNA and biodistance of skeletal remains of the East and West Tombs of Huaca Loro. In this interpretation, each mound would have functioned as the locus of ancestor worship and veneration by its associated lineage, where public ceremonies and rituals worked as symbols of political propaganda and power, but also as a means of commensality and integration of the highly stratified and multiethnic Sicán society (Matsumoto 2014 a,b, Shimada 2014, Shimada et al. 2004).

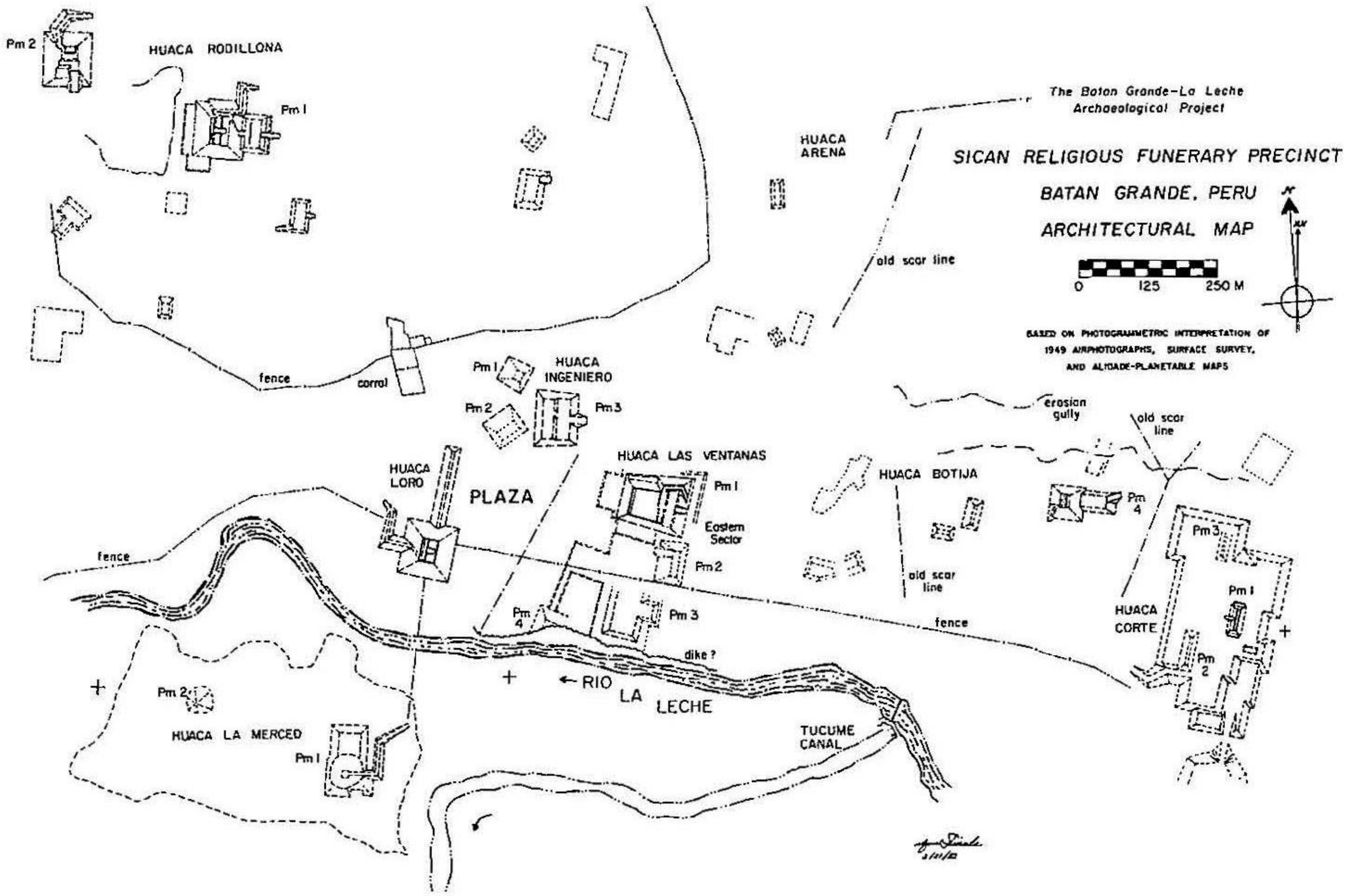


Figure 3. The Sican site (Shimada 1995, Fig.2).

The main monuments located in the Sicán Core are the following:

a. Huaca Las Ventanas: (AD 950+-60, AD 1050+-50, AD 1040+-40, Cavallaro and Shimada 1988, Table 2)

This monument has a north-south orientation perpendicular to the La Leche river. It is a large complex of platforms with ramps that were added in several episodes (Elera 2016: 101, Shimada 1981). The number and complete sequence of construction stages is unknown. To the south there is a large cemetery that has been heavily affected by looting and river activity. The total size and volume of the monument remains unknown, since the southern edge, including the cemetery, has been eroded by the La Leche river. I calculated an approximate area of 60721 square meters, using as a basis the first map of the building published by Shimada in 1981. Currently, the remaining standing architecture has a total area of 32830 square meters. According to Shimada (1995), in the southeast corner there was a complex of uniform rectangular rooms made with carefully plastered adobe walls and with floors made of stone slabs. This is taken as evidence of the storage of valuable goods and their careful protection from pests and natural elements (Shimada 1995). Similar structures have also been found at Huaca Corte (Shimada 2014: personal communication).

The Sicán National Museum conducted excavations during 2006, 2007, documenting three construction phases. The earliest architectural phase, phase A, corresponds to Early Middle Sicán; phase B corresponds to Middle Middle Sicán, and phase C corresponds to Late Middle Sicán (Elera 2016:101 West Profile, Trench 1). Nearly 270 m of profile, including several burials, were exposed during a 1998 river boundaries improvement project. In the southern Platform, evidence of metal craft production was found that was contemporary with the construction of the funerary chambers, leading to the conclusion that the funerary objects were produced near the monument (Carlos Elera, personal communication 2014).

One structure located in the Edificio C, which covers the crenellated (*almenado*) wall, was built with marked adobes and then plastered and painted with murals. Fragments of the murals show local birds such as tordos and parrots eating corn. This imagery has been interpreted by Elera as a depiction of abundance of subsistence. There are also anthropomorphic figures and geometric designs that formed part of the last construction phase (Elera 2016: 101).

b. Huaca Corte: (AD 1040+-60, AD 1030+-20, Cavallaro and Shimada 1988, Table 2)

This monument is a large complex of low platforms and ramps placed in a north-south orientation. The number and sequence of construction stages is unknown. The monument is built on top of what seems to be a sand dune or natural terrace, also noticed in 1981 by Shimada and his team (Shimada 1981:412).

This monument has suffered severely due to its vicinity to the river, which regrettably has washed away most of the construction. A comparison between the map made in 1978-79 (Shimada, 1981) and the map produced in 2014 shows the dramatic difference (see Chapter 4).

c. Huaca Loro (AD 1040+-40, Cavallaro and Shimada 1988, Table 2)

Huaca Loro, also known as Huaca Oro pyramid, is oriented to the north and has a total footprint of 15106 square meters, its base measuring 80 x 80 m, and is 35 m high including a 150 m long, multilevel terrace platform located to the north of the building. Investigation on and around the platform has revealed that the platforms held colonnaded temples with mural-decorated interior rooms and elaborate offerings (Shimada 1981). A zig-zag shaped ramp is located at the west.

d. Huaca La Merced

Huaca La Merced was a complex of two buildings: a large platform mound built in a pyramidal shape and a smaller pyramid. In total, they comprising an area of 13160 square meters.

The largest building, or Pyramid One (Shimada 1981), is oriented in a north-south axis with a large zig-zag ramp located on the east side of the building.

e. Huaca Lercanlech (also known as Rodillona) (AD 1020+-50, AD 1030+-30, Cavallaro and Shimada 1988, Table 2)

The Huaca Lercanlech pyramid is oriented east-west. It has the shape of a truncated pyramid with a zig-zag shaped ramp on one side. It is the largest and tallest truncated pyramid of the Sicán site. On the east edge, there is a smaller pyramid with a straight ramp to the east.

f. Huaca Sontillo

Huaca Sontillo is located to the northeast of the Great Plaza and dates to 1000-1100 AD (Shimada 2014a:71). No further information on it has been published.

g. Huaca Colorada (AD 1060+-40, Cavallaro and Shimada 1988, Table 2)

Huaca Colorada is located northeast of Huaca Loro and northwest of Huaca Las Ventanas. It has a quadrangular shape, with two tiers and one ramp located to the east of the building.

h. Huaca Menor (AD 1100+-70, Cavallaro and Shimada 1988, Table 2)

This was a smaller mound located to the southeast of Huaca Las Ventanas. In the 1970s it was heavily looted in the search for a large tomb. The structure of the looted tomb was located and documented (Pedersen 1976), but the building was totally destroyed.

According to Shimada, the differences in size and shape among these huacas are a reflection of the variability of manpower and available resources, as well as the relative status of the lineages (Shimada 2014:60). Each of these monuments is surrounded by a series of elite shaft tombs placed in a planned manner (Shimada 2014b:59). This careful planning, together with the results of the analysis of human remains and associated artifacts, leads Shimada to postulate that each monument and its associated cemetery represents a lineage of the Middle Sicán elite (Shimada 2014, Shimada et al. 2006, 2004).

The present view of the Sicán city centers on the hypothesis that the Sicán Precinct was a major religious center with a relatively small group of elite residents overseeing the production of valued goods in central workshops, the construction of public monuments and major tombs, and the management of storage. Craft production and construction would have been performed by laborers coming from residential settlements surrounding the precinct (Shimada 2000). Shimada mentions that he and his crew did not find evidence of extensive residential sectors in the Sicán Precinct (Shimada i.p., 2014b:63), and concludes that the Poma area itself did not have any large, nucleated, permanent resident populations during its long history (Shimada 1981:435). Shimada et al. (2004:172) have inferred that "extensive commoners' residential settlements encircled the perimeter of the capital," and suggested that craft production and construction were performed by laborers coming from residences surrounding the precinct at a distance of 0.5 to 2.5 km. The paucity of evidence and information on domestic occupation has even led some archaeologists to cite the, "lack of residential architecture (either elite or commoner)," as supporting the idea that "Sicán's function was ceremonial not administrative" (Conlee et al. 2004:212).

I consider that this view has been shaped by the intensive investigation of ceremonial contexts (monumental architecture, funerary rites and ceremonial activities) as well as craft production, leaving under-researched one of the major and most important aspects of any city or settlement of any kind, which is the domestic occupation of the site. According to the research presented in this dissertation, many medium and small mounds exist in the Poma area but are currently covered by Dry Forest trees that make them "invisible." Only the monumental architecture found in the Sicán Core is visible from a distance.

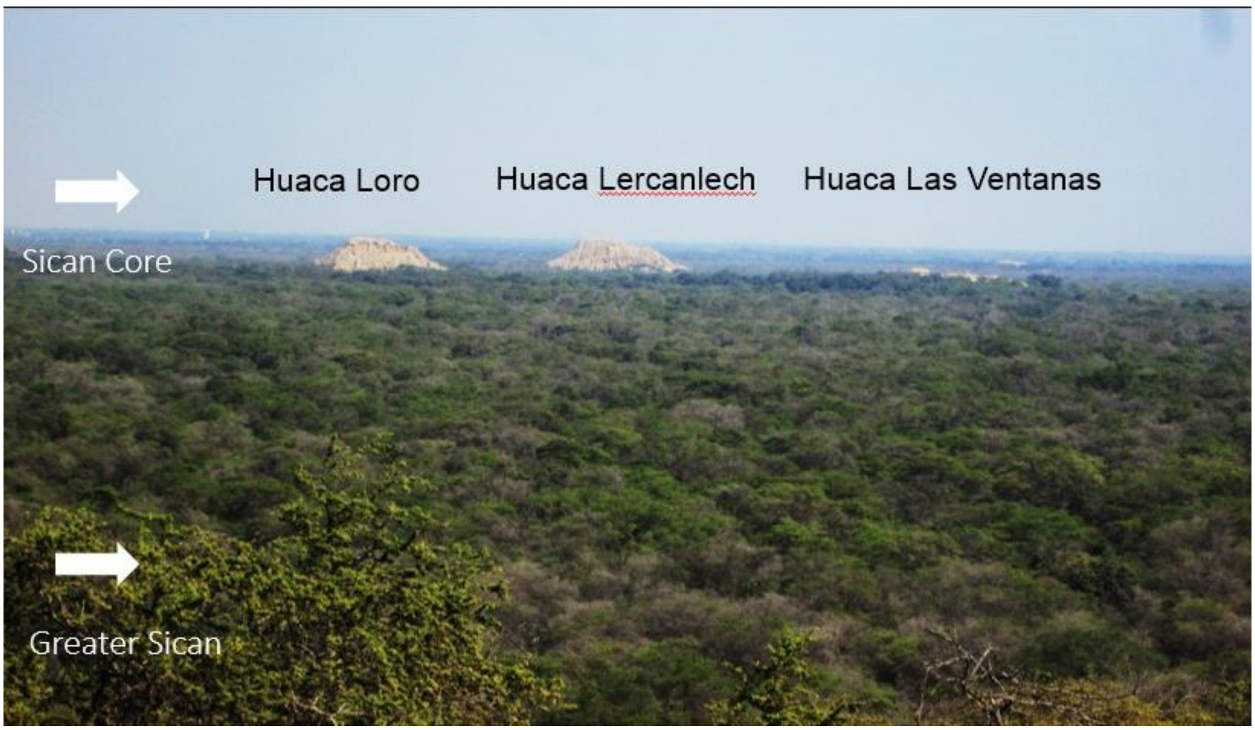


Figure 4. Sican Core and Greater Sican. Foto by Gabriela Cervantes Quequezana.

2.4.2 Greater Sicán

From the survey in 1978 and 1979, Shimada (1981) identified archaeological features in the surroundings of the Sicán Precinct. Shimada and colleagues report the following: a) a series of contemporary settlements, such as Huaca Arena and Huaca Loayza, that according to the author are residences of commoners that surround the Sicán site at a distance of 0.5 up to 2 km. b) By implication, there must have been an organized system of managing and mobilizing labor and materials. Shimada suggests that, given the limited number of residents in the Sicán site, the elite depended on the labor provided by nearby communities such as Huaca Arena and Huaca Loayza for productive and maintenance activities (Cavallaro and Shimada 1988, Shimada 1997). c) A different architectural class is formed by relatively small conical mounds overlooking cemeteries, such as Huaca Cholope, La Mayanga, Soledad (Mounds I and II), and Tordo (Shimada 1981:412). These are hypothesized to be shrines with enclosures on top, with a complex architectural history.

Excavations in Huaca Soledad Mound II showed the presence of Middle Horizon burials, polychrome murals blending Moche-Wari iconography, and a long construction history (five phases of adobe and mortar modifications, each covered by fill consisting of sand or algarrobo leaves and branches) (Shimada 1981:418-419 Fig. 19). Shimada sees a parallel with the "entombment" of temples at Kotosh, arguing that there is a symbolic linkage between the human burials and the burial of the building (Shimada 1981:418).

2.5 SUMMARY

The Sicán polity has been characterized as a theocratic state transitional between the well-known Moche states and the highly bureaucratic Chimú Empire, two very different political systems. To date, our knowledge of the Sicán polity is based largely on the excavation of monumental and funerary contexts, on the study of craft production, especially metals and ceramics, and agriculture. However, little is known about its urban and social organization.

By initiating the first comprehensive investigation of this polity's capital site, centered around the "Sicán Precinct," I aimed to document the nature of socioeconomic organization at the capital, and produce the data needed to compare the Sicán city capital with other cities in the pre-Hispanic Andes and elsewhere. Sicán lacks the compact urban character of earlier and later capitals such as Pampa Grande, or Chan Chan found in earlier and later North Coast states. My results, presented in the following chapters, shows that the Sicán capital had an extended, low density population, with many settlement nuclei, and space between houses or house groups; this is a layout reminiscent of the dispersed or garden city studied in the Maya area and in Southeast Asia, but very unusual for the Andes (Cervantes Quequezana 2014, 2017a,b, 2018a). This current work examines this dispersed low-density pattern for Sicán, and the characteristics and implications of an Andean version of the dispersed city.

3.0 METHODOLOGY

This research investigates the social organization, urban layout and residential characteristics of the Sicán site, inferred capital of the Sicán polity (AD 900 – 1375), in the La Leche valley, located in the Lambayeque region on the north coast of Peru.

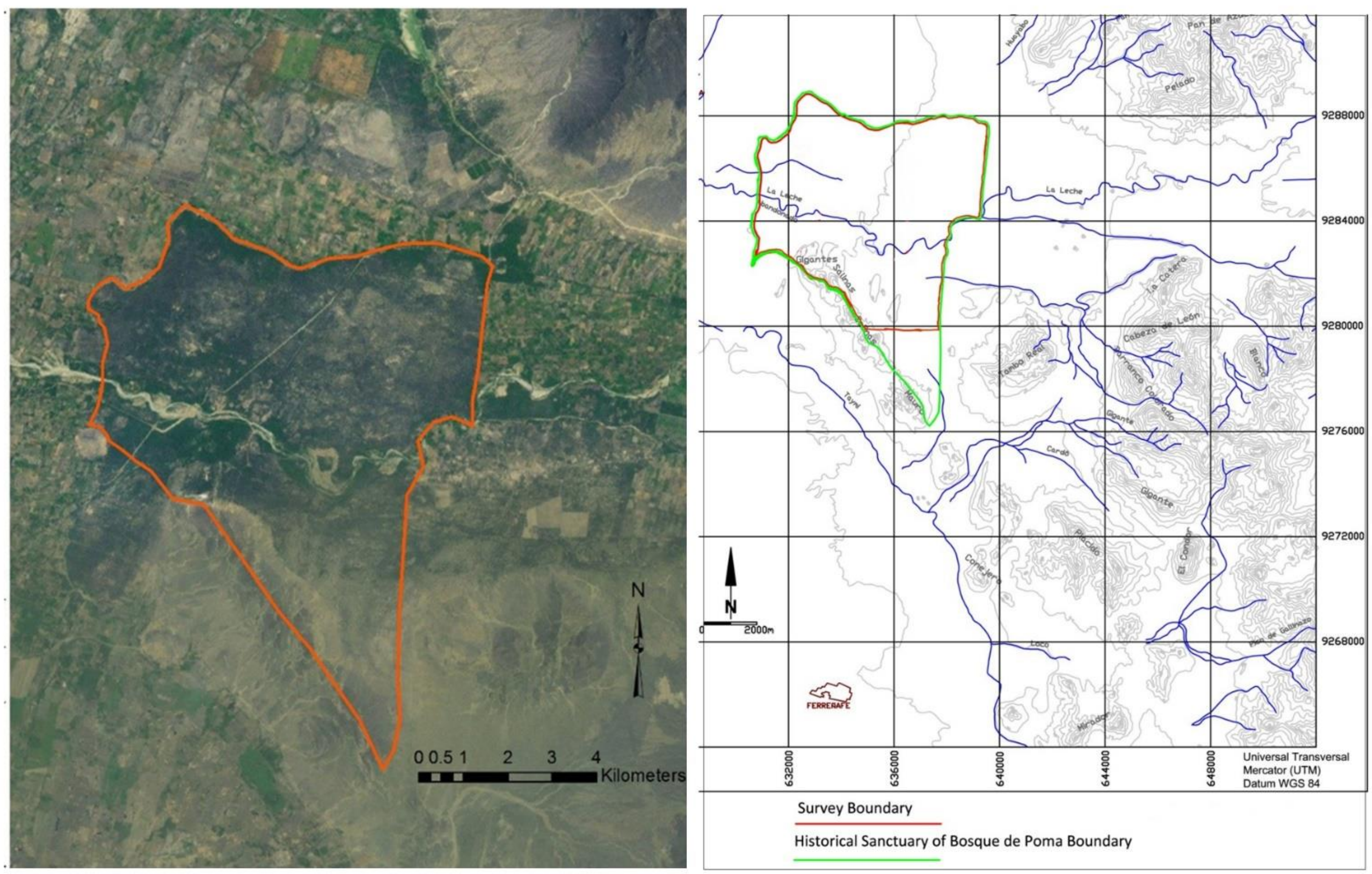


Figure 5. Santuario Historico Bosque de Poma and research area.

The Sican site was chosen as a case study for this research because it presents an already well-known monumental core and a large surrounding area with domestic occupation identified during my pilot work. The zone is designated as a natural and cultural protected area by the Peruvian Government, and presents a unique opportunity to study a well-preserved ancient city.

My research addresses: (1) the urban and architectural layout of the Sican city, (2) the size and population density, (3) socioeconomic differentiation and economic occupation of its residents; and (4) continuity and change through time in residential patterns in the area. In this chapter I discuss the methods used to answer these questions. In the first part I discuss the survey field methodology, then I discuss surface collections, mapping and finally the ceramic analysis.

3.1 SURVEY: FIELD METHODOLOGY AND TECHNIQUES

The Sican Survey consisted of a full coverage pedestrian survey/surface collection program at the Sican city monumental core and its surroundings**.**

Most survey studies in the Peruvian Andean region have had as the primary objective to identify and register archaeological sites, usually based on visible surface architectural remains (i.e. Billman 1996; Tschauner 2001; Wilson 1988). A previous survey in the area (Shimada 1981) helped identify the monumental core and produced a map of the major monumental buildings.

My approach was different: it was a "siteless survey" approach, since it was aimed at the identification of material remains, especially ceramics, regardless of the existence of architecture, in order to register human activity. Households carry out several different activities, each with different intensity and frequency. Unlike architecture, a focus on artifacts, particularly on ceramics, highlights those activities that took place outdoors as well as indoors. Unlike architecture, ceramics have a more limited lifespan; pots need to be replaced according to the intensity and frequency of use. Domestic or utilitarian ceramics are a good representation of domestic refuse and can be of particular importance in cases of low-density or dispersed settlements. Given the fact that domestic refuse or garbage is not deposited far from residential places (Hayden and Cannon 1983, Beck and Hill 2004), the accumulation of ceramic material is interpreted as evidence of residential units.

One of the guiding questions of my research was to verify if Sican was a low-density city. In order to be able to grasp if this was the case, a systematic pedestrian survey encompassing a total coverage of the area was needed. The main goal of the survey study was the identification and record of any human activity, such as architectural features, cemeteries, domestic refuse, craft production evidence, canals, etc. An essential goal is to reconstruct the city settlement in its entirety, including low density or dispersed residential areas. Collections from those sampling units must be adequate to assess chronology, function, and status/wealth differences (as measured by the proportion of fine ceramics and other objects).

The total survey area of 50 km2 was covered in five months using two survey crews. There were 90 effective days of fieldwork, covering 0.55 km^2 or 55 ha per day as an average. Fieldwork speed varied considerably and depended most of the time on the density of materials and the presence of architectural features. In some areas the presence of dense arboreal vegetation slowed down the fieldwork. Towards the end of the field season, the rainy season started in the highlands and the La Leche river started flowing, making it impossible to cross on the usual track. At that point we needed to take another route, leaving the Santuario Historico Bosque Poma to cross the river via the Panamerican Highway bridge, and then returning to the survey area. This added up to a total of 4 hours of transportation per day.

3.1.1 Survey Area

The scale of the survey was designed to encompass the Sican Core and an ample area surrounding it, and at the same time to remain feasible to cover with the proposed survey method **(Figs. 5, 6.).**

The Sican Survey covered most of the Santuario Historico Bosque de Poma (SHBP). The limits of the SHBP encompass a total of 58 km^2. The SHBP is defined by topographic features, such as the Cerro Salinas to the south, canal Pacora to the north and west and the highway to Batán Grande to the east. The Sican Core, where most of the monumental architecture is located, is situated at the center of the Sanctuary.

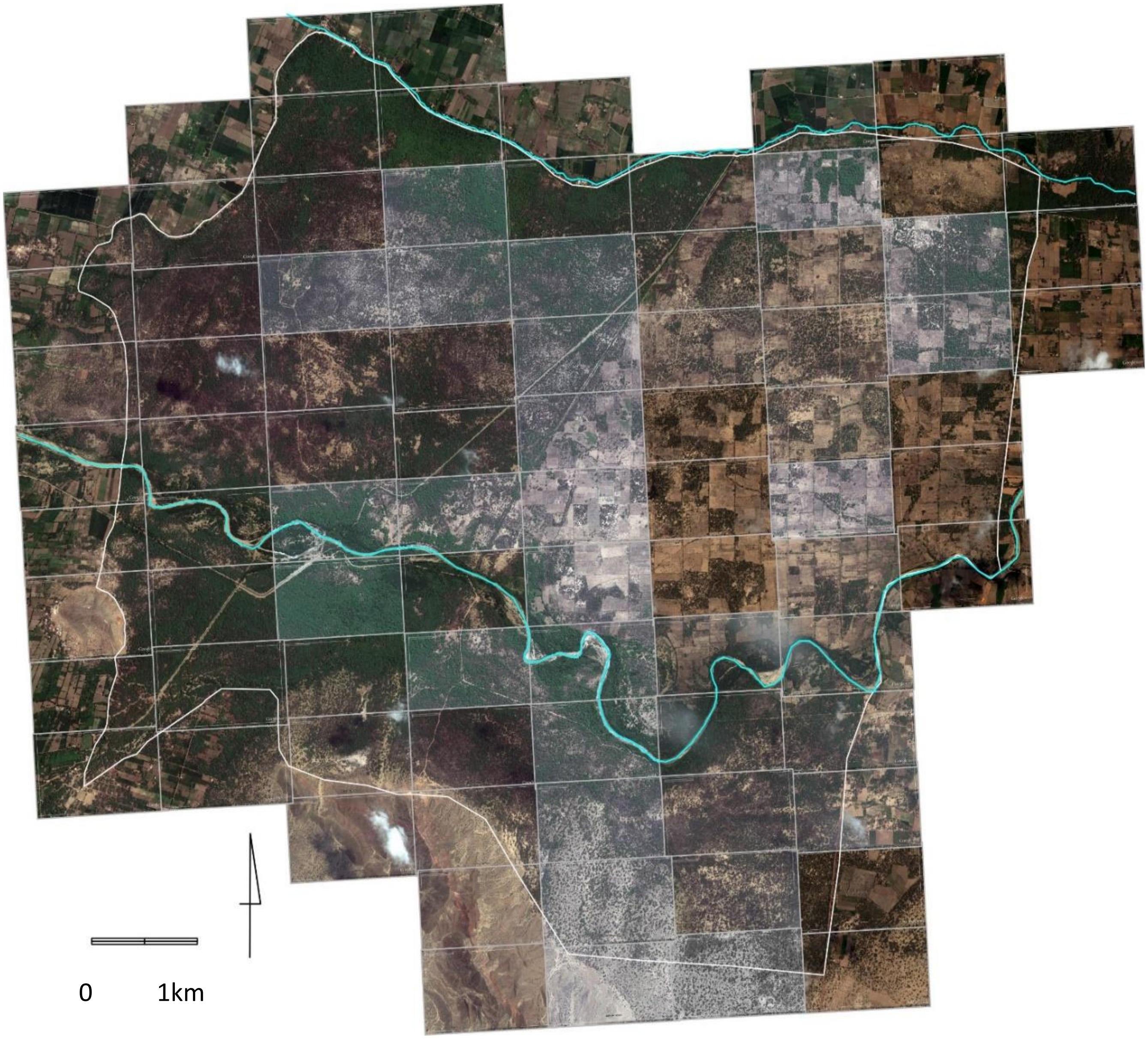


Figure 6. Survey area within the Santuario Historico Bosque de Poma.

It is important to note that even though the distribution of ceramics continued outside of the survey limits, no monumental architecture was present in a 10 km perimeter outside of the research area. This is the main reason why I decided to take advantage of the existing border of the SHBP and use it as the research area limits. The fact that no monumental architecture was found outside the perimeter of the research area could be an indication that the use of the area was more rural and less urban. The current limits of the SHBP, although arbitrary, seem thus to reflect a certain cultural boundary, that of an urban settlement.

The southernmost area of the SHBP, which forms an irregular triangular shape, was taken out of the survey limits, since it has a well-known Chimú occupation and it covers a hilly area considered not central to the present research. In the southwestern corner, the known site of Cerro Sapame was not included in the survey area since it is currently exploited as a source of stone and construction materials and it has been heavily disturbed. The flat area immediately next to Cerro Sapame was surveyed, but the area had suffered several flooding events and surface material was not visible.

After eliminating these two areas, the total area surveyed was 50 km^2. The survey area includes the La Leche river bottom, ravines, sand dunes and flat terrain.

3.1.2 Survey Techniques and Surface Collection Methods

Transects every 50 m were prepared in AutoCAD in a north-south orientation covering all the survey area. These were uploaded into two handheld GPS units using ExpertGPS. Each survey crew was formed by three persons following the transects uploaded in the GPS at a distance of 25 m from each other. The head of each survey group had a GPS and served as guide and point of reference to the other crew members. Every 50 m (the length of each survey unit) all crew members stopped, bagged materials collected, and recorded any information during their the last 50m of the transect, using the Survey Forms.

3.1.3 Survey Units

Survey Units are areas no bigger than about 2500 m^2 (0.25 ha) for collections of surface materials. Survey Units were defined using landscape features as limits, including both ancient features (mounds, canals) and modern features (fences, agricultural furrows left by past invasive agriculture within the park) useful for that purpose.

They were recorded by drawing a sketch on printed satellite imagery from Google Earth and Digital Globe. This technique was used in areas with no forest cover and good aerial visibility. A UTM grid was created in AutoCAD and was superimposed on the images. Sections of the images were printed at a 1:10,000 scale. These were taken to the field to be used as reference and to record collection units and any architectural features. Polygons with the size and shape of survey units were drawn directly on the printed images. Those polygons were then digitized in AutoCAD in the lab. In the areas where forest vegetation was present and affected aerial visibility, arbitrary polygons of a square shape of 0.25 ha were drawn in AutoCAD.

Where large monumental architectural remains were present, a sketch was made recording the different sectors found. Each sector represented a survey unit, and thus, a collection of sherds. So, areas with architecture (or what in another survey might be called “sites”) were thus divided into many small patches for separate collections. When residential mounds were present, smaller survey units were placed following their shape. Since most of the survey area was flat, the two survey crews worked next to each other; in this manner survey time was optimized.

A total of 20,000 survey units were defined within the 5,000 ha of research area. Of those, 2787 (13.93%) presented archaeological materials on the surface, and surface collections were made at each of them**.**

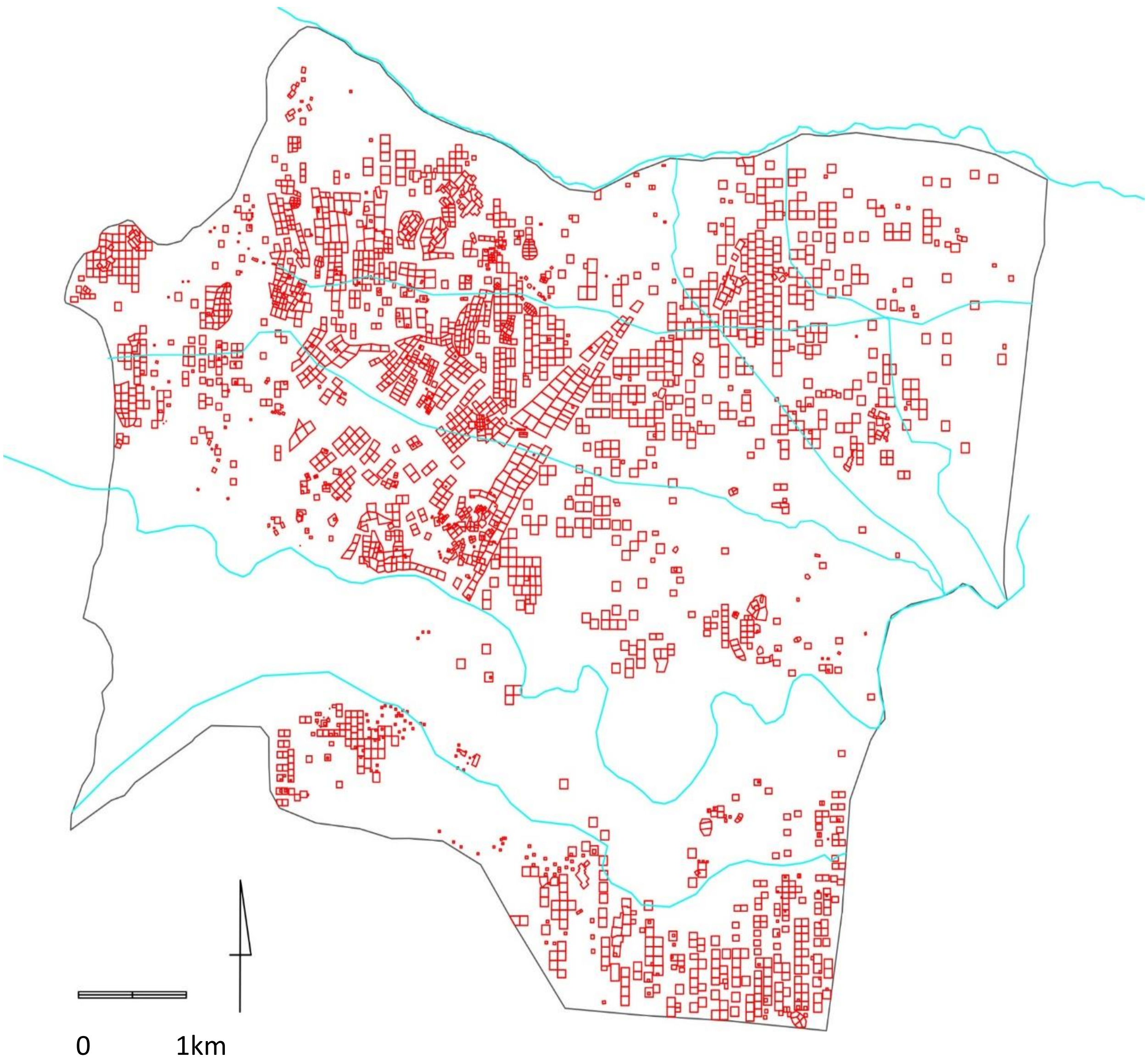


Figure 7. Map of the research area showing collection lots.

3.2 SURVEY: SURFACE COLLECTIONS

Surface Collections followed a sampling strategy designed to facilitate quantitative comparisons of surface assemblages in terms of chronology, differential activities, and wealth (Peterson and Drennan 2005). A total of 2787 surface collection lots were taken **(Fig. 7)**. Within each survey unit, we collected all surface materials using one or more sampling units ($1m^2$), placed in the approximate center of the spatial unit - until the minimum sample size (25 sherds, including diagnostic and non-diagnostic) was achieved. If 25 sherds were not collected within the first sampling unit, a second one was placed adjacent to the first, and a third if needed, etc.

The dry environment allows only desert-adapted trees to grow but not low-lying vegetation like grass. Dense vegetation is present only near water sources, which allowed an overall good surface visibility.

Table 2. Survey collection form.

1. IMAGE CODE ________ 2. APROX SURVEY_ UNIT AREA: ______ Ha 3. DATE: __|__|__

4. GEOG. COORDINATES: ____________ mE, ____________ mE UTM-WGS84

VEGETATION:		LOCATION:		VISIBILITY:	
NONE	☐	HILLTOP	☐	VERY GOOD	☐
WILDGRASS	☐	HILL-SLOPE	☐	GOOD	☐
SUGARCANE	☐	VALLEY-FLOOR	☐	FAIR	☐
THICK FOREST	☐	QUEBRADA	☐	POOR	☐
FRUIT-TREES	☐	PLAIN at the valley_EDGES	☐		
OTHER CROPS:	☐				

SURVEY UNIT / COLLECTION-NUMBER: ☐

ESTIMATED DENSITY OF SHERDS PER M^2		SAMPLING UNIT AREA	RADIUS	NUMBER OF COLLECTIONS:
LESS THAN 1 →		GENERAL COLLECTION		→ ____
1 TO 5 →	SYSTEMATIC	10 m2	→ **180 cm**	→ ____
5 TO 10 →	SYSTEMATIC	5 m2	→ **130 cm**	→ ____
10 TO 20 →	SYSTEMATIC	2 m2	→ **80 cm**	→ ____
20 TO 50 →	SYSTEMATIC	1 m2	→ **60 cm**	→ ____
MORE THAN 50 →	SYSTEMATIC	0.5 m2	→ **40 cm**	→ ____

NUMBER OF BAGS	
BONE-ECOFACT:	____
BONE-ARTIFACT:	____
SMALL STONE ART:	____
CERAMIC:	____
SHELLS-ECOFACT:	____
SHELLS-ARTIFACT:	____
OTHER:	____

IF LARGE LITHIC ARTIFACS WAS LEAVED:	WHAT?	NUMBER

Was the surface scraped? Yes / No

Because the area of study presents parts with high densities of materials as well as low density areas, different strategies were used:

3.2.1 General Collections

In low density areas (1 sherd/m^2 or below) a General Collection was taken of artifacts in that spatial unit. In General Collections all artifacts found were recovered. A minimum number of 3 sherds was necessary to take a collection.

3.2.2 Systematic Collections

In high density areas (1-20 sherds/m^2 or more) sampling units of 0.5m2, 1m^2, or 2m^2 were collected until reaching the minimum sample size. Systematic Collections should have a minimum of 25 sherds/survey unit providing error ranges of 10% with 66% confidence level for the four temporal components identified (Formative, Moche, Sican, Chimú/Inka). In other words, each systematic collection had a minimum of 25 sherds. An increase or decrease in the sample size of each temporal component would only increase or reduce the error range, but not the assessment of the proportions among the variables under analysis (Drennan 2009). These collections contained mostly plain sherds. In some cases, one or two sherds were diagnostic (rim/decorated). Since some collections included some rims, and others didn't, they were not adequate for more fine-grained time period assignments within the Sican Period (see next section). I used these collections for density calculations only for the four large time periods (Formative, Moche, Sican, Chimú/Inka).

3.2.3 Chronology-Purposive Collections

One of the most important aspects of my research was to define residential occupation during the Sican period. Technological changes in ceramics are not drastic enough to define chronology on the basis of plain sherds alone (Hayashida 2006) and thus, chronology has to rely on diagnostic sherds for shapes (rims) that do change within the Late Intermediate Period (including Sican and Chimú). In order to solve this problem, a chronology-purposive collection was added to a systematic collection of all sherds. A minimum number of 10 diagnostic sherds was collected to have a 66% Confidence Level and 15% Error Range. These sherds were collected in separate bags associated with their corresponding Systematic Collections. They were used to assign chronology (rims and decorated diagnostics) forming the Diagnostic Ceramic database and were not included in the calculations for densities. A period of 5-10 minutes was allocated to the search of the diagnostic sherds, after which the search would stop even if the minimum number was not achieved in order not to delay excessively the survey work. The logic behind this is to establish chronology based on the Chronology-Purposive Collections, and then to extrapolate the proportions of those time periods to the Systematic Collections when no time period can be assigned for the latter.

These collections were also used to characterize the Sican Ceramic Assemblage and its distribution, as well as to assess activities through space (see Chapter 6).

3.2.4 Isolated Finds

During the survey some isolated finds were registered in areas that had been surveyed, but we chose to keep them separate from the regular surface collection. Usually these were Special Objects such as metal artifacts, beads, and figurines. But diagnostic ceramics such as rims or decorated sherds were also found. These isolated finds were located with a GPS point and recovered in a separate bag. In the case of Special Objects such as metals and beads, this information was used to produced presence/absence maps of their distribution.

In the case of diagnostic ceramics, these findings were not added to the Purposive Collections, nor to the Systematic Collections used for demographic densities (see Chapter 5). These findings were used in the economic activities analysis (see Chapter 6).

3.2.5 Summary and Survey Results

A total of 2,787 survey units contained materials and resulted in collection lots, with a total of 70,378 sherds. During the analysis some collection lots were eliminated from the analysis since they resulted in duplicates, some had missing or confusing information on their provenance or had fewer sherds than the minimum required. Chronology-Purposive Collections were also separated since they were not intended to be used for density. After this separation, a total of 2701 collection lots containing 53,407 sherds were used for the demographic analyses.

The Systematic Collections account for 44.83% of all collections made. Ceramic collections were made in sampling units of $1m^2$ until reaching the minimum sample size of 25 sherds. The careful systematic collections of a small number of square meters provided a density value (sherds/m^2), and that value was used to characterize the entire collection unit (0.25ha in size).

The General Collections accounted for 55.16% of all collections. Since General Collections have a different procedure of collecting than the Systematic ones, the number of sherds cannot just be divided by the entire area of the collection unit. This is explained in detail in Chapter 5.

3.3 MAPPING

Civic-ceremonial architecture was already well-known in the Sican core and was mapped by the Sican Archaeological Project in 1978-79 (Shimada 1981). I used this map as a base source, and added revisions and new architectural features found in the new survey. Civic-ceremonial architecture outside the Sican Core was known but had never been systematically mapped or studied before this project. Residential architecture had never been identified nor mapped in the research area.

3.3.1 Architectural Features

Architectural features identified include both monumental or public architecture and residential architecture. Structures could not be recorded with the aid of satellite imagery (except for the largest monuments), since the dry forest canopy covers most of the research area. Structures were recorded using traditional methods such as GPS, compass and tape measurements. Field sketches of architectural form and layout were done by me with the help of the crew members. Later in the field season, and when time allowed, a crew headed by archaeologist Jhon Cruz went back to selected areas with the original sketches and measurements to add details.

Table 3. Mound registry form.

SICAN SURVEY 2014 MOUND #: _______________
1. IMAGE CODE_________ 2. ORIENTATION _______________ 3. DATE: ___/___/___
4. CONSTRUCTION MATERIAL 5. ASOC. MATERIAL 6. PRESERVATION
STONE: _____________ CERAMIC: ___________ VERY GOOD: _______
ADOBE: _____________ LITHIC: _____________ GOOD: ____________
TAPIA: ______________ SHELL: _____________ FAIR: _____________
QUINCHA: ___________ OTHER: ____________ POOR: _____________
7. LOTS: _____________
8. DESCRIPTION:
____
____
____

Architectural features in the research area were mostly made from adobe (unfired brick). These architectural features have suffered heavily from wind and rain erosion. Unlike stone architecture that would allow one to distinguish clear corners, internal wall sub-divisions, etc., in this case only general characteristics could be recovered from the surface, such as orientations and footprint shapes. Because of this, the error range of the portable standard GPS units, which is from 3 to 10 m depending on the topographic conditions and satellites' availability, does not significantly affect the final maps, especially considering the scale and preservation of the architectural features mapped. Elevation and vertical measures were taken with GPS. Total station or theodolite mapping was not possible mostly due to tree vegetation, but also to the lack of time and budget. Still, all efforts were made to take as accurate measurements as possible in the field, together with handmade sketches of visible architectural features.

While these methods do not allow for high precision or accuracy of measurements, they were useful in accomplishing the main goals of this research, which are to create a complete map of the city. See Chapter 4 for results.

3.3.2 Topographic and other Landscape Features

Detailed topographic maps of the area were made in 1963 as part of a large irrigation project called “Proyecto Especial Tinajones” with the support of the German Government. I used these topographic maps for the present research, which today are still the most accurate ones produced for this area. Elevation lines are drawn every 2 meters and start at 62 masl. Topographic elevations are formed mostly by sand dunes (medanos de arena).

Besides architectural maps, landscape features were also recorded in the survey, such as small creeks, natural and modified waterways, flooding areas and seasonal lagoons that formed during the ENSO phenomenon in 2016-17**.**

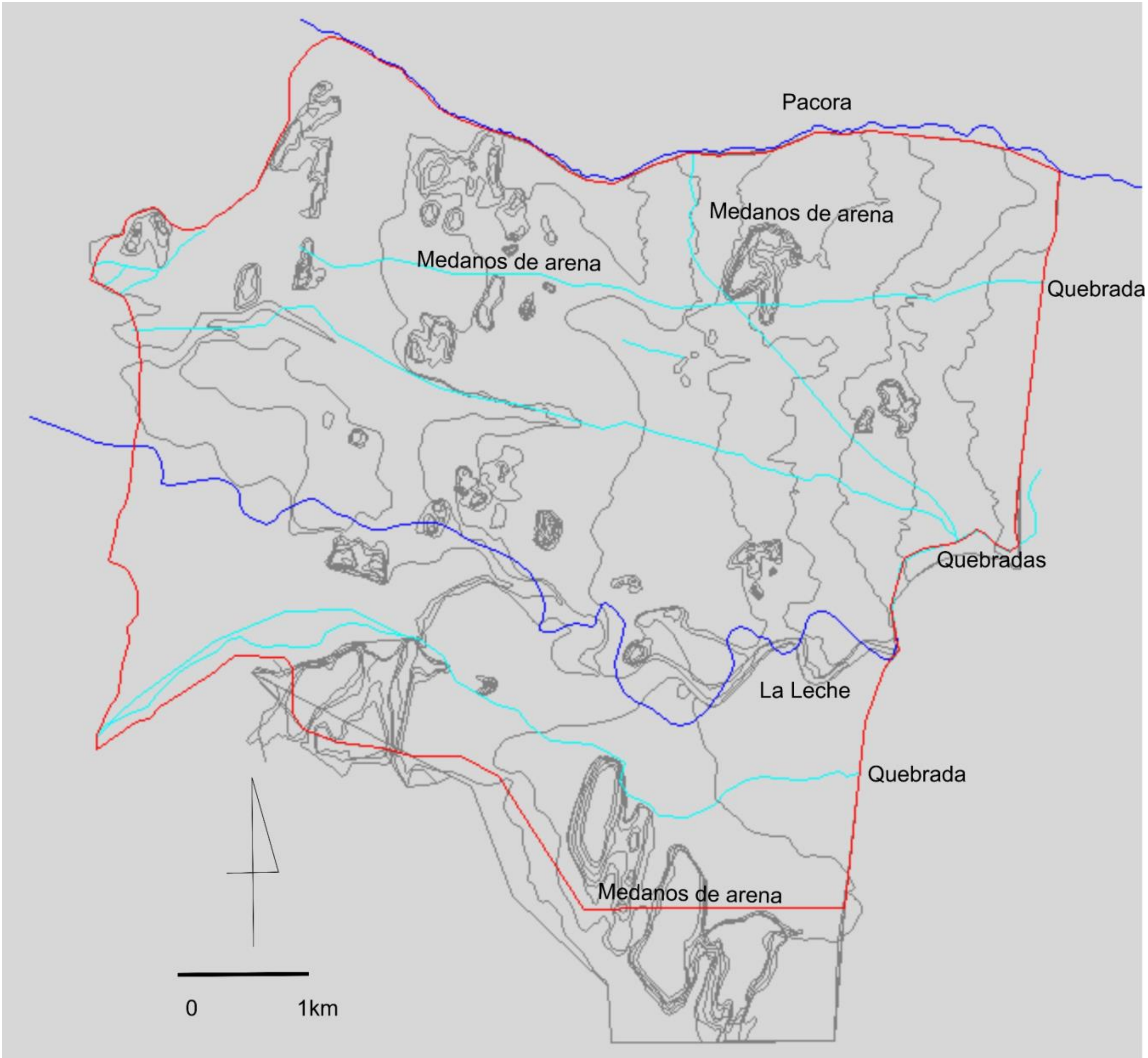


Figure 8. Topographic map of the research area, survey limits in red.

3.4 CERAMIC ANALYSIS

3.4.1 Chronology

Collections from the sampling units were analyzed to assess chronology, function, and status/wealth differences (as measured by the proportion of fine ceramics and other objects).

Chronological classification of the ceramic assemblage was oriented toward distinguishing four major periods: Formative, Moche, Sican and Chimú/Inka. An emphasis was given to the Sican period which in turn is subdivided into Early, Middle and Late phases. The ceramic chronology used for this research is based mainly on the chronology developed by the Sican Archaeological Project (Cleland and Shimada 1992, 1998, Shimada 2000, Shimada et al. 2004) based on stratigraphic contexts excavated in the Middle La Leche valley (Shimada 1981) and several radiocarbon dates (Shimada 1995). This chronology was then complemented with the work of Frances Hayashida (Hayashida 1998, 1999, 2006), Hartmuth Tschauner (2001) and Go Matsumoto (2014b, 2019).

I analyzed the collections from stratigraphic excavations of the Huaca El Pueblo de Batán Grande, which represents the whole radiocarbon-dated cultural sequence in the valley. I also analyzed the collections from stratigraphic excavations of Huaca Arena within the Sican site (Cervantes Quequezana 2013). I used these analyses to complement and refine the already detailed ceramic chronology, and define the Sican Ceramic Assemblage **(Appendix C, D)**.

The general chronology used in this research has the following periods.

3.4.1.1 Period 1

This period comprises the Formative Period, including all internal subdivisions such as Early, Middle, Late and Epiformative from 1500 BC to AD 100 (Kaulicke 2010). Most the ceramics corresponding to this period correspond to the Late part of the Formative Period and consist of the Cholope Style (Carlos Elera, personal communication 2014).

3.4.1.2 Period 2

This corresponds to the Early Intermediate Period, consists basically of Moche ceramics. There was a Moche polity within the research area located at the site of Huaca Soledad. Moche ceramics have been found in several locations within the research area. The Moche period in the northern part of the North Coast goes from AD 200 to 700 (Shimada 1994).

Periods 3 and 4 encompass the Late Intermediate Period and Late Horizon. As mentioned earlier, technological changes in ceramics are not drastic enough during the Late Intermediate Period to define chronology on the basis of plain sherds alone (Hayashida 2006). For this reason, chronology had to rely on diagnostic sherds (rims) that do change within the Late Intermediate Period. In order to solve this problem, a chronology-purposive collection consisting of rims or decorated fine ceramics was made.

3.4.1.3 Period 3

This period encompasses the Sican Period with its three subdivisions: Early Sican (AD 750-900), Middle Sican (AD 1000-1100), and Late Sican (AD 1100-1375).

3.4.1.4 Period 4

This encompasses Chimú (AD 1375-1460) and Chimú-Inka (AD 1460-1532) ceramics.

Most periods were found throughout the research area, highlighting a certain stability in occupation through time, as will be seen in detail in Chapter 5.

3.4.2 Sican Ceramic Assemblage and Function

Besides chronological classification, ceramic analysis involved recording vessel form, size and decoration. Analysis of the ceramic assemblage was focused on the Sican Period. The sample of ceramics used for this analysis consists of diagnostic ceramics (rims and finewares) obtained from: General Collections, Systematic Collections, Chronology-Purposive Collections and Isolated Finds.

The Sican diagnostic ceramic assemblage consists of a total of 12,793 sherds.

Form and size are important functional markers to recognize differences in ceramic assemblages involving possible household and district differences in cooking and food processing (i.e. chicha making), serving and storage. For results, see Chapter 6 **(Appendix C, D)**.

4.0 SICÁN CITY URBAN ORGANIZATION AND ARCHITECTURAL LAYOUT

The architectural layout and organization of settlements can tell us valuable information regarding the social organization, economic, religious, and political institutions of a society. Architecture, particularly public buildings, have been at the center of urban organization studies.

The Sicán city consists of large civic-ceremonial architecture, located within the central area of today's Santuario Historico Bosque de Poma in the middle La Leche valley. This monumental area has received important attention and sustained archaeological research during the past decades. However, the large extension surrounding the monumental area has received little to no attention.

According to Shimada and colleagues, the monumental part of the Sicán site, also known as the "Sicán Precinct," is the inferred capital of the Middle Sicán polity (Shimada 2014). As described by Shimada, it extends 1.6 km east-west and 1 km north-south and it has the shape of a *tumi* or ceremonial knife. It contains six major platform mounds (La Merced, Huaca Loro, Lercanlech, Colorada, Las Ventanas and Corte) located around a large plaza (Shimada 2014 a,b). Each mound would have functioned as the locus of ancestor worship and veneration by its associated lineage, where public ceremonies and rituals worked as symbols of political propaganda and power, but also as a means of commensality and integration of the highly stratified and multiethnic Sicán society (Matsumoto 2014b, Shimada 2014a, Shimada et al. 2004).

The principal hypothesis used by several scholars to interpret the Sicán site is that it was an important religious center where feasts, ancestor cult rituals and presumably pilgrimage took place. This hypothesis emphasizes the religious character of the site (Conlee at al. 2004; Elera 2008; Klaus and Shimada 2016; Matsumoto 2014 a,b, 2019; Shimada 2014 a,c; Shimada et al. 2004). All these authors suggest that: a) Sicán was a largely empty Ceremonial Center, whose major function was to host seasonal feasts and pilgrimages; and b) that the Sicán site consists of one central civic-ceremonial area. However, no research had been oriented to answer exactly those kinds of questions or verify those hypotheses. Even though the Middle Sicán period is the best known in the archaeological literature on the research area, aside from funerary contexts almost nothing was known about its population.

I argue that the long-term characterization of the Sicán site as an "empty/pilgrimage center" is the result of the focus of research in monumental architecture and ritual contexts. The study of public architecture and monumental areas alone cannot offer the evidence needed to investigate cities. On the contrary, the study of cities must involve large scale spatial analysis to include the residential occupation. I also argue that there has been a misidentification of the Sicán city due to a lack of a research program specifically tailored to answer questions related to urbanism, residential occupation, and economic activity.

Since the area of study is large, I have subdivided it into two main areas: Sicán Core and Greater Sicán **(Fig. 9).** The intention of these terms is primarily descriptive. I use the term Sicán Core to refer to an area of high density monumental architecture, inferred to be the civic-ceremonial area. The Sicán Core encompasses an area larger than what Shimada defined as the "Sicán Precinct" (Shimada 2014a), and includes additional monuments. Additionally, the term "Core" does not imply a purely religious nature. Greater Sicán refers to the larger area that surrounds the Sicán Core. It also includes large-scale monumental architecture, which in a few cases had been previously identified, but never mapped.

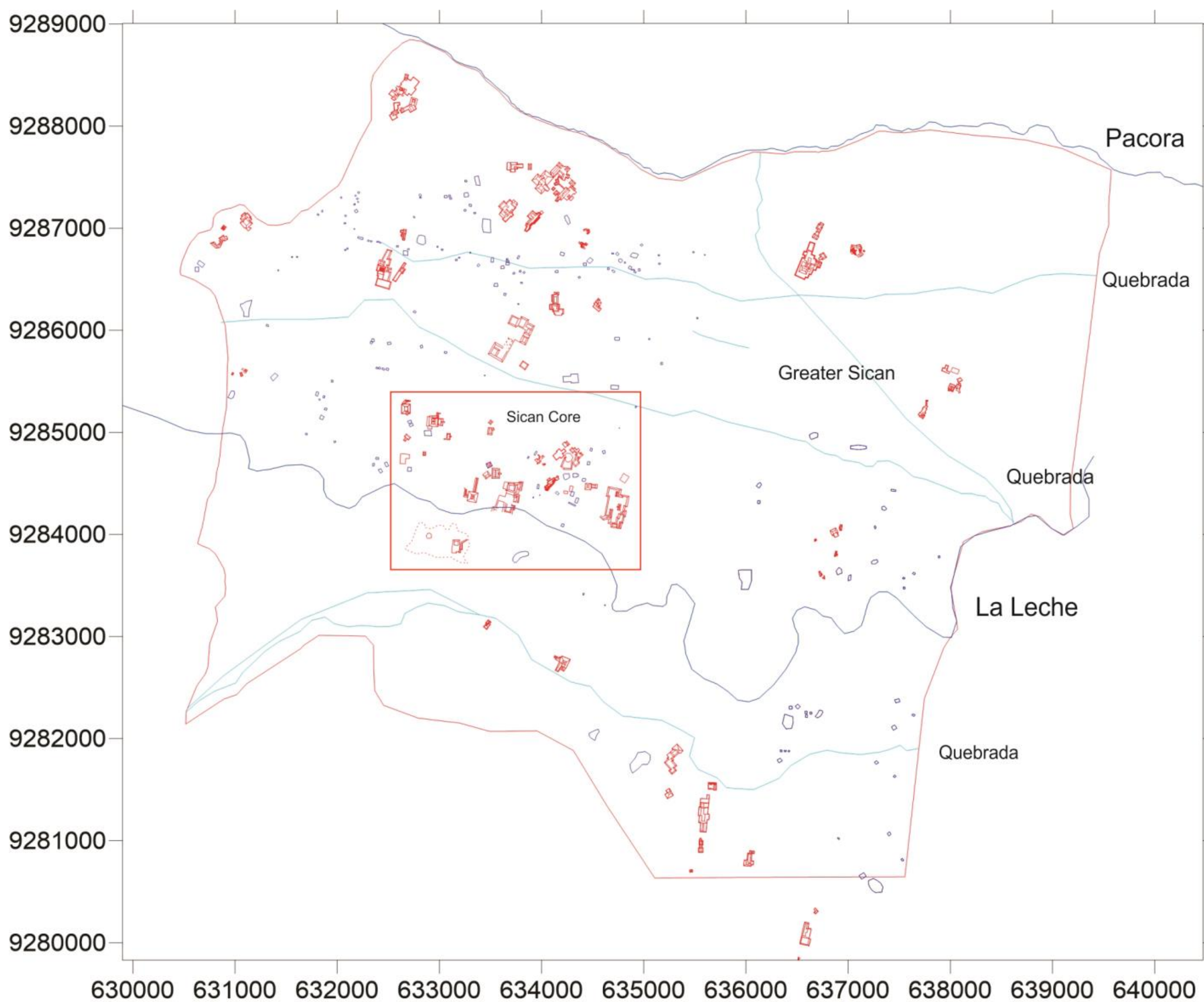


Figure 9. The Sicán city showing the Sican Core and Greater Sicán. Monumental architecture in red, residential mounds in blue.

The present chapter analyzes the urban organization and architectural layout within the Sicán city. This research is of utmost importance to understand the site's social organization and more broadly the political organization of the Sicán polity (AD 750-1375). This chapter focuses on civic-ceremonial architecture, a central theme of my first research question: **What was the layout of the city? What does the distribution of archaeological remains suggest about public-civic spaces and monumental architecture?**

This question addresses the city criteria of external specialization, or function regarding a broader hinterland in terms of different kinds of services provided, as explained in Chapter one. Cities often have a monumental core or center for political, religious and/or administrative institutions or government.

In order to answer this question, first I present the methods used to analyze civic-ceremonial architecture in the study area. Second, I present the results on the architectural layout of the Sicán Core. Third, I present the results on the architectural layout of Greater Sicán and its several Architectural Groups. Fourth, I discuss the labor pool used in the construction of the architectural monuments of the city. Finally, I address Civic-ceremonial architecture found, its possible functions, and the interpretation of the Architectural Groups of Greater Sicán, drawing on the concepts of intermediate urban organization or districts.

4.1 ARCHITECTURAL LAYOUT

The survey revealed an extensive dispersion of archaeological materials, the product of a permanent residential occupation that covered most of the 50km2 of the study area. All visible architecture was mapped, both monumental and domestic. Civic-ceremonial architecture was already known in the Sicán core and was mapped by the Sicán Archaeological Project in 1978-79 (Shimada 1981). Consequently, I used this map as a base source for the Sicán Core and added new architectural features found in this project. Civic-ceremonial architecture outside the Sicán core was mapped for the first time in this doctoral project. See Chapter 3 for field methods.

A total of 276 mounds and monuments of different size and shape were registered, mapped in detail and photographed. Three major categories were documented: large monumental architecture composed by superimposed platforms, medium size mounds, and small, low mounds. The first category is monumental architecture. Most monumental architecture at this site consists of complexes of high pyramids, platforms and ramps. Most of this architecture corresponds well with Sicán-like architectural features. The architectural complexes outside the Sicán Core are located at different directions and distances, forming not one, but several nuclei **(Fig. 9)**. Close to these monuments, medium and small size mounds were also identified and mapped. These medium and small, low mounds present abundant domestic refuse (domestic ceramics, shells, lithics). On the basis of this evidence these mounds are inferred to be residential mounds. A total of 215 mounds registered belong to this category.

Since long term occupation was found in most of the survey area, we can expect there was re-use and re-modeling of pre-existing structures. The extent of architectural remodeling is unknown and can only be appropriately approached through a project of large scale excavation and conservation that goes beyond the scope of this dissertation. However, all architectural monuments at the site present a high proportion of Sicán diagnostic ceramics associated with them. And all architectural monuments present Sicán-like style features, except for Architectural

Complex 17 which has a Chimú occupation. On the basis of these facts, it is assumed that most monumental architecture belongs (in at least one part of their sequence) to the Sicán period. When known, I emphasize architectural chronology in the descriptions below.

As discussed in Chapter 1, I use Smith's notion of **social district**, a large residential area including several neighborhoods that may or may not be an administrative unit (M. E. Smith 2010:140). The main archaeological correlates for the identification of social districts in this chapter are Spatial Clustering and Stylistic Assemblages of architectural features.

4.2 SICÁN CORE: ARCHITECTURAL LAYOUT

The Sicán Core is located on the northern margin of La Leche river. It measures 2 km east-west and 1.5 km north-south. The Sicán Core is formed by the Platform Complex and the Pyramid Complex, forming an East-West axis **(Fig. 10).** The Platform Complex is located to the east and is composed by Huaca Corte and two clusters of platforms surrounding two mineral outcrop formations. The Pyramid Complex is located to the west and is composed by large, high pyramidal structures such as Huaca Loro, Huaca Las Ventanas, Huaca La Merced, Huaca Colorada and Huaca Lercanlech.

As mentioned above, the Sicán Core has an East-West axis, with the Platform Complex to the east and the Pyramid Complex to the west. Elera argues that the Sicán civic-ceremonial center was built in a new and different sacred landscape, different from the Mochica. Elera argues that a straight line connects this sacred landscape as a ceque, starting at the sacred mound of Cerro

Chaparrí (known sacred Apu) to the east, crossing the Sicán central nucleus and reaching the Lobos de Tierra island to the west (Elera 2006:64 Fig. 4; 2008:306).

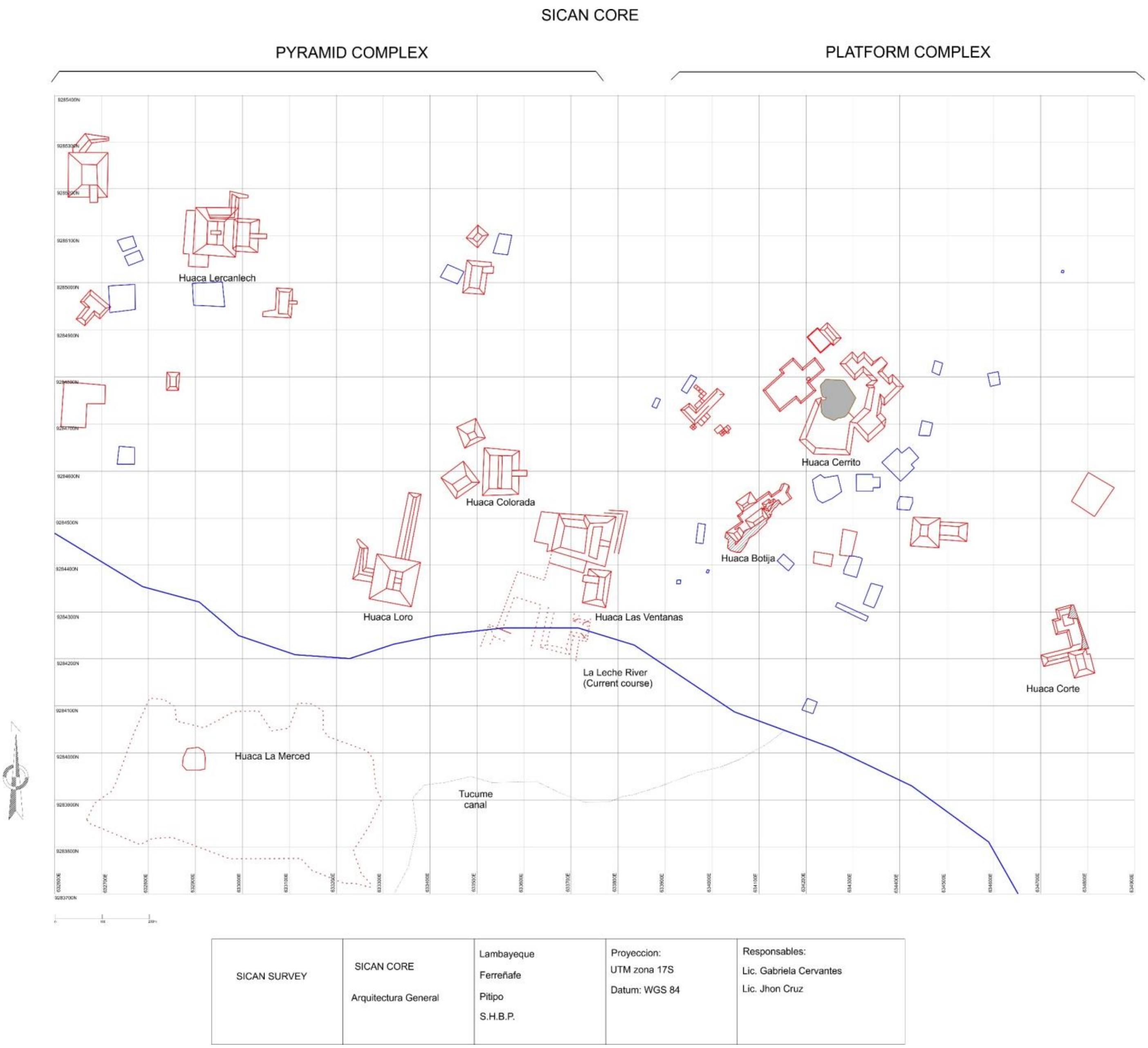


Figure 10. Sican Core formed by the Pyramid Complex and the Platform Complex. Monumental architecture in red, residential architecture in blue.

4.2.1 Platform Complex

No research has been done in the Platform Complex before now. This complex is formed by several platforms of relatively low height. An important proportion of Early Sicán (AD 750-900) ceramics was recovered during my fieldwork in this area, suggesting that the construction of the monuments started in Early Sicán and continued sequentially over generations into the Middle Sicán period.

The Platform Complex seems to be organized around the natural Huaca El Cerrito, a mineral outcrop, as a focal center. Although there is some variability in the orientation of structures, most of them present a NE-SW orientation. The Platform Complex is composed of the following monuments:

4.2.1.1 Huaca Corte

Huaca Corte is formed by several low platform mounds built on top of an extensive sand dune. Two platform mounds are clearly identified following a NE-SW axis **(Appendix A Figure 31).** Huaca Corte has been heavily damaged by flooding of the La Leche river in the last years; see Fig. 3.3. for comparison with Shimada's map from 1981.

4.2.1.2 Huaca Botija

This complex is formed by three small platforms located one next to each other alongside a natural elongated outcrop in an E-W orientation. The platforms were constructed on the north side of the natural formation, incorporating natural features into the built environment

(Appendix A Figure 32). The natural outcrop does not present signs of having been exploited as a natural resource.

4.2.1.3 Huaca Cerrito

To the northeast of Huaca Botija, there is a natural mineral outcrop with a circular shape. This outcrop has traces of having been heavily exploited. During my survey, several cut marks and worn areas on most of its surface were identified. In a similar manner as with Huaca Botija, platforms were built in the proximity, incorporating natural features together with the built environment. A complex of four platforms interconnected with each other was built surrounding this mineral outcrop **(Appendix A Figure 33).** These platforms are rectangular in shape and relatively low in height (3m). On top of many of them there is evidence for metal craft production. Large and small mineral nuclei are dispersed as well as slag remains for ore processing. The platforms and the natural feature encircle a flat space that could have been used as a patio or plaza. Additionally, several other smaller platforms and mounds surround these buildings.

4.2.2 Pyramid Complex

The Pyramid Complex is located west of the Platform Complex.

It is formed by high truncated pyramidal structures with several associated features such as ramps and platforms. These are the highest monuments of the study area and are the only ones visible from great distances **(Fig. 10).** They are oriented to the north (slightly NE) following a north-south axis. The Pyramid Complex is formed by Huaca Loro, Huaca Las Ventanas, Huaca La Merced, Huaca Colorada and Huaca Lercanlech (for a detailed description of these monuments see Chapter 2). The earliest building, where Early Sicán ceramics were found, is Huaca Las Ventanas; this is also the closest building to the Platform Complex. All other monuments were built during the Middle Sicán period. The last monument built, and the farthest from the Platform Complex, was Huaca Lercanlech, built during the late part of the Middle Sicán period around AD 1100. Unfortunately, Huaca La Merced has disappeared almost completely due to the mega ENSO floods in 1982-83.

Mural painting has been recovered from Huaca Loro and Huaca Las Ventanas (Shimada 2014a), suggesting that other pyramids might have been decorated as well. Movement through this colorful built environment must have created quite an impact to both residents and visitors alike.

At the center of the Pyramid Complex there is a large area of 200 m^2 or Great Plaza. A number of activities have been registered in this area such as a small metallurgical workshop (Shimada and Merkel in Shimada and Cervantes Quequezana 2018), feasting activities (Matsumoto 2014 a,b) and ritual human sacrifices (Klaus and Shimada 2016). Huaca Lercanlech is further northwest of this plaza, raising the possibility that it had its own plaza in the flat area right west of the building.

An important amount of literature has been written about the functions and activities that took place in the Pyramid Complex (Conlee et al. 2004; Elera 2016; Jennings 2008; Matsumoto 2014a,b, 2019; Shimada 1981, 1990, 1995, 2000, 2014; Tschauner 2001). All this literature draws attention to the religious and ritual nature of the area. Research led by Shimada indicates that the Sicán site was characterized by the intense presence of ritual-related activities during most of the year, including rituals centered in the cult of the Sicán deity and deceased leaders turned into ancestors, as well as the construction and maintenance of mounds and the preparation of elite tombs (Shimada 2014c:61). Matsumoto states that "The Great Plaza" was also the locus of diverse activities such as feasts for the Ancestor Cult, as evidenced in the high proportion of decorated dishes, traces of big fires, and special canals made with ceramic fragments and mud (Matsumoto 2014b).

Besides the activities described above, other ritual-related events are mentioned by scholars. Recently, a metal workshop has been identified in the northeast corners of both Huaca Loro and Huaca Las Ventanas (Shimada 2014a:72) and Huaca Botija (Shimada 2014c:61). The Huaca Loro metal workshop has been recently excavated, and the results of laboratory analysis show the working of metals such as gold, silver and copper (Shimada and Merkel in Shimada and Cervantes Quequezana 2018).

The Pyramid Complex buildings share in common pyramidal shapes and very high-altitude constructions. In the Sicán tradition, high status places are elevated (Shimada and Cavallaro 1986:46). Accessibility to the top was through long, narrow ramps, features that can be interpreted as a sign of exclusionary activities where only the highest elites could participate.

Residential occupation in the Pyramid Complex is very scarce (see Chapter 5). This might have been one of the main reasons why the whole area has been interpreted as mostly ceremonial (Conlee et al. 2004:211); Shimada 1981, 2000, 2014a:72; 2014b; Matsumoto 2014a,b). The lack of residential occupation supports the general claim that domestic and construction workers lived some distance away from the core (Shimada 1981, 1991, 2014a:72-73).

4.3 GREATER SICÁN: ARCHITECTURAL LAYOUT

The Greater Sicán area surrounds the Sicán Core and extends widely in all directions. It encompasses the whole study area, 50 km^2, measuring approximately 8 km east-west and 6 km north-south. A quick observation of both ceramics and architectural features during my fieldwork confirms that the occupation continues outside of the study area.

The Greater Sicán area is composed by 17 Architectural Groups interspersed over the whole survey area **(Fig. 11).** In terms of location, the northwestern part of the study area presents a higher number of Architectural Groups. The geomorphology of the area seems to have played an important role regarding the location of monumental architecture. Most of the research area is a flat alluvial plain with the presence of sand dunes distributed in different parts. Towards the western part of the study area, the terrain presents a higher number of sand dunes of different shapes and sizes. Sand dunes presented the advantage of offering height and volume. Architecture was built on top of these natural features, giving the buildings a better visibility and prominence from the flat ground.

My survey found areas with no occupation or empty areas interspersed between these architectural groups. Some of the empty areas found have an ecological explanation, since they become seasonal swamps during the rainy season. Some "empty" areas most likely would have served for agricultural purposes since we documented the presence of modified quebradas or water drainages. The presence of small-scale agriculture like gardens or orchards is a possibility.

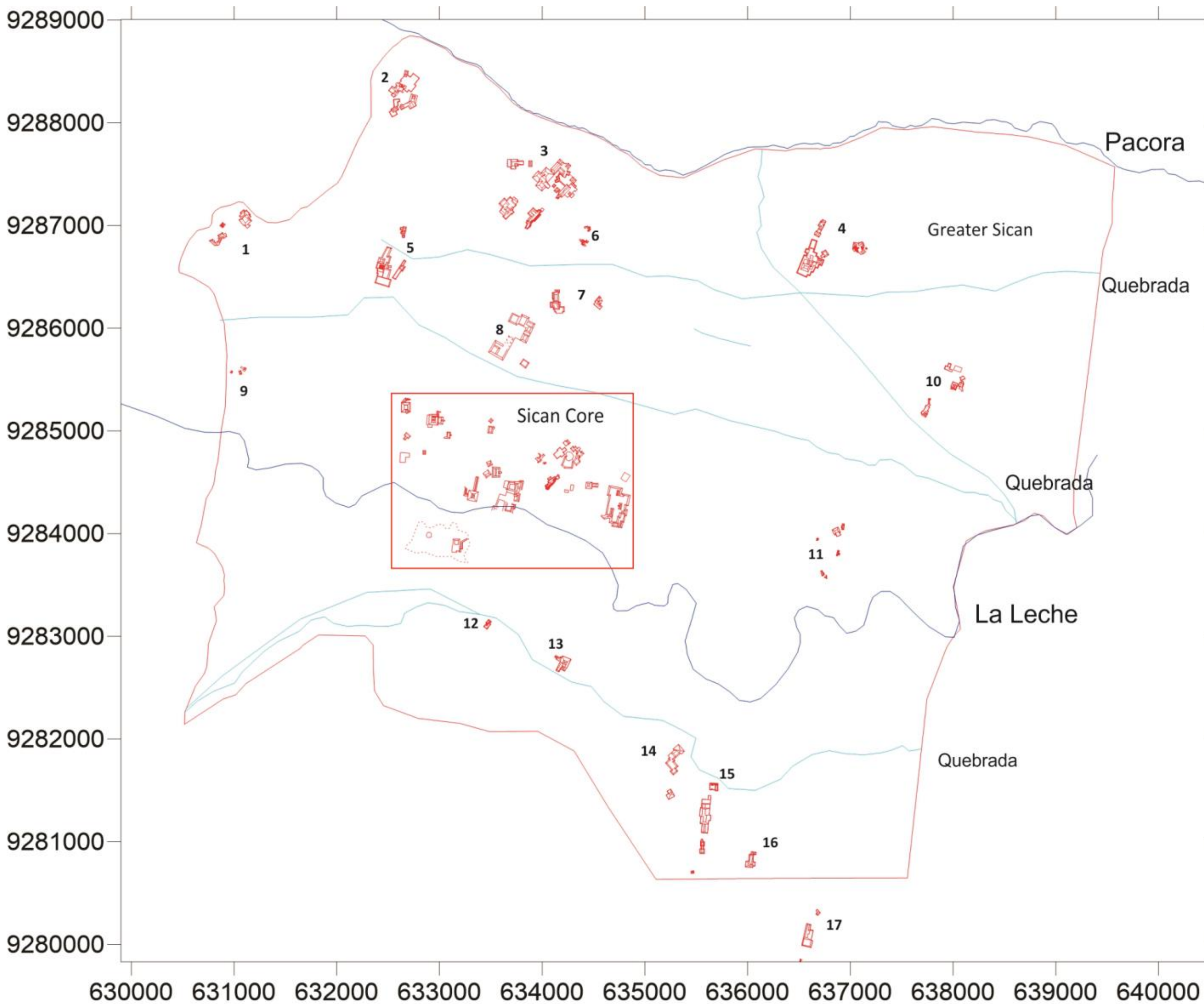


Figure 11. Sican Core and Greater Sican Architectural Groups.

Architectural Groups in Greater Sicán vary widely in shape, area occupied and number of buildings. No apparent order in the layout is identifiable, except for a consistent N-S or NE-SW orientation. This coincides with natural topographic features such as sand dunes. People took advantage of natural elevated areas in order to build monumental architecture on top.

Each Architectural Group is composed by some combination of the following features:

- Monumental platforms (some of them in a pyramidal shape). All groups are composed of multiple platforms, with two exceptions formed by just one platform: Architectural groups 12 and 13.
- Open space or plaza
- Associated cemetery
- Residential areas (mound and non-mound residences)
- Craft production areas (variable)

A total of seventeen Architectural Groups have been registered in the Greater Sicán area. Following is a brief description of them and their main features, given from north to south.

4.3.1 Architectural Group 1 (Huaca Castaneda) (Fig. 34, Appendix A)

This group is located in the northwest corner of the survey area. It consists of three buildings and an open area, covering 10 ha. The first component, Castaneda 1, has a total footprint of 13211m^2. It is a large set of five platforms built next to each other (modules?), with the orientation NE-SW. The result is a geometrical escalated shape. Castaneda 2 covers a footprint of 1386 m^2, it is a small pyramid oriented NW-SE, without a ramp. Castaneda 3 covers 7288 m^2; it consists of a mound of rectangular shape with a long platform to the south. This platform is connected with another platform, forming an “L” shape.

4.3.2 Architectural Group 2 (Huaca Caracol) (Fig. 35, Appendix A)

Huaca Caracol is located in the northernmost area of the survey area. It is elevated because it is located on top of a large sand dune that runs NE-SW. It consists of three large buildings. Platform A consists of a large platform of irregular shape with a total footprint of 33424 m^2. There is a small pyramidal structure on top of Platform A, as well as a ramp to the east. Platform B is composed by three linked platforms with a total footprint of 8997 m^2, and Platform C is composed by two linked platforms with a total footprint of 11829 m^2. These three buildings leave a space in the center that may have functioned as a plaza.

4.3.3 Architectural Group 3 (Huaca La Mayanga) (Fig. 4.36, Appendix A)

This group is located in the northern margin of the survey area, on top of a large sand dune that has an E-W orientation. This complex is formed by four large platforms of different size and shape. Mayanga 1 is the largest and most complex, following a NE-SW orientation, with a total footprint of 74489 m^2. It is formed by seven linked platforms, leaving a space in the middle where two small square platforms have been built. Five small platforms were built on top of the large platform in different parts. In the western part of the platform there is a pyramidal structure and a ramp next to it that serves as an access.

To the northwest of Mayanga 1, two smaller platforms are located, forming Mayanga 4. Mayanga 4 has a pyramid with a ramp to the east, with a total area of 10168 m^2, as well as a smaller platform that has 1846 m^2 of area and is oriented N-S. Mayanga 3 is south of Mayanga 4. Mayanga 3 is located on top a small sand dune and is a large platform that is oriented NE-SW and has an extensive low platform of 23553 m^2 with a small pyramidal structure on top. South of Mayanga 1 is Mayanga 2, a medium size platform built on top of a sand dune with a total area of 12222 m^2. This platform is oriented NE-SW with a ramp to the west. The eastern part has been damaged, and its shape is unknown.

4.3.4 Architectural Group 4 (Huaca Soledad) (Fig.37, Appendix A)

This group is located in the northeast corner of the survey area, on top of a large and high sand dune. It is formed by five platforms. Two of them have the same orientation, NE-SW, and the other three cluster in different orientations. Soledad A, the largest, has a footprint of 47930 m^2; it is a low platform with two linked platforms on top as well as two pyramidal structures. There is a large cemetery on the top of the platform. Domestic refuse is found on and around the platform. Concentrations of metal slag indicate associated metal production activities. To the north is Soledad B, a small rectangular platform of 2251 m^2. To the north of B is Soledad C, a medium size rectangular platform of 4743 m^2.

To the east of Soledad A, there is a cluster of three small platforms that surround an open space that form Soledad D. One of the small platforms is oriented E-W and covers 3745 m^2 and has an elongated shape with stairs in the northeast corner. The two other platforms are both rectangular in shape. One is oriented NW-SE and covers 1466 m^2 and the other is oriented NE-SW and covers 1987 m^2. To the east of Soledad D there is a small rectangular building, Soledad E, with an area of 462 m^2.

Excavations in the Mound II of Soledad (not specified in a general map) back in 1981 registered important features. There were five architectural phases. In phase III a U-shape construction with wall niches was found, similar to Chimú *audiencias* (Shimada 1981). Huaca Soledad Mound II showed the presence of Middle Horizon burials, polychrome murals blending Moche-Wari iconography, and a long construction history (Shimada 1981:418-419 Fig. 19).

4.3.5 Architectural Group 5 (Huaca Sontillo) (Fig.38, Appendix A)

This group is located in the north of the survey area, to the south of Architectural Group 2, and east of Architectural Group 1. It consists of two buildings. The larger one has five linked adobe-brick platforms and one pyramid, with a combined footprint of 40356 square meters in a NE-SW orientation. The pyramid is placed on top the platform complex. To the north of the pyramid there is a long rectangular platform. To the south of the pyramid there is a large cemetery which contained burials carefully put into several square adobe structures (Carlos Elera, personal communication 2014), many of which are visible from the surface and have been drawn in the map. To the east of this building there is a long platform in an NE-SW orientation that has a total area of 7877 square meters. The two buildings of Group 5 (Huaca Sontillo) are almost parallel, but their orientation is not exactly the same; the main building is oriented 20 degrees north while the second platform is 35 degrees. Due to this variation in the two buildings' orientation, they converge toward the south, enclosing a flat space of 24247 m^2 that could have been a plaza.

4.3.6 Architectural Group 6 (Huaca Facho) (Fig. 39, Appendix A)

This group is located southeast of Architectural Group 3. It is formed by two monumental structures in a northwest-southeast orientation. One structure has a footprint area of 2752.15 m^2, and the other a footprint of 146.75 m^2. Both buildings have platforms and ramps. Unfortunately, they have been largely disturbed and the shapes are almost unrecognizable.

4.3.7 Architectural Group 7 (Huaca Monja-Tordo) (Fig. 40, Appendix A)

Architectural Group 7 is located south of Architectural Group 6. It is formed by two buildings. The largest building has a N-S orientation and total footprint of 5348.11 m sq. The smaller building has a NE-SW orientation and an area of 2752.15 m^2. This building has a pyramidal shape and presents additional platforms and ramps.

4.3.8 Architectural Group 8 (Huaca Arena) (Fig. 41, Appendix A)

This group is located south of Architectural Group 3. It is elevated because of its location on top of a large low sand dune. It consists of 3 adobe-brick platforms, with around 12 m in height, with a combined footprint of 129249.7 m^2. They are arranged to enclose a space of 100m^2, although we found no surface evidence that this space was modified to be a formal plaza. None of the platforms are pyramidal, and there were no signs of ramps. No structures could be observed on top of the platforms. A small cemetery is located just to the west of the largest platform of the group. Associated surface material dates from Moche V through Chimú

Periods, while excavations indicate construction phases beginning in Moche V and going through Middle Sicán (Le Count 1990). Domestic refuse is found around the platforms. Concentrations of metal slag indicate associated metal production activities.

4.3.9 Architectural Group 9 (Huaca Polocas) (Fig. 42, Appendix A)

This group is located in the west part of the survey area, south of Architectural Group 1. It is formed by three monumental structures in different orientations. One structure has an area of 1157.61 m^2 and has a pyramidal shape and adjacent platform. Two other structures are smaller platforms, one with a total footprint of 781.04 m^2 and the other 367.64 m^2.

4.3.10 Architectural Group 10 (Huaca Lucia) (Fig. 43, Appendix A)

Group 10 is located in the easternmost part of the survey area. This Architectural Complex is built on top of two sand dunes. Five buildings are built on top of one sand dune and are clustered together. The largest platform is built on top of a separate sand dune located to the west. The entire Architectural Complex has a U shape oriented to the north, a shape commonly associated with Formative Period monumentality. Earlier excavations in one part of the monument revealed the presence of a large Formative Temple (Shimada 1981).

The largest platform has an irregular elongated shape extending to the north and a small pyramidal structure on top of the southern edge. It measures 6254 m^2 and it is oriented in a SW-NE manner.

The other sand dune holds several small platforms. Lucia A is formed by two platforms. One is built in a T-shaped form of 3365 m^2 oriented to the NE, and the other one is a low rectangular platform that is oriented NW-SE. Lucia B is formed by three platforms. The northern one is a square low platform of 1478 m^2 with a small ramp to the south. To the middle there is a low platform of irregular shape covering 3016 m^2, which has a low small platform on top and a ramp to the south. Finally, to the east, there is a platform of square shape of 3874 m^2, which has a small pyramidal structure on top and is oriented to the NE. Domestic refuse was found around the platforms

4.3.11 Architectural Group 11 (Huaca Chepa) (Fig. 44, Appendix A)

This group is located in the east part of the survey area, south of Architectural Group 10.

This complex is composed by six platforms. Chepa A is the largest one. It is oriented to the NW, and has a pyramidal shape with a wide ramp to the SE and an area of 4540 m^2. To the east there is Chepa B, covering 1196 m^2 in area in a T-shape formed by a large body and a central ramp. To the west there is Chepa C, a small pyramid of 268 m^2 area, oriented to the NE, with a ramp to the SW. To the south of Chepa A, there is Chepa D, built in a T-shape with an area of 980 m^2. To the SE are Chepa E and F. Chepa E is very similar to Chepa D in shape and size, but with an orientation to the NW. Chepa F is composed by two small linked platforms forming an “L” shape building of 295 m^2 oriented to the NW.

Six architectural groups are located in the southern margin of the La Leche river. They are the following:

4.3.12 Architectural Group 12 (Huaca Benites) (Fig. 45, Appendix A)

Group 12 is located in the southeastern-most part of the research area. The monumental structure has platforms and a small pyramidal shape with a total footprint of 3405.65 m^2. It has a NE-SW orientation. It is placed on the northern part of a large sand dune.

4.3.13 Architectural Group 13 (Fig. 46, Appendix A)

This group is located in the southeastern part of the research area. The monumental structure has a pyramidal shape with a total footprint of 13870.95 m sq. It has a NE-SW orientation.

4.3.14 Architectural Group 14 (Huaca Colorada) (Fig. 47, Appendix A)

Group 14 is located in the southern part of the research area. It is formed by 2 structures. Colorada A is formed by several adjacent platforms with a total footprint of 20909.68 m^2. It has a N-S orientation. Colorada B is a smaller platform is located south of Colorada A, and has a footprint of 4530.10 m^2. Both structures have a N-S orientation that follows the natural orientation of an elongated sand dune.

4.3.15 Architectural Group 15 (Fig. 48, Appendix A)

This group is located in the southern part of the research area. It is formed by 4 structures built in a N-S orientation following the natural shape of another elongated sand dune. The first structure has a square shape with a footprint of 4597.45 m^2. The second structure, the largest one, has a rectangular shape and a total footprint of 27323.23 m^2. The third structure is also rectangular and has a total footprint of 4837.31 m^2. Finally, the last structure is the smallest one with a footprint of 618.25 m^2.

4.3.16 Architectural Group 16 (Fig. 49, Appendix A)

This group is located in the southernmost part of the research area. It is formed by several adjacent platforms built on a north-south axis. The structure has an area of 9040.68 m^2. It is located on top of another elongated sand dune that runs N-S, parallel to dunes previously described in nearby groups.

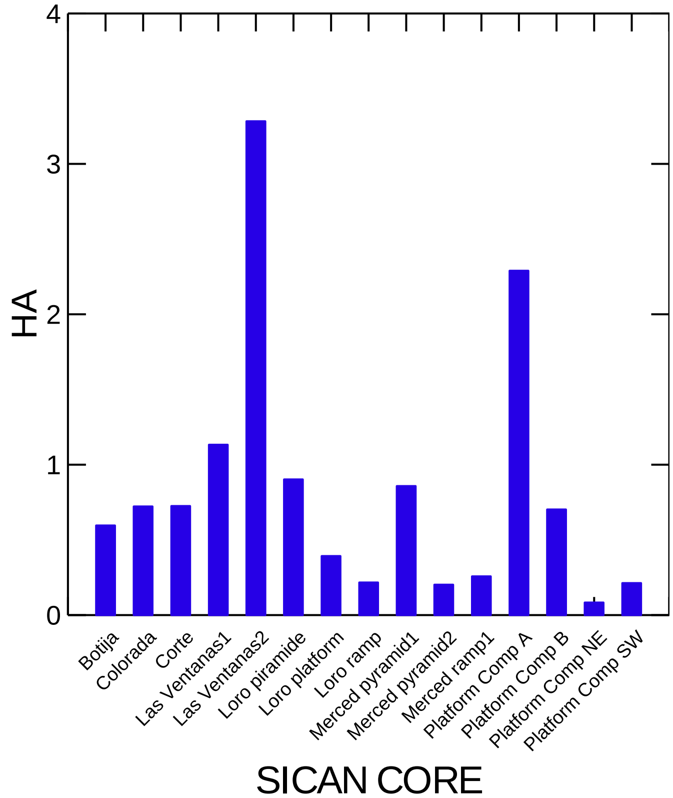
4.3.17 Architectural Group 17 (Huaca La Pared) (Fig. 50, Appendix A)

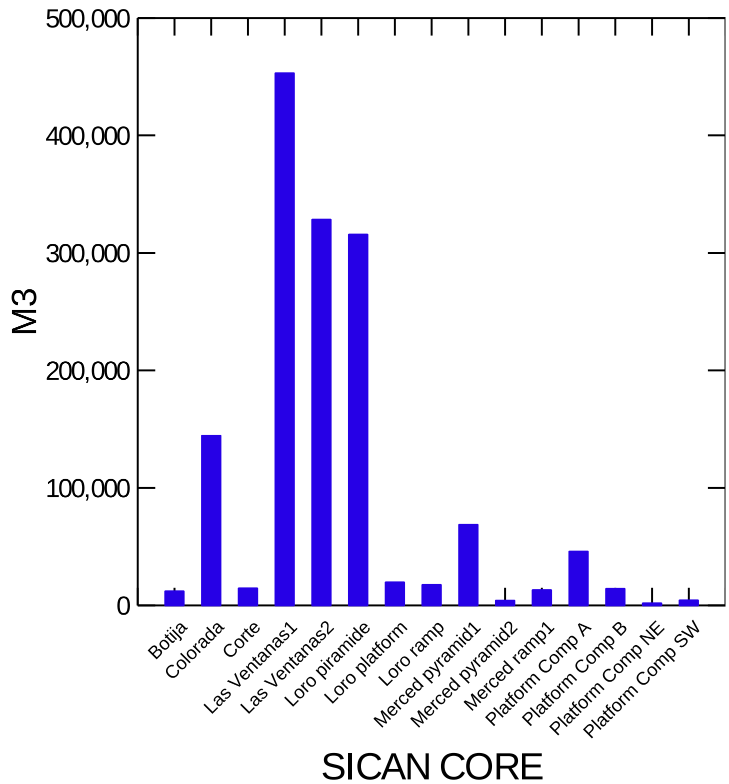
This group is located just outside of the survey area to the south and has a Chimú occupation. It is included here since it was mapped, and can be usefully considered for comparative purposes. As in the previous 3 cases described, it is located on top of a sand dune that runs N-S. The first structure has an “L” shape with a footprint of 1375.33 m^2. The second structure is the largest one, with a rectangular shape, and has a total footprint of 16307.49 m^2. The third structure is the smallest one and has a total footprint of 340 m^2.

4.4 LABOR POOL AND THE CONSTRUCTION OF PUBLIC CENTERS

There are different ways of quantifying architecture in archaeological studies in order to consider construction effort. One approach is through making volumetric measurements of architectural buildings (Abrams 1994). In this dissertation, the volume of the constructions was estimated taking into account the architectural maps of the buildings made from field observations and measurements. Volume estimates are presented for the Sicán Core with a total of 15 monuments and for Greater Sicán with a total of 61 monuments within the 17 architectural groups **(Appendix B Tables 21, 22).**

Table 4. Area and volume estimates for the Sican Core.





A comparison between the Sicán Core (Platform and Pyramid Complexes) and Greater Sicán (17 Architectural Groups) brings some insights. When comparing footprints of buildings, or areas, 4 groups of buildings are the largest ones: Architectural Groups 3, 4, and 8 within Greater Sicán, and the Pyramid Complex in the Sicán Core. When comparing height there is a clear outlier that corresponds to the Pyramid Complex. More importantly, when comparing volumes of all groups of buildings within the research area, there is a clear outlier: the Pyramid Complex in the Sicán Core is by far the greatest in volume. Among the Greater Sicán Architectural Groups 4, 5 and 6 have the greatest volumes.

Table 5. Area and volume estimates for the Greater Sican and the Sican Core (Platform and Pyramid Complexes).

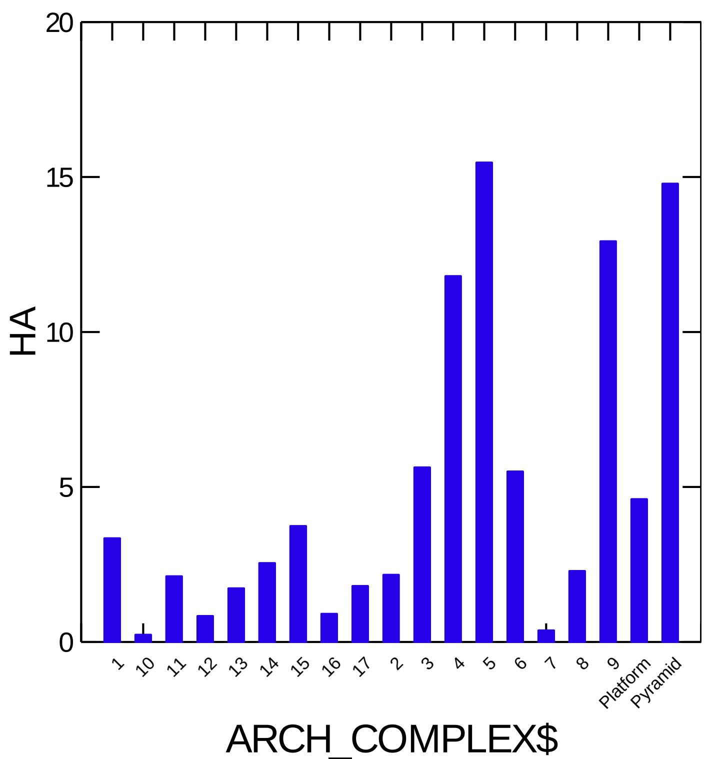
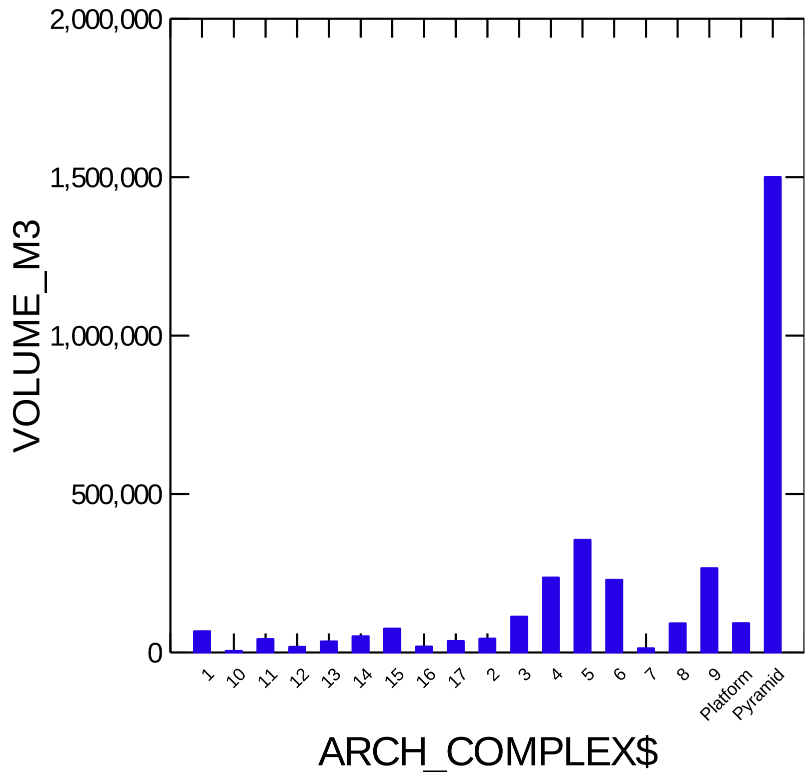


Table 5 (continued)



It is important to highlight that Architectural Groups 5 and 6 correspond with Demographic District B and Architectural Group 4 corresponds with Demographic District C, districts defined on the basis of demographic concentration in Chapter 5. These are two of the largest demographic Districts for the Sicán Period (see Chapter 5 for details). We could assume that large local populations in these two districts would have been capable of building those large Architectural Groups.

The case of the Pyramid Complex is especially important, since it points to a completely different scenario. The Pyramid Complex presents the largest volumes, and at the same time, little population. No separate demographic district was found for this area (see Chapter 5). This means that in order to build these monuments, labor had to be mobilized from different areas, most likely from Greater Sicán.

A second approach to architectural construction effort is the **energetic assessment** of architecture (Abrams 1994; Erasmus 1965). Energetics is defined as the method of quantifying the energy expended in those activities associated with the production, distribution, and consumption of materials within a cultural system (Abrahams 1994:37). The main goal of these methods is to reduce subjective assessments of architectural scale or cost for its use in comparative analysis (Abrahams 1994:39). This approach involves several steps: first, making volumetric measurements, then translating those results into a labor equivalent. The final product in this approach is a labor cost estimate for each one of the constructions analyzed (Abrams 1994:5).

In the case of the Sicán monuments, the labor investment was calculated by an estimation of monumental volume. This includes the amount of labor that would have been needed for the construction of platforms, mounds, and any other architectural feature. Most of the literature takes into consideration a combination of construction materials such as tuff, earth, cobbles, stone and the time expended (measured in work per person per day) in processes of the procurement, transport, manufacture and construction of those materials (Abrahams 1994:43,44; Erasmus 1965).

In the Sicán case, all construction material is adobe, or unfired brick. Adobe making involves combining clayey soil and water in a shallow mud pit and then mixing those materials with a shovel, or hoe, or by foot (Smailes 2000:35). Adobe makers drop the mixture into molds made of wood, remove air bubbles, and level the top with a stick; molds are immediately removed and rinsed and are ready for the next charge (Smailes 2000:35, 36; Figures 2-4, 2-5).

For the Moche valley, Smailes gathered information from an informant who stated that he mixed materials and made 300 bricks in 3 days carrying his own water about 50m (Smailes 2000:35); this translates into 3.45m^3 in volume of adobes produced in 7 hours per person (Smailes 2000: 37 Table 2-2). Smailes' informant data covers procurement, manufacture and construction. It does not cover transportation costs from the site of manufacture to the site of construction. For the Sicán case, I did not take into account the Transportation variable, since the whole research area presents clayey soils suitable for making adobes, and it is assumed that the production areas were very close to the construction sites. Labor investment over time in Sicán could not be calculated with the available data, since we do not have good information on different architectural construction episodes within the Sicán period for most monuments. Only future research targeting this issue can solve this problem.

Table 6. Energetics analysis of the Greater Sican and Sican Core.

	Architectural Group #	Area m2	ha	Height m	m3	p-p/d	p-p/y
GREATER SICAN	1	21646.07	2.164607	6	43292.14	12548.44638	52.28519324
	2	56295.7	5.62957	8	112591.4	32635.18841	135.9799517
	3	117990.1	11.799014	18	235980.28	68400.08116	285.0003382
	4	154629.2	15.462915	13	354867.74	102860.2145	428.5842271
	5	54994.55	5.499455	7	228527.27	66239.78841	275.9991184
	6	3694.53	0.369453	8	12893.36	3737.205797	15.57169082
	7	22880.27	2.288027	8	91521.08	26527.84928	110.5327053
	8	129249.7	12.924968	12	265942.96	77084.91594	321.1871498
	9	2306.29	0.230629	6	4612.58	1336.97971	5.570748792
	10	21149.46	2.114946	12	42298.92	12260.55652	51.08565217
	11	8358.02	0.835802	14	17452.04	5058.562319	21.077343
	12	3405.65	0.340565	2	6811.3	1974.289855	8.226207729
	13	13870.95	1.387095	2	27741.9	8041.130435	33.50471014
	14	25439.78	2.543978	4	50879.56	14747.69855	61.44874396
	15	37376.24	3.737624	8	74752.48	21667.38551	90.28077295
	16	9040.68	0.904068	2	18081.36	5240.973913	21.8373913
	17	18022.82	1.802282	6	36045.64	10448.01159	43.53338164
	Sub-Total	**700350**	**70.034998**	**136**	**1624292.01**	**470809.2783**	**1961.705326**
SICAN CORE	Platform	46072	4.6072	12	92144	26708.4058	111.2850242
	Pyramid	147828.8	14.78287827	135	1500016.967	434787.5267	1811.614694
	Sub-Total	**193900.8**	**19.39007827**	**147**	**1592160.967**	**461495.9325**	**1922.899719**

p-p/d = per person per day of 7 hours (Smailes 2000:37 Table 2-2).
p-p/y = per person per year of 240 days (Assuming that people would not work exclusively in this task all year round).

4.5 DISCUSSION

The Sicán city consists of the Sicán Core, a Middle Sicán large civic-ceremonial center comprising the Pyramid Complex and the Platform Complex; and several dispersed civic-ceremonial areas, which in total comprise 17 Architectural Groups. Monuments in the Pyramid Complex had clear ritual functions as murals have been found in Huaca Loro and Huaca Las Ventanas (Shimada 2014a).

Architectural Complexes in Greater Sicán vary widely in size and shape, but overall they are lower in height when compared to the Pyramid Complex, allowing visibility from people concentrated nearby in associated empty spaces or plazas. This could reflect more inclusive activities and/or rituals at the level of the separate districts of the city. Some of these monuments certainly had ceremonial functions. Murals with religious iconography have been found at several monuments in the Greater Sicán area, specifically in Huaca Soledad, Huaca Facho, Huaca Las Ventanas and Huaca Mayanga (Donnan 1972; Schaedel 1978; Shimada 2014a).

The differences in scale and form found among the Architectural Groups could be explained by the amount of architectural additions done, the product of a longer or shorter use. The scale of Architectural Groups could also be explained by the scale of the community involved in their construction, as well as by the social trajectory of said communities.

The most striking pattern in the architecture in Greater Sicán is simply the presence of numerous separate architectural groups at quite some distance from the Sicán Core. Andrew Creekmore (2014:47-50) has proposed that many cities were “multi-centric” on the basis of having more than one zone of monumental architecture, and thus had physical layouts that would have implicitly divided cities into different neighborhood configurations. Monica Smith mentions that multi-centric urban configuration would have resulted in different neighborhoods of residence and daily interaction (M.L. Smith 2019). According to the evidence presented here, Greater Sicán was multi-centric. This evidence shows a pattern very different from compact, nucleated cities elsewhere in the north coast, a pattern that has important implications for the nature of daily life, political and social integration, and the patterns of ceremonial activity.

5.0 SICAN CITY DEMOGRAPHY AND POPULATION DENSITY

Demographic studies in the Sicán city are relevant to understand social and political dynamics. Given that interpretations about the site of Sicán have been until now based mainly on the study of monumental structures and ritual and funerary practices, in this chapter I provide information about residential patterns using the density and spatial distribution of ceramics recovered from surface survey units, regardless of architectural features.

My preliminary field research back in 2013 had revealed significant domestic refuse throughout and well beyond the Sicán Core area. In order to assess the feasibility of comprehensive intensive surface collecting, in the summer of 2013 I conducted a pilot reconnaissance in the Sicán Core and surrounding areas and made trial transects across the extent of the Santuario Historico Bosque de Poma in order to get a "profile" of residential distribution and artifact density. The survey documented abundant ceramic material on the surface of the site belonging to Moche, Middle Sicán, Late Sicán and Chimú periods. I found several discrete concentrations of domestic ceramics interspersed among the monuments in the Core. This initial indication of domestic occupation in the Sicán city was thoroughly borne out by findings from the full survey conducted on 2014, discussed in this chapter. In fact, this should not be surprising: small scale testing decades ago had revealed domestic occupations in two mounds in Huaca Arena, located 1 km away from the Sicán Core (Le Count 1990).

In this chapter I focus on demography both in the Sican Core and Greater Sican. The chapter analyzes the patterns of population density and distribution within the Sicán city. This research sheds light on the social organization of the Sicán city and its wider significance for the political organization of the Sicán polity (AD 750-1375). The chapter responds to the second research question: **What does the distribution of Sicán period archaeological remains suggest about: (a) population size and residential density; (b) the nature of intermediate social units and social segmentation?** It also addresses my fourth research question**: How did the Sicán settlement evolve through time? What was its social trajectory like?**

These questions address the city criteria of demography, encompassing population size and density, as addressed in Chapter 1. For example, Hutson affirms that a city refers to a settlement with a relatively large number of people; settlements with 5,000 people might meet this criterion (Hutson 2016:9-10). As we will see, the Sican city far exceeds this number.

In this chapter, first I present the methods used to analyze demographic patterns in the study area. Second, I present the results of the complete demographic trajectory of the study area, including all periods in which human occupation was registered, to answer the fourth research question. Third, I focus specifically on the Sicán period and my second research question, its population size and density at that time. Finally, I address districts, as intermediate social units in Sicán, by looking at the relationship between Sicán demographic patterns and Architectural groups discussed in the previous chapter.

5.1 DEMOGRAPHIC ANALYSIS: METHODS

Population size, growth, and distribution are considered major forces in the emergence, development and change of cities. Researchers have found a correlation between population size and social complexity (Spencer 1987); new forms of hierarchy and complexity might emerge at population thresholds in order to overcome social stress (Bandy 2004), or to deal with information flow (Spencer 1987). Population density also has political consequences, as large, dense populations can better support leadership. The population is the source of labor, whose control and management are key for the political economy of certain polities (Bauer and Covey 2002). Larger populations can support larger economies, while reducing the burden of tax (or surplus) extraction. However, the ways populations are distributed in the landscape, concentrated or dispersed, in small villages or large villages, are related to the different ways in which society is organized. Researchers have looked for the relationships between demography and the availability of resources, particularly resources favorable for agriculture. In 1965 Boserup hypothesized that extensive agricultural systems are more productive (and efficient) than intensive ones, with population density being the major variable that leads to technological changes in crop management (intensification). Different methods in the analysis of population distribution range from the simple identification of occupational gaps (i.e. Billman 1996; Wilson 1988), to the use of topographical features (i.e. de Montmollin 1989a) or central places as references (i.e. Thiessen polygons in Hodder and Orton 1976), mutual visibility and stylistic similarities (Arkush 2011), and mathematical models to identify both clustering patterns and affiliation (Alden 1979).

In this chapter, spatial clustering is the main criterion used for the identification of intermediate social units. This interpretation of spatial clusters of buildings or people relies on the assumption that distance is inversely correlated with social interaction (M. E. Smith 2010): the closer people live, the more social interactions there will be between them. In this chapter, people are represented by the garbage (sherds) they produced, as discussed in the following section.

5.1.1 Relative Demographic Estimates based on Collection Unit Area and Surface Ceramic Density

Since in archaeology we cannot count population directly, there are several things we can use as population *proxies*. Population *proxies* are "things we can observe and quantify in the regional scale archaeological record that show a consistent relationship to overall population" (Drennan et al. 2015:12). Population proxies are, then, assumed to be directly proportional to actual populations (Drennan et al. 2015).

Some of the material culture that has been used as population proxies includes counting radiocarbon dates, counting houses, counting sites and measuring the area of sites. When counting houses for example, population estimates are obtained by multiplying the number of rooms or structures by a constant, as in the Santa Valley Regional Survey developed by Wilson in 1988. Another approach is multiplying the habitation area by a constant, as done in the Chifeng region of China by Peterson (Peterson 2006:71-73). While these efforts present many advantages and represent a valuable effort to address population estimates, there are several critiques to them as well. The main critiques point to the issue of contemporaneity of occupation of all structures in one settlement.

The method used in this chapter is to combine the density of surface ceramics with areal extent of surface ceramics (an area-density index) as a population proxy (Drennan et al. 2015). In this sense, density of ceramics is used as a proxy for residential density. For the purpose of acquiring residential population estimates, the materials recovered should have a residential provenience. In many cases, a classification of residential areas vs. burial areas vs. ceremonial/monumental areas is feasible. In these cases, ceramics from a residential context are the only ones that should be used to acquire population estimates (Drennan et al. 2015). For the present research area, this task in more complicated. One factor is the long-term multicomponent occupation, and the change in the function of the same spaces through time. While some areas might have been used for ceremonial purposes in one period of time, the same area might have been used for residential purposes in an earlier time. Given the fact that in many cases, areas could be classified as both residential and ceremonial, excluding surface materials could contribute to a deflation of population proxy values (Drennan et al. 2015:41). Given the multicomponent nature of the research study area, all surface sherds were taken into account to arrive at population proxy values.

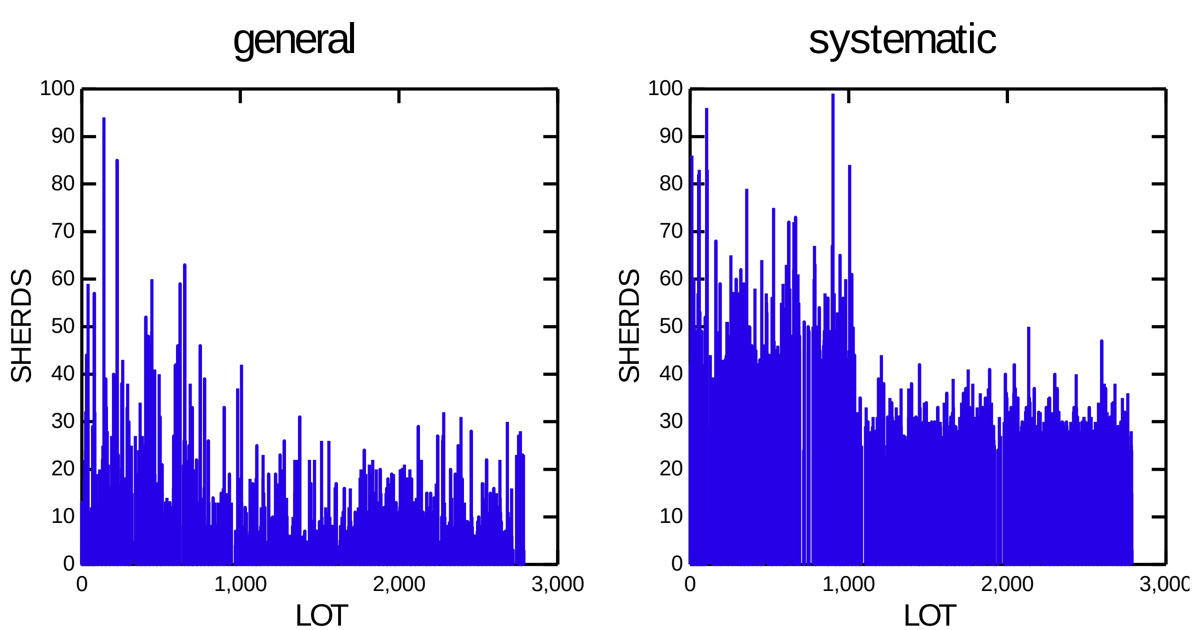
As explained in Chapter 3, two kinds of collection units were taken for demographic purposes: General Collections and Systematic Collections. The Systematic Collections account for 44.83% of all collections made. Ceramic collections were made in sampling units of 1m^2 until reaching the minimum sample size of 25 sherds. The careful systematic collections of a small number of square meters provided a density value (sherds/m^2), and that value was used to characterize the entire collection unit (0.25 ha in size ideally).

Table 7. Areas of collection lots.

	AREA_HA
N of Cases	2,701
Minimum	0.001
Maximum	1.743
Arithmetic Mean	0.314
Standard Deviation	0.220

The General Collections accounted for 55.16% of all collections. On average, collection units were 0.3 ha in size. When possible, collections should have a minimum of 25 sherds/survey unit providing error ranges of 10% with 66% confidence level for the four temporal components identified (Formative, Moche, Sicán, Chimú/Inka).

Table 8. Histograms showing the counts of sherds per different type of collection lot.



Since the nature of both collections is different, here I explain how density was calculated for each case. General Collections have a different procedure of collecting than the Systematic ones, so the number of sherds cannot just be divided by the entire area of the collection unit. Since I used the same criterion of density for making a General Collection as the one used in the Upper Daling survey (Peterson et al. 2014), I used the same conversion table provided by Drennan et al. 2014: 2. The conversion table establishes numeric sherd density values for general collections, depending on the numbers of sherds collected. These parameters have also been used in the Regional Survey at Nepeña in the North Coast of Peru (Ikehara 2014). This conversion is as follows:

fewer than 5 sherds = 0.05 sherds/m 2

5–9 sherds = 0.10 sherds/m 2

10–19 sherds = 0.30 sherds/m 2

20 sherds or more = 0.50 sherds/m 2

Once densities from both General Collections and Systematic Collections were obtained, a final dataset was created. The next step was to identify the temporal aspect. The ceramic classification (Chapter 3) was completed with the aim of assessing chronological periods per collection unit. Once the proportions of sherds per period were obtained for each collection unit, this data was multiplied by the sherd density and thus, sherd densities were obtained per period.

5.1.2 Absolute Demographic Estimates based on Collection Unit Area and Surface Ceramic Density

Following the methods for establishing sherd densities per period, the next step to create absolute demographic estimates is to obtain the area-density index (Peterson and Drennan 2005). This index is obtained by multiplying the sherd densities per period by the area of each survey unit (Drennan and Peterson 2011; Drennan, Peterson, et al. 2003; Drennan et al. 2015). Time periods vary widely, and this can affect the calculations, since the longer the period, the more accumulation of garbage (sherds) there will be. The area-density index is normalized by dividing its values by the number of centuries each period lasts, giving as a result the **area-density index/century**. For example, an area-density index/century of 1.0 represents 100 years of occupation over 1 ha at an average density of 1 sherd per m2. The area-density index/century takes into account the variability in residential density and the variability in occupational length.

To accomplish this task, several steps were taken. First, I calculated an area-density index for each collection unit by multiplying the number of sherds per m^2 by the area of the collection unit in hectares. These calculations were done for each period. Second, this index was divided by the number of centuries in each period. This operation was done to compare periods of different lengths. Third, I multiplied that number by a conversion factor (Sican residential mound index, see below) to produce an estimated number of people in that collection unit (see below). Fourth, those estimates were summed up for all collection units to produce an estimated population per period.

The results of relative and absolute demographic analysis are shown and discussed in section 5.2.

5.1.3 Absolute Demographic Estimates based on Residential Architecture: Mounds

While the emphasis on this chapter is on demographic analysis based on the remains of ceramics, residential architecture was also registered. Residential architecture found in the research area corresponds to small mounds. These medium and small low mounds present abundant domestic refuse (domestic ceramics, shells, lithics). On the basis of this evidence, these mounds are inferred to be residential mounds. A total of 194 mounds registered belong to this category **(Fig. 9).** A total of 9 mounds did not present any materials on surface. A total of 185 residential mounds present multicomponent occupation, as most of the research area does. Finally, 174 mounds present Sicán occupation. Most domestic mounds are located interspersed among the large architectural features in the study area. While all domestic mounds are dispersed, the quantity of mounds tends to diminish towards the northeast. This part of the research area was recently invaded and occupied for almost 10 years, mostly for farming. I have found evidence of discrete areas of very clayey soil (adobe type) and abundant domestic refuse in the middle of abandoned modern agricultural furrows. It is possible that these areas are the remains of residential mounds that were leveled for agricultural purposes in modern times.

5.1.3.1 Mounds as Nuclear Family Residences

One possible assumption is that one residential mound corresponds to one household. Literature on residential mounds for the North Coast of Peru is very scarce, but information used to make population estimates based on standing architecture has been provided previously by Wilson for the Santa valley (1988) and Billman for the Moche valley (1996). Cross-cultural studies tend to estimate the average size of nuclear families as slightly more than 5 people (Kolb 1985: Table 1), so a conservative approach would be to consider one nuclear family or household to be consistent with a range of 5 to 7 people.

Since I registered 174 Sican residential mounds, Sican population estimates using these assumptions range from 870 people (households of 5 members) to 1218 people (households of 7 members).

5.1.3.2 Mounds as Extended Family Residences

A different and more realistic assumption is that one residential mound corresponds to an extended family. In the La Leche Valley, Hayashida's (2006) survey identified Sicán domestic structures on the Pampa de Chaparrí. Based on surface architecture, she sees that Sicán domestic architecture consists mostly (54%) of widely spaced, free-standing rooms (Hayashida 2006:256), though areas for such structures are not provided. At the site of San Jose de Moro in the Jequetepeque valley, one elite residential mound (450m^2) was excavated and has been interpreted as an elite residence of a corporate group of "lower level Sicán nobles" whose function was to administer and control funerary practices of the middle- and lower-class population in the valley (Prieto 2010:239). According to Cutright (2009) residential architecture for the same time period in the site of Pedregal in the Jequetepeque Valley consists of compounds of irregularly sized, rectangular, agglutinated rooms (5-12). Compounds have an area of approximately 200m^2-400m^2 and likely held extended families of 10 to 20 people (Cutright

2009:134). Moore (1985) suggests that Spanish chroniclers and colonial visitas overemphasized the nuclear family and tended to overlook extended family households or other kinds of living arrangements that would have been more common living patterns. If residential mounds are assumed to be the dwellings of extended families, since I registered 174 Sican residential mounds, Sican population estimates would have a range from 1740 people (extended families of 10 members) to 3480 people (extended families of 20 members), based only on residential mounds.

However, aside from mound residences, there are discrete concentrations of domestic ceramics in non-disturbed areas that are inferred as non-mound occupation. It is important to highlight that non-mound residences most likely existed but were made of less durable materials such as wattle and daub. Such residences are still in use by modern families in the surroundings of the research area. Absolute demographic estimates based on sherd density, as opposed to mounds alone, give much higher results. To calculate demography from sherd density, or the average number of people that lived in a certain period, I first developed a conversion factor by drawing on the sherd density of small residential mounds, which I call the Sican residential mound index. From the total of 174 Sican residential mounds, a sample of 43 small mounds was chosen, all having exclusively Sican occupation and areas ranging between 200 and 400m^2. While residential mounds are indicators of structures (rooms), an adjacent area of around ¼ of a hectare was also assumed to be part of the activities taken by its residents. Next, the area-density index of the residential mounds and the adjacent areas were summed up for each case. This number was divided by 5, since I assumed that each one of these small residential mounds hosted a nuclear family of 5 people. The result, the **Sican residential mound index,** is 0.238 and corresponds to the mean of these calculations. This index was then multiplied by the area-density index/century to achieve the absolute population estimates (see below)

The calculations of **area-density index** have error ranges of 10% with 66% confidence level for the four temporal components (Formative, Moche, Sicán, Chimú/Late Horizon). Absolute Demographic Estimates point overall to a well populated area, particularly during the Late Intermediate Period. The population never surpassed the average of 12,681 inhabitants (per century). During the Sican Period population reached 26,230 inhabitants within the area of $50km^2$, pointing to a low-density population pattern.

Table 9. Average number of people after using the Sican residential mound index for the main four periods with 10%ER and 66%CL. (*Contact/Colonial period is shown for comparison, no ER were calculated).

	Period	Dates	area-density index	area-density index/century	Average number of people
1	Formative	1500 BC-100 AD	693	43	181
2	Moche	AD 100-750	1536	236	992
3	Early Sican	AD 750-900	3632	2421	10172
	Middle Sican	AD 950-1100	4235	2823	11861
	Late Sican	AD 1100-1375	2749	999	4197
4	Chimu-Late Horizon	AD 1375-1532	4739	3018	12681
*	Contact/ Colonial	AD 1532-1821	3	0.9	4

5.2 DEMOGRAPHIC TRAJECTORY: DISTRICTS

In this section, I reconstruct the demographic trajectories from the Formative Period through the Chimú/Late Horizon Period in the research area. Although my focus is on the Sicán period, I include a complete demographic trajectory of the research area that includes all the periods that had human occupation.

Demographic studies identifying small and large communities abound in the literature, mostly referred as community studies. In this dissertation I use the same methods to identify intermediate social units (urban districts) in an area that during the most important periods corresponded to a city.

Communities are at the central place of most societies since they are the place where social interactions occur (Drennan and Peterson 2011; Canutto and Yaeger 2012). But when archaeologists and anthropologists talk about communities, what do they mean? Several scholars have followed the seminal work of Murdock (1949), who defines a community as a "co-residential collection of individuals or households characterized by day-to-day interaction, shared experiences and common culture" (Murdock 1949). Recent definitions vary, defining communities as a "dynamic socially constituted institution that is contingent upon human agency for its creation and existence" (Yaeger and Canutto 2012:5), or focusing on "how people perceive themselves and their belonging in imagined communities" (Paucketat 2012). Since daily interactions are a key part in the constitution and maintenance of communities, households most likely choose to live in close proximity to those who they interact often with. Under this line of thought, “patterns of interaction, and thus social communities, will be broadly reflected in patterns of spatial distribution of residence” (Peterson and Drennan 2010:80).

The ways to delimit these clusters of intensive interaction and thus delimit urban districts have been widely discussed in archaeology (Ashmore et al. 1994; Becker 2004; Becker et al. 1999; Freter 2004; Leventhal and Baxter 1988; Robin 2004, 2013; Webster 1999; Webster et al. 1992). The method used in the present chapter follows the one proposed by Peterson and Drennan (2005) where densities of surface ceramics and their distribution are used to determine clusters of intensive social interaction.

All 2701 survey units were digitized in AutoCAD Map 2015, and the associated database with the information of densities of sherds per period was prepared in Excel (sherd density would count as a Z value). Once both sets of files (one set per period) were ready, they were linked in AutoCAD Map 2015. This linked file was exported and converted into raster files in IDRISI Selva. Finally, these sets of files were exported into Surfer 13 in order to create demographic surfaces. The resulting maps present spatial demographic patters showing tridimensional surfaces. The maps are similar to topographic maps, except the elevation information (or z value) represents population. Several sets of maps were created representing each period of the study area. Visualization of the results varies according to mathematical smoothing of the grid, by the use of interpolation at an inverse distance to a power. Each period grid was analyzed with the powers 4, 2, 1, 0.5, 0.25 and 0.001 because it is impossible to determine beforehand at which scale the patterns of interaction are detectable (Peterson and Drennan 2005).

The demographic trajectory in the research area shows both continuity and changes. Both are important to understand the social organization of the polities that existed through time in the research area, particularly the Sicán.

5.2.1 Period 1: Formative (BC 1500-100 AD)

During the Formative period (BC 1500-100 AD) the population was relatively low. Absolute population estimates arrive at an average of 181 people for the entire survey area **(Table 9).** It is important to note that although they were found at a low density, Formative sherds were found in most of the research area. This would point to the existence of an important Formative residential occupation in the Middle La Leche valley. Most of the Formative occupation corresponds to the Late Formative period, represented by the Cholope style (Carlos Elera, personal communication 2015). There are several small isolated settlements that would have been small local communities. In terms of supra-local communities or districts, there are five in total. The larger ones are in the northern margin of the survey area, with the largest one in the northwest corner. The location of these supra-local communities could be related to the Pacora river that delimits the survey area to the north. The northern area also contains several large sand dunes that may have provided better visibility for the location of residences, as well as protection during flooding events. The easternmost supra-local community corresponds to the well-known archaeological Formative Complex of Huaca Lucia-Cholope (Shimada 1981). Unlike the other supra-local communities, Lucia-Cholope is located on the valley floor closer to better agricultural lands, and it is located closer to the La Leche river, although not so close that it would suffer from flooding.

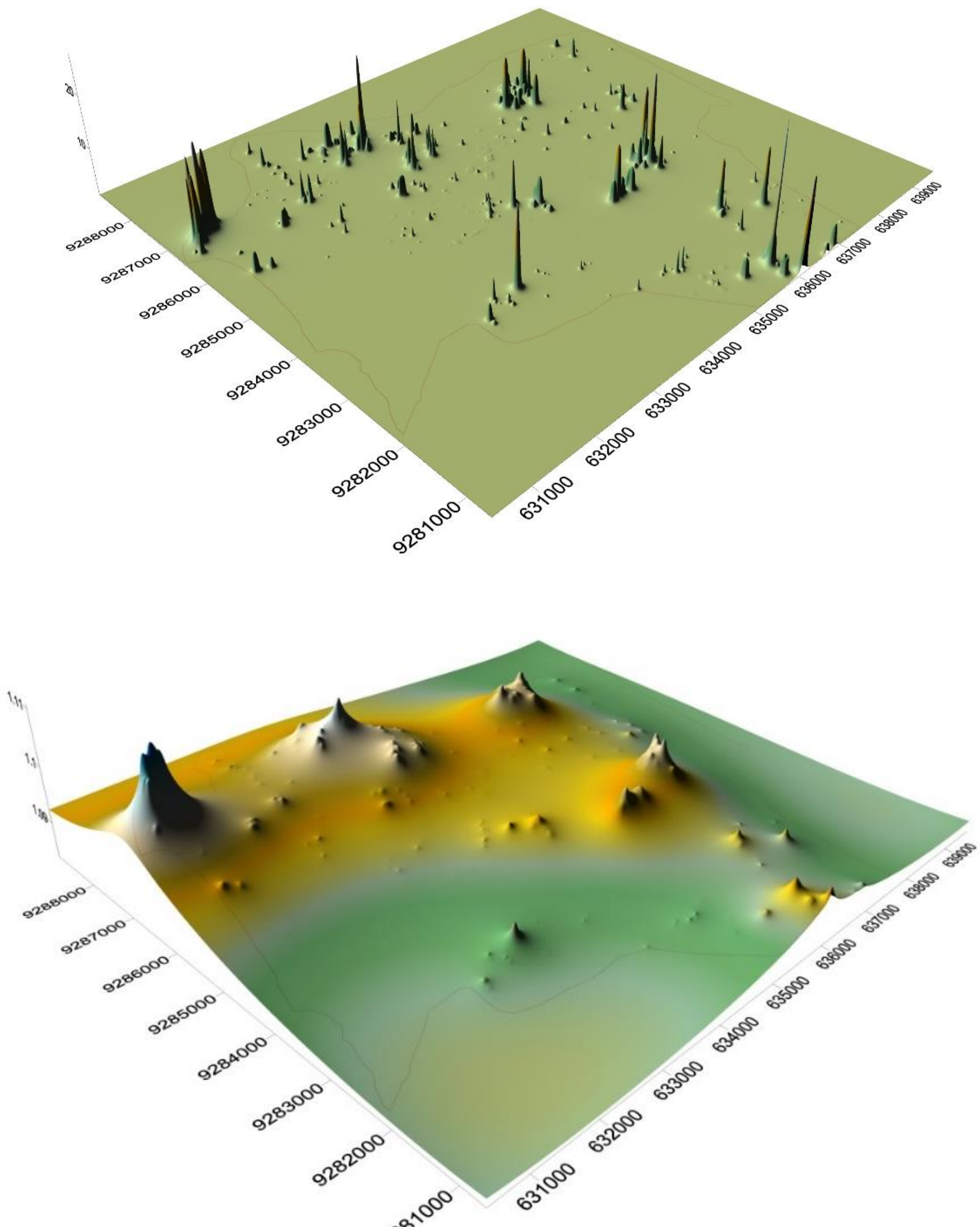
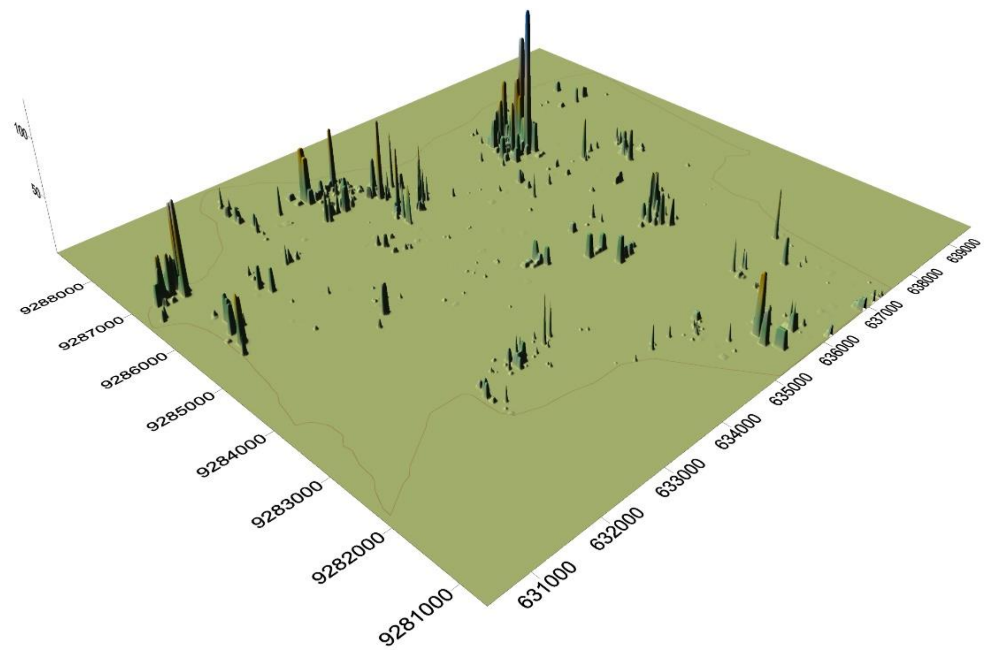


Figure 12. Density surface of Period 1: Formative. Smoothing by inverse distance power of 4 (up) and 0.25 (bottom).

5.2.2 Period 2: Moche (AD 100-750)

During the Moche period there is an important increase in population estimates, from an average estimate of 181 people in the Formative, to an average estimate of 992 people for the Moche period **(Table 9).** There is evidence of residential Moche occupation in most of the research area.

Demographic patterns change drastically from the earlier Formative period where there were five clearly differentiated supra-local communities. For the Moche period there is a single large supra-local community or district in the northeast corner of the research area. This corresponds to the well-known site of Huaca Soledad. Huaca Soledad might have been a regional center or a polity, since it is the largest known Moche settlement in the La Leche valley. This is the only time in the complete social trajectory of the area that we see a highly centralized pattern. This centralized pattern resembles the one found in the neighboring southern valley of Lambayeque, where Pampa Grande is the largest Moche site of the valley, capital of the Mochica V state.



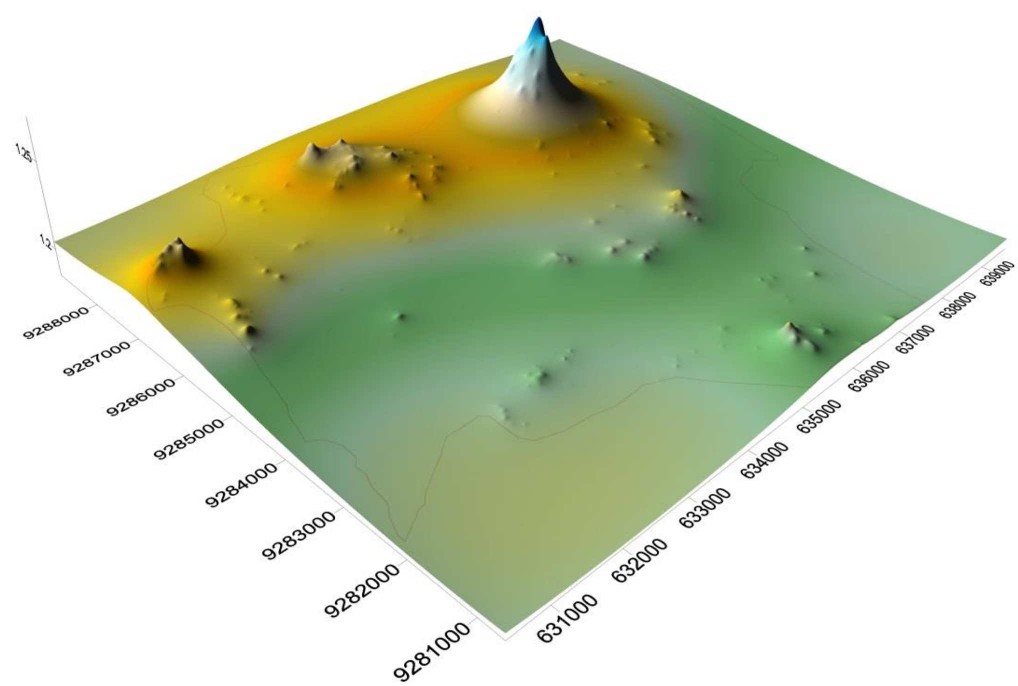


Figure 13. Density surface of Period 2: Moche. Smoothing by inverse distance power of 4 (up) and 0.25 (bottom).

5.2.3 Period 3: Sicán (AD 950-1375)

The Sicán period sees an impressive increase in population when compared with the previous Moche period, from an average estimate of 992 for the Moche period to an average estimate of 26,230 inhabitants for Sicán. I explain these results in detail for each of the Sicán sub-periods in the following section. Residential occupation continues in most of the research area. Small, isolated settlements (local communities) are found dispersed within the 50km^2. Unlike earlier periods, it is clear that local communities get bigger over time, forming urban districts, as population in the city increases. Several large demographic districts grow from the Moche period, particularly those located in the northern margin of the research area**.**

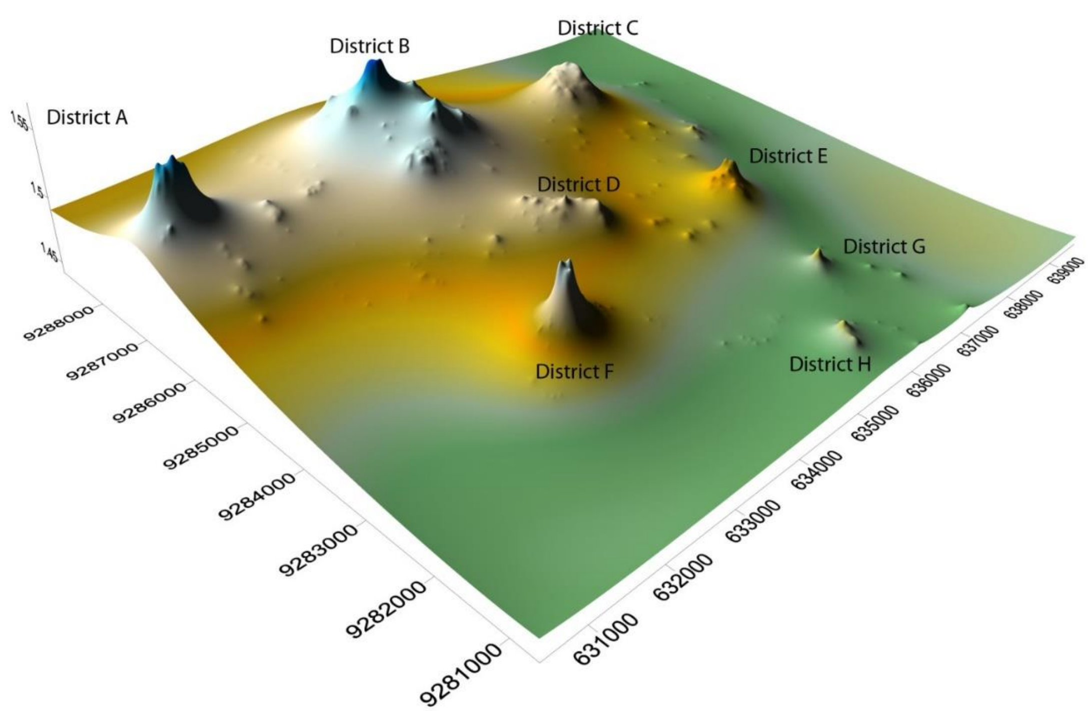


Figure 14. Density surface of Period 3.1: Early Sican showing demographic districts identified for all Sican sub-periods. Smoothing by inverse distance power of 0.25.

During the Sicán Period practically the whole research area was populated. Demographic estimates for the area show the presence of permanent residents throughout the different Sicán sub-periods: Early Sicán, Middle Sicán and Late Sicán. While the presence of ceremonial functions is undeniable for the Sicán site, the conception that this area was exclusively or mainly ceremonial is far from correct.

An important fact to highlight is that, during the Sicán Period and all its sub-periods, no demographic district corresponds with the Pyramid Complex, also known as the Sicán Precinct. During the Sicán Period the Pyramid Complex had a very small resident population, while the rest of the city had a large permanent population.

a. Period 3.1: Early Sicán (AD 750-900)

A major increase in demography in the area takes place during the Early Sicán period. In terms of absolute demographic estimates, an average of 10,172 people was calculated for the Early Sicán Period **(Table 9)**. This is especially important given the poor or almost nonexistent information known for the Early Sicán period within the research area and elsewhere.

In the Early Sicán period the highest density of population is located on the northern margin of the river in Districts A, B and C, which account for the largest concentration of population during this period. This pattern of high population density near the northern limits of the research area maintains some continuity from the earlier Moche period, which also presented high population densities in the same area. Further, Districts A, B and C were already formed in the Moche period. District B is the largest district during the Early Sican period and grows dramatically from the preceding period. Although still very important, District C sees a significant decrease in importance when compared to the Moche period, when

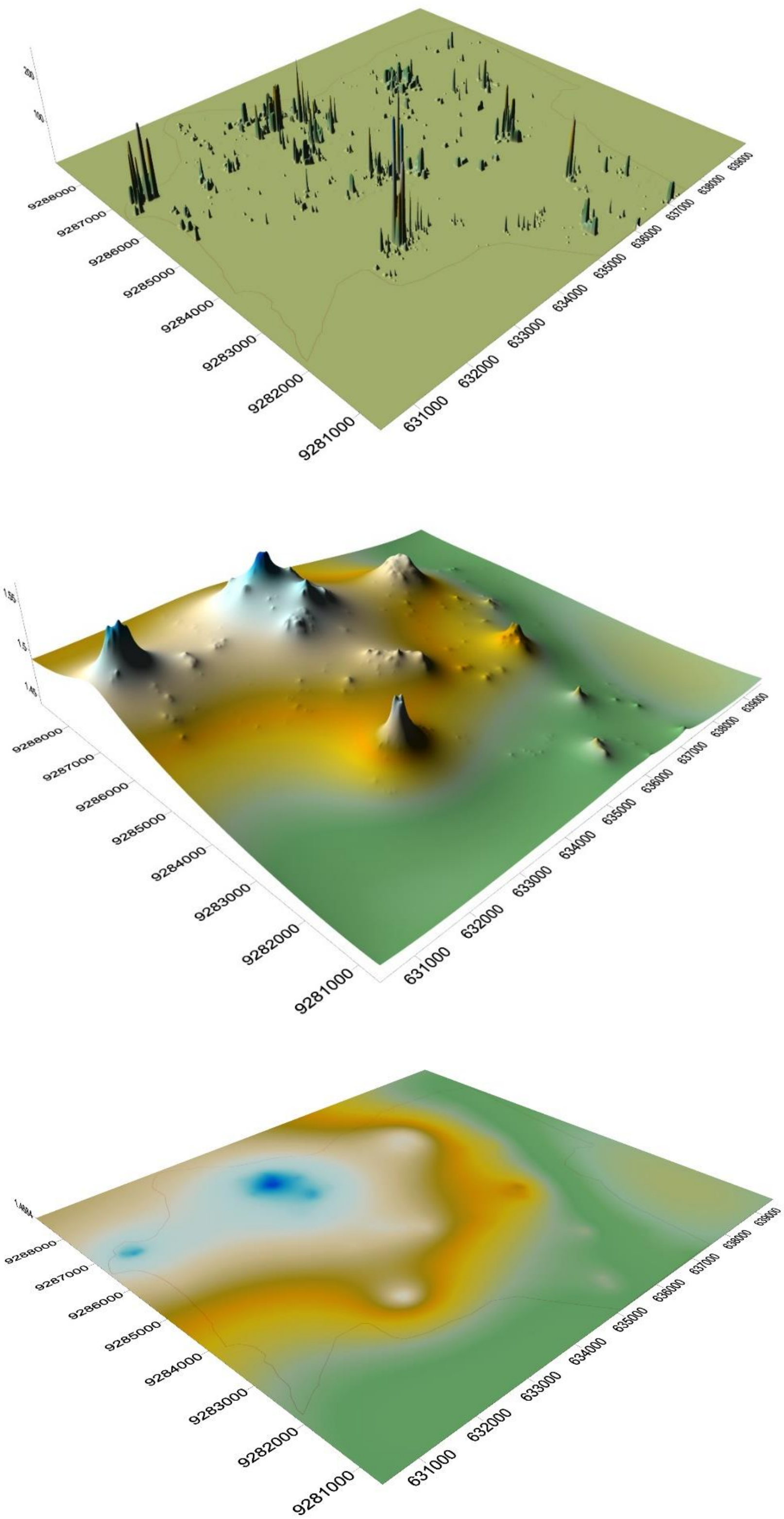


Figure 15. Density surface of Period 3.1: Early Sican. Smoothing by inverse distance power of 4 (up), 0.25 (middle) and 0.001 (bottom).

it occupied a central place. District D is located in the central part of the research area, some 2 km east of the monumental core, corresponding well with the Platform Complex (see section 5.5 below), and is relatively small when compared to the previous districts described. District E is located to the east in the northern margin.

South of the La Leche river, District F presents a high population density and is the densest district on the southern side of the river. District F shows a drastic change from the Moche period when it was a very small district, to a highly dense one during the Early Sicán period. District G is located to the east, and District H is located to the south, both on the southern side of the river.

There is no demographic district that corresponds to the Sicán monumental core or Pyramid Complex. Although Early Sican ceramics were found in this area, their densities are not high enough to form a demographic district, meaning only very few people lived there.

b. Period 3.2: Middle Sicán (AD 950-1100)

The Middle Sicán period is the best known in the archaeological literature, although until now nothing was known about its residential population in the Sicán city. Middle Sicán represents the highest peak in demographic estimates during Sicán times. There is a substantial increase in population during Middle Sicán when compared to Early Sicán. This is expected, since this is the equivalent of a "Classic Sicán" period, when we see the Sican city and polity flourish.

In the Middle Sicán period, in terms of absolute demographic estimates, an average estimate of 11,861 people lived in the Sican city **(Table 9)**. The pattern of high population densities in the northern

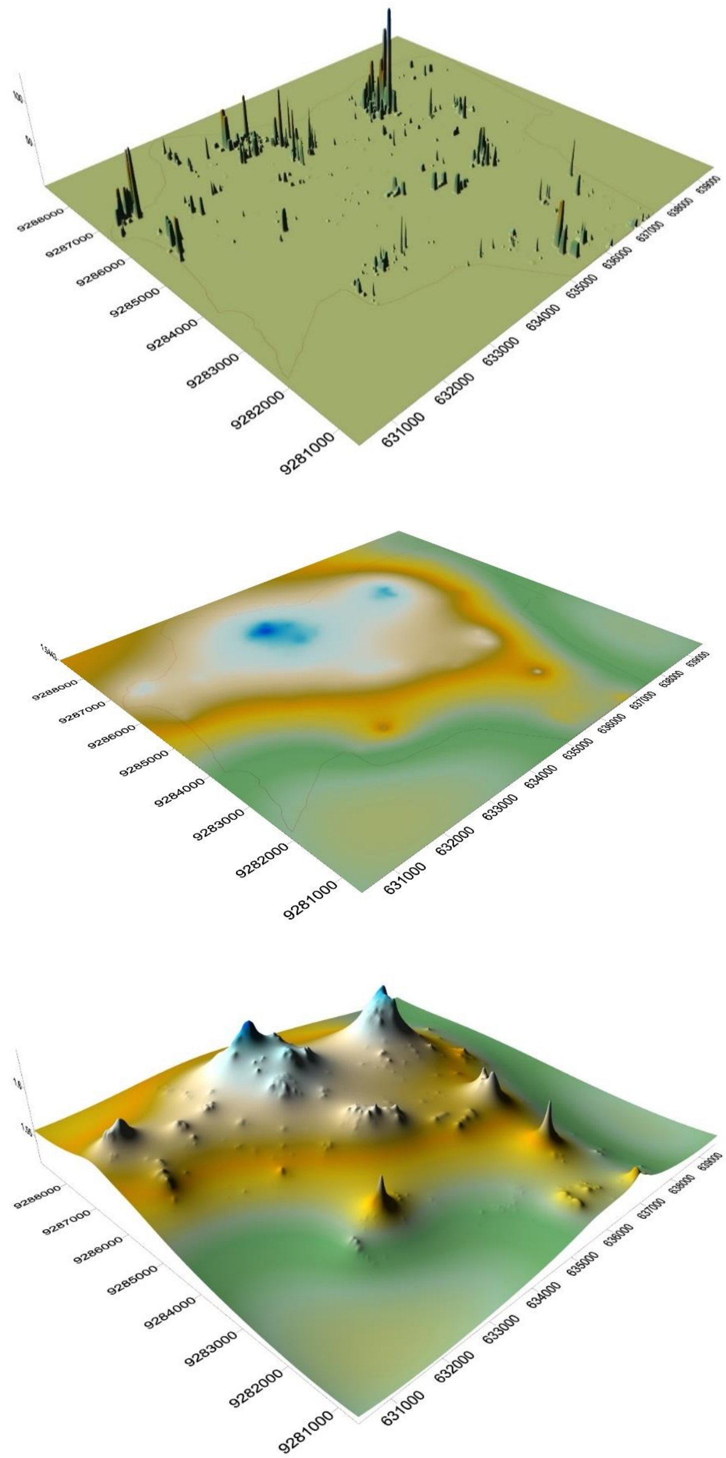


Figure 16. Density surface of Period 3.2: Middle Sican. Smoothing by inverse distance power of 4 (up), 0.25 (middle) and 0.001 (bottom).

side of the research area continues, as Districts A (Architectural Group 1), District B (Architectural Groups 3, 5, 6, 7, 8) and District C (Architectural Group 4) account for the largest concentration of population. District B continues to be the largest, but District C increases notably in size, regaining some of the importance previously seen in Moche times. District A decreases when compared to Early Sicán. Both Districts D (Platform Complex) and E (Architectural Group 11) maintain their size.

Districts B and C are the largest demographic districts during this period, the period when the Pyramid Complex or Sicán Precinct was built and used. It is possible that the prosperity of these two districts was related to the flourishing of the Pyramid Complex, its construction and use.

In the southern side, District F (Architectural Group 12) reduces its size moderately and District G (no Architectural Group associated) increases in size notably. These two districts are the densest areas on the southern side of the river and are comparable in scope. District H (Architectural Group 15 and 16) toward the southern edge continues to be small.

c. Period 3.3: Late Sicán (AD 1100-1375)

For the Late Sicán period (AD 1100-1375) Shimada hypothesizes that the site was abandoned due to political upheavals as a new Sicán capital was funded in Túcume (Shimada 2000). Shimada and colleagues state that the abandonment of the Sicán site occurred in a quick and violent manner, with systematic burning of the main ceremonial centers and elite constructions during or near the three-decade drought around AD 1020-1050 (Shimada

2014b:66-67, 1990, 1995). Soon after, the site suffered the strong effects of a mega ENSO at AD 1050 (Craig and Shimada 1986, Shimada 2014a, b, 1995, Shimada and Wagner 2007).

However, my research shows that although the population decreases, the area was not abandoned during Late Sicán. The population decreases substantially from an average estimate of 11,861 inhabitants during Middle Sicán to an average estimate of 4,197 people in Late Sicán **(Table 9).**

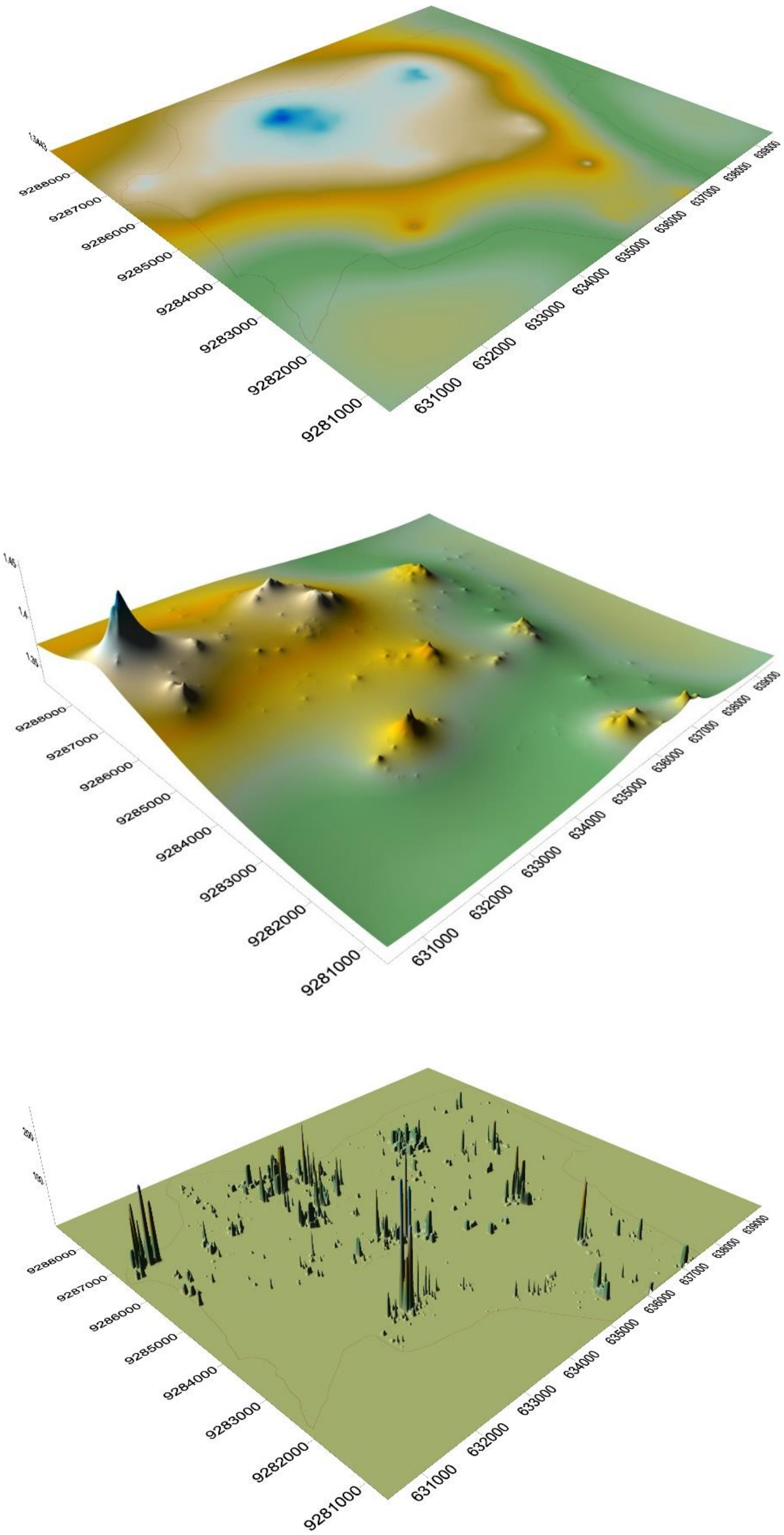


Figure 17. Density surface of Period 3.3: Late Sican. Smoothing by inverse distance power of 4 (up), 0.25 (middle) and 0.001 (bottom).

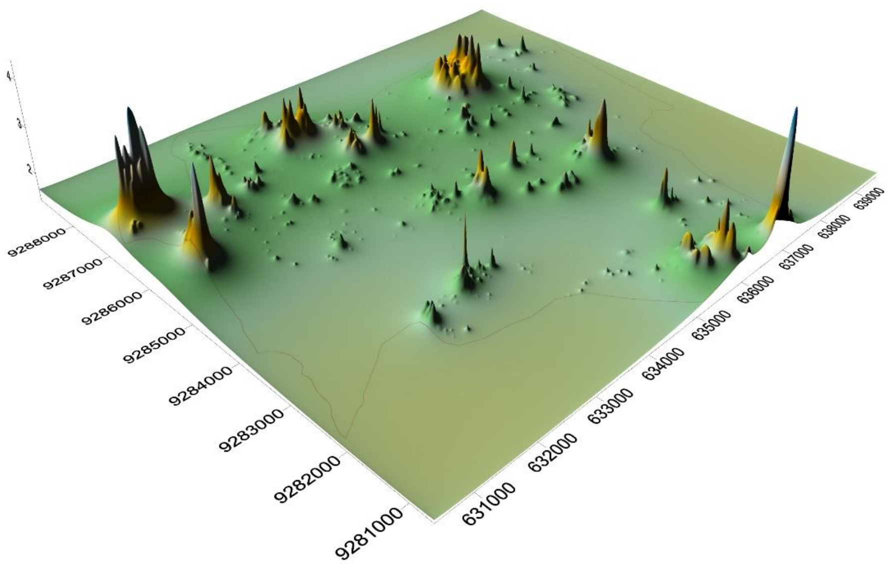
Most demographic Districts decrease in size. District A, however, becomes larger during this period of time. As mentioned earlier, Districts B and C had grown and flourished together with the Pyramid Complex, and by Late Sicán when it is abandoned, these districts decrease dramatically, suggesting that they were closely connected to the civic/religious core.

Although there is a decrease in population, most likely due to sociopolitical upheavals and changes in the religious Pyramidal Complex like the burning of the main civil-ceremonial monuments (Shimada 2000), most aspects of daily life do not seem to have been severely affected. This is a clear indication that the polity was not highly centralized, nor its population and economic activities centrally controlled. Residential mounds were not burned (based on surface evidence, as opposed to some of the Monumental mounds such as Huaca Colorada and Huaca El Corte, where clear burnt surface evidence was found) nor abandoned. Architectural groups and civic-religious monumental architecture in the Greater Sicán were not burned or abandoned either. The evidence presented here shows that the whole city area was never abandoned during Late Sicán or during any other pre-Columbian time. Further, after Late Sicán, there was again a significant increase in population. Important centers located 20 km east such as the metal workshops in Cerro Huaringa continued to function (Shimada 2000), and the rural population in the Pampa de Chaparrí did not show any apparent impact either (Hayashida 2006).

5.2.4 Period 4: Chimú-Late Horizon (1375-1532)

During the Chimú-Late Horizon period, the population increases drastically from an average estimate of 4,197 people during Late Sicán to an average estimate of 12,681 inhabitants

(Table 9). Local communities are found dispersed in all the research area. All districts grow in size, particularly Districts A, B and C. Districts F and G decrease notably in population. District H in the southernmost part increases substantially. It might be related to a large Chimú occupation in the Cerro Salinas (Tschauner 2001), located to the south of the research area.



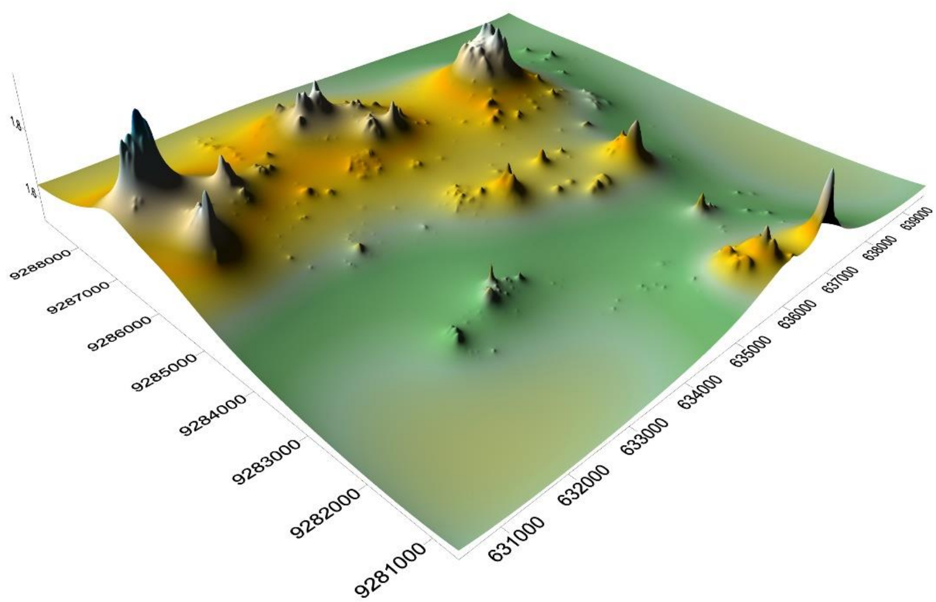


Figure 18. Density surface of Period 4: Chimú/Late Horizon. Smoothing by inverse distance power of 4 (up) and 0.25 (bottom).

5.2.5 Colonial/Contact Period (1533-1821)

A massive population decline took place starting in 1532 in the research area. Demographic decline in the Andes in the Contact and Early Colonial period has been attributed to European diseases, social dislocation and warfare and abuse (Cook 1981; Netherly, 1977; Ramirez 1996). The northern part of the north coast of Peru suffered particularly from maximum exposure to Europeans as they travelled from Paita to Lima, as has been highlighted by Netherly (Netherly 1977:126).

In this study, a decline from an average estimate of 12,681 inhabitants during the Chimú/Late Horizon period to an average of 4 inhabitants or one family in the Contact/Colonial period attests to the massive depopulation of the research area **(Table 9).** That possible family lived in the northeastern part of the research area. This is the first time during the whole sequence that the area was abandoned.

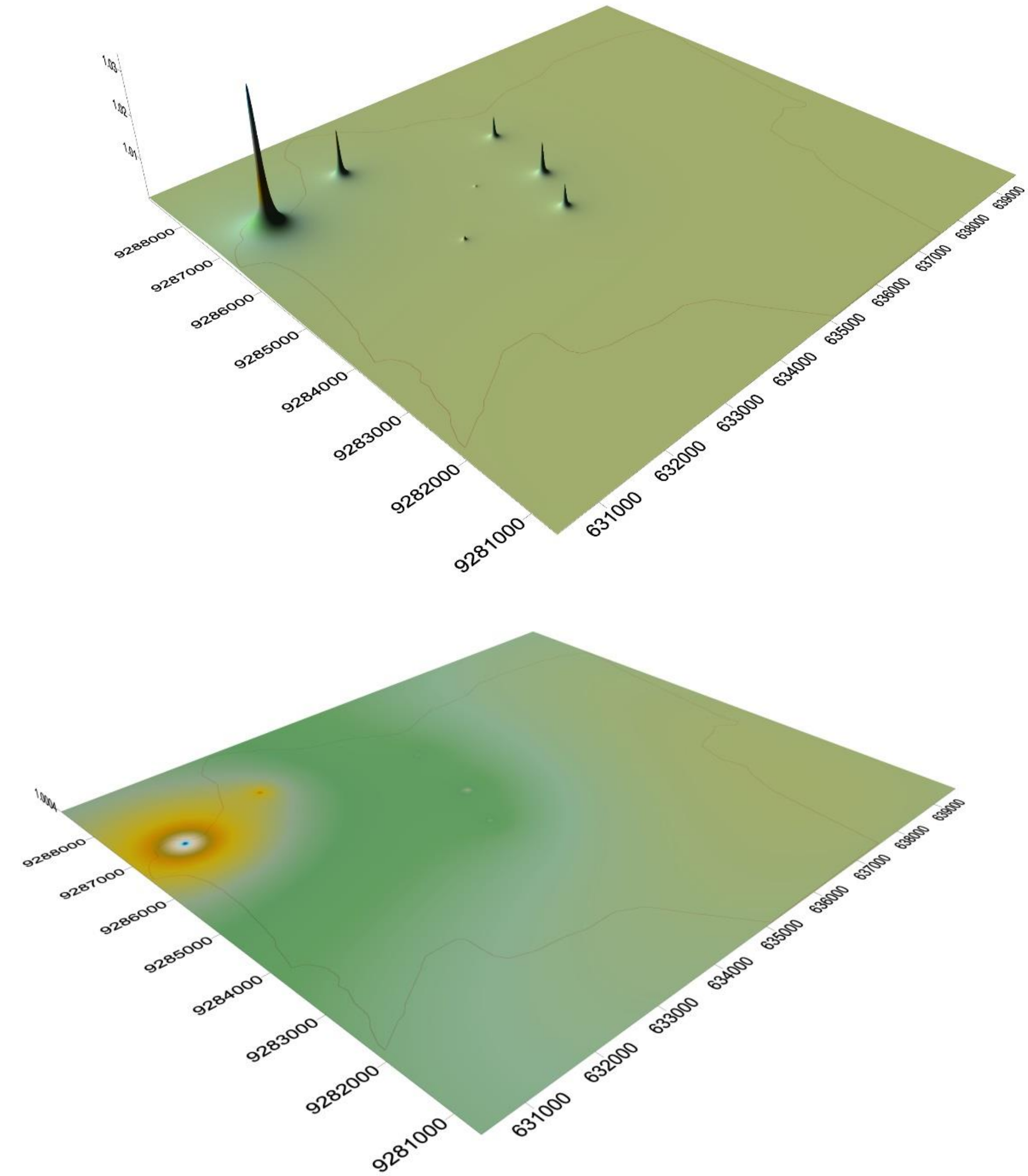


Figure 19. Density surface of Colonial/Contact Period. Smoothing by inverse distance power of 4 (up) and 0.25 (bottom).

However, this interpretation might be problematic because it relies on Colonial period ceramics. It is important to note that at least for the early part of the contact period, people might have continued to use their traditional ceramic wares (since the use of ceramics tends to be conservative). While I acknowledge this fact, there is no possible method to account for such use, if that was the case.

The data shows that during the conquest, colonial and subsequent republican periods, the area suffers a complete depopulation and abandonment. The area was never re-populated, and today stands as a National Historical-Sanctuary, a protected area by the Peruvian State.

To summarize, the research area presents a long-term human occupation that begins in the Formative period, and includes an important Moche polity-like occupation. A dramatic increase in population takes place during the Sicán period when the Sican city functioned, particularly during Early and Middle Sicán, with a significant decrease during Late Sicán. During Chimú-Late Horizon a significant increase in population takes place to reach the highest population peak in the whole demographic trajectory. As shown here, the area was never abandoned during pre-Columbian times.

5.3 SICÁN CITY INTERMEDIATE URBAN ORGANIZATION: DEMOGRAPHIC DISTRICTS AND ARCHITECTURAL GROUPS

In this section I compare Sicán demographic districts and discuss their relation with the Architectural Groups described in Chapter 4 **(Fig. 20, Table 10)**.

A city can be studied as formed by several communities or intermediate social units such as neighborhoods and districts. The development of neighborhoods as physical and social entities allowed people to manage the complexities of individual and household life at an optimal (intermediate) scale and still benefit from the array of opportunities that only exist in cities (M.L. Smith 2019). The interpretation of a residential zone as a neighborhood versus a district will depend on the size and architectural composition of the zone (M. E. Smith 2010:146). I use Michael Smith's notion of social district, as being a large residential area that comprises several neighborhoods (M. E. Smith 2010:140). This definition agrees with the one provided by Hutson, where a district is a division within a city that is larger than a neighborhood but whose inhabitants share some things in common (Hutson 2016:72).

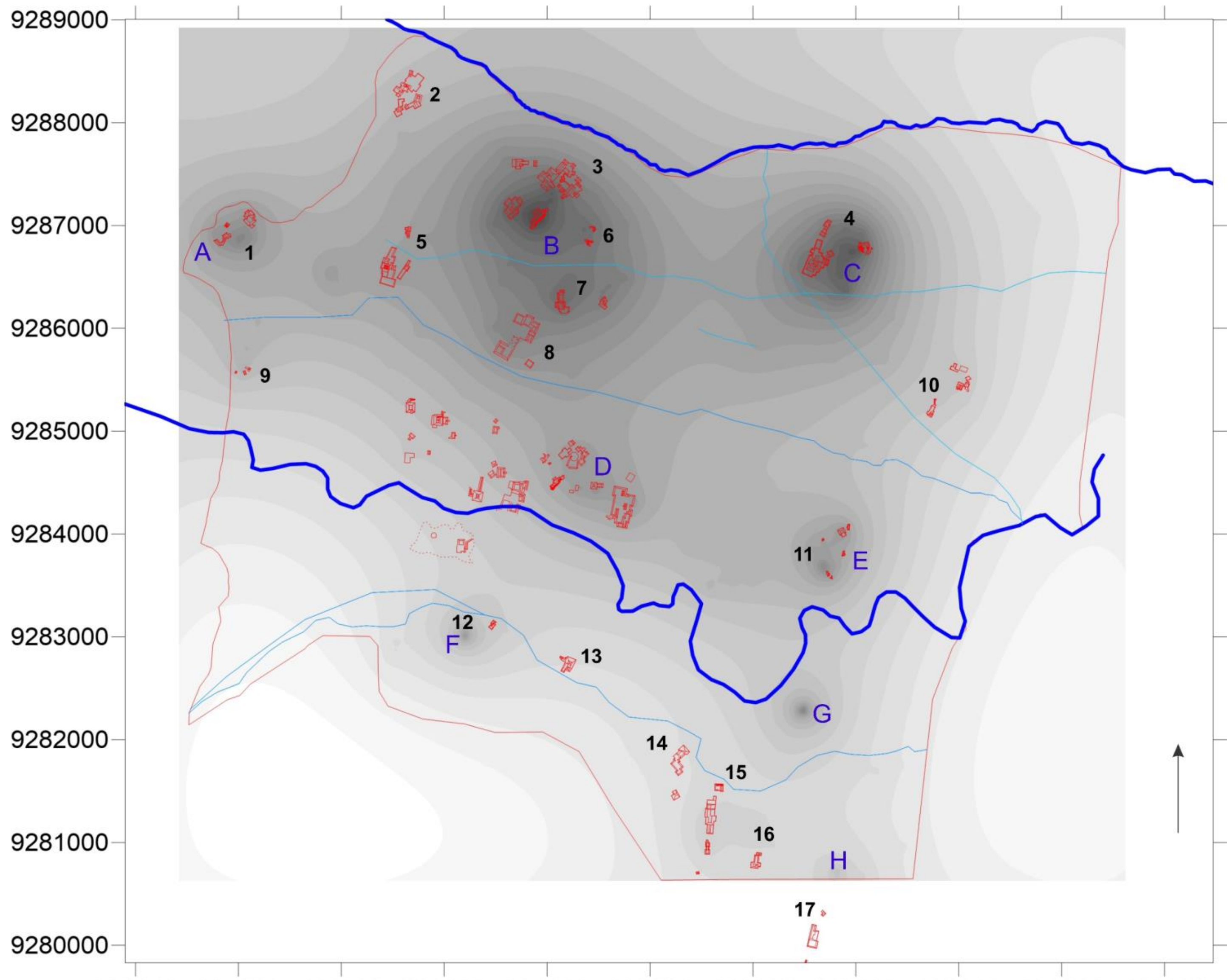


Figure 20. Density surface of Period 3.2: Middle Sican, showing demographic districts (letters) and Architectural Groups (numbers).

There is a dispersed distribution of population in local communities spanning pretty much all of the 50km^2 of survey area during most periods, but particularly during Sicán. There are several population concentrations that can be identified as supra-local communities or districts.

First, it is noteworthy that no district was found corresponding to the Pyramid Complex located in the Sican Core. The ceremonial area composed by large pyramids presents small, dispersed population peaks that may represent households. This means that in the Sicán Core there was a resident population, but a very small and dispersed one.

The Pyramid Complex became a civic-ceremonial center of great dimensions only in Middle Sicán. Most monuments of the Pyramid Complex (like Huaca Loro, Huaca Lercanlech, Huaca Colorada and probably Huaca La Merced) date to the Middle Sicán period. This means that during Early Sicán this was an "empty" area with a small scattered population and without any civic-ceremonial buildings (except for Huaca Las Ventanas). This relatively empty area might have served as a mutual "neutral zone" where several large important social groups from the different districts came together to build monuments, a reflection of their social and economic power.

The most important feature during Late Sicán is that no new civic-ceremonial buildings were built. This fact fits Shimada's hypothesis that the political capital might have been moved to Túcume (Shimada 2000), where Late Sicán civic-ceremonial architecture was built.

When the Sican Precinct is put into perspective and compared with the Architectural Groups, demographic patterns and diachronic trajectories of the city, it raises questions about its longstanding characterization as a "religious or pilgrimage center". A better characterization would be the Middle Sican civic-ceremonial core of the Sican city, since it is only during Middle Sicán times that it was built and mostly used.

Next I discuss Sican intermediate organization or urban districts. Absolute demographic estimations follow the same methods discussed above. For this section, Sican Districts encompass all Sican sub-periods.

Table 10. Average number of people after using the Sican residential mound index for the demographic districts of the Sican city.

Sican Districts	area-density index/century	Average number of people	% Sican Absolute Population
A	656	2756	10.5
B	1888	7930	30.2
C	1071	4496	17.1
D	442	1855	7.1
E	461	1935	7.4
F	507	2129	8.1
G	213	894	3.4
H	150	629	2.4
no district	858	3604	13.7
Total	**6244**	**26225**	**100**

5.3.1 District A

District A is located in the westernmost corner of the city and corresponds well with Architectural Group 1 (Huaca Castaneda) **(Fig 20, Table 10)**. District A has an average population of 2,756 inhabitants, which adds up to 10.5% of the city's population.

5.3.2 District B

District B is located in the central part of the northern survey area. It is the largest district both in geographical and demographic terms **(Fig 20, Table 10)**. District B has an average population of 7,930 inhabitants, adding up to 30.2% of the city's population. It includes several Architectural Groups, with Architectural Group 3 (Huaca Mayanga) as the central and largest one. There are also sub-peaks, accounting for Architectural Groups 5 (Huaca Sontillo), 8 (Huaca Arena), 6 (Huaca Facho) and 7 (Huaca Monja-Tordo), all of which nevertheless form a larger unit. This suggests that all these architectural groups were encompassed into one large urban sprawl belonging to a single large and important social group. Architectural Group 2 (Huaca Caracol) seems to be absorbed by this district as well, although its location in the NE corner of the survey area makes it difficult to make a conclusive statement.

5.3.3 District C

District C is also a very large demographic district located in the northeast part of the city **(Fig 11, 20, Table 10)**. It corresponds well with the Architectural Group 4 (Huaca Soledad). District C has an average population of 4,496 inhabitants, adding up to 17.1% of the city's population.

There are two more districts on the northern margin of the La Leche valley. In both cases they are substantially smaller than any of the three mentioned so far.

5.3.4 District D

District D is the smallest district on the northern side of the river and corresponds well with the Platform Complex in the Sicán Core **(Fig 20, Table 10)**. District D has an average population of 1,855 inhabitants, adding up to 7.1% of the city's population.

This area presents abundant remains of mineral extraction and metal craft production (see Chapter 6). There is a high possibility that metalworking craftsmen used this area for workshops and living spaces, as has been documented for Huaca Sialupe (Goldstein 2007; Goldstein and Shimada 2007), a middle Sicán metal and ceramic workshop in Morrope, a few kilometers northwest.

5.3.5 District E

District E is located to the southeast, still on the northern side of the river. It corresponds well with Architectural Group 11 (Huaca Chepa) **(Fig 20, Table 10)**. District E has an average population of 1,935 inhabitants, which adds up to 7.4% of the city's population.

Although they wax and wane somewhat in importance, the demographic **Districts A, B, C, D** and **E** maintain a certain continuity and stability through the Sicán period (600 years). Even more important, districts A, B and C maintain large amounts of population throughout the human occupation of the area, starting in the Formative period, and continuing through the Moche period, the Sicán period and up to the Chimú-Late Horizon period. This continuity and stability through a long social trajectory can be interpreted as reflecting relatively successful social organization of the people who inhabited these districts. This stability does not mean stasis, but included dynamic "life histories", such as the one exemplified by District C. District C is centrally important in Moche times; then it seems to become overshadowed by District B in Early Sicán in terms of population. By Middle Sicán it is booming; then it almost collapses in Late Sicán; but it manages to survive and thrive again in Chimú /Late Horizon times.

5.3.6 District F

On the southern margin of the river there are three additional districts. **District F** is the largest of the southern margin. It is located in the southwest part of the survey area. Although this district is not very large in terms of area, it has a high population density, making it the densest district in city. It is located immediately south of the La Leche river, near water accessibility. It corresponds well with Architectural Group 12 (Huaca Benites). Unlike other demographic districts that are associated with relatively large architectural groups, in this case the architectural group is relatively small. Due to its proximity, it might have been associated with Huaca La Merced in the Sican Core **(Fig 20, Table 10)**. District F has an average population of 2,129 inhabitants, adding up to 8.1% of the city's population.

5.3.7 District G

District G is located towards the east and is the only District that does not have a corresponding Architectural Group **(Fig 20, Table 10)**. District G has an average population of 894 inhabitants, which adds up to 3.4% of the city's population.

5.3.8 District H

District H is the southernmost of the city and corresponds well with Architectural Groups 16 and 17 (Huaca La Pared). These are located in the southern edge of the research area, making it difficult to make thorough assessments. Still, we know Huaca La Pared is the southernmost Sicán site before reaching Cerro Salinas, which presents an important geographical barrier some 300 m to the south, and an important Chimú occupation **(Fig 20, Table 10)**. District H has an average population of 629 inhabitants, adding up to 2.4% of the city's population.

As seen in the previous section, **Demographic Districts** correspond well with Architectural Groups registered in the survey. This means that these intermediate social units are most likely social districts usually found within a larger urban entity, a city. In Sican times there is an average of 3,604 inhabitants that do not live within any demographic district, making up 13.7% of the city's population.

Overall during the Sicán period, the largest amount of population (18,972 inhabitants or 72.3% of the city population) resided in Districts A, B, C, D and E, in the area between the La Leche river to the south and the Pacora river to the north. Even when demographic peaks are easily noticeable, these districts are still connected to each other, forming a larger social unit, the city. This is clearer when we look at the demographic surfaces for all Sicán sub-periods at smoothing by inverse distance power of 0.001 **(Fig 14).** In all three periods, the only feature separating Districts F and G located in the southern area of the research is the La Leche river.

The most densely populated area was in the northern margin of the research area. Why did people during Sicán times chose to live in this area, particularly forming Districts A, B and C? I consider a twofold answer.

The first reason is an ecological one. Of great importance is the availability of water. The Pacora river runs east-west and was chosen as a natural boundary on the northern side of the research area. This river has a more regular basin than the La Leche river and thus, causes less flooding. The presence of large and high sand dunes in the northern area offered a safer place to build ceremonial architecture and houses, as well as better visibility and fresh currents of air in an otherwise very hot and dry environment.

The second reason is social. The presence of demographic districts in the northern area early on in the social sequence (Formative and Moche periods) seems to have conditioned the way people tended to locate themselves in later periods. There was an existing network of interacting centers already during the Formative period. These districts acted as centralizing forces and seem to be of great importance for households to decide where to locate themselves. In this sense, they preferred to locate themselves in smaller plots but in closer proximity to centers instead of in larger (and possibly more productive) plots further away. Likewise, civic-ceremonial infrastructure was remodeled and built on top of existing earlier architecture, as in the case of Architectural Group 4 (Huaca Soledad), a well-known Moche architectural building. A similar scenario could be hypothesized for other architectural groups to the north of the river. This stability observed in the permanence of some districts through long periods of time may be an indication of “persistent places”, places associated with long-lived use (Thompson and Pluckhan 2012). A similar case was found by Nicholas (1989) for Oaxaca when she tested

Boserup's (1965) hypothesis, arriving at the conclusion that there is no correlation between large centers and the environment (agricultural resources) in the Valley of Oaxaca. Large centers seem to have had an important effect on the placement of smaller sites, while environmental conditions had little influence in the location of settlements.

As Monica Smith mentions, cities are internally coherent population centers with internally driven trajectories, where the urban form attracts a large variety of inhabitants as they seek to build economic and social networks for themselves; these networks are created and maintained at the household and neighborhood levels, illustrating how and why cities can exist before the development of states and how they survive when these political systems collapse (M. L. Smith 2006:98). The stability seen in Districts A, B, C and D could attest to the importance of such social networks. Further, social groups represented by these districts seem to have survived much longer than state-level political organization, such as the Moche and Sican states and the Chimú empire.

5.4 DISCUSSION

The Sicán's city layout - with scattered monuments and numerous dispersed residential mounds, each at the center of a residential cluster of population - more closely resembles the sprawling layout of a "low density" or garden city studied in the Maya area or in Southeast Asia with their dispersed mound/patio/plaza groups spreading over several square kilometers (Isendahl and Smith 2012). The basic organizational model of such cities is a civic-ceremonial core with elite residences and regal and public functions, surrounded by an extensive, low density urban sprawl with clustering around subsidiary civic complexes or higher-ranking households. The Sicán monumental core or Pyramid Complex itself was never densely populated. Instead, the population lived in the "suburbs" or districts.

During Sicán times (and throughout almost the whole social sequence), the Sican city was a **multi-centric** city. It was a rather dispersed city, composed of several separate districts. Each district had its own smaller civic-ceremonial centers (as seen in the Architectural Groups formed by huacas or huaca groups), and there was no occupation or a thin spread of occupation between the districts. These features are very unusual for an Andean city; most Andean cities are compact and centralized. There is only one point in the whole social trajectory in which the occupation is centralized, the Moche period, with its center at Huaca Soledad.

There are obvious implications for the structure of Sicán political rule, as a non-centralized polity. The evidence may point to a segmentary or factional political organization. It is also important to note that those different districts survived for a very long time, even though they seem to rise and fall somewhat in importance. We are probably talking about very long-lived social groups. There are implications here for the long-term persistence or survival of (elite?) social groups – i.e., they seem to last much longer than the rise and fall of political regimes.

Demographic estimates (Sican period) for the Sican city average a total of 26,225 people, greatly surpassing the amount of people needed to build those civic-ceremonial monuments. As discussed in Chapter 4, buildings in Greater Sican would have required 1,961 persons per year (assuming 240 work-days in a year). Buildings in the Sican Core would have required 1,922 persons per year (assuming 240 work-days in a year). It seems feasible that local people from each district would have provided the labor needed for the construction of each Architectural

Group. In the case of the Sicán Core, particularly the Pyramid Complex where little resident population was found, laborers from different districts would be needed to accomplish the construction of the monuments.

6.0 SOCIOECONOMIC ORGANIZATION AND DIFFERENTIATION IN THE SICÁN CITY

Socioeconomic organization and differentiation can be addressed in different ways. Socioeconomic inequalities in Sicán are widely known, particularly from the differential treatment of individuals at death through the placing of valuable goods in their graves, including the impressive elite tombs at the elite cemetery of Huaca Loro. Such valuable goods included gold masks, gold gloves, keros, earspools, and fine ceramics, among others (Cervantes Quequezana 2018b; Matsumoto 2014b; Shimada 1995; Shimada et al. 2004, 2015).

Shimada and colleagues have proposed the existence of a highly hierarchical social structure subdivided into four segments, with the presence of politico-religious elites located in the first two segments (Shimada 2014a, Shimada et al. 2004). This classification was done based on iconography and the variability of funerary treatment of contexts excavated at Sicán, Huaca Sialupe and Huaca El Pueblo de Batán Grande (Shimada 2014a: 48; Shimada et al. 2015). Copper-arsenic alloy objects are found in commoner tombs. The lower elites or Segment 2 had access to arsenical copper and silver and the high elites or Segment 1 had access to all previous metals plus high karat golden alloys (Shimada 2014a). Segment 1 is represented by the famous tombs of the Lords of Sicán found in Huaca Loro (Klaus et al 2014; Matsumoto 2014b; Shimada 1995, 2000, 2014a; Shimada y Montenegro 1993; Shimada et al. 2004, 2015).

Lately, I have argued for the importance of women in political power in Sicán as studied through high elite funerary practices (Cervantes Quequezana i.p., 2018b). I argue that there is an assemblage of ‘power objects’ (independent from the metal alloy) worn by the Sicán rulers, including not only the men from the Huaca Loro tombs, but also the woman from the Huaca Las Ventanas royal tomb. Power acquisition seems to have had different trajectories among genders.

Given that interpretations about the social organization of Sicán are based mainly on the study of ritual and funerary practices, in this chapter I provide information about residential socioeconomic patterns using the density and spatial distribution of ceramics, metals, Spondylus shell, and lithics recovered from surface survey units.

The present chapter analyzes the patterns of socioeconomic organization and distribution within the Sicán city. This chapter seeks to answer my third research question: **What socioeconomic differentiation (in terms of wealth/status, stylistic preferences, and economic activities) was present among site residents during the Sicán Period?**

This question addresses the city criteria of Internal Specialization outlined in Chapter 1. According to Smith, internal specialization criteria meet Childe's list of ten abstract criteria deducible from archaeologically recovered material (Childe 1950:9). Most of these criteria are met in terms of internal social differentiation. Social differentiation refers to how different or heterogeneous people are in terms of their wealth, authority, ethnicity, and economic occupations (Hutson 2016:11).

To answer these questions, first I focus on the Sicán ceramic assemblage, and second on the socioeconomic status/wealth aspect. Third, I focus on evidence of economic activities in the research area such as craft production of ceramics and metals. Fourth I describe the lithic assemblage, and finally I provide a discussion.

6.1 THE SICÁN CERAMIC ASSEMBLAGE

The sample of ceramics used for this analysis consists only of diagnostic ceramics (rims and decorated sherds); for a detailed explanation see Chapter 3. The Sicán ceramic assemblage consisted of a total of 12,793 sherds recovered in the survey, and is the largest analyzed diagnostic Sicán ceramic sample to date. The ceramic assemblage includes all 3 sub-periods.

We can see important differences in the Sicán assemblage. Differential involvement in activities related to food may appear in significant proportional differences in vessel forms. Household contexts include activities of food processing, preparation, storage and consumption. Sherds from utilitarian ollas, cantaros, platos, tazones, graters and storage vessels made up the bulk of household refuse. The Sicán ceramic assemblage consists of the following vessel forms:

Table 11. Table showing the Sican ceramic assemblage.

Sican Assemblage		
	#	%
Olla	1455	11.37
Cantaro	2034	15.90
Plato	3705	28.96
Tazon	96	0.75
Botella	254	1.99
Tinaja	2450	19.15
Rallador	112	0.88
Otros	2682	20.96
Total	12793	100

Ollas (pots) are used for food production. Ollas represent 11% of sherds in the Sicán Assemblage.

Cantaros (jars) are used for water transportation, serving and storage. Cantaros represent 15%.

Platos (plates) are used for serving food, particularly dry foods. Platos represent 28%.

Tazones (bowls) are also used for serving food, particularly wet foods or stews. Tazones represent 0.7%. A preferred material for similar use is gourds, which have been found in funerary contexts of the same period, containing food remains (Cutright 2007).

Botellas (bottles) are used to contain special beverages like chicha and are usually charged with religious/ritual iconography. We can conclude their use is mostly ritual, since most of them have been found in funerary contexts and ritual cache offerings. Botellas represent 1.9% of the Sicán ceramic assemblage.

Tinajas are used for the storage of water and grains. Tinajas correspond well with Cobo's (1990[1653]) description of colonial storage practices, in which food staples were stored inside the house in large jars or alcoves, or outside in bins. Their presence might be interpreted as implying a special focus on beverage (*Chicha*?) production and consumption. Tinajas represent 19% of the ceramic assemblage.

Ralladores (graters) are used to process foods, particularly grains such as maize, in order to prepare chicha or stews. Ralladores amount to 0.8% of the assemblage.

Otros (others) encompass a long list of varied identified objects that do not belong to the main types or belong to unidentified objects. They add up to 20% of the assemblage.

Artifact assemblages reveal whether there are differences between those living in the different Districts in the city. According to the demographic analysis performed in Chapter 5, a total of eight districts were identified during the Sicán period, Districts A-H. None of them include the Pyramid Complex.

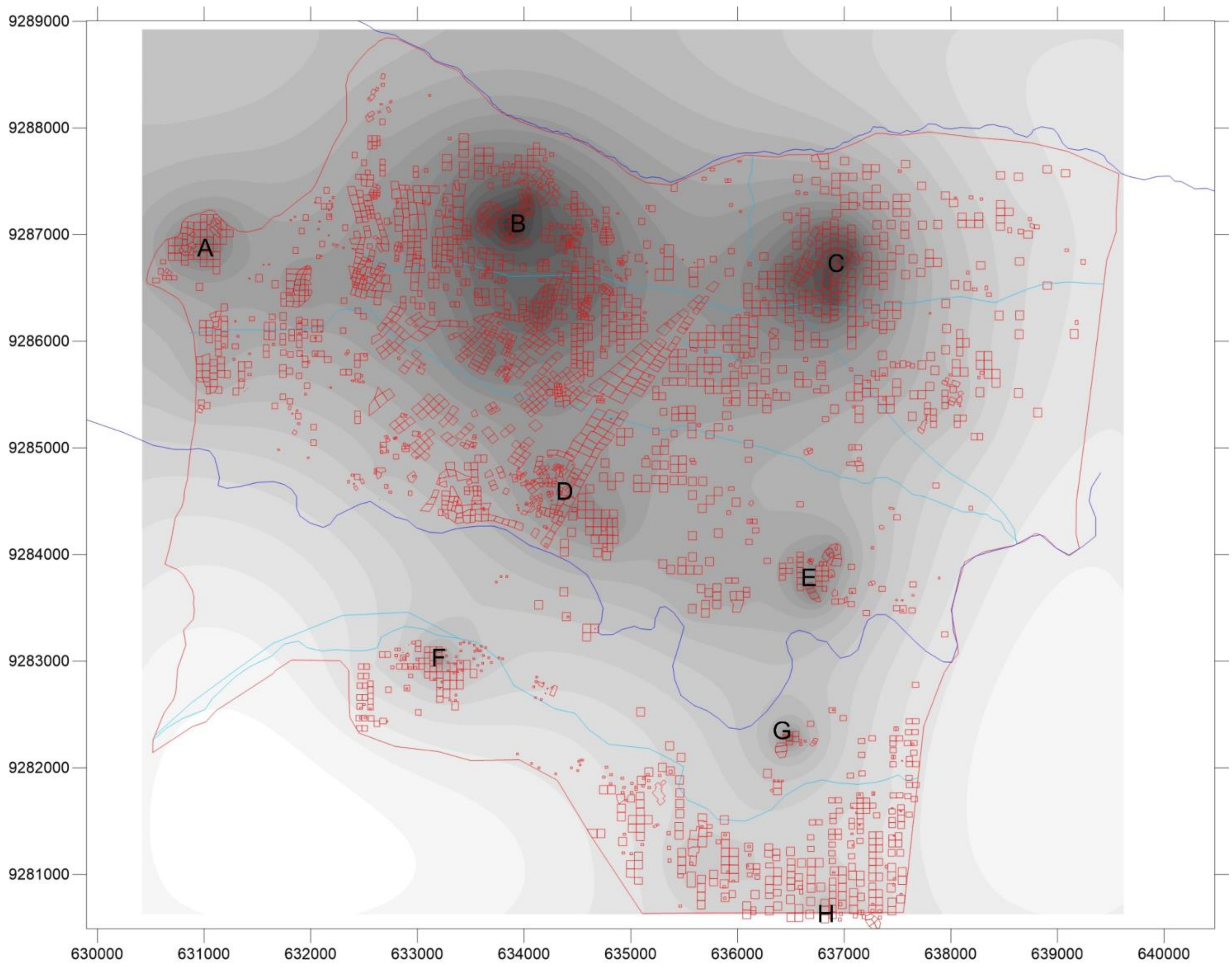


Figure 21. Demographic districts for the Sican period and location of all collection lots as reference.

For this section I have considered only ceramics from collection lots that could be associated with the demographic districts. After eliminating the collection lots not belonging to any district, there is a total of 7,473 diagnostic Sicán sherds that were analyzed. In this section I will discuss the Sicán Assemblage in relation to food production, consumption and storage. Other activities will be addressed in the following sections.

The **Cooking** category includes Ollas and Ralladores.

The **Serving** category includes Platos and Tazones.

The **Storage** category includes Tinajas.

Cantaro remains as a separate category since it encompasses both storage and serving of liquids.

Table 12. Table showing the Sican ceramic assemblage per district.

	A		B		C		D		E		F		G		H		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Cooking	35	10.97	547	15.29	213	20.84	186	14.25	48	19.12	107	15.35	27	15.98	27	20.45	1190	15.92
Cantaro	82	25.71	704	19.68	235	22.99	232	17.78	64	25.50	107	15.35	31	18.34	45	34.09	1500	20.07
Serving	135	42.32	1277	35.69	276	27.01	682	52.26	79	31.47	366	52.51	78	46.15	22	16.67	2915	39.01
Storage	67	21	1050	29.35	298	29.16	205	15.71	60	23.90	117	16.79	33	19.53	38	28.79	1868	25.00
Total	319	100	3578	100	1022	100	1305	100	251	100	697	100	169	100	132	100	7473	100

Table 12 and Figure 22 show each District and the activities that were associated with them, based on vessel form. District A has a very high percentage of Cantaros (25%) and Serving ceramics (42%), both used in serving liquids and food. District B, the largest demographic district, has a high percentage of Storage vessels (29%). District C, the second largest demographic district, has high percentages of Cooking (20%), Cantaros (22%), and Storage (29%) vessels, meaning that food production, serving liquids and storage were important aspects in the everyday life of its residents. This is the only district where all food production activities related to cooking are above the mean. District D has a very high percentage of Serving vessels (52%), highlighting the involvement of its residents in serving and commensality activities. District E has a high percentage of Cooking vessels (19%) and Cantaros (25%) highlighting its involvement in food production and the storage and serving of liquids. District F has a high percentage of Serving vessels (52%), stressing the importance in food serving activities, as does District G (with 46%). Finally, District H has a high percentage of Cooking vessels (20%), Cantaros (34%) and Storage vessels (28%) highlighting the importance of food production and storage. These results show a high diversity in activities of food production, consumption and storage among all districts. Districts B and H are the only ones involved in all food production phases.

When comparing activities across districts, a clearer pattern can be seen. In terms of cooking, Districts C, E and H produced more food as a proportion of their activities. District H produced more cantaros, needed for liquid serving and storage. This might be due to the larger distance to water resources of this district when compared to others. Districts B, C and H were more involved in storage. Serving is the most diverse activity among districts. District D and F highlight their great involvement in serving food and commensality activities.

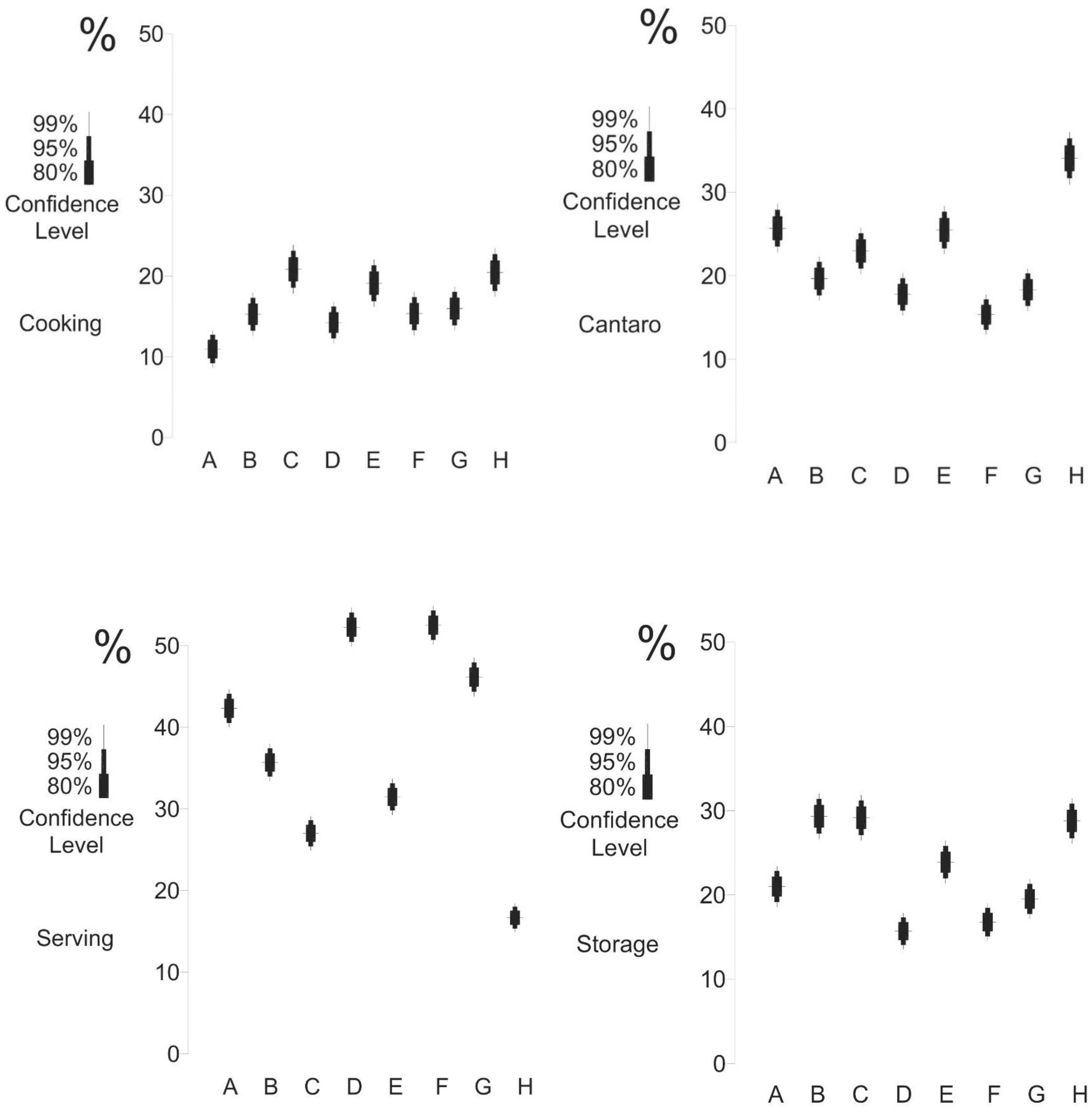


Figure 22. Sican food production activities: Cooking, Liquid use, Serving and Storage among the eight districts identified for the Sican period at 80%, 95%, 99% Confidence Level.

Overall the food related activities developed in each demographic district are very varied. We do not see a consistent profile of activities repeated across districts; on the contrary, the patterns support diversity in activities. I want to highlight District D and its involvement in serving activities (52%). This is very important since it is the District that is closest to the Pyramid Complex, where ceremonial activities have been registered accompanied by large feasts. By contrast, cooking activities in this district were very low (14%), suggesting that food preparation took place elsewhere (other districts) and was brought to be consumed here.

6.2 SOCIOECONOMIC STATUS AND WEALTH

6.2.1 Residences: Mound vs. Non-mound

Residential housing was documented for the first time in the research area in this study. Residences consisted of mounds and non-mound areas identified throughout the whole research area. Residential mounds are generally small and low, with domestic refuse on top (see Chapter 4). Separate from mound residences, there are also discrete concentrations of domestic ceramics that have been inferred to be non-mound (wattle and daub) residences. There are a total of 174 residential mounds with Sicán occupation, but for the purpose of this analysis I am using the Sicán single-occupation mounds, which total 132. There are a total of 176 discrete concentrations of domestic refuse interpreted as non-mound residences. This means that most of the Sicán population lived off of mounds, presumably in wattle and daub houses.

I propose that mound residences were occupied by individuals with better means, or elites; and non-mound residences were occupied by commoners. Based on construction materials and labor input, mound houses (made from adobe) are costlier than wattle and daub houses. In addition, the consumption of finewares (fine paste, thin vessel walls, polished surface) differs between mound and non-mound residences. People living on mounds consumed 12.53% of finewares compared to 10.31% consumed by people living on non-mound houses. The distribution of high-status mound residences follows the pattern common to low-density cities, in which elite households are scattered throughout the settlement.

Table 13. Table showing counts and proportions of fineware vs. utilitarian ceramics for mound and non-mound residences.

Mounds

utilitarian		fineware		total
#	%	#	%	#
2,010.00	**87.46**	**288**	**12.53**	**2298**

Non Mounds

utilitarian		fineware		total
#	%	#	%	#
1,226.00	**89.68**	**141**	**10.31**	**1367**

6.2.2 Fineware Consumption among Districts

To evaluate wealth/status among assemblages, I focus on proportions of finewares vs. utilitarian ceramics, since decorated pottery *paleteada* is quite common during Sicán**.** In general, the Sicán Ceramic Assemblage presents an average of 12.9% of finewares (fine paste, thin vessel walls, high temperature firing, for example in bottles), whereas an average of around 87% of sherds belongs to utilitarian ceramics. This pattern tends to be within the expected for ceramic assemblages elsewhere.

When finewares are compared among districts, we can see that in most cases districts have an average of 8% of finewares in their ceramic assemblage. District B has a high percentage with 11%, and District G the lowest with 5%. District D stands out from the rest with 24.6% of finewares in the assemblage, twice the mean. Based on the comparison of finewares among the districts in Sicán, District D is clearly the wealthiest and the one with the highest status.

Table 14. Table showing counts and proportions of fineware vs. utilitarian ceramics for each demographic district.

DISTRICT$(rows) by FINEWARE$(columns)	utilitarian	fineware	Total
A	338	30	368
B	4,235	542	4,777
C	1,254	99	1,353
D	1,358	444	1,802
E	269	27	296
F	742	68	810
G	230	14	244
H	154	14	168
Total	**8,580**	**1,238**	**9,818**

DISTRICT$(rows) by FINEWARE$(columns)	utilitarian	fineware	Total	N
A	91.848	8.152	100.000	368.000
B	88.654	11.346	100.000	4,777.000
C	92.683	7.317	100.000	1,353.000
D	75.361	24.639	100.000	1,802.000
E	90.878	9.122	100.000	296.000
F	91.605	8.395	100.000	810.000
G	94.262	5.738	100.000	244.000
H	91.667	8.333	100.000	168.000
Total	**87.391**	**12.609**	**100.000**	
N	**8,580.000**	**1,238.000**		**9,818.000**

6.2.3 Metal Consumption among Districts

Copper was more widely available in the prehispanic Andes than gold or silver, but access to metal objects was still likely related to socioeconomic status. Sicán metal objects have been extensively studied (Alva 1986; Carcedo 1989; Shimada 1994b; Carcedo and Shimada 1985;

Pedersen 1976; Shimada and Montenegro 1993; Shimada et al. 2000; Tello 1937; Valcarcel 1937; Zevallos 1989).

Most metal objects recovered (in the Purposive Collections) have a distinct green oxidation produced by copper or copper-alloy oxidation, though specialized analysis is still needed for the identification of compositional analysis of each metal object found.

The distribution of all metal objects found is shown in **Fig. 23.** While metal objects cannot be assigned a chronological period with certainty, it is likely that metals and metal production dates mostly to Sicán (or Sicán and Chimú) given the known high scale of metal production known for those periods.

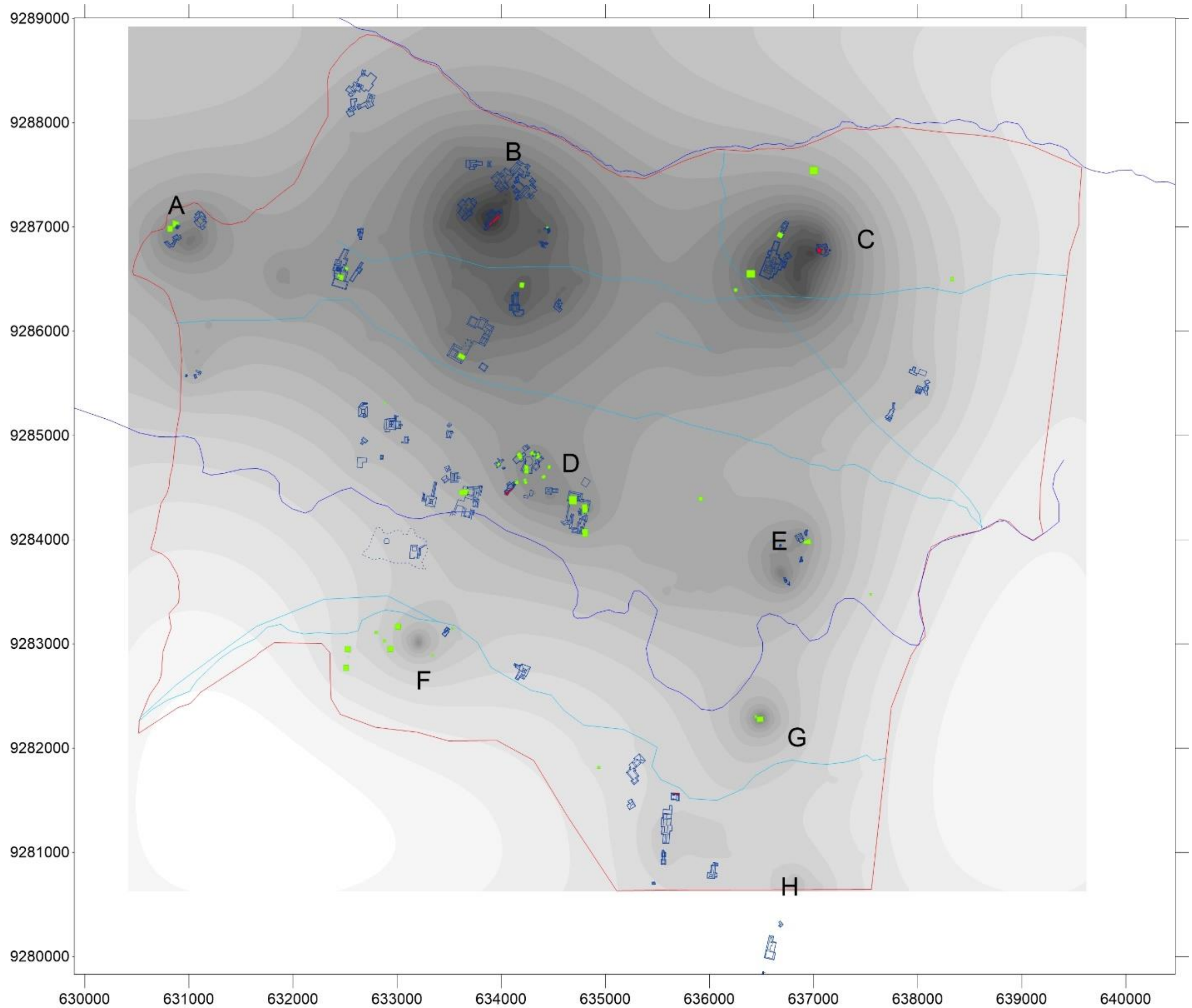


Figure 23. Map showing the collection lots with presence of metal objects.

One could assume that metal consumption would be evenly distributed among the population, but as seen in **Table 15,** [1] District D, even though it has a small population, is the one that consumes the most metal objects (22.43% of all metal objects) when compared to all other districts. District D has a ratio of 112 metal objects per 100 sherds. This is remarkable: it means that we actually collected more metals than sherds (using sherd collection methods for demographic purposes). District D clearly stands out for its high metal consumption. Districts C, F, and G also consume high amounts of metal objects, whereas Districts A, B and H have low to no metal consumption. District B is the largest in population, but its inhabitants didn't consume much metal when compared with other districts. A total of 26.46%, or a ratio of 68 metal objects per 100 sherds, were not found within any demographic district.

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[1] The number and percentage of Sicán sherds used for the ratios of different kinds of materials per 100 sherds are based on Sicán sherds obtained for demographic purposes (see Chapter 3).

Table 15. Table showing counts, proportions and 1:100 ratio of metal objects vs. Sican sherds per district.

	Metal Objects		Sican Sherds		Metal per 100 Sherds
	#	%	#	%	
A	39	1.76	656	10.51	5.9
B	239	10.81	1888	30.24	12.7
C	347	15.69	1071	17.15	32.4
D	496	22.43	442	7.07	112.2
E	54	2.44	461	7.38	11.7
F	348	15.74	507	8.12	68.6
G	103	4.66	213	3.41	48.4
H	0	0	150	2.40	0.0
no district	585	26.46	858	13.74	68.2
	2211	100	6244	100	35.4

Overall, metal consumption was performed in the whole research area except for District H. This means that the Sicán population had widespread access to metal objects, with District D as the highest consumers. Most of the metal objects were pieces of sheet metal that presumably formed some kind of larger object, but were mostly found as fragments. A few exceptions are worth mentioning: 3 tumis or ceremonial knives, 1 metal ingot, and needles **(Figure 24)**.

Figure 24. Examples of metal objects found in the city: (a, b, d) tumi, (c) needle.

6.2.4 Consumption of Exotic Materials among Districts

For this section, exotic materials are considered to include *Spondylus princeps* and beads. Both were registered following the Purposive Collection strategy. *Spondylus princeps* is a bivalve shell that grows on the coast of Ecuador; it has a long history as a precious object throughout the Andean social trajectory, and Sicán was no exception. Although Spondylus is associated with elite consumption, its production seems to have been in the hands of non-elites. Increased traffic for

Sicán elite consumption presented the opportunity for households in Machalilla (Ecuador) to become involved in Spondylus craft production for the benefit of the domestic economy (Martin 2010). *Spondylus* shell was found in different forms in this survey (complete shells and fragments). Spondylus was found in several areas, and in all demographic districts, except for District F**.**

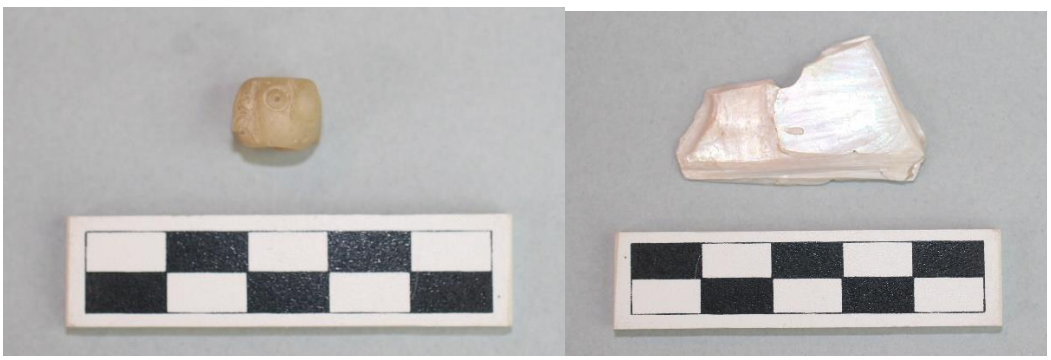


Figure 25. Examples of bead objects found in the city.

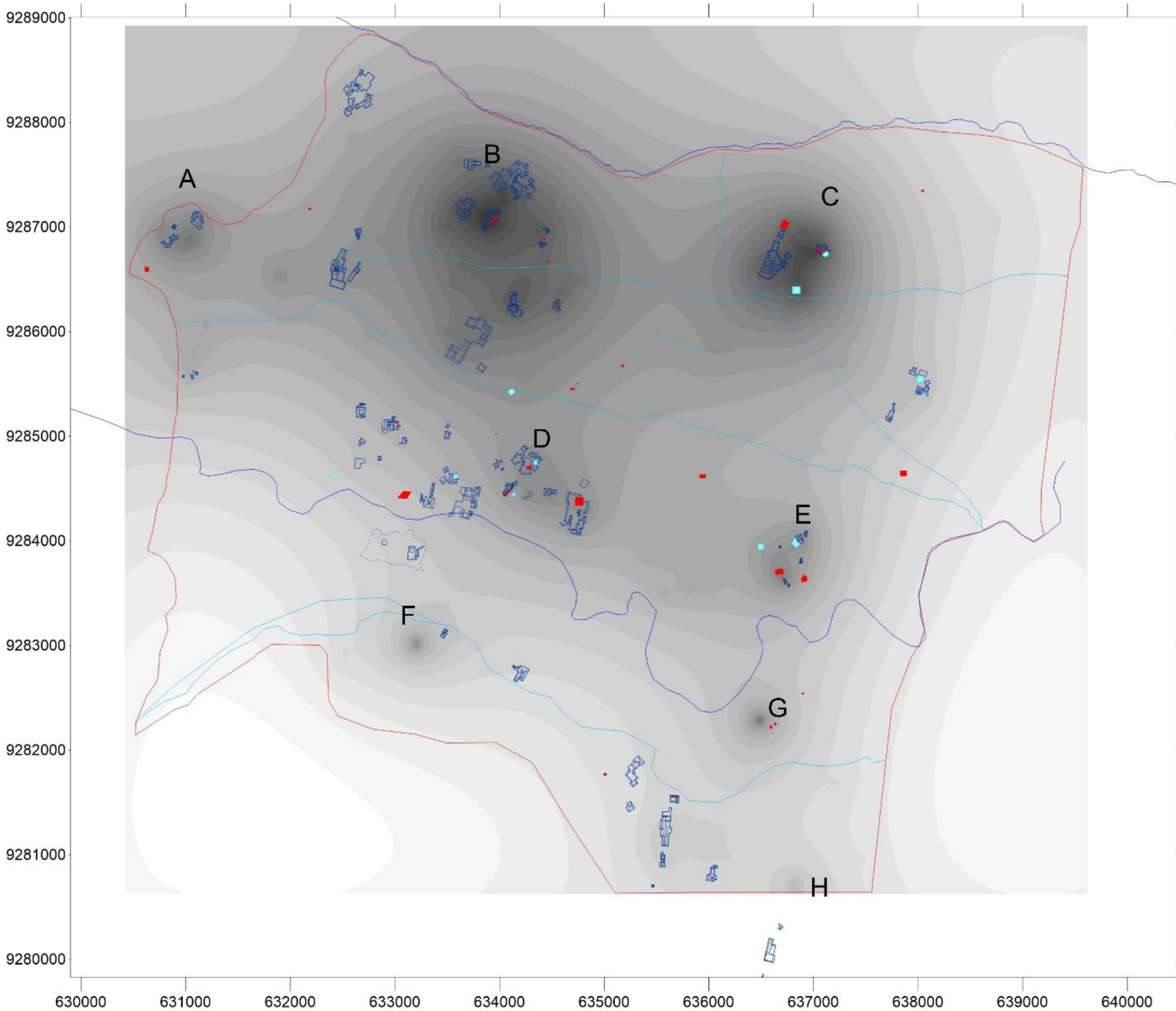


Figure 26. Map showing the collection lots with presence of *Spondyllus* (red) and bead objects (light blue).

Beads were made from different materials, including colorful stones marine shell. A total of 36 beads were registered **(Table 16)**. Beads were found in all districts except for Districts F and H. Districts D and F present important bead/*Spondylus* consumption. However, District G is the district that has the highest consumption of these exotic materials. Both *Spondylus* shells and beads were found in small quantities in the Pyramid Complex. This makes a lot of sense, since we know of the presence of extremely rich tombs and ceremonial caches in that area. It is plausible that elites from these Districts were differentially and independently involved in the exchange to obtain foreign materials. However, just as in the case of metal objects, these exotic materials were also found outside of the demographic districts. Evidence for bead production and/or standardization was not found in the survey. It is plausible that bead production was performed independently in a decentralized manner.

Table 16. Table showing counts, proportions and 1:100 ratio of beads/*Spondyllus* objects vs. Sican sherds per district.

	Bead/Spondyllus		Sican Sherds		Bead/Spondyllus per 100 Sherds
	#	%	#	%	
A	1	2.8	656	10.51	0.15
B	8	22.2	1888	30.24	0.42
C	4	11.1	1071	17.15	0.37
D	4	11.1	442	7.07	0.90
E	5	13.9	461	7.38	1.08
F	0	0.0	507	8.12	0.00
G	3	8.3	213	3.41	1.41
H	0	0.0	150	2.40	0.00
no district	11	30.6	858	13.74	1.28
	36	100.0	6244	100	0.58

Special objects such as figurines can also indicate an exceptional use such as ritual purposes. A feminine figurine presenting Sican style features was found in the northern part of the research area, not belonging to any Demographic District. It is included here due to its rarity and as an example that more rural households (not in districts) also had access to special objects. This object in particular seems to have been produced by a rural household for their own private rituals.

Figure 27. Feminine figurine made of ceramics. Drawing by Hugo Ikehara.

To summarize, socioeconomic status and wealth for Sicán differed both between residence types and also between districts. Mound residences probably belonged to elites, and are interspersed throughout the research area. To compare status and wealth between districts, 3 different variables are used in this section. The first variable is fineware consumption, where District D clearly stands out as the highest consumer. The second variable is metal consumption, with District D as the highest metal consumer. The third and final variable is exotic materials consumption. In this case beads and *Spondylus* are found in almost all districts, with District G as the highest consumer of these goods. Sumptuary objects such as metals and beads/ *Spondylus* are found across almost all of the city, meaning that most people had access to these objects, but at different levels. District D stands out as an elite district on the basis of fineware and metal objects consumption.

6.3 CRAFT PRODUCTION

Economic activities can be studied through craft production (Costin 1991, Costin and Earle 1989). Hirth (1993) argues that elite households would be more likely to engage in or diversify household craft production. Households located next to each other may have participated in the same craft production activity (Hutson 2016:90). In the Andes, craft-based social intermediate units have been identified in Tiwanaku (Janusek 2002) and Huacas de Moche (Uceda y Armas 1998).

This forms a second line of investigation for Sicán: exploring the distribution of economic activities across the site at the district level. Inter-assemblage comparison revealing relatively higher proportions of items related to staple production or craft production allows us to assess: (a) the characteristics of district craft specialization; and (b) the production context (residential, non-residential) of activities such as metal working or pottery production. A particular goal is assessing the involvement of elites in ritual practices and craft production. The aim is to see how this multi-centric city distributed its economic activities.

6.3.1 Ceramic Production

In the following paragraphs I will present an overview of the ceramic technology according to the production sequence described by Rye (1981).

Raw materials and clay acquisition: There is no reported archaeological clay source for Sicán, but ethnoarchaeological studies reveal that most potters use banks of alluvial clay along the river. Some modern potters use clay banks within their agricultural property which can be up to 2 hours driving time from their homes/workshops. Archaeological ceramics present added temper which is in most cases fine river sand. In the case of larger vessels like storage jars, ground local black stone is used. In addition, in a few cases ground shell is used in the fabric as temper.

Ceramic forming techniques: There are two major techniques for ceramic formation: paddle-and-anvil and mold made ceramic. The paddle-and-anvil technology pre-dates the Sicán culture, perhaps originating at the beginning of the first millennium B.C. The types of ceramics made by this technique are mostly domestic ceramics like pots, jars and large vessels for storage and chicha (maize beer) production. The addition of designs to the paddles, however, can be traced back to the beginning of the Middle Sicán period. This technology is still practiced by traditional potters today (Cleland and Shimada 1998).

Most reliable information about mold made ceramics comes from the Huaca Sialupe workshop. The central sector of the workshop included rooms for the forming, finishing and perhaps drying and storage of ceramic vessels; cutting, shaping and assembly of small metal objects; and making of molds for appliqué and other small decorations. Forming vessels was done by preparing different parts of the vessels separately, especially for bottles (body, spout, handle, appliqués, etc), and later joining them together (Shimada and Wagner 2001, 2007).

This characterization was based on the differential distribution of diverse ceramic production and metalworking debris and tools, including prepared clay lumps, potter's plates, scraper-shapers (made of sherds), unfired vessels, "models" or "positives" (from which multiple molds are made) and fragmentary molds (Shimada and Wagner 2007). Besides the major techniques described above, finger modeling and pinching techniques were used to produce small size vessels. Miniature vessels made by the pinching technique have been found in high numbers in elite funerary contexts as ritual offerings (Cervantes Quequezana 2010).

Surface treatment and decoration: Domestic or utilitarian vessels sometimes present white paint on the neck. Paddle and anvil ceramics present decoration applied through decorated carved paddles, mostly consisting of geometric motifs (lines, zig-zag, squares, diamonds, and triangles). Figurative decoration is less frequent, but also present in the form of zoomorphic and anthropological figures. In the case of very large storage vessels, some decorations, like circle motifs, are done by cane impressions in the upper section of the vessel. Mold made ceramics present careful and time-consuming polishing over the entire vessel´s surface. The mold made ceramics also have three-dimensional or sculptural decoration, such as anthropomorphic and zoomorphic figures. There is also impressed molded decoration that can be geometrical or figurative. In general, fine and time-consuming surface treatments are associated with fine mold made ceramics like bottles, and little or no time-consuming surface treatments are associated with domestic paddle and anvil vessels.

Firing: Domestic vessels were possibly fired in open areas. There is no archaeological evidence of open-air kilns so far, but the red color of the fired vessels and the large size of them probably indicate open-air firing. Also, ethnoarchaeological work on the production of modern domestic paddle and anvil ceramics reveal that these vessels are fired in open air kilns (Cleland and Shimada 1994, 1998; Shimada 1994d, 1997).

Fine ceramics like bottles and figurines usually have a fine black finish from well-controlled reduction firing. Though reduction-fired gray and black ceramics appeared at different times starting as early as the Early Horizon, uniformly black vessels were generally not produced in large numbers until Middle Sicán times. Sicán black pottery was achieved by using levigated, fine clay, thoroughly burnishing the surface, and firing it at a temperature over 900°C under reducing conditions created by sealing a relatively small (100-150 m long, 50-70 cm wide, and 30-40 cm high) kiln with incurving walls. When pottery is fired for at least one hour at a temperature of 900°C or higher, carbon from thick smoke generated by organic fuel such as "green" firewood not only penetrates pottery's surface to a depth of a few millimeters, but also forms layers of graphite crystals on the surface, resulting in a shiny and truly black finish (Shimada and Wagner 2007).

The widespread and distribution of blackware ceramics along the Peruvian North Coast can be explained by the expansion of the Sicán state and its ritual ideology (Shimada 2000, 2014a).

Fuels: Different materials might have been used as fuel for firing ceramics, but the most common fuel used both in the past and present is the wood of *algarrobo* (Prosopis pallida), a resin-rich tree abundant in the Dry Forest environment. A paleoethnobotanical study of fuel remains from ceramic kilns and metalworking furnaces by David J. Goldstein (Goldstein 2007; Goldstein and Shimada 2007) revealed an important, unexpected form of multi-craft interaction. Unconsumed fuel found inside excavated ceramic kilns was pure *algarrobo* wood, while in metalworking furnaces there was found a mixture of hardwood charcoal and refuse or low-quality fuel (e.g., maize cobs, canes, and twigs), suggesting that in Sicán times charcoal from ceramic kilns was recycled for use in metalworking furnaces.

To assess inter-district differences in economic activities, it would be ideal to compare residential loci in each demographic district in terms of proportions of craft production items, such as ceramic wasters and molds for pottery production, and slag for metal production (Shimada and Craig 2013; Tschauner 2001). Unfortunately, the survey collected only a small sample of ceramic craft production tools, so they are discussed here in terms of presence and absence, not proportion. There are important things that can be highlighted, nonetheless.

Figure 28. Examples of ceramic craft production objects found in the city: (a,b,c) paddles,(d) polisher,(e,f) molds.

Tools found related to ceramic craft production include**:**

Moldes (molds), used in the production of fine ceramics, particularly bottles, are well-known for Sicán. Molds are found in Districts B, C, D, F and G and areas outside demographic districts. This means that these districts were involved to some extent in fine ceramic production, either for local consumption or to be sent to the Pyramidal Complex when ritual/religious activities demanded such vessels. Fine ceramic production was not restricted to a single district; on the contrary, this decentralized pattern supports an interpretation of independent production.

Herramientas (tools): 24 tools used in ceramic production were found. They include polishers and scrapers. Herramientas are found in Districts B and F and outside of the demographic districts. These tools for ceramic manufacture are usually used on an already formed ceramic piece to add surface treatment towards the end of the process. Districts B and F also present molds. District B stands out for presenting more evidence of dedication to fine ceramic production.

Paletas (paddles), used for the production of domestic vessels (pots, jars and large vessels for storage) using the paddle and anvil technique. Only two ceramic paddles were found, in District B and in an area not pertaining to any district. Wooden paddles have been found in archaeological contexts that would not preserve on surface, explaining the small sample found in this study.

Table 17. Table showing counts of ceramic production objects per district.

District	Molde	Herramienta	Paleta
A			
B	22	11	1
C	3		
D	1		
E			
F	3	3	
G	1		
H			
no district	11	10	1
Total	41	24	2

6.3.2 Metal Production

Sicán metallurgical production has no precedent in Andean prehistory, both in terms of scale of production as well as in the variety of technologies used (Bezur 2003, 2014; Carcedo 1989, 1992, 1998, 2009; Epstein and Shimada 1983; Goldstein and Shimada 2007; Gordus and Shimada 1995; Lechtman 1981; Merkel et al. 1994, 1995; Shimada 1994b, c, 1996, 1998; Shimada and Craig 2013; Shimada and Griffin 1994, 2005; Shimada and Merkel 1991; Shimada et al. 1982, 1983, 1999, 2007; Shimada and Wagner 2007). The main metals used were gold, silver and copper. Alloys were frequently produced, including arsenical copper alloy for functional objects and ternary alloys of gold, silver and copper also known as tumbaga for the production of sumptuary goods. Even though metal production objects are not chronologically diagnostic, it makes sense to assume that they mostly belong to the Sicán period.

Oversized *Batanes* for mineral processing and extraction were not found in the survey area. A possible explanation is that they were taken in historic or modern times by families living in the surrounding areas to be re-used. The scarcity of large flat stones in the area would cause *Batanes* to be curated and moved. Mineral in large quantities was extracted in the mines of Cerro Los Cementerios some 20km to the east, where *Batane*s and evidence for smelting have been found. Primary smelting (the process to acquire metal from the mineral ore) has been documented in Cerro Los Cementerios (Shimada and Craig 2013; Shimada et al. 2007) and the Pampa de Chaparri (Hayashida et al. 2013).

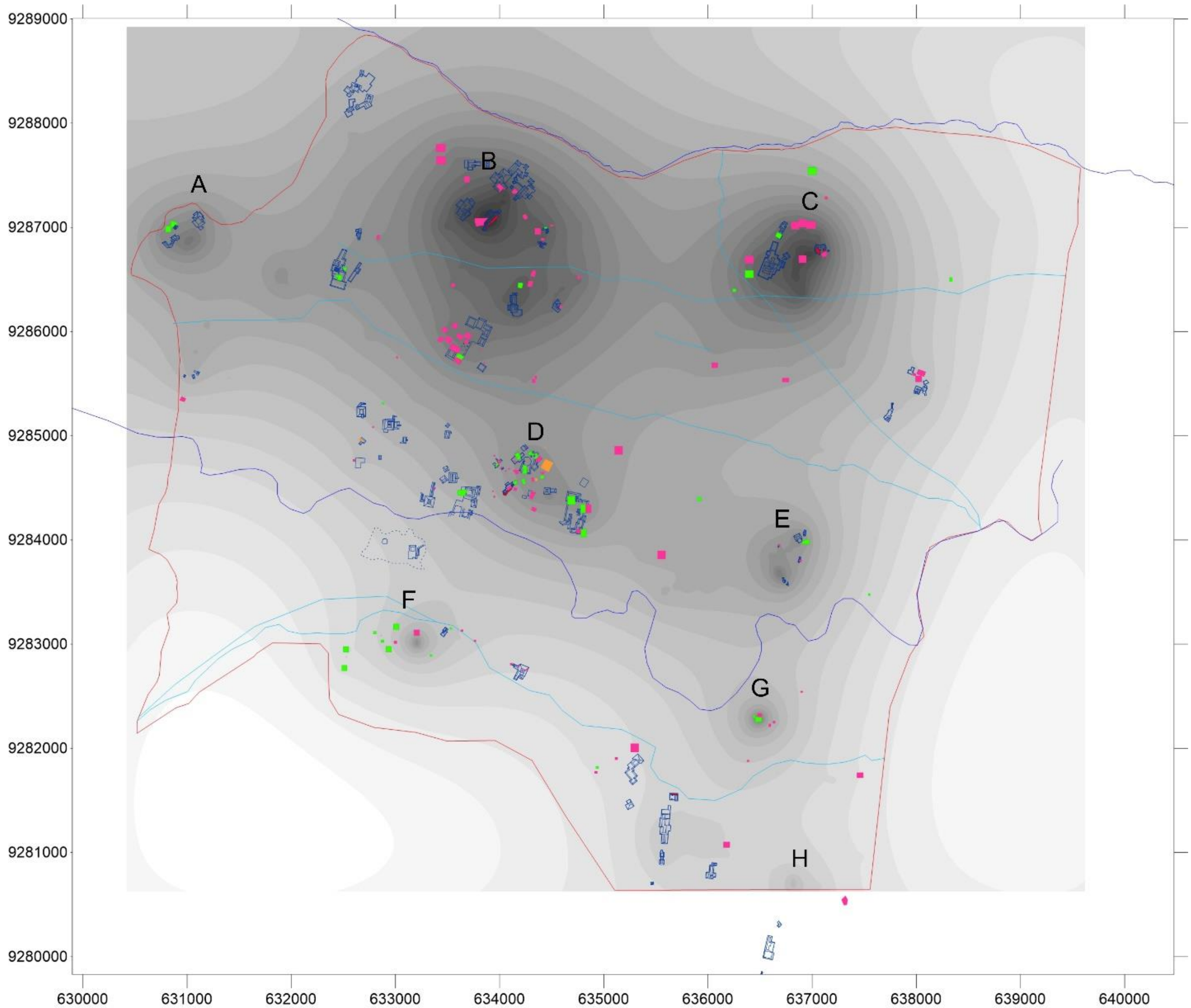


Figure 29. Map showing collection lots with presence of metals (green), expedient crucibles (pink) and mineral (orange).

My research found that metal craft production took place in different parts of the city. Tools found related to metal craft production are:

Crisoles expeditos (expedient crucibles with metal slag) used in the smelting or reheating of metals. These metal production wasters were abundant in the survey. They consist mostly of metal slag adhering into fragmented ceramic containers. Unlike regular crucibles used for smelting, which have an open shape and thick walls, present evidence of high temperature exposure and have slag in the interiors, expedient crucibles are mostly ordinary plates that were given a secondary use in metal work. They do not present the physical characteristics of crucibles, and they seemed to have been for one-time use-and-discard for reheating metals and producing different objects.

Toberas (blowing pipes). Toberas were extensively used in the north coast for metal production. They are made of ceramics and have different sizes and widths according to the specific aspects of metal production. A long cane is secured to a tobera, so that on one end a person can blow air; on the other end, the air goes through the pipe into a small furnace, allowing smelting. One blowing pipe was recovered in the survey in District B.

To study the **Compositional Analysis** of the metal objects and metal byproducts recovered, 23 samples were sent to the Institute of Archaeometallurgy at University College London, where Dr. John Merkel and his students analyzed them. His analysis included techniques such as X Ray Fluorescence (pXRF). According to Dr. Merkel, the samples represent different production phases in the production of alloys of gold-silver-copper. The basis of the alloys would start with the alloy of copper-arsenic. He concluded that 18 fragments belonged to crucibles and 5 belong to corroded metal and slag.

One special metal object recovered in the research is worthy of attention; it is a metal ingot. **Analysis (SEM-EDS) on the ingot** detected a high level of arsenic (23%) in the ingot. This specimen is unusual, since it presents the highest concentration of arsenic in all samples analyzed from Sicán by previous studies as well as the present study. The ingot seems to be a high arsenic alloy specifically prepared for future alloying processes, maybe to replace the loss of arsenic in the oxidation and re-smelting process (Merkel 2018 in Shimada and Cervantes Quequezana 2018:149-151).

Figure 30. Examples of metal craft production objects found in the city: (a, b, c) expedient crucibles, (d) tobera, (e) ingot, (f) slag.

My hypothesis is that most metal found in the city was transported (in the form of ingots) from the mining center of Cerro Los Cementerios some 20 km east to satisfy the city's great metal consumption. Besides this source, the only mineral source within the city is Huaca El Cerrito in the Platform Complex (in District D).

A total of 115 metal production objects were recorded through the city. Of special note is District D, a small demographic district with a total of 21.74% of all metal production objects recovered in the survey, and a ratio of 5 objects per 100 sherds. In addition to this, District D presents medium to big size rocks of mineral ore (presumably copper). Evidence for stone tools that might have been used in quarrying and crushing ore (mostly expedient knives and hammers) was found next to Huaca El Cerrito as well (see Chapter 4). Residential mounds located near the Huaca were probably the residences of the craftsmen working in that area. District D is the only district that has the raw material (copper ore), metal production objects, and finished metal objects, representing the entire sequence of production and consumption. District B yielded the most metal objects in the city with a total of 33% of the overall total. Its southernmost Architectural Complex, Huaca Arena, appears to be particularly involved in metal production.

Table 18. Table showing counts, proportions and 1:100 ratio of metal production objects vs. Sican sherds per district.

	Metal Production		Sican Sherds		Metal Production per 100 Sherds
	#	%	#	%	
A	0	0.00	656	10.51	0.0
B	38	33.04	1888	30.24	2.0
C	13	11.30	1071	17.15	1.2
D	25	21.74	442	7.07	5.7
E	2	1.74	461	7.38	0.4
F	6	5.22	507	8.12	1.2
G	6	5.22	213	3.41	2.8
H	0	0.00	150	2.40	0.0
no district	25	21.74	858	13.74	2.9
	115	100.00	6244	100	1.8

6.4 THE LITHIC OBJECTS

Lithic objects recovered in the Sicán city amount to a total of 743 objects. The lithic objects recovered, unlike ceramics, can't be confidently classified chronologically. For this analysis, I am treating all recovered lithic objects as though they belong to the Sicán period, which is the period that registered the highest population in the demographic trajectory of the area. Even though that assumption is obviously problematic, I contend that the results are not only a heuristic exercise, but provide some important information, especially when compared with other analyses presented in this chapter.

District B is where most lithic objects were found (29% of the total), and District D (27%) follows in second place, while the rest of the demographic districts present very small amounts of lithic objects. I want to call attention to District D when ratios of lithic objects per 100 sherds are compared among districts. In this case, District D clearly stands out with 45 lithic objects per 100 sherds.

Table 19. Table showing counts, proportions and 1:100 ratio of lithic objects vs. Sican sherds per district.

	Lithic Objects		**Sican Sherds**		**Lithics per 100 Sherds**
	#	**%**	**#**	**%**	
A	14	1.88	656	10.51	2.1
B	221	29.74	1888	30.24	11.7
C	60	8.08	1071	17.15	5.6
D	202	27.19	442	7.07	45.7
E	24	3.23	461	7.38	5.2
F	18	2.42	507	8.12	3.6
G	32	4.31	213	3.41	15.0
H	2	0.27	150	2.40	1.3
no district	170	22.88	858	13.74	19.8
	743	100.00	6244	100	11.9

As with most other materials analyzed, lithic objects were also found in areas not pertaining to demographic districts, or low-populated areas.

The preliminary analysis I present here suggests a wide array of activities developed in different parts of the city. The main categories of lithics are:

Canto rodados: river cobbles.

Raw material

Ground stone objects (polished): These include hammers, manos, and polishers.

Chipped (flaked) stone objects: These include preforms, flakes, blades, knives, and debitage.

Table 20. Main lithic types per district.

Districts	A		B		C		D		E		F		G		H		no district		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
River cobbles	5	35.71	72	32.58	11	18.33	22	10.89	2	8.33	7	38.89	3	9.38	0	0.00	39	22.94	161	21.67
Raw material	0	0.00	4	1.81	2	3.33	21	10.40	0	0.00	3	16.67	0	0.00	0	0.00	7	4.12	37	4.98
Polished	3	21.43	31	14.03	5	8.33	10	4.95	1	4.17	1	5.56	2	6.25	0	0	22	12.94	75	10.09
Chipped stone	6	42.86	114	51.58	42	70	148	73.27	21	87.50	7	38.89	27	84.38	2	100	102	60.00	469	63.12
n/a	0	0.00	0	0	0	0	1	0.50	0	0	0	0.00	0	0	0	0	0	0	1	0.13
Total	14	100	221	100	60	100	202	100	24	100	18	100	32	100	2	100	170	100	743	100

Raw material debris was found mostly in District F. This makes sense since this district is the closest to Cerro Salinas, a natural source of lithic material. The second district is District D, where a natural mineral outcrop was found (see Chapter 4 for details).

Polished or ground stone objects were found mostly in Districts A, B and C, while chipped stone objects were found with higher percentages in Districts D, E and G.

Overall, different types of lithics were found in different parts of the city, meaning that people who lived in varied areas of the city, either in demographic districts or in the low-density inhabited areas outside of districts, had access to various and diverse kinds of lithic objects.

6.5 DISCUSSION

To summarize the evidence about socioeconomic status, we can say that there is a wide variety in the distribution of fineware, metal objects and exotic goods among districts.

District B is the largest district in population, and it is the one producing the most ceramics and metals, basic staples in the Sicán city economy. Yet it is not the one consuming most of those products. Districts C and E are the ones producing more food, presumably to be consumed elsewhere as well. These districts surround a demographic district that is smaller, but very important: District D.

District D is located in a strategic location, central in relation to other districts and the only one with access to a natural mineral outcrop (Huaca Cerrito). This location may have provided this social group with preferential access and control of raw materials for mineral extraction and metal production. There is evidence both for metal production, with high amounts of slag, and the final product, metal objects themselves. Besides the control of metallurgical production, inhabitants of District D also had the highest consumption of finewares and metal objects in the city, which attests to the status and wealth of this social group. Finally, the spatial location of this district, in close proximity to the Pyramid Complex that flourished during the Middle Sicán period, also points to its importance.

I propose that the different social groups represented by the demographic districts identified in my research were elite social groups organized in a segmentary manner. These social groups competed to become the emergent social and economic elites during the Early Sicán period, after the fall of the centralized Moche polity of the valley located in Huaca Soledad. These groups might have started as kinship groups or lineages, but they grew into social groups larger than the immediate kin group. During Middle Sicán, it is the elites of District D who were the ones who acquired more social and economic prestige and power, separating themselves from the other Districts. By Middle Sicán, the elites in District D had differentiated themselves economically, consuming the most sumptuary goods (metals and finewares). Elites in District D also differentiated themselves from others ritually. Ceramic evidence shows that District D elites were highly involved in hosting feasting activities, presumably for religious ceremonies. It is important to note the strategic location of this district, the closest to the Pyramid Complex.

I hypothesize that the source of power and prestige in the Sicán city and the polity may have been the knowledge and control of metal production. In this sense, I contend that the elites of District D were most likely metal production specialists or goldsmiths who became the rulers of the Middle Sicán state. Metal ingots have been found in Middle Sican high elite tombs in Huaca Loro (Cervantes Quequezana 2018). As noted by Shimada and colleagues (Shimada et al. 2004), the Lord of Sicán located in the East Tomb of Huaca Loro presented physical signs of having performed hard physical work with his right arm. Shimada infers it was due to his involvement in metallurgical production: in other words, he may have been a goldsmith.

Overall, the data presented shows that social groups living in the different Districts of the Sicán city enjoyed differential access to wealth objects. The Sicán city had a large middle class, as evidenced by the ample distribution of wealth/status items (finewares, beads, and metals). While households living on mound residences seem to be better off than the ones living in non-mound residences, the latter had important access to wealth and ritual items too.

The districts in Sicán were diverse and varied, producing and consuming different goods. There was no evidence of controlled centralized craft production (production restricted to a single location). It seems more likely that social districts in Sicán enjoyed some freedom in the production and consumption of goods at different levels. This evidence strengthens the idea of a multi-centric city with a segmentary organization, represented in districts involved in diverse activities.

7.0 CONCLUSIONS

The Sicán polity (AD 750 - 1375) developed in the middle La Leche Valley on the north coast of Peru. By the Middle Sicán Period (AD 900-1100), the Sicán city, and the capital of the polity, was formed by the Sicán Core and Greater Sicán. The Sicán Core is formed by the Platform Complex and the Pyramid Complex, comprising several pyramidal mounds and platforms and a central plaza. Greater Sicán surrounds the Sicán Core and is formed by several demographic districts, each with its own civic-ceremonial nucleus.

The principal hypothesis to interpret the Sicán site previous to my research has been that it was an important religious center where feasts, ancestor cult rituals and pilgrimage took place. This hypothesis emphasizes the religious character of the site as a ceremonial center, without a permanent residential population (Matsumoto 2014a,b, 2019; Shimada 1995, 2000, 2014 a,c). Shimada, for example, mentions that he and his crew did not find evidence of extensive residential sectors in the Sicán Precinct, and states that "the Sicán site without a differentiated resident population, offered a series of services usually found in a nuclear city" (Shimada 2014:63). Shimada and his colleagues have inferred that "extensive commoners' residential settlements encircled the perimeter of the capital," and proposed that craft production and construction activities were implemented by workers coming in from residences surrounding the monumental core at a distance of 0.5 to 2.5 km (Shimada et al. 2004:172). However, no evidence was available to reinforce this statement. Likewise, Conlee and colleagues state that Sicán is a "non-state society composed of dispersed ceremonial centers" (Conlee et al. 2004:211). The authors highlight the "lack of residential architecture" (Conlee et al. 2004:212).

Due to the absence of systematic research in and around the Sicán city oriented to the distribution and amount of resident population, empirical evidence was lacking until now to evaluate the hypothesis that considers the Sicán site as mainly a pilgrimage ceremonial center. While Shimada (Shimada 2014c) infers that there was a resident population in the proximities of the core and outside of the capital, the assessment of its quantity and distribution are important to determine the Sicán social organization, the capacity of Sicán elites to mobilize labor in order to build the ceremonial monuments, and the degree of social and economic interrelation between the different urban segments that formed Sicán society.

It is within this context that my research questions were born. My main research question is: What was the urban organization of the Sicán city (AD 750-1375)? This question leads to more specific sub questions: What does the distribution of archaeological remains suggest about architectural urban layout, demography, socioeconomic organization and social trajectories?

As Michael Smith states, there is no single best definition of urbanism nor a singular best approach for analyzing early cities (M. E. Smith 2016: 166). For this dissertation, I use the following working polythetic criteria for the study of the Sicán city: **specialized functions, demography, and social differentiation.** These criteria have been analyzed by several scholars of ancient urbanism and are explained in detail in Chapter 1. Each of these criteria corresponds with one of my research questions.

7.1 ANSWERING THE RESEARCH QUESTIONS

7.1.1 What was the Layout of the City? What was the Distribution of Public-Civic Spaces and Monumental Architecture? (Chapter 4)

This question addresses the city criterion of **specialized functions** regarding a broader hinterland in terms of different kinds of services. Civic-ceremonial architecture was already well known in the Sicán core. Civic-ceremonial architecture in the Greater Sicán was known but had never been mapped or studied before my research.

The Greater Sicán area surrounds the Sicán Core and is formed by several Architectural Complexes formed by large to small mounds that extend widely in all directions. Architectural buildings are made of unfired clay bricks or adobes. A total of 17 Architectural Complexes of different size and shape were registered and mapped in detail. Most monumental architecture consists of complexes of pyramids, platforms and ramps. Most of this architecture corresponds well to Sicán conventions, with Sicán-like architectural features. Each Architectural Complex has a large monumental platform (some of them in a pyramidal shape), most likely for political-religious purposes, an open space or plaza presumably for public activities, an associated cemetery, craft production areas and small residential mounds. These Architectural Complexes form not one but several nuclei.

Analyzing monumental architecture and its relation to labor is done through the examination of energetics. Energetics is the method of quantifying the energy expended in those activities associated with the production, distribution, and consumption of materials (here, architecture) within a cultural system (Abrahams 1994). The main goal of these methods is to reduce subjective assessments of architectural scale or cost for its use in comparative analysis. Results of the energetic analysis for Sicán architecture in Chapter 4 highlight that in total, Greater Sicán volumetric estimates (summed from several buildings) come quite close to the Sicán Core total (fewer buildings). The reason is that buildings in Greater Sicán are more numerous, but lower in height, whereas the pyramids in the Sicán Core are fewer but higher.

Residential occupation consists of small size, low mounds. These mounds are also made of adobe bricks, and have an areal extent between 200 and 400 m^2. A total of 174 Sicán residential mounds were registered. There mounds are interspersed thought the city. In addition to the residential mounds, non-mound residences are indicated by areas of surface ceramics, and may have been made of less durable materials such as wattle and daub that were most likely used by non-elites. Such residences are still in use today in the surroundings of the research area. A total of 176 Sicán non-mound residences were registered. As with the residential mounds, these are interspersed throughout the city.

7.1.2 What does the Distribution of Archaeological Remains Suggest about: (A) Population Size and Residential Density; (B) the Nature of Intermediate Social Units and Social Segmentation? (Chapter 5)

This question addresses the city criterion of **demography,** including population size and density. Before my research, almost nothing was known about the Early Sicán Period (in any valley). I suggest that Early Sicán is the key to understand the Sicán polity. This is the time when substantial social changes are happening, setting the stage for the rise of the Middle Sicán polity. There is a dramatic increase in population, and decentralization from the previous Moche period. The multiple nuclei pattern appears here. Major districts in the north are Districts A, B, and C. District D, while not large in population, is very important, as we'll see later. In Early Sicán, the Pyramid Complex in the Sicán Core did not exist; it was built during Middle Sicán.

During Middle Sicán, all districts grow, particularly the ones on the north (A, B C and D). The Sicán Core is built in this period. In general, demographic districts correspond well to architectural complexes, forming social districts. The area was not abandoned in the Late Sicán Period, as hypothesized by Shimada and colleagues (Shimada 2000); on the contrary, it continued to be occupied with a decreased but still large population, and continued to be populated during the Chimú/Late Horizon period.

Overall, during the whole Sicán period, the largest amount of population resided in Districts A, B, C, D and E, which are located in the area between the La Leche river to the south, and the Pacora river to the north. An important fraction of the residential population lived in Districts F, G and H, located south of the La Leche river. I consider that these districts are intermediate urban units, part of a large urban entity. Demographic peaks are easily noticeable and connected to each other, forming a larger social unit, the city. A different scenario of disconnected peaks would be expected for regional centers.

I consider that the important large population in the north may have a twofold explanation. The first reason is an ecological one. Of great importance is the availability of water: the Pacora river has a more regular discharge than the La Leche river, and thus, causes less flooding. The second reason is social. The presence of demographic districts in the northern area early on the social sequence (Formative and Moche periods) seems to have conditioned the way people tended to locate themselves in later periods.

Every scholar who has written about Sicán mentions that Sicán was most likely an empty ceremonial/pilgrimage center. Here I present evidence that it was a city with a large permanent population. Moving beyond the relative population estimates discussed above, absolute population estimates were produced for each of the Sicán sub-periods per century. The average inhabitants of the Sicán city per period are:

Early Sicán 10,172 average inhabitants.

Middle Sicán 11,861 average inhabitants.

Late Sicán 4,197 average inhabitants.

These demographic results are well within the range of what scholars consider “urban”, they are also comparable with other Andean cities.

7.1.3 What Socioeconomic Differentiation (in Terms of Wealth/Status, Stylistic Preferences, and Economic Occupation) was Present Among City Residents? (Chapter 6)

This question addresses the city criterion of **social specialization**. Artifact assemblages reveal whether there were status/wealth and craft production differences among the city residents.

The Sicán ceramic assemblage was defined (or refined) in this dissertation on the basis of the largest diagnostic sample of Sicán sherds to date, including all sub-periods. The analysis of artifact assemblages reveals differences among districts in the city. Districts C, E and H were more involved in food production activities. District H was more involved in liquid serving and storing. Districts B, C and H were highly involved in storage. District D has highly involved in serving activities, most likely feasting.

Socioeconomic status and wealth was inferred from several variables: residential building material, fineware consumption, metal consumption, and finally consumption of exotic materials such as bead and *Spondylus*. Socioeconomic status and wealth can also be addressed though metal production and consumption. Sicán metal production was unprecedented in the Andean region in terms of scale and techniques of production.

In terms of socioeconomic status and wealth, households living on mound residences seem to be better off when compared with households living on non-mound residences. Mounds are costlier to make since they are made of adobe bricks, and fineware consumption among mound houses is also higher, although not dramatically so. The distribution of high-status residences interspersed through the city is a feature commonly found in low-density cities.

Among districts, District D stands out for its fineware consumption. Metal consumption was registered in most districts of the city, with District D as the highest consumer with a ratio of 112 metal objects per 100 sherds collected. Metals found are mostly fragments of sheet metal but also include pieces of complete objects such as tumis, needles or metal cast points. Just as important for its metal consumption, District D clearly stands out as the highest metal producer with a ratio of 5.7 metal production objects per 100 sherds collected. This is emphasized by the fact that the only mineral ore within the city is located in District D. Exotic materials such as *Spondylus princeps* and stone/shell beads were also consumed throughout the city. Again, District D stands out in most variables (especially fineware and metal consumption and production) as an elite district.

The social organization of production and labor in economic activities such as craft production was likely based in kin groups or clusters of them who lived in the different districts of the city.

7.1.4 How did the Site Change Through Time? What was its Social Trajectory? (Chapter 5)

Prior to this study, the research area was only known for its Middle Sicán occupation. My research has shown that the area had a long social trajectory, and that it had a very long and continuous human occupation that spans from the Formative Period up to the Late Horizon. It was only during the Contact/Colonial period that the area was abandoned, and remained abandoned until today.

While overall human occupation was continuous, demographic patterns show dynamic changes, the result of very dynamic social processes. This section summarizes the social trajectories of the research area except for the Sicán Period, which was addressed in point 7.1.2, Demography.

The Formative period sees the formation of important supra-local communities, particularly on the northern edge of the research area (what I call Districts A, B and C). Again, the location could be associated with the Pacora river that delimits the survey area to the north. The northern area also contains several large sand dunes that may have provided better visibility and breezes (in an otherwise very hot area) for the location of residences and ceremonial buildings, as well as protection during possible flooding events. Fertile agricultural fields are located on the north of the Pacora River, and access to these lands may have also played an important role when people decided to locate themselves.

The Moche period is only tangentially known in the valley. My research shows that during the whole social trajectory, the only period of time when a single centralized polity appears is during the Moche period. This polity corresponds to District C or Huaca Soledad. Huaca Soledad is the largest Moche site in the valley, and could be considered the Moche state of the La Leche valley. This raises questions about its relationship with Pampa Grande in the southern Lambayeque valley and its similarities or differences. By Moche V, the Taymi canal (which irrigates the fields between the Lambayeque and La Leche rivers) was already in function, so large agricultural fields were available to sustain a large population.

The area was not abandoned in the Sicán Period (contra Shimada 2000); it continued to be occupied with a large population during the Chimú/Late Horizon period. It is important to note that population did decrease during Late Sicán supporting the hypothesis that the political capital moved to Tucume, but the city was not abandoned; further, population grew to its maximum during Chimú/Late Horizon. The area was only abandoned during the Contact/Colonial period and it remains without population today, protected as a Historical Sanctuary.

7.2 THE SICÁN CITY AND POLITY: SEGMENTARY SOCIOPOLITICAL ORGANIZATION

Unlike other well-known centralized Andean cities like Pampa Grande, Sicán appears more segmentary in organization. The **Segmentary-Unitary** continuum deals with the nature and interrelation of a polity's constituent territorial units or districts and their leaders. This continuum relates to the degree to which constituent territorial units (districts or provinces) and their inhabitants are distinguished and bound into a network with a central hub (De Montmollin 1989:19). There are three sub-continua: degrees of centralization, differentiation and integration (De Montmollin 1989).

Centralization is an indicator of hierarchical organization and centralized leadership and power. When different centers did not coincide, multiple parallel hierarchies and leaderships are observed (Crumley 1995). The correspondence of numerous hierarchical measures around the same households and groups is a robust indicator of centralized power. Clearly, centralized power is not a characteristic of Sicán sociopolitical organization.

Integration and **differentiation** derive from Durkheim's contrast between mechanical and organic solidarity (Durkehim 1993). According to De Montmollin's explanation about its operationalization spatially, in a segmentary polity authority is somewhat concentrated at the center, with a number of nearly equivalent and competing sub-centers. This is the case for the Sicán polity where we see leadership and power acquired by the inhabitants of District D taking over the ritual activities held at the Pyramid Complex in the Sicán city only during the Middle Sicán period. At the same time, there are several urban districts or nuclei functioning in the city. The principles that governed political relations within and among districts in the Sicán segmentary polity were most likely based on ascription or kinship (*societas*), as opposed to *civitas*.

A **segmentary** or hegemonic polity like Sicán has a loose aggregation of districts which are duplications of one another in their political structure, with relatively low degrees of centralization, differentiation and integration. In these cases, there is no strong distinction between heartland (urban) and hinterland (rural) (DeMontmollin 1989:19; Hassig 1999). A relevant model is that of the "garden city" developed for Maya centers. The dispersed residential layout and the intensification of agriculture has led archaeologists to characterize Maya centers as "garden cities" (Tourtellot 1993:222). Open space between residences is indirect evidence of small gardens and orchards located within walking distance of residences (Rice 2006:252-276). I suggest that the same is true for the Sicán city, where orchards may have been interspersed within the city. Unlike the Maya, where intensification of agriculture relied on rainfall, in the Sicán case agricultural intensification relied on canal irrigation systems, most likely managed in a segmentary manner.

This leads me to argue that the Sicán city was a dispersed or garden city as defined by Fletcher (Fletcher 2011), characterized by an extended, relatively low-density population, and space between urban houses, possibly for agriculture. Sicán sociopolitical organization may have also had these characteristics outside of the La Leche valley, where smaller Sicán valley polities were not part of a single centralized overarching political system.

In the Andes, a dispersed, segmentary urban pattern is very uncommon in cities. Recently, Millaire and Eastaugh (2014:249) have proposed that the Viru society created its city as an archipelago of tells rather than as a compact settlement. This would be another of the very few exceptions to highly compact cities documented thus far in the Andes.

7.3 THE QUESTION OF URBAN FARMING

This study raises questions that can only be addressed with new research. One important and challenging research future objective is assessing the involvement of Sicán's residents in agriculture. Urban farming is considered a key aspect of the "agro-urban" low-density city (Chase and Chase 1998), with the urban population largely made up of farmsteads growing food in the spaces around them. For Sicán, the bulk of agricultural production probably would have taken place in areas such as the Pampa de Chaparri (Hayashida 2006) whereas the "empty" areas within the city may have been used for small scale agriculture such as orchards for family subsistence. The city landscape might have mixed agricultural land use within residential areas.

Evidence for agriculture within the city is indirect. There are empty spaces where small scale agriculture could have taken place, like gardening in orchards. Water availability in the city is provided, first, by the La Leche river and Pacora river. Second, modified quebradas or canals were registered during the survey (Chapter 4). Third, most of the area presents a high water table or aquifer. Currently, local families in the surroundings of the research area have small agricultural plots or orchards, and have their own water wells for their personal use and for the care and irrigation of fruit trees, including guava, *Annona* or chirimoya, algarrobo and mangos. Current crops also include chili peppers (aji), squash, maize and cotton. Today, these orchards are called "invernas" or greenhouses among locals.

I found only 2 stone hoes in the survey. But there is no source for large stones available in the area, so I presume hoes would be valuable objects that people would take with them when/if they moved. Another possibility is the use of other agricultural tools such as wooden digging sticks that did not preserve. Wooden digging sticks might have had a hard point made of copper-arsenic alloy. Several pieces of this metal alloy have been found in the research area. The survey did not provide direct evidence for garden agriculture, but future research with excavations could resolve the question.

7.4 CONCLUSIONS

There are several significant conclusions to emphasize from the new findings in this dissertation.

1.During the Sicán Period, the Sicán city was a multi-centric city. There are obvious implications for the structure of Sicán political rule, as a non-centralized polity. Instead, the evidence points to a segmentary sociopolitical organization of the city. In segmentary states such as Sicán, elites and commoners do not reside in segregated parts of the city, but are interspersed. Likewise, there is not a single monumental center, but several clusters or districts with residents and smaller monuments. Evidence for this type of social organization in Sicán has been also found in agriculture through water and land management (Hayashida 2006; Netherly 1984). Segmentary sources of power and legitimation are developed by leaders through "network relations" (Blanton et al. 1996; Feinman 1995).

2. Sicán's layout - with scattered monuments and numerous dispersed residential mounds, forming several discrete residential clusters - more closely resembles the sprawling layout of a dispersed or garden city as originally defined for the Maya area and southeast Asia. Sicán was composed of several separate "centers" or districts, most of which had their own

huacas or huaca groups, and no occupation or a thin spread of occupation between them. This is really unusual for an Andean city.

3. The Pyramid Complex in the Sicán Core was built and mostly used only during Middle Sicán times and was never densely populated. During Early Sicán, it was a relatively “empty area”, by Middle Sicán it became the civic ceremonial center of the city, and by Late Sicán it seems to have stopped its major functions.

4. Each Demographic District presents monumental architecture, an open space most likely a plaza for meetings or gatherings, a cemetery, and a combination of elite and non-elite residences. In addition, each district was engaged in diverse economic activities such as craft production. These groups might have started as kinship groups or lineages, but they grew into social groups larger than the original immediate kin group, perhaps attracting additional followers. Districts may have represented a *parcialidad* or group of subjects under the control of a lord (Netherly 1977).

5. Demographic estimates for the complete research area greatly surpass the number of people needed to build the main monuments. It seems feasible that local people from each district would have provided the labor needed for the construction of each Architectural Group. In the case of the Sicán Core, particularly the Pyramid Complex where little resident population was found, laborers from outside this area (presumably, from the districts) would be needed to accomplish the construction of the monuments.

6. Demographic districts survived for a very long time even though they rose and fell somewhat in importance. They apparently correspond to very long-lived social groups. There are implications here for the long-term persistence or survival of (elite?) social groups – they seem

to last much longer than the rise and fall of political regimes. The presence of demographic districts in the northern area early on the social sequence (Formative and Moche periods) seems to have conditioned the way people tended to locate themselves in later periods. There was an existing network of interacting centers already in place during the Formative period. The presence of these districts acting as centralizing forces seems to be of great importance for households to decide where to locate themselves during later periods.

7. Residential mounds were most likely the residences of elites, whereas regular people lived on the ground level and built their dwellings with more fragile materials such as wattle and daub. However, the distribution of finewares indicates access to wealth for non-elites (see point 6). No elite walled compounds were found, suggesting there was no restriction in access for non-elite members within the city.

8. Widespread distribution of wealth consumption objects such as finewares, metals and beads show that the Sicán city had a large middle class population. This evidence coincides with bioarchaeological data that indicates that while there were health differences among social classes, these seem to be minor and mostly related to access to animal protein (Muno 2014). In general, when compared with other coastal populations, Sicán inhabitants seemed to have better health conditions and less violence exposure (Farnum 2002), except for specific sacrificial occasions (Klaus and Shimada 2016).

9. I propose that the social group in District D was the new emergent social and economic elite after the end of the Moche period. This social group acquired social and economic prestige during the Early Sicán period and they were the most powerful and prestigious group of the Sicán city during Middle Sicán, and may have been the “rulers” seen in high-status tombs. Elite lineages

in Sicán (District D) developed their source of power based on metal craft production. These lineages crafted their symbols of power in metal objects, shrines and ancestor tombs that became their means for legitimation.

10. I consider that craft production, particularly metallurgy, was the critical source of wealth, prestige and power in the Sicán city and probably the Sicán polity. District D is located in a strategic location, surrounding a natural mineral outcrop. Although small in terms of population, District D dominated mineral extraction and metal production within the city, probably starting in Early Sicán. By Middle Sicán when the Pyramid Complex was built, District D was the closest district hosting large feasts.

11. Finally, Sicán was obviously more than an empty ceremonial center. Sicán was a city; it was just a very different kind of city from what is expected in the Andes, which is a centralized, compact city. Sicán is a dispersed city with several separate nuclei that corresponds to a segmentary form of sociopolitical organization. With this study, I hope to open up the debate and re-think the discussion about what is considered to be an "Andean city," and start recognizing different and diverse Andean cities.

7.5 FINAL CONSIDERATIONS

This research is the first project to systematically investigate Sicán Period residential patterns and the first concerned with both commoners and elites. It generated the kind of inter-household comparative data needed to delineate Sicán socioeconomic differentiation and complement existing evidence on Sicán craft production, funerary practices, and agriculture. By focusing on Sicán's urban and sociopolitical organization, this research makes the Sicán city a case-study of comparative value in contemporary discussions of urban districts, urban layouts, segmentary political systems and compact vs dispersed settlements in ancient cities.

Further, this research provides a complete social trajectory of the research area spanning across the Formative, Moche, Sicán, Chimú/Late Horizon and Contact/Colonial periods.

This research implemented long-term systematic investigation on residential patterns and urbanism with survey techniques used successfully in other parts of the world (Cowgill 2004; Manzanilla 2009; Peterson and Drennan 2005; Smith 2003b) but not previously in an Andean city. It provides important documentation to the Museo Nacional Sicán and to the Santuario Historico Bosque de Poma in Peru. The resulting data is available online for other researchers through the University of Pittsburgh's Comparative Archaeology Database.

APPENDIX A . SICAN ARCHITECTURAL MAPS

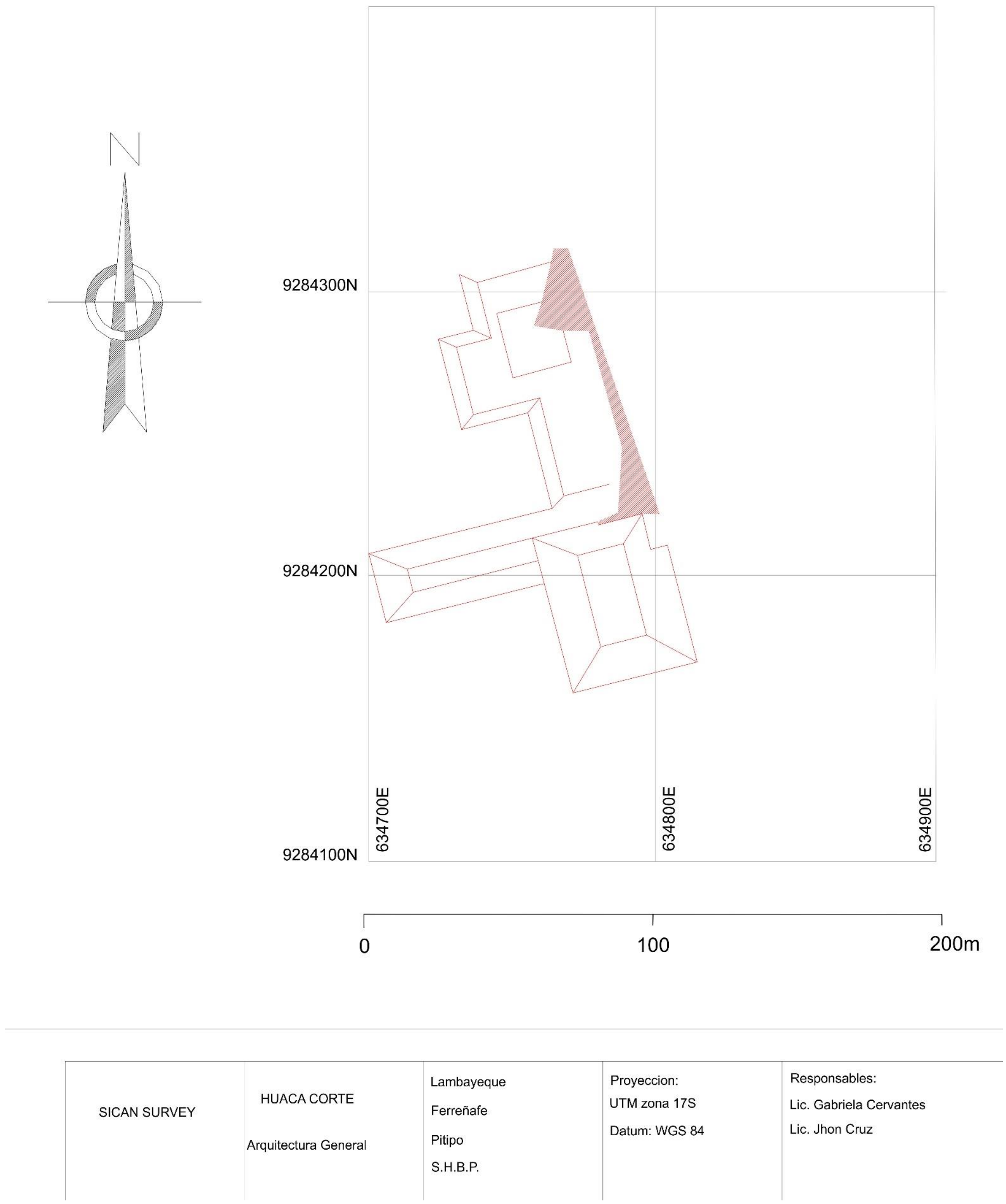


Figure 31. Platform Complex. Huaca Corte.

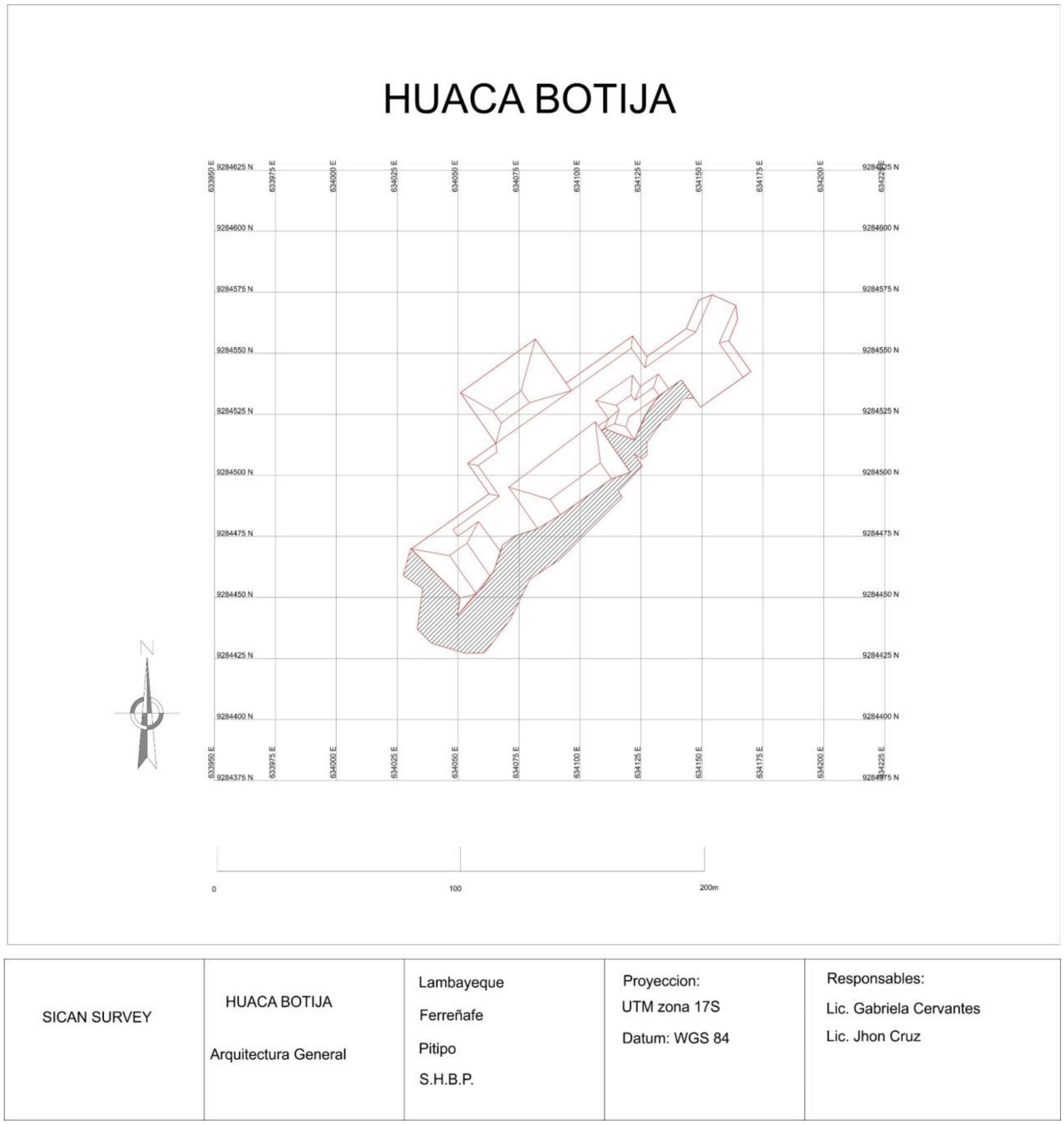
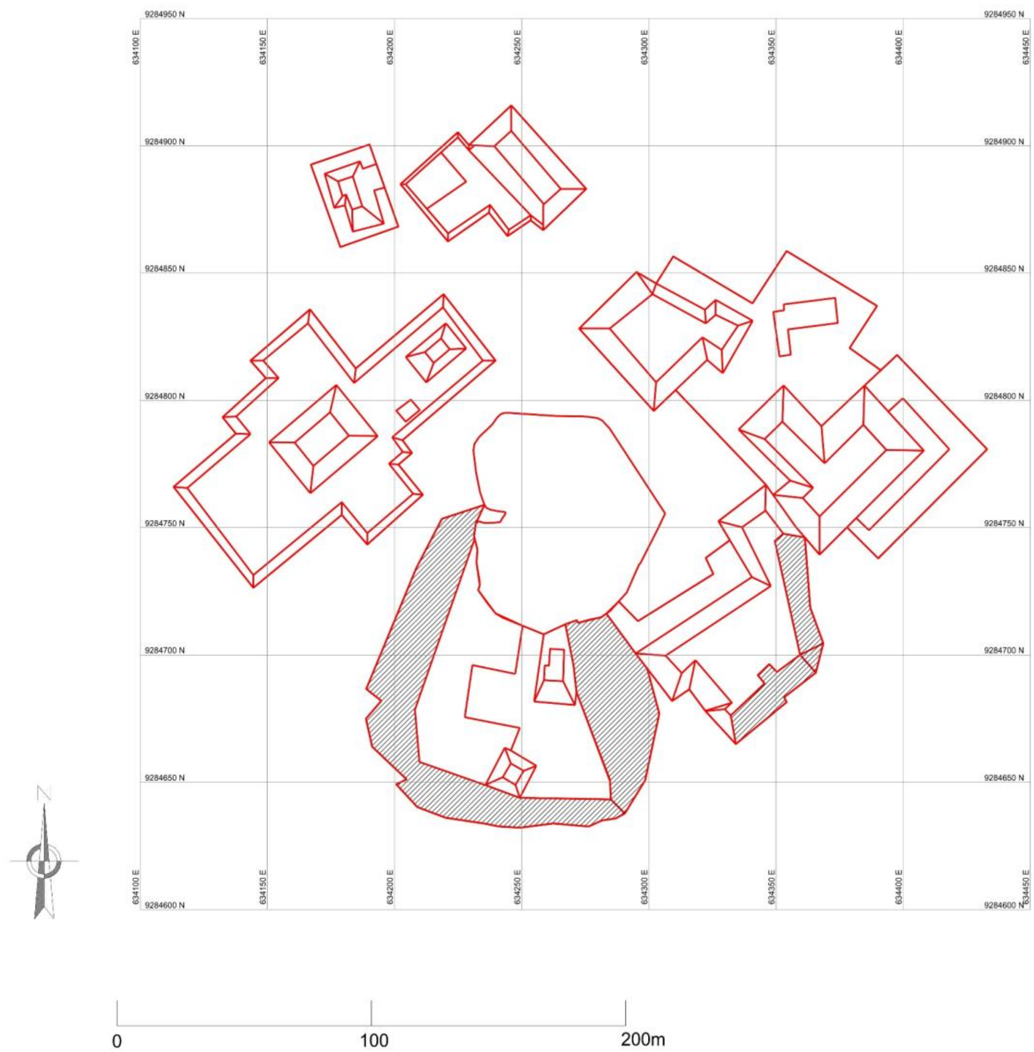


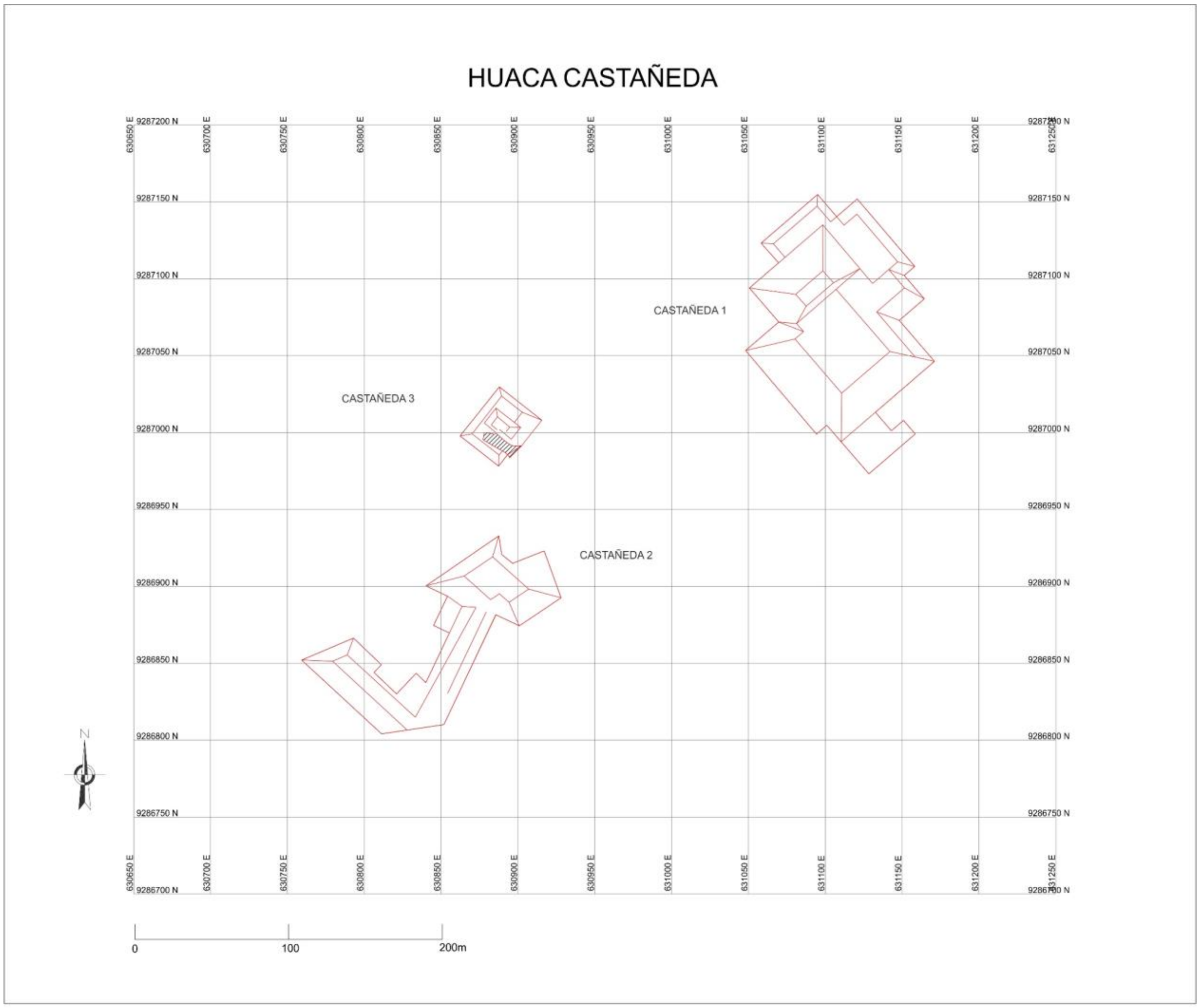
Figure 32. Platform Complex. Huaca Botija.

HUACA CERRITO



SICAN SURVEY	HUACA CERRITO Arquitectura General	Lambayeque Ferreñafe Pitipo S.H.B.P.	Proyeccion: UTM zona 17S Datum: WGS 84	Responsables: Lic. Gabriela Cervantes Lic. Jhon Cruz

Figure 33. Platform Complex. Huaca Cerrito.

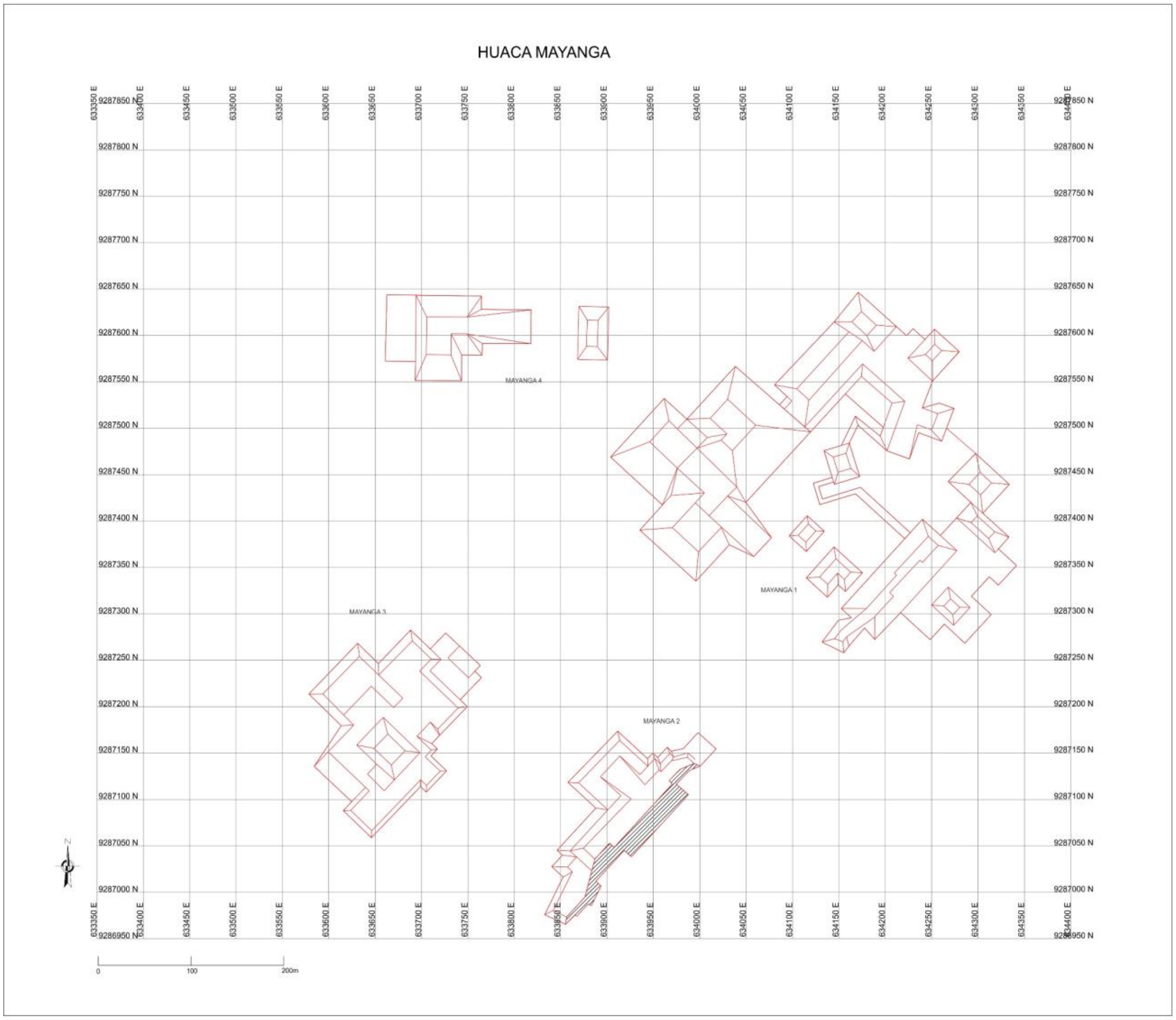


SICAN SURVEY	HUACA CASTAÑEDA Arquitectura General	Lambayeque Ferreñafe Pitipo S.H.B.P.	Proyeccion: UTM zona 17S Datum: WGS 84	Responsables: Lic. Gabriela Cervantes Lic. Jhon Cruz

Figure 34. Greater Sican: Architectural Group 1. Huaca Castaneda.

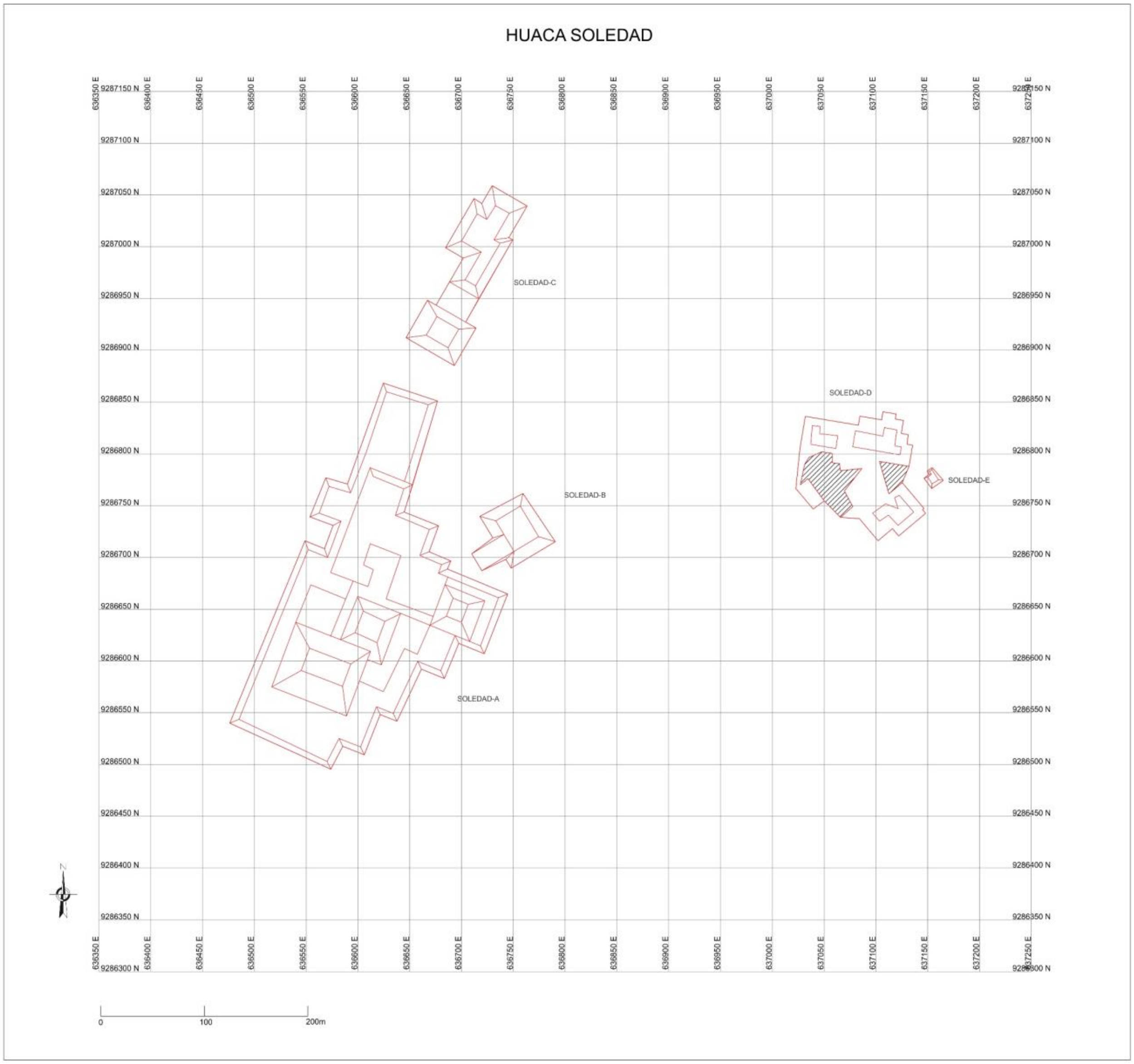
SICAN SURVEY	HUACA CARACOL Arquitectura General	Lambayeque Ferreñafe Pitipo S.H.B.P.	Proyeccion: UTM zona 17S Datum: WGS 84	Responsables: Lic. Gabriela Cervantes Lic. Jhon Cruz

Figure 35. Greater Sican: Architectural Group 2. Huaca Caracol.



SICAN SURVEY	HUACA MAYANGA Arquitectura General	Lambayeque Ferreñafe Pitipo S.H.B.P.	Proyeccion: UTM zona 17S Datum: WGS 84	Responsables: Lic. Gabriela Cervantes Lic. Jhon Cruz

Figure 36. Greater Sican: Architectural Group 3. Huaca Mayanga.



SICAN SURVEY	HUACA SOLEDAD Arquitectura General	Lambayeque Ferreñafe Pitipo S.H.B.P.	Proyeccion: UTM zona 17S Datum: WGS 84	Responsables: Lic. Gabriela Cervantes Lic. Jhon Cruz

Figure 37. Greater Sican: Architectural Group 4. Huaca Soledad.

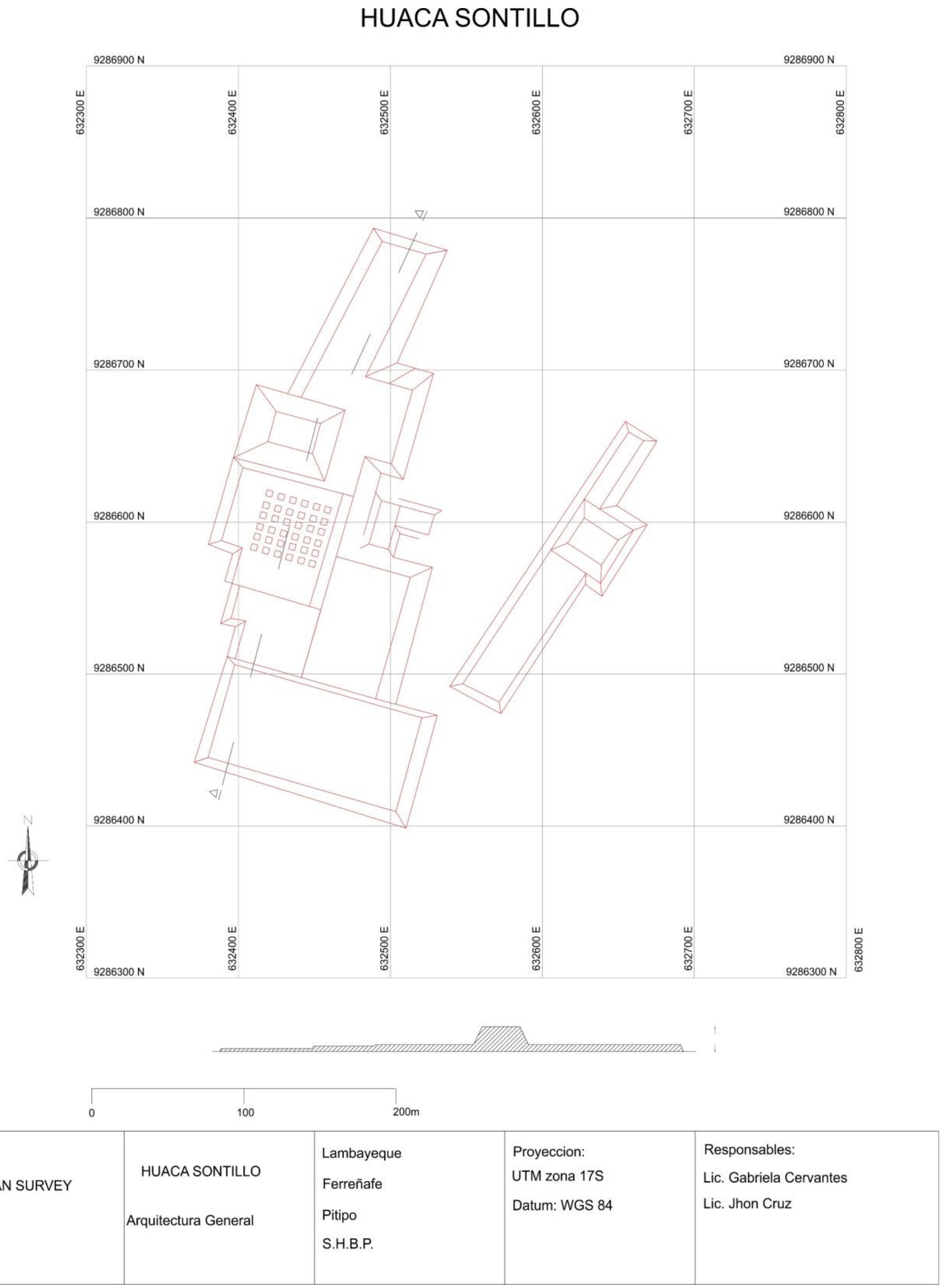
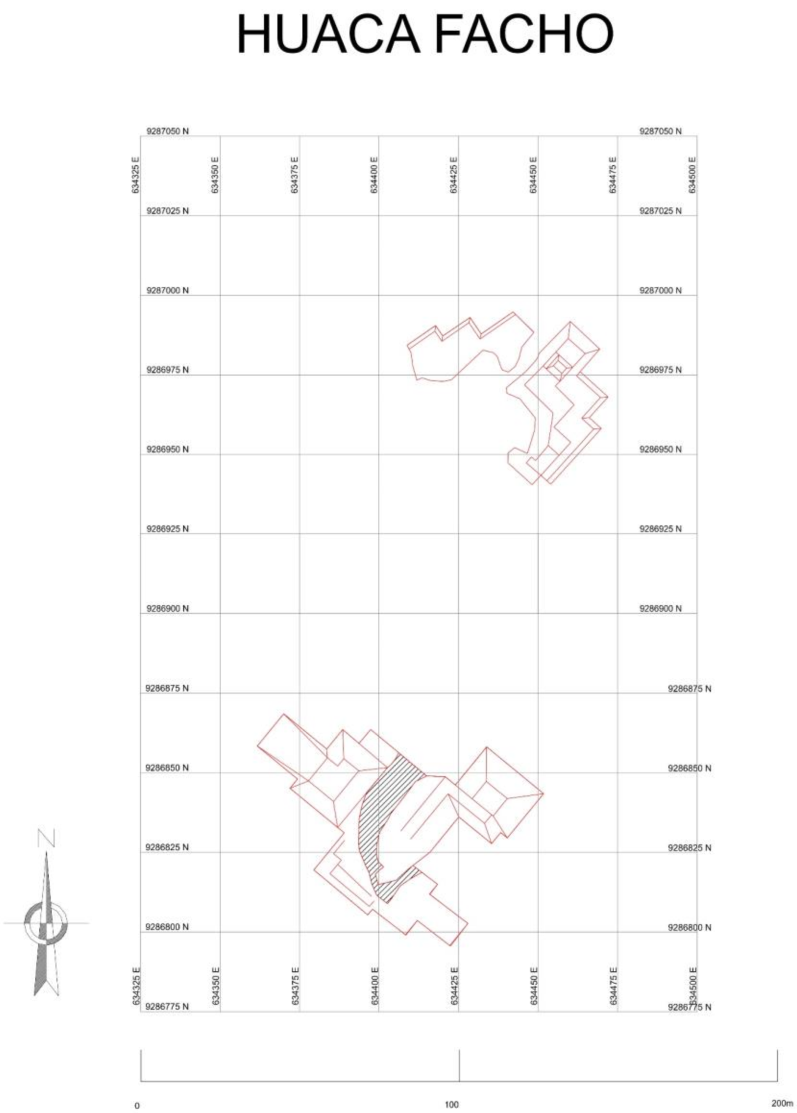
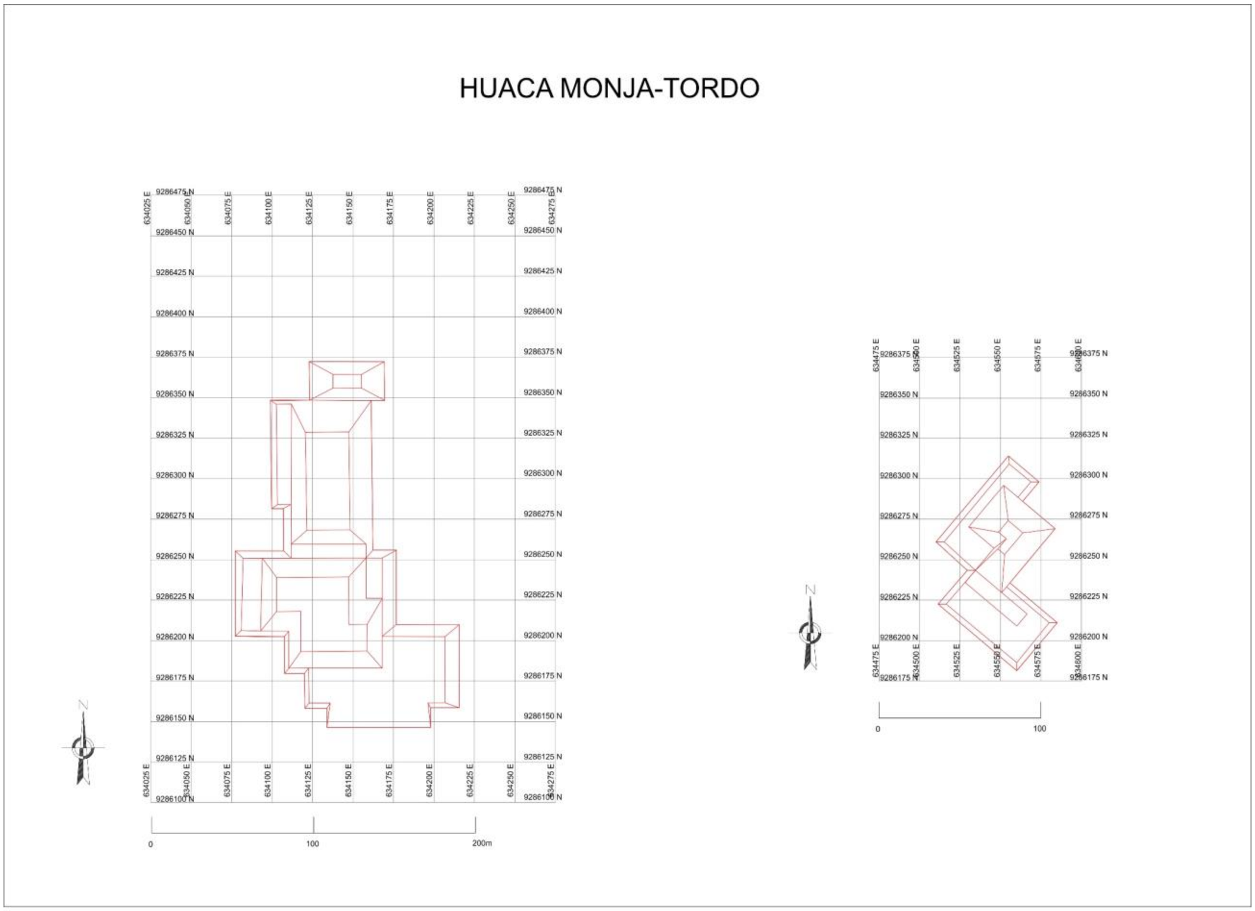


Figure 38. Greater Sican: Architectural Group 5. Huaca Sontillo.



SICAN SURVEY	HUACA FACHO Arquitectura General	Lambayeque Ferreñafe Pitipo S.H.B.P.	Proyeccion: UTM zona 17S Datum: WGS 84	Responsables: Lic. Gabriela Cervantes Lic. Jhon Cruz

Figure 39. Greater Sican: Architectural Group 6. Huaca Facho.



SICAN SURVEY	HUACA MONJA-TORDO Arquitectura General	Lambayeque Ferreñafe Pitipo S.H.B.P.	Proyeccion: UTM zona 17S Datum: WGS 84	Responsables: Lic. Gabriela Cervantes Lic. Jhon Cruz

Figure 40. Greater Sican: Architectural Group 7. Huaca Monja-Tordo.

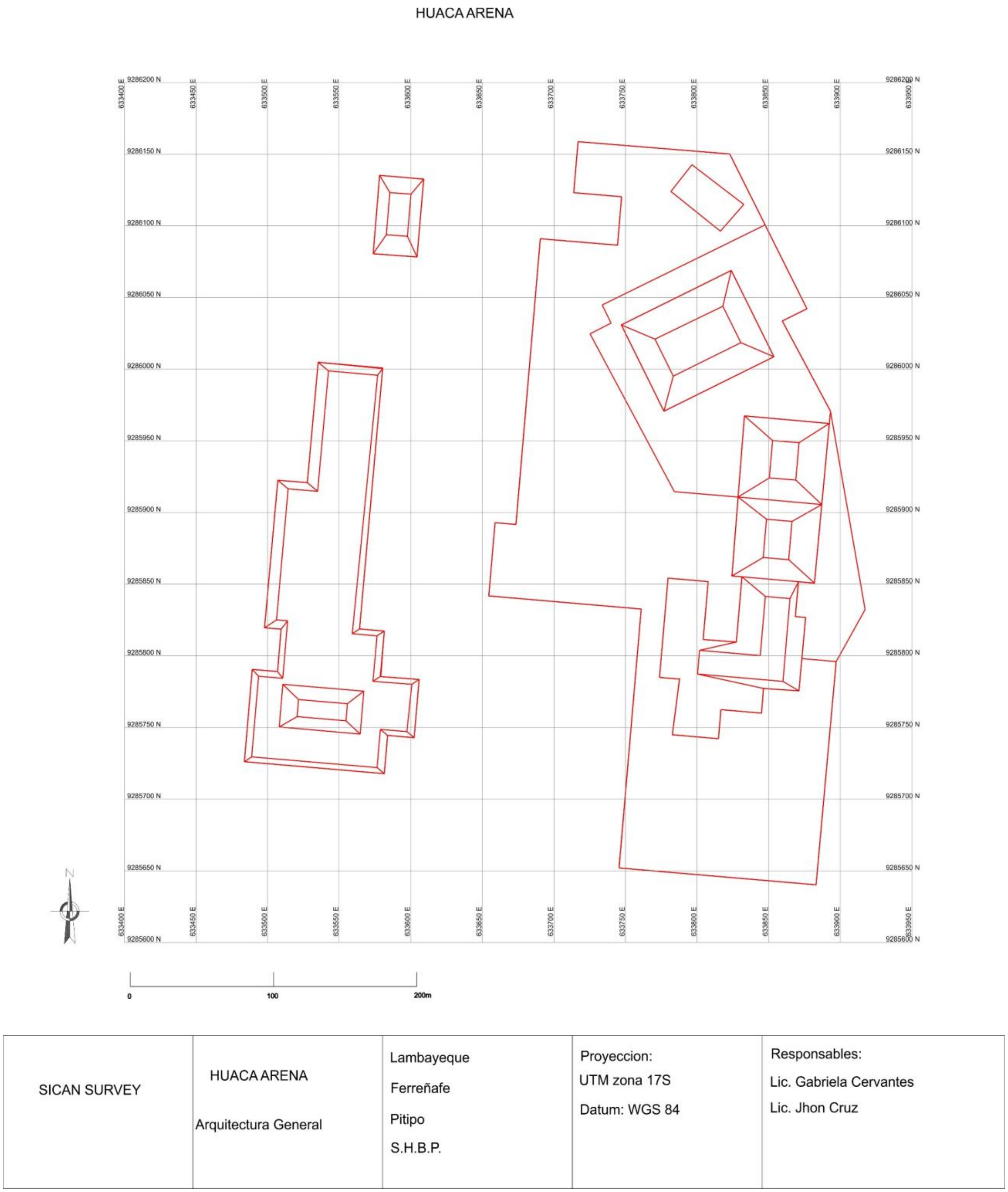
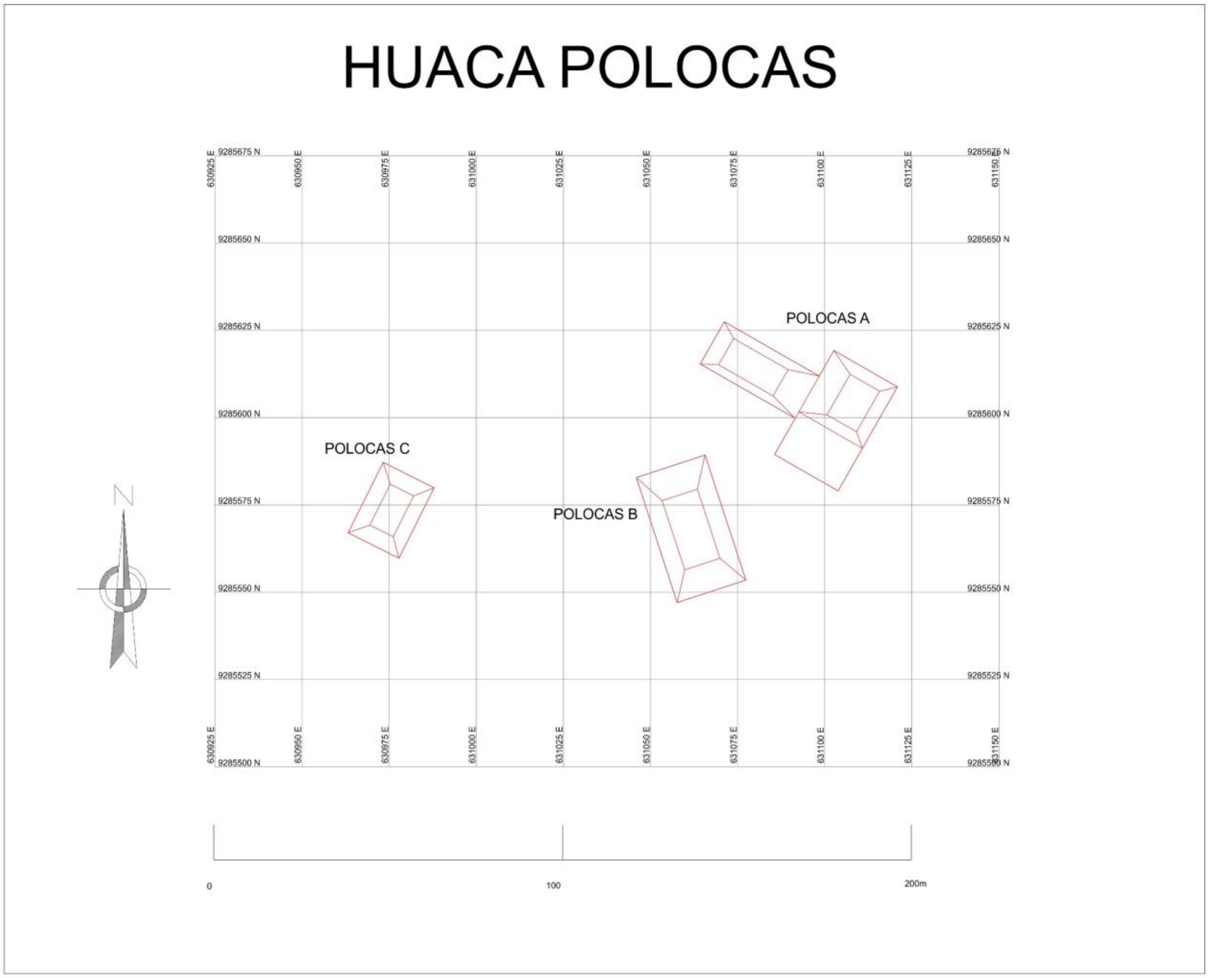
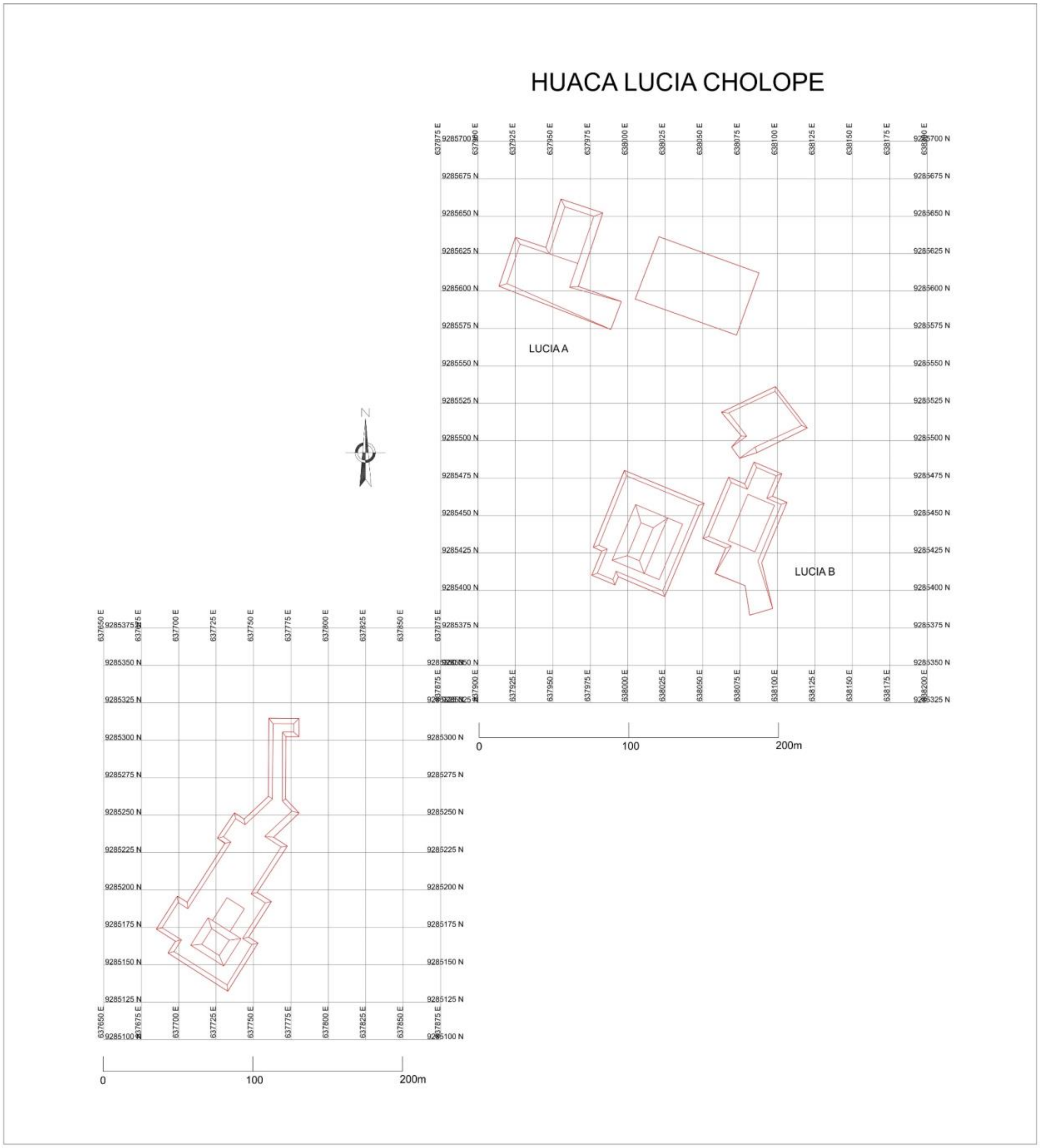


Figure 41. Greater Sican: Architectural Group 8. Huaca Arena.



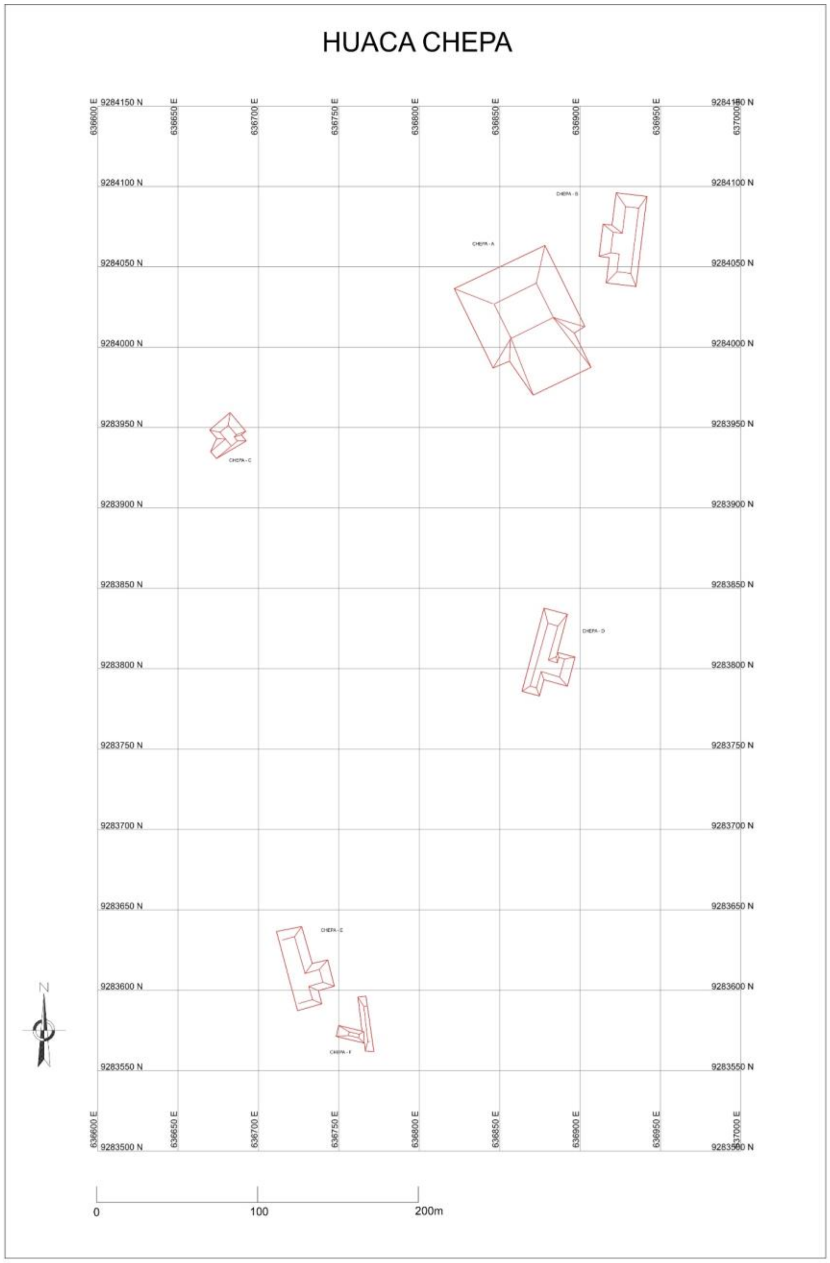
SICAN SURVEY	HUACA POLOCAS Arquitectura General	Lambayeque Ferreñafe Pitipo S.H.B.P.	Proyeccion: UTM zona 17S Datum: WGS 84	Responsables: Lic. Gabriela Cervantes Lic. Jhon Cruz

Figure 42. Greater Sican: Architectural Group 9. Huaca Polocas.



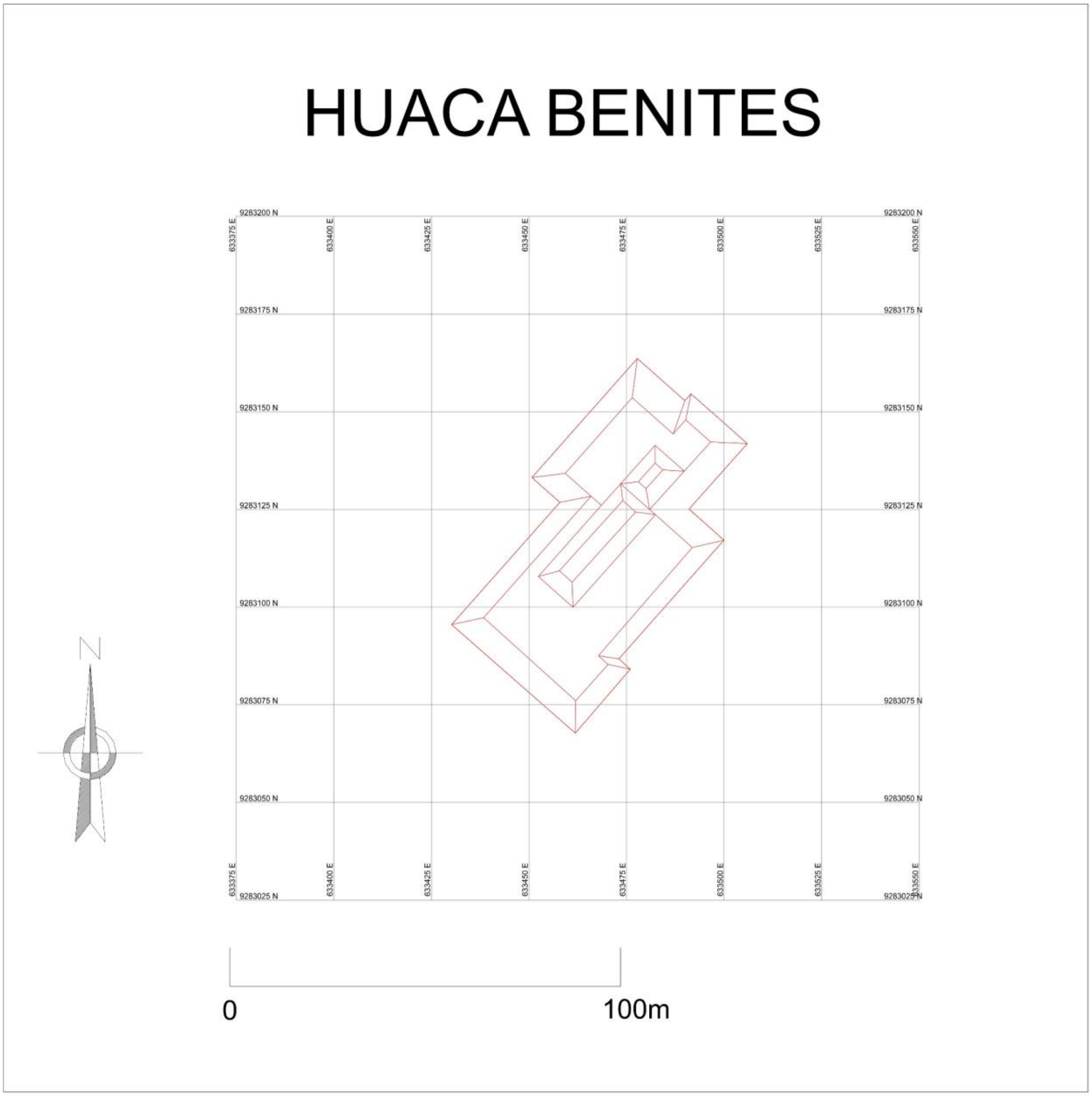
SICAN SURVEY	HUACA LUCIA-CHOLOPE Arquitectura General	Lambayeque Ferreñafe Pitipo S.H.B.P.	Proyeccion: UTM zona 17S Datum: WGS 84	Responsables: Lic. Gabriela Cervantes Lic. Jhon Cruz

Figure 43. Greater Sican: Architectural Group 10. Huaca Lucia-Cholope.



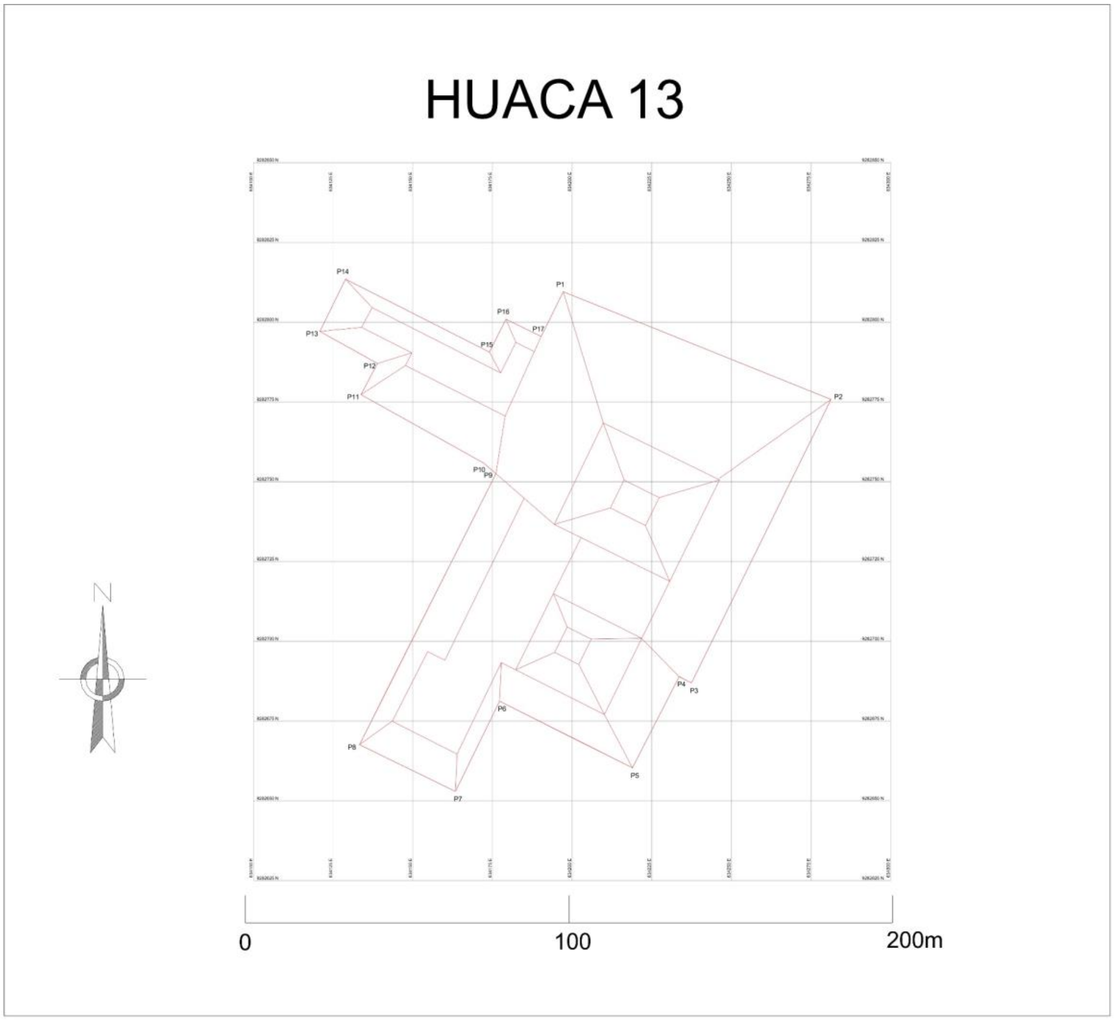
SICAN SURVEY	HUACA CHEPA Arquitectura General	Lambayeque Ferreñafe Pitipo S.H.B.P.	Proyeccion: UTM zona 17S Datum: WGS 84	Responsables: Lic. Gabriela Cervantes Lic. Jhon Cruz

Figure 44. Greater Sican: Architectural Group 11. Huaca Chepa.



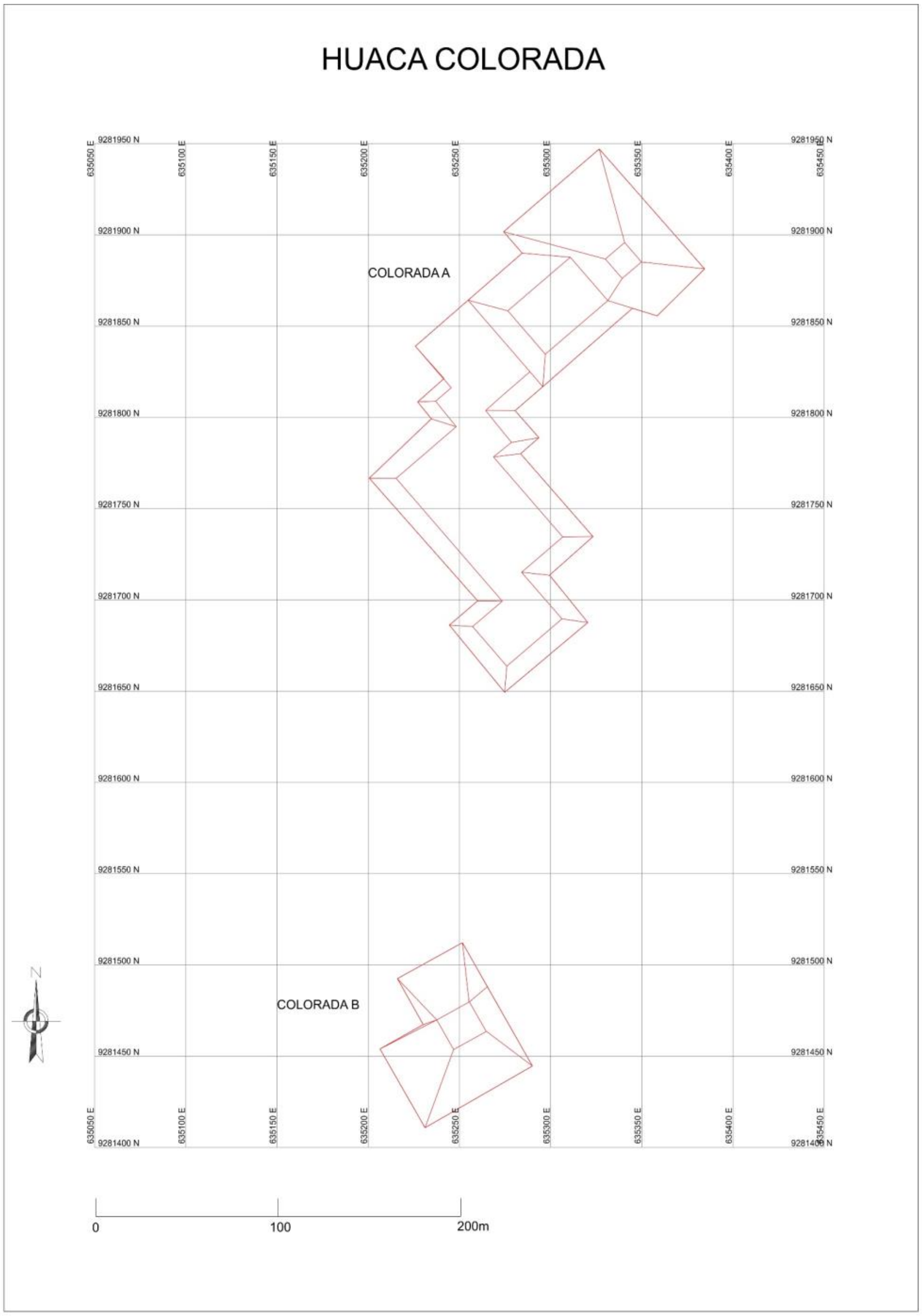
SICAN SURVEY	HUACA BENITES Arquitectura General	Lambayeque Ferreñafe Pitipo S.H.B.P.	Proyeccion: UTM zona 17S Datum: WGS 84	Responsables: Lic. Gabriela Cervantes Lic. Jhon Cruz

Figure 45. Greater Sican: Architectural Group 12. Huaca Benites.



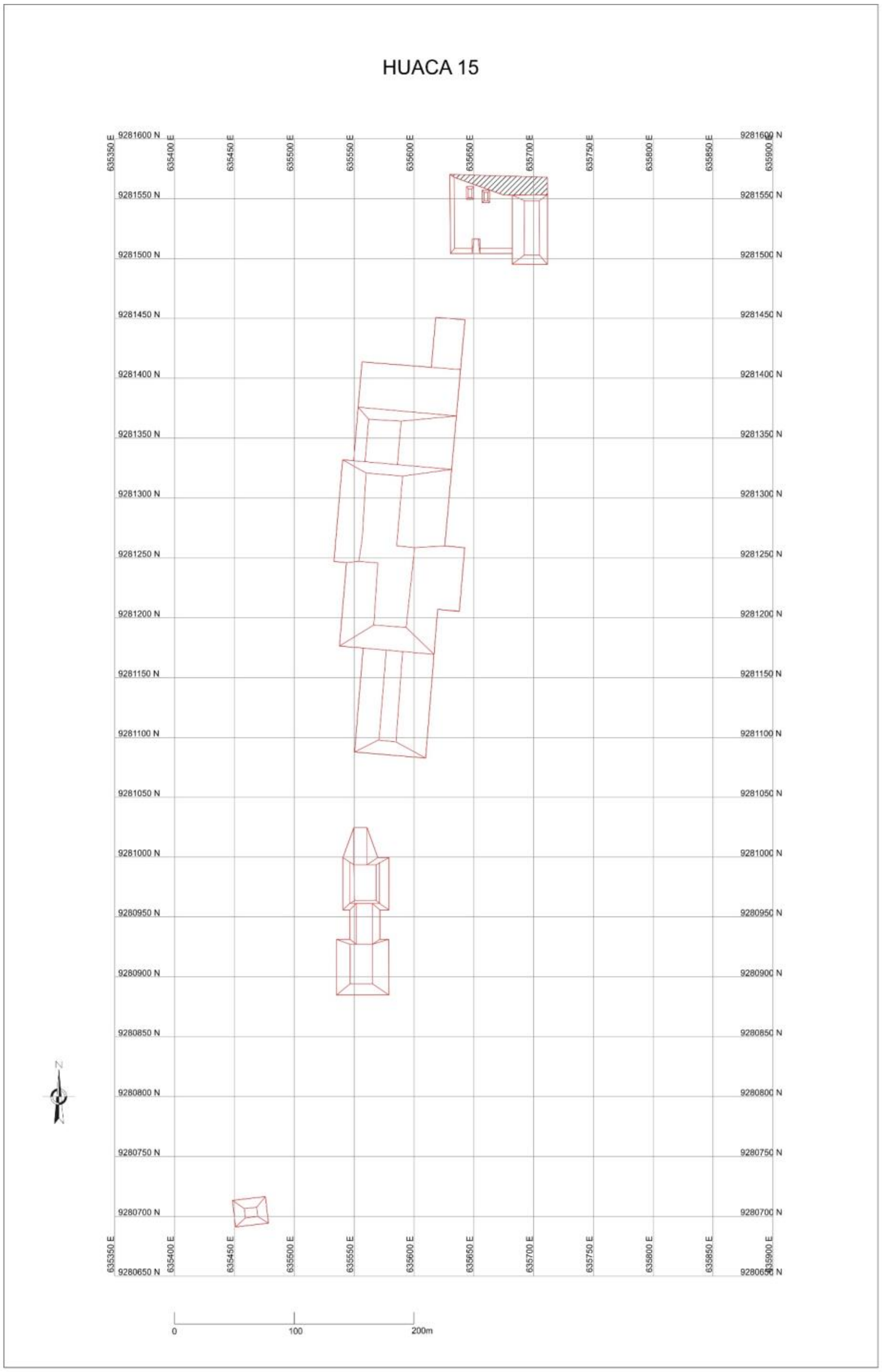
SICAN SURVEY	HUACA 13 Arquitectura General	Lambayeque Ferreñafe Pitipo S.H.B.P.	Proyeccion: UTM zona 17S Datum: WGS 84	Responsables: Lic. Gabriela Cervantes Lic. Jhon Cruz

Figure 46. Greater Sican: Architectural Group 13.



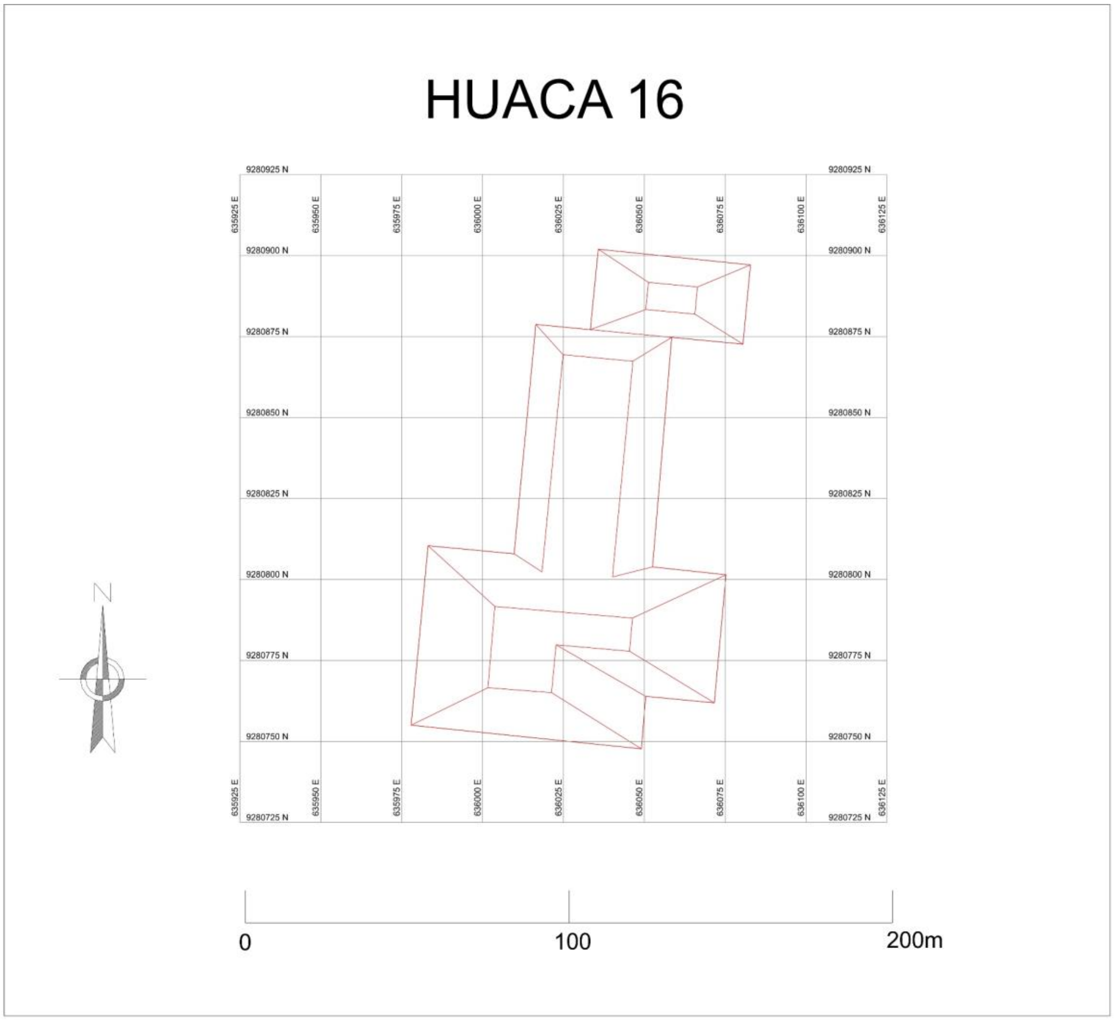
SICAN SURVEY	HUACA COLORADA Arquitectura General	Lambayeque Ferreñafe Pitipo S.H.B.P.	Proyeccion: UTM zona 17S Datum: WGS 84	Responsables: Lic. Gabriela Cervantes Lic. Jhon Cruz

Figure 47. Greater Sican: Architectural Group 14, Huaca Colorada.



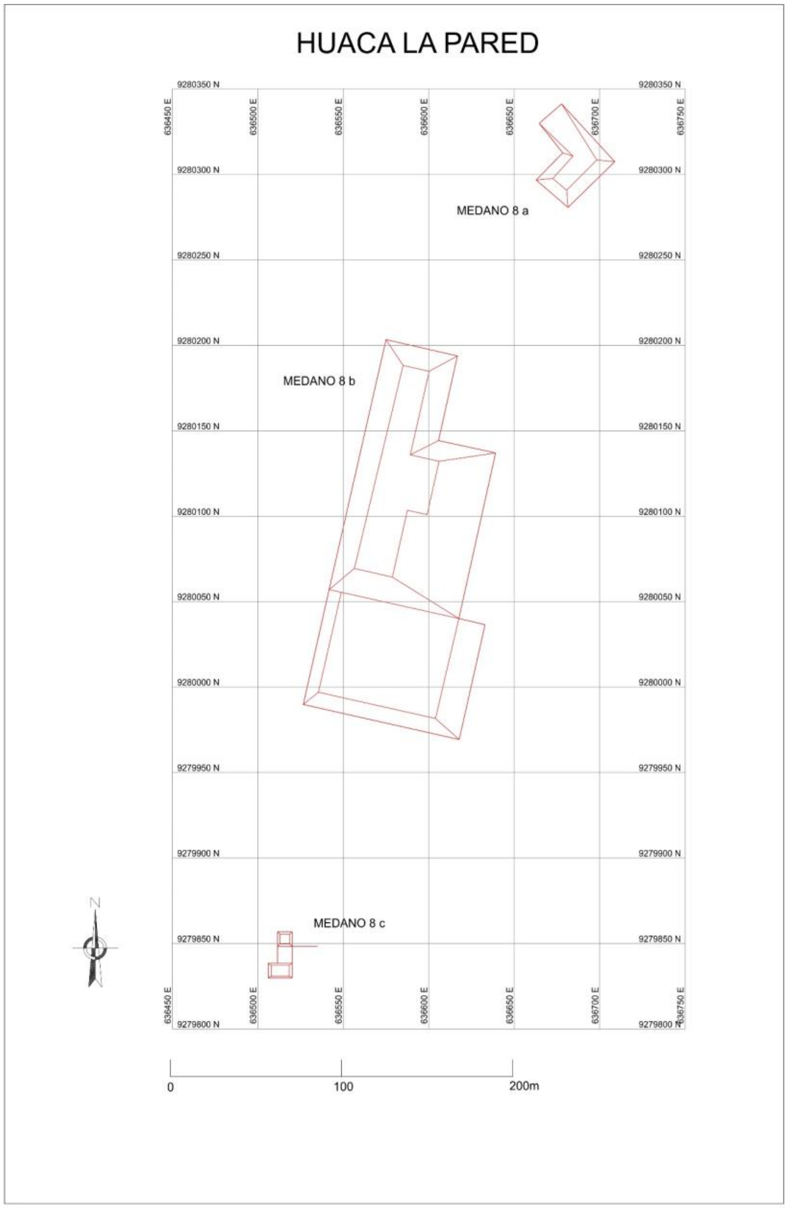
SICAN SURVEY	HUACA 15 Arquitectura General	Lambayeque Ferreñafe Pitipo S.H.B.P.	Proyeccion: UTM zona 17S Datum: WGS 84	Responsables: Lic. Gabriela Cervantes Lic. Jhon Cruz

Figure 48. Greater Sican: Architectural Group 15.



SICAN SURVEY	HUACA 16 Arquitectura General	Lambayeque Ferreñafe Pitipo S.H.B.P.	Proyeccion: UTM zona 17S Datum: WGS 84	Responsables: Lic. Gabriela Cervantes Lic. Jhon Cruz

Figure 49. Greater Sican: Architectural Group 16.



SICAN SURVEY	HUACA LA PARED Arquitectura General	Lambayeque Ferreñafe Pitipo S.H.B.P.	Proyeccion: UTM zona 17S Datum: WGS 84	Responsables: Lic. Gabriela Cervantes Lic. Jhon Cruz

Figure 50. Greater Sican: Architectural Group 17, Huaca La Pared.

APPENDIX B . SICAN ARCHITECTURAL MEASUREMENTS

Table 21. Sican Core volume estimates.

Architecture	Area m2	Area ha	Height m	m3
Platform Comp A	22894.91	2.289491	2	45789.82
Platform Comp B	7018.37	0.701837	2	14036.74
Platform Comp SW	2124.38	0.212438	2	4248.76
Platform Comp NE	833.08	0.083308	2	1666.16
Botija	5957.62	0.595762	2	11915.24
Corte (now)	7243.64	0.724364	2	14487.28
Corte (1981)	68189.14	6.818914	2	136378.28
Loro piramide	9017.29	0.901729	35	315605.15
Loro ramp	2166.23	0.216623	8	17329.84
Loro platform	3923.01	0.392301	5	19615.05
Merced pyramid1	8571.89	0.857189	8	68575.12
Merced ramp1	2573.02	0.257302	5	12865.1
Merced pyramid2	2016	0.2016	2	4032
Colorada	7218.43	0.721843	20	144368.6
Las Ventanas1	11323.67	1.132367	40	452946.8
Las Ventanas2	32830.1027	3.2830103	10	328301.027

Table 22. Greater Sican volume estimates.

Architecture	Area m2	ha	Height m	m3
Arena A	14310.89	1.431089	2	28621.78
Arena A Plataforma	87495.01	8.7495	2	174990
Arena A Piramide Norte	5758.42	0.575842	3	17275.26
Arena B Piramide Norte	1685.16	0.168516	3	5055.48
Arena B Plataforma	20000.21	2.000021	2	40000.42
Caracol A	33418.44	3.341844	2	66836.88
Caracol Aa	2050.9	0.20509	2	4101.8
Caracol B	11828.97	1.182897	2	23657.94
Caracol C	8997.39	0.899739	2	17994.78
Castaneda 1	13211.66	1.321166	2	26423.32
Castaneda 2	7047.82	0.704782	2	14095.64
Castaneda 3	1386.59	0.138659	2	2773.18
Chepa A	1196.16	0.119616	2	2392.32
Chepa B	4540.62	0.454062	2	9081.24
Chepa C	368	0.0368	4	1472
Chepa D	980.1	0.09801	2	1960.2
Chepa E	977.74	0.097774	2	1955.48
Chepa F	295.4	0.02954	2	590.8
Facho I	2752.15	0.275215	4	11008.6
Facho IIA	795.63	0.079563	2	1591.26
Facho IIB	146.75	0.014675	2	293.5
Huaca Tordo	5348.11	0.534811	4	21392.44
Lucia A	3872.62	0.387262	2	7745.24
Lucia B	3022.08	0.302208	2	6044.16
Lucia C	1468.08	0.146808	2	2936.16
Lucia D	3365.3	0.33653	2	6730.6
Lucia D2	3169.36	0.316936	2	6338.72
M257	6252.02	0.625202	2	12504.04
Mayanga 1	727.2	0.07272	2	1454.4
Mayanga 1	1667.4	0.16674	2	3334.8
Mayanga 1	18258.87	1.825887	2	36517.74
Mayanga 1	20743.5	2.07435	2	41487
Mayanga 1	25555.31	2.555531	2	51110.62
Mayanga 2	23553.57	2.355357	2	47107.14
Mayanga 3	15469.75	1.546975	2	30939.5
Mayanga 4	1846.27	0.184627	2	3692.54

Table 22. (continued)

Mayanga 4	10168.27	1.016827	2	20336.54
Medano 3	3405.65	0.340565	2	6811.3
Medano 5A	20909.68	2.090968	2	41819.36
Medano 5B	4530.1	0.45301	2	9060.2
Medano 5B	13870.95	1.387095	2	27741.9
Medano 6a	4597.45	0.459745	2	9194.9
Medano 6b	27323.23	2.732323	2	54646.46
Medano 6c	4837.31	0.483731	2	9674.62
Medano 6d	618.25	0.061825	2	1236.5
Medano 7	9040.68	0.904068	2	18081.36
Medano 8a	1375.33	0.137533	2	2750.66
Medano 8b	16307.49	1.630749	2	32614.98
Medano 8c	340	0.034	2	680
Monja	17532.16	1.753216	4	70128.64
Polocas A	1157.61	0.115761	2	2315.22
Polocas B	781.04	0.078104	2	1562.08
Polocas C	367.64	0.036764	2	735.28
Soledad A	45609.44	4.560944	3	136828.3
Soledad B	3313.95	0.331395	2	6627.9
Soledad C	7619.54	0.761954	2	15239.08
Soledad D	10402.6	1.04026	2	20805.2
Soledad E	188.61	0.018861	2	377.22
Soledad Plataforma	87495.01	8.749501	2	174990
Sontillo 1	43383.18	4.338318	5	216915.9
Sontillo 2	7632.06	0.763206	1	7632.06
Sontillo 3	3979.31	0.397931	1	3979.31

APPENDIX C . SICAN CERAMIC TYPOLOGY

Botellas (bottles) follow the typology by Cleland and Shimada (1992) and thus are not drawn here.

APPENDIX C.1 EARLY SICAN CERAMIC TYPES

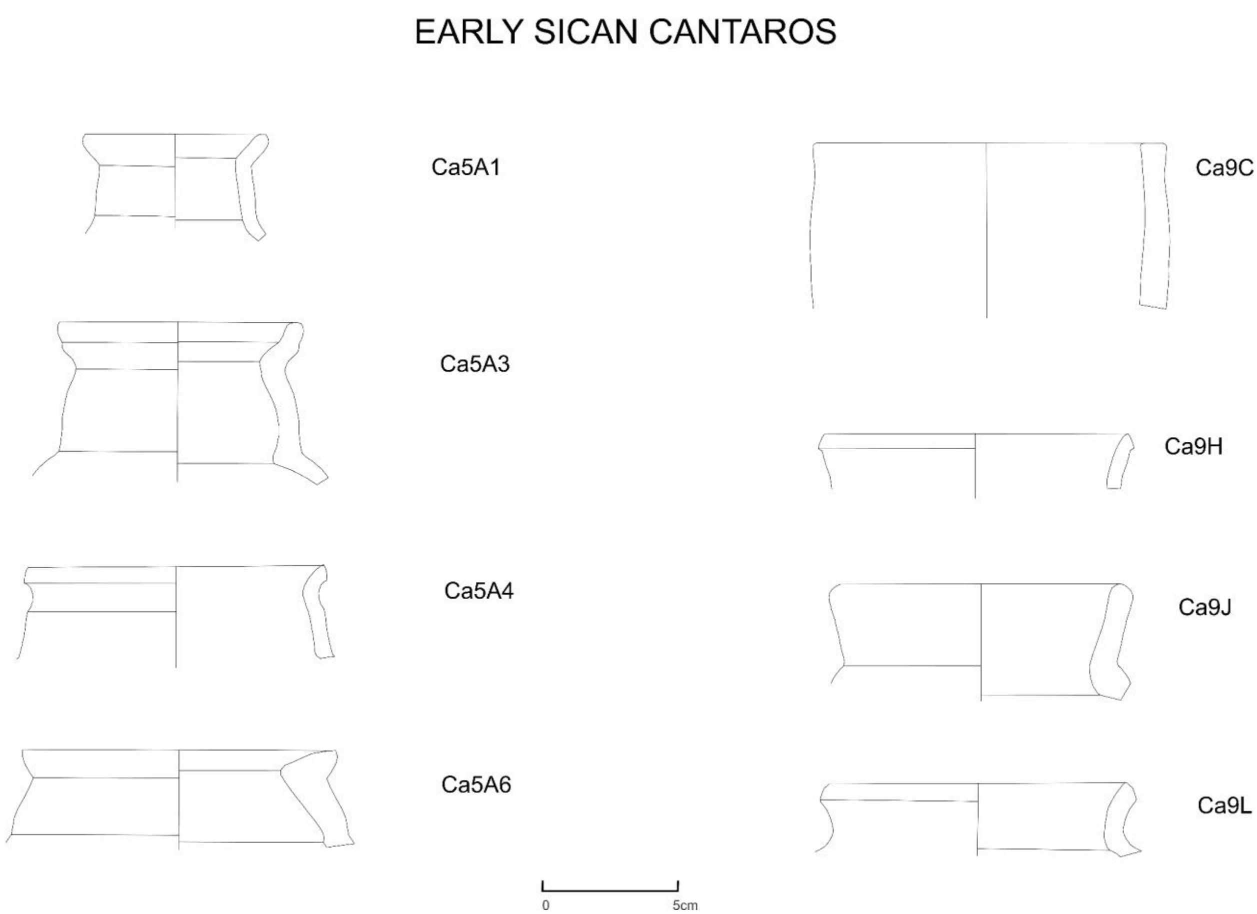


Figure 51. Early Sican Cantaros.

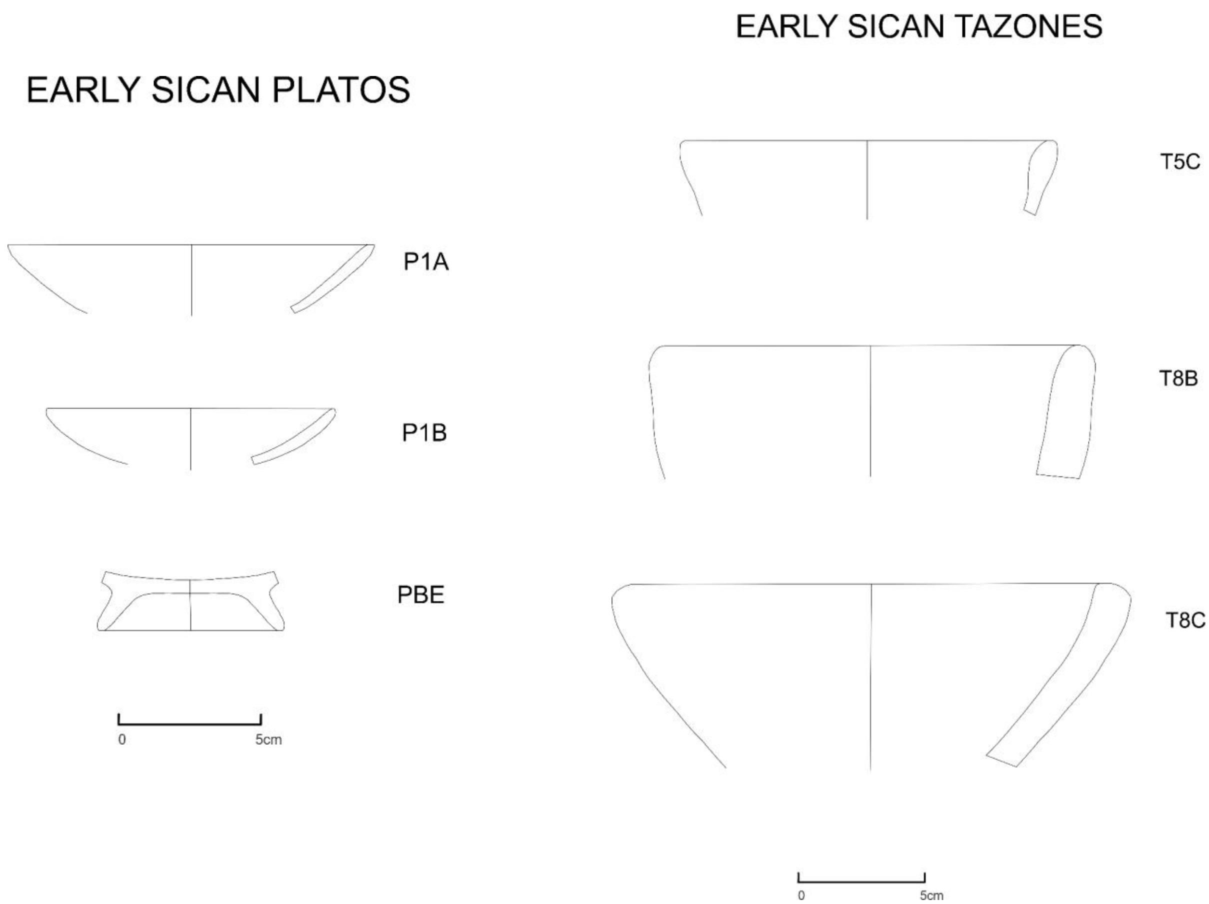


Figure 52. Early Sican Platos and Tazones.

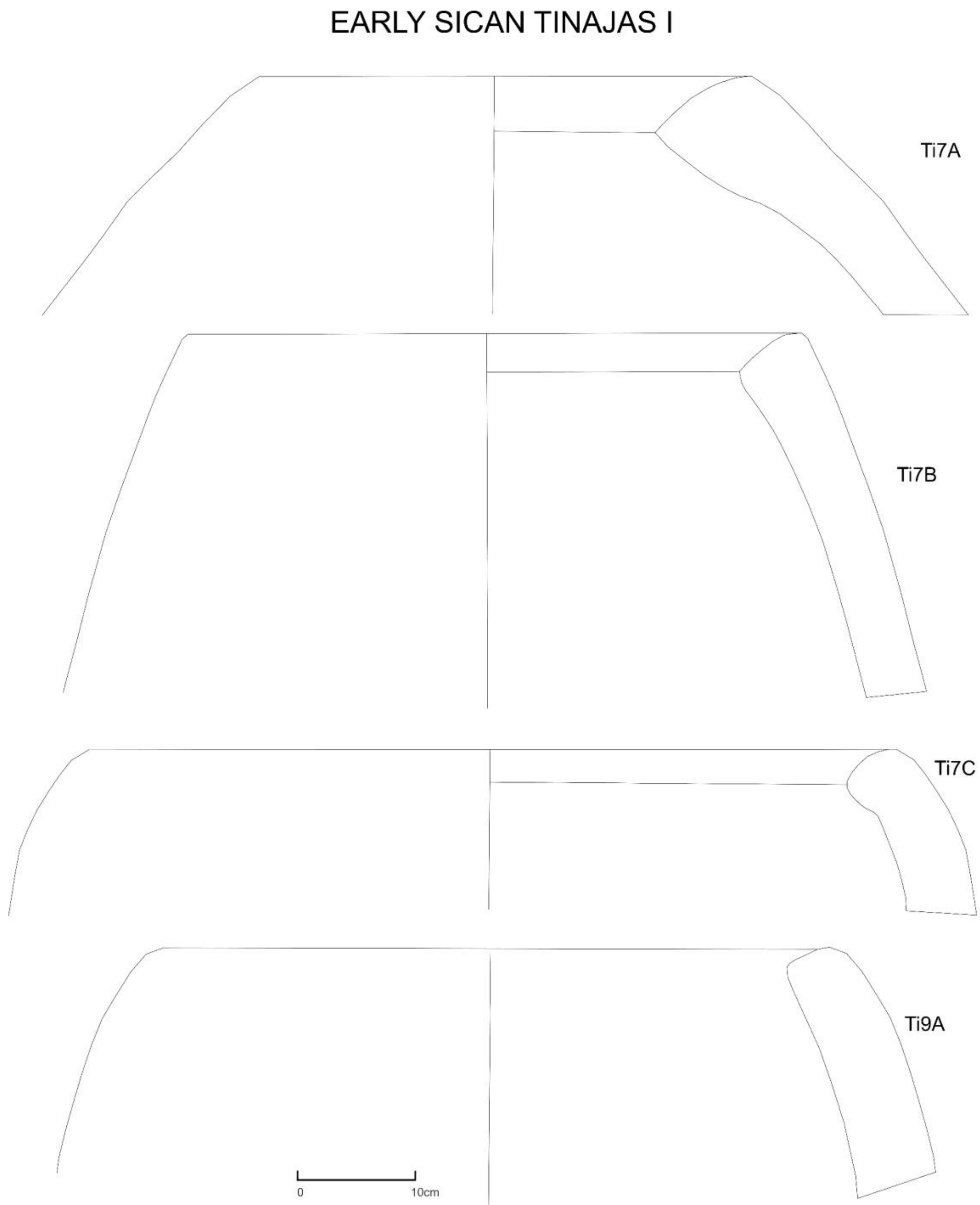


Figure 53. Early Sican Tinajas.

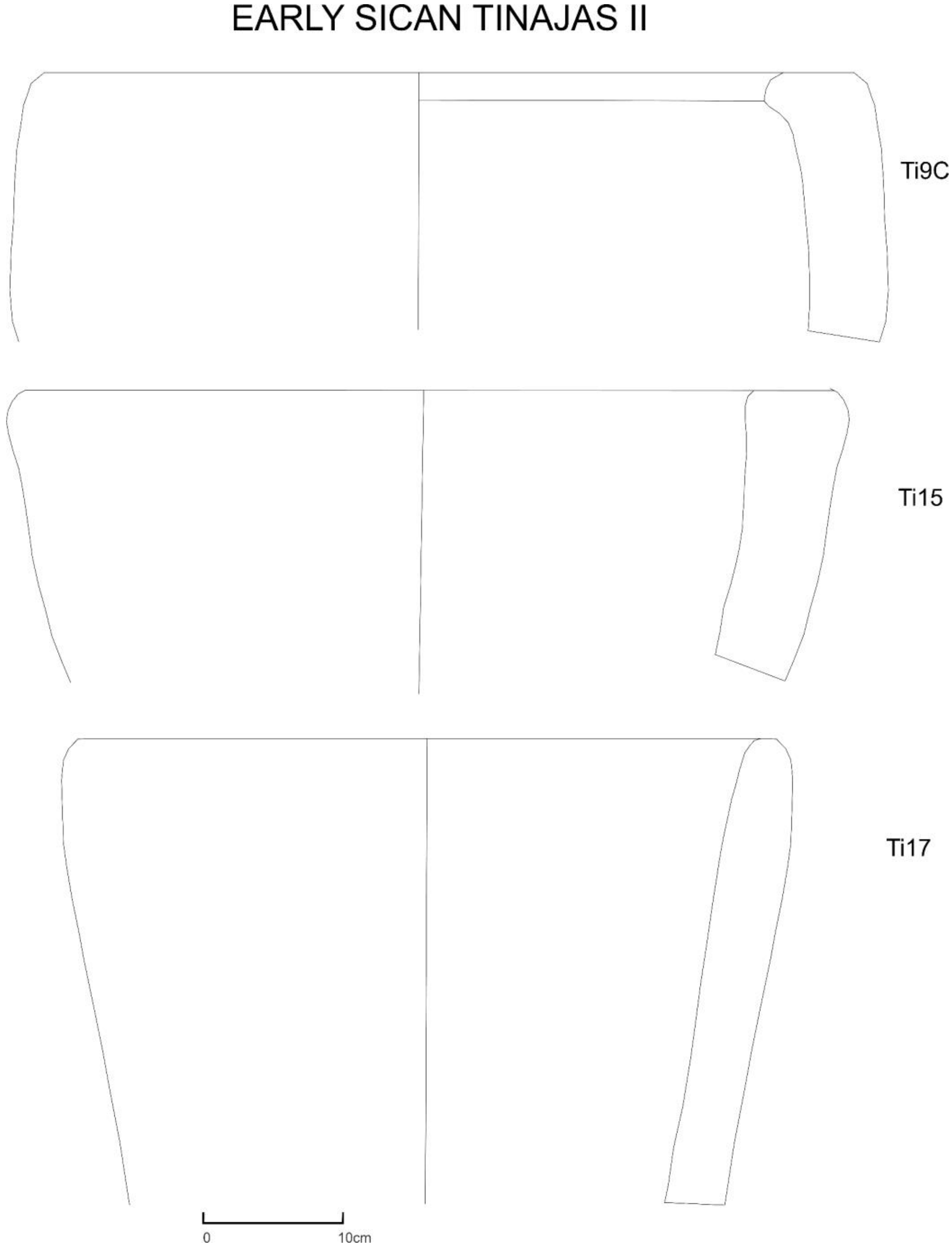


Figure 53. (Continued)

APPENDIX C.2 . MIDDLE SICAN CERAMIC TYPES

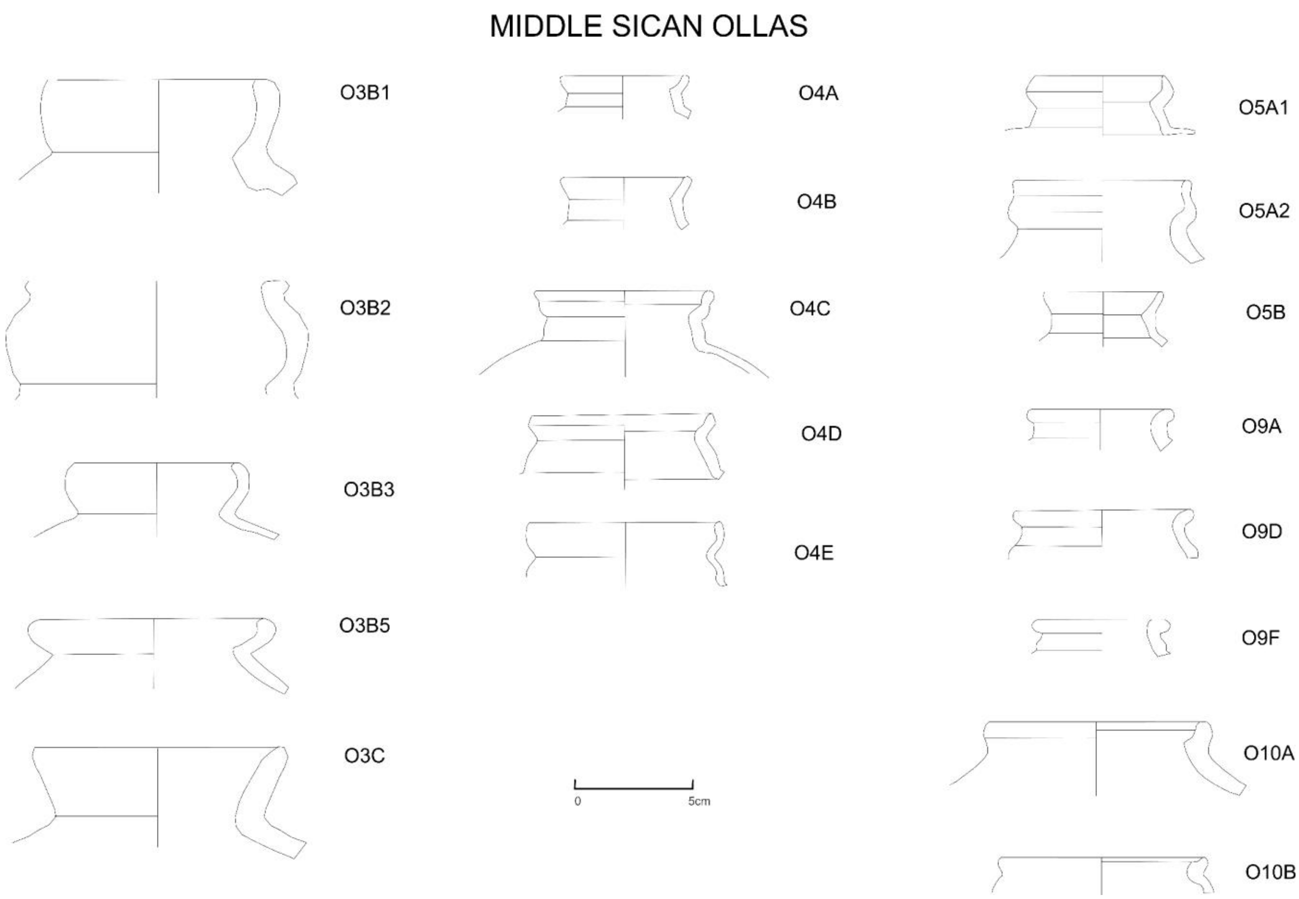


Figure 54. Middle Sican Ollas.

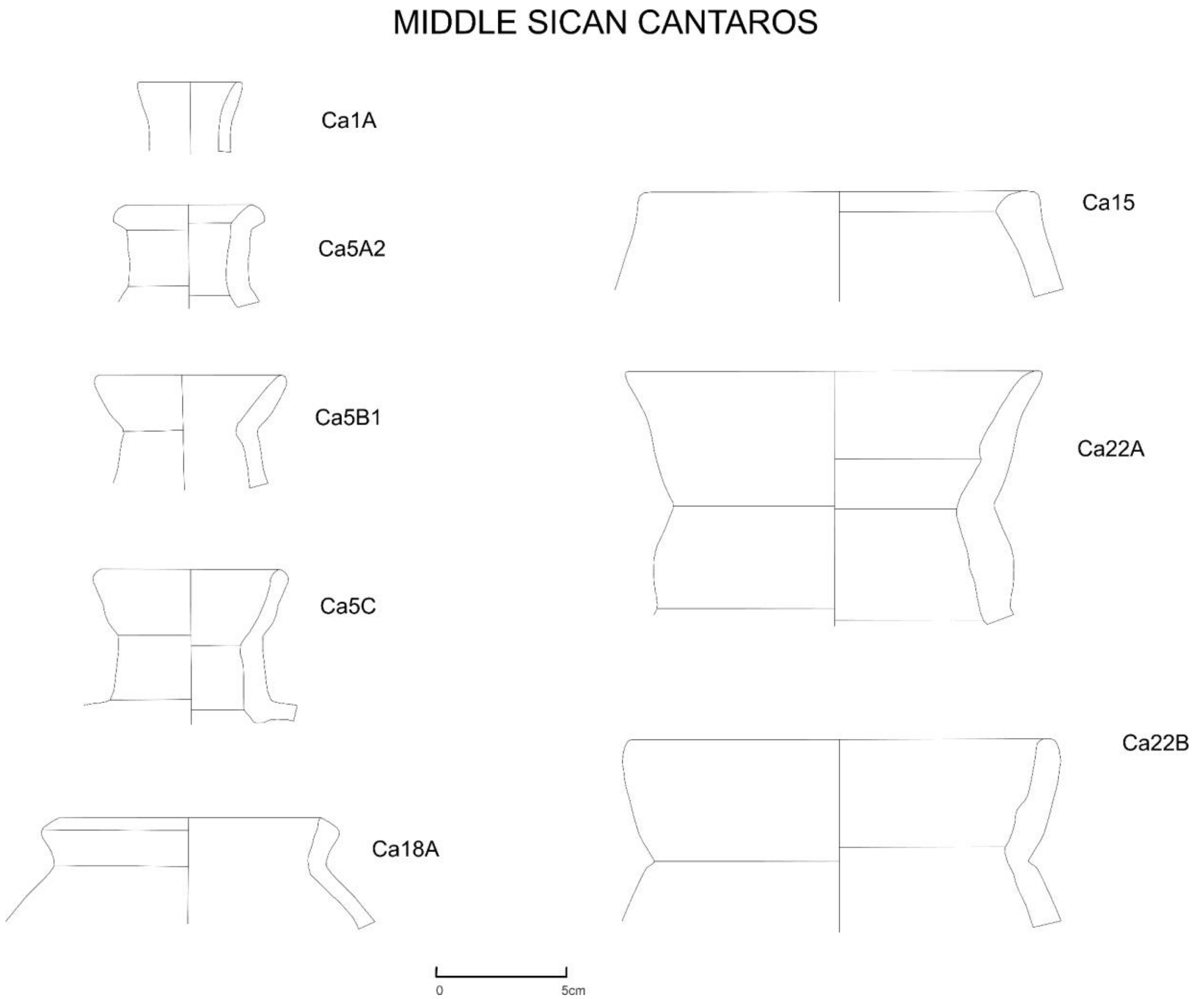


Figure 55. Middle Sican Cantaros.

MIDDLE SICAN PLATOS

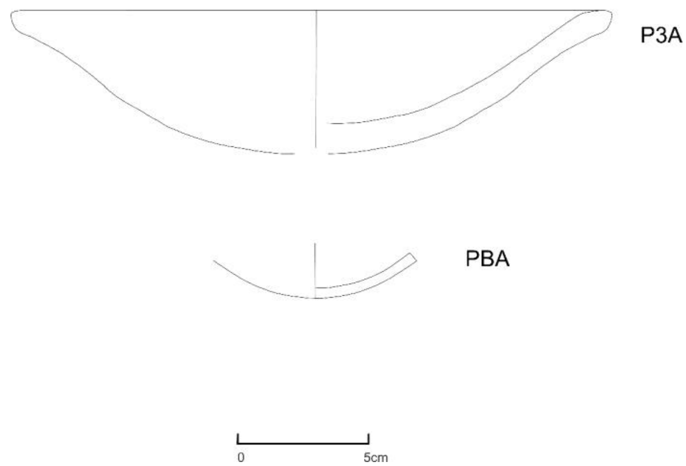


Figure 56. Middle Sican Platos.

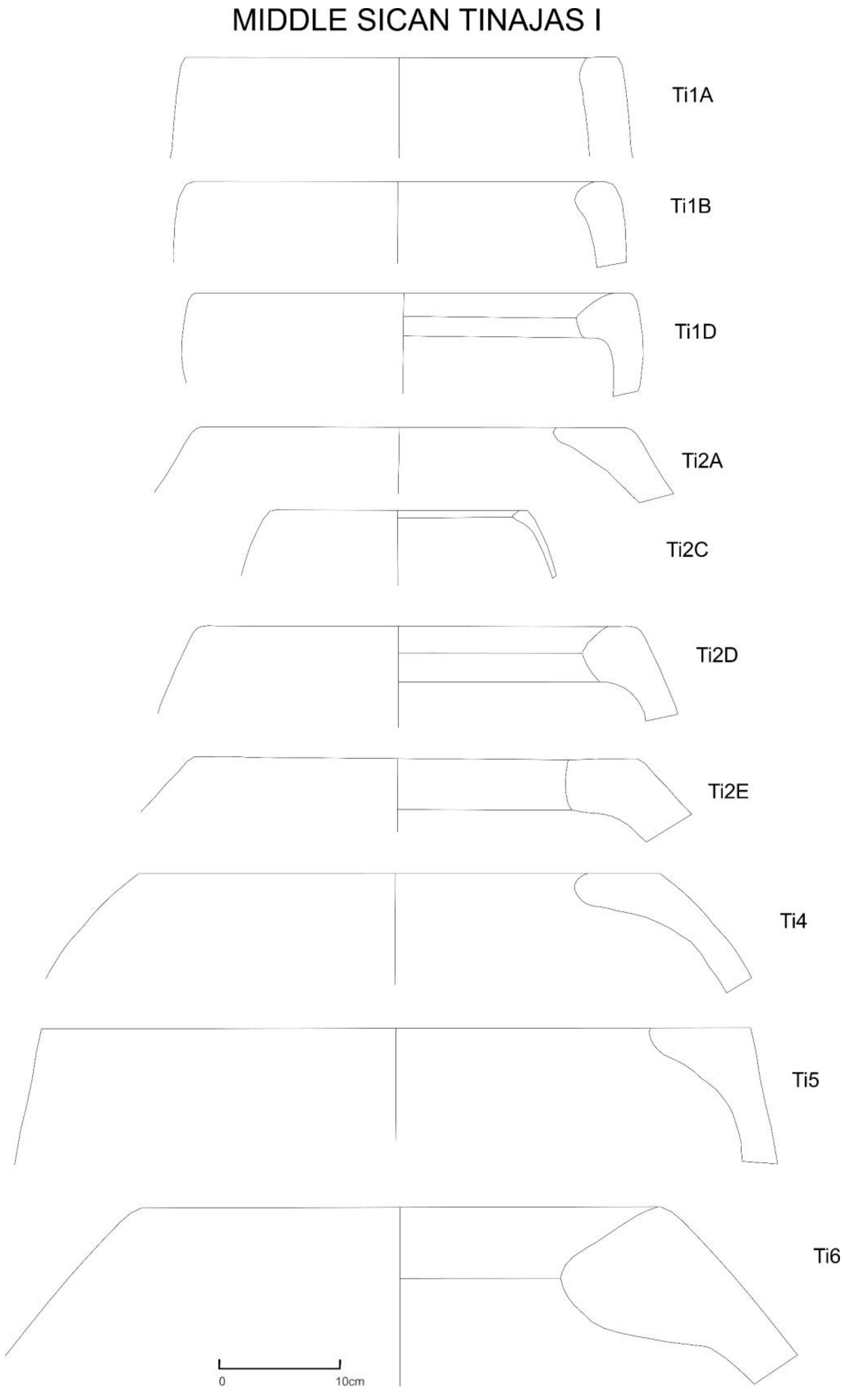


Figure 57. Middle Sican Tinajas.

MIDDLE SICAN TINAJAS II

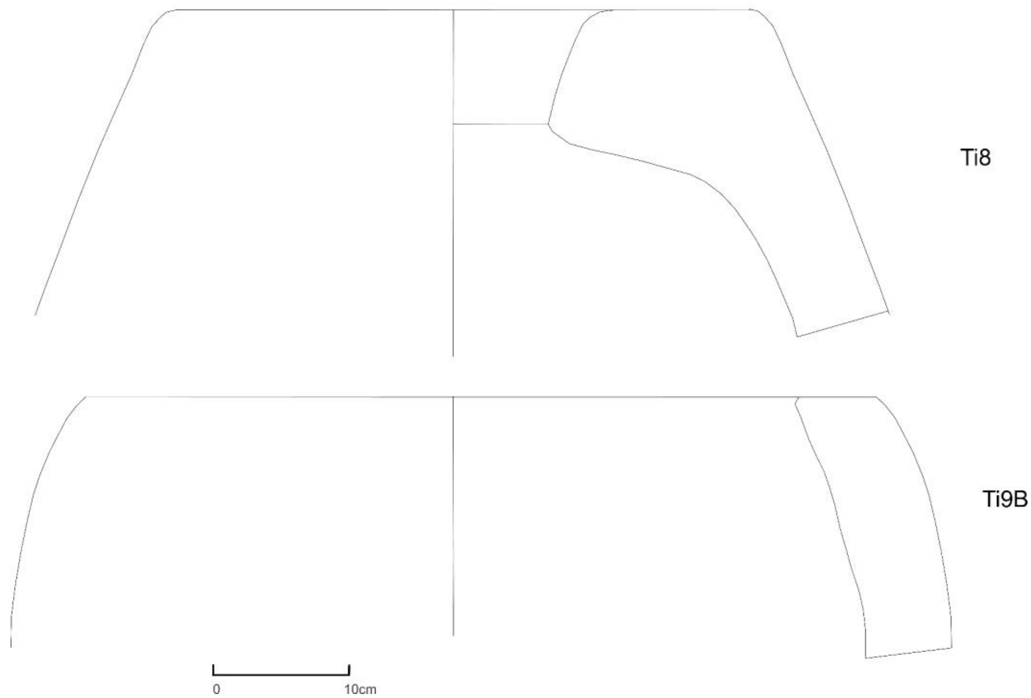


Figure 57. (Continued)

APPENDIX C.3 LATE SICAN CERAMIC TYPES

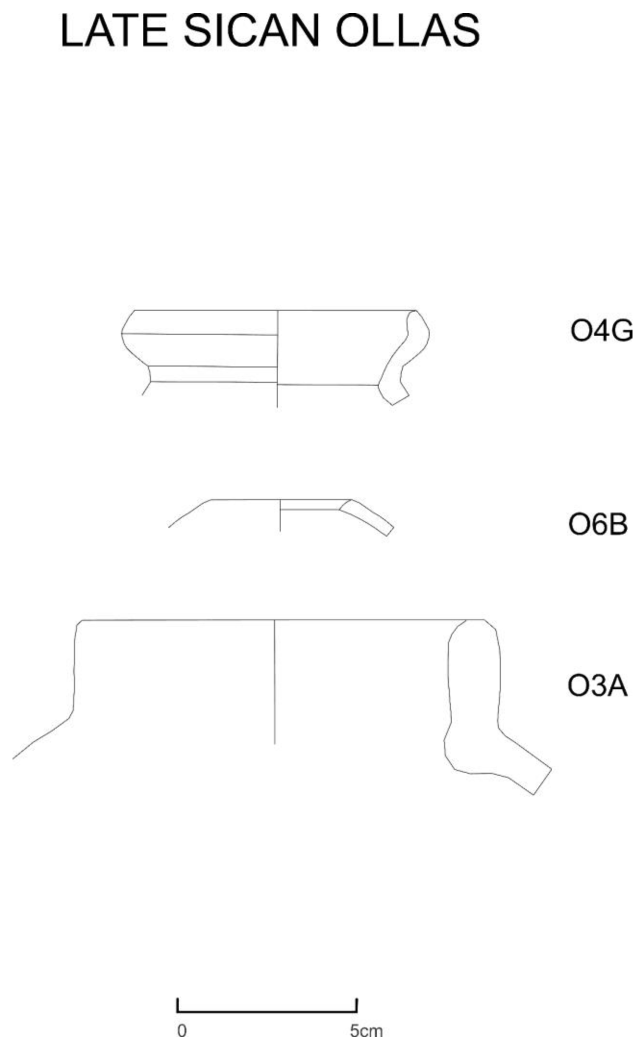


Figure 58. Late Sican Ollas.

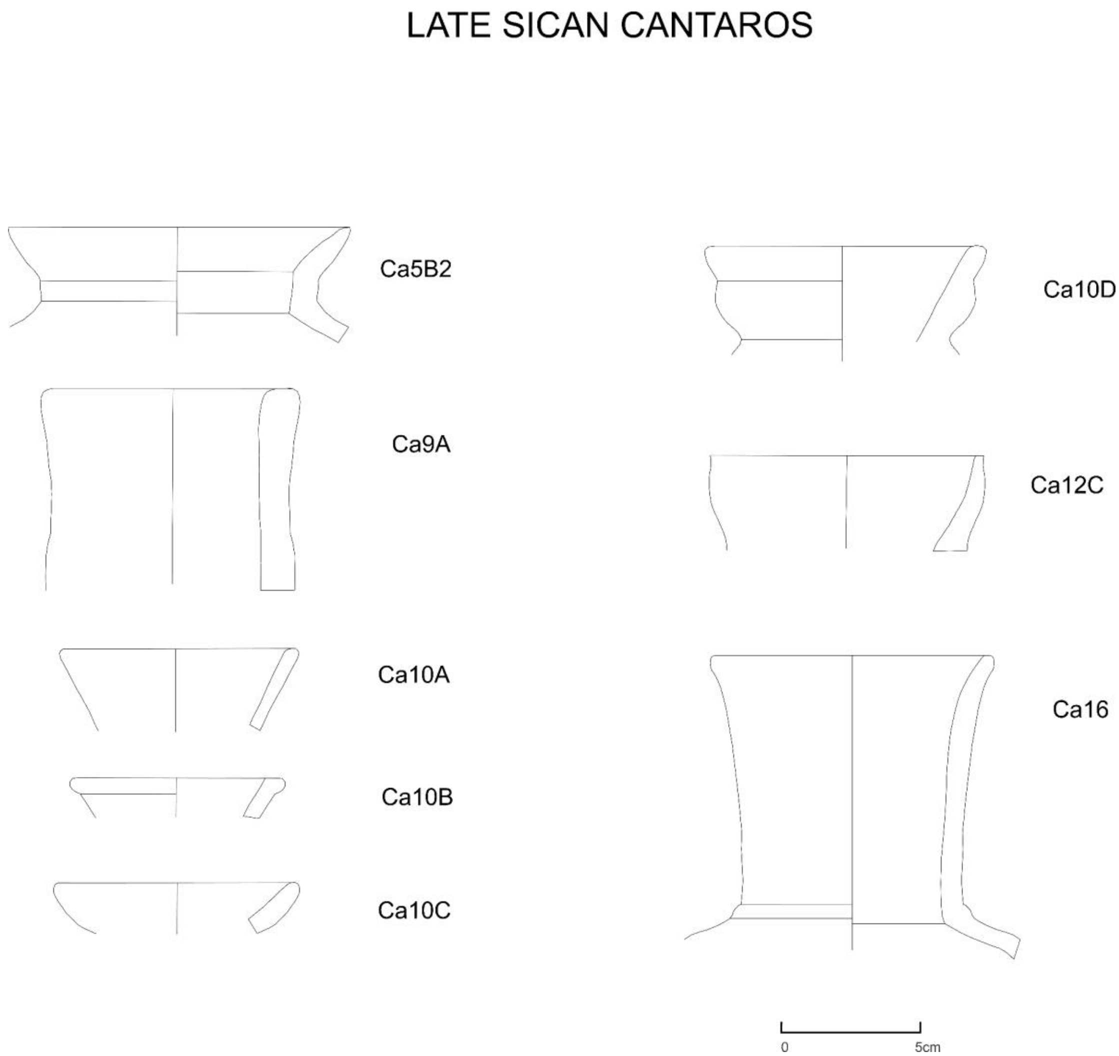


Figure 59. Late Sican Cantaros.

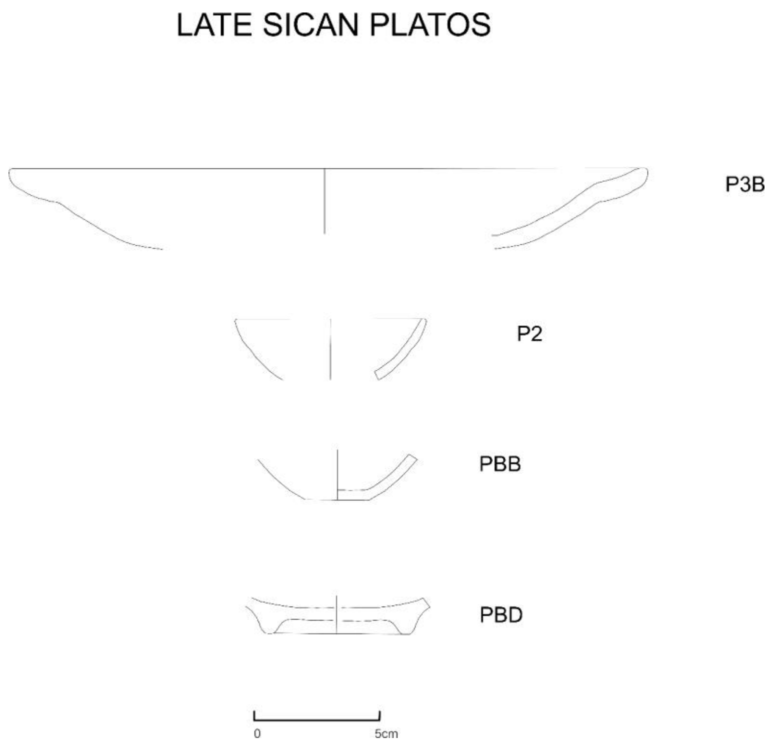


Figure 60. Late Sican Platos.

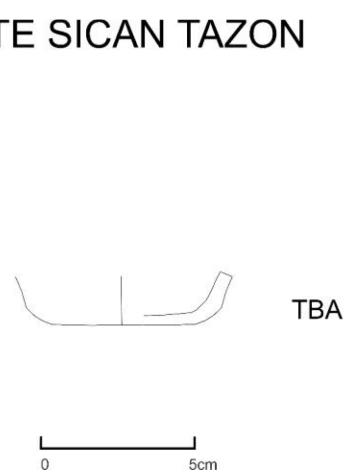


Figure 61. Late Sican Tazon.

LATE SICAN TINAJA

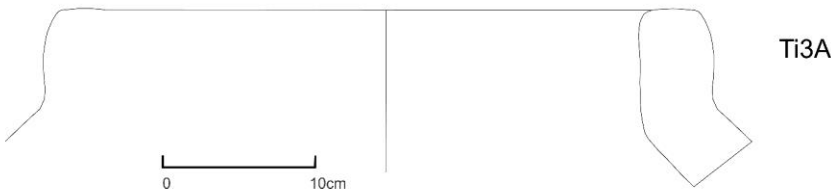


Figure 62. Late Sican Tinaja.

APPENDIX D . CERAMIC TYPES ANALYZED

Table 23. Ceramic types recovered from all periods. Sican period in blue.

OLLA					
O1	pronounced carination, short neck	**O1A**	lip vertical in profile	**4**	Chimu
		O1B	lip set-back in profile	**4**	Chimu
O2	soft carination, long neck	**O2A**	lip vertical in profile	**4**	Chimu
		O2B	lip set-back in profile	**4**	Chimu
O3	no carination, short neck	**O3A**	lip vertical in profile	**3.3**	Late Sican
		O3B1	lip set-back in profile	**3.2**	Middle Sican
		O3B2		**3.2**	Middle Sican
		O3B3		**3.2**	Middle Sican
		O3B4		**4**	Chimu
		O3B5		**3.2**	Middle Sican
		O3C	lip everted in profile	**3.2**	Middle Sican
		O3D		**4**	Chimu
O4	high vertical neck	**O4A**	high vertical neck, C-shaped rim	**3.2**	Middle Sican
		O4B	high vertical neck, everted rim	**3.2**	Middle Sican
		O4C		**3.2**	Middle Sican
		O4D		**3.2**	Middle Sican
		O4E		**3.2**	Middle Sican
		O4F		3	Sican
		O4G		**3.3**	Late Sican
O5	high inverted neck	**O5A1**	high vertical neck, C-shaped rim	**3.2**	Middle Sican
		O5A2		**3.2**	Middle Sican

		O5B	high vertical neck, everted rim	**3.2**	Middle Sican
O6	neckless olla	**O6A**	C-shaped rim	**4**	Chimu
		O6B	flat rim	**3.3**	Late Sican
		O6C		**4**	Chimu
		O6D		**4**	Chimu
		O6E		**4**	Chimu
O7	double carination	**O7**		**2**	Moche
O8	olla s/cuello	**O8A**	rounded rim	**1**	Formativo
		O8B	borde engrosado	**1**	Formativo
		O8C	very incurving	**1**	Formativo
		O8D	biseled rim	**1**	Formativo
		O8E		**1**	Formativo
		O8F	biseled rim	**1**	Formativo
O9	short inverted neck	**O9A**	rounded rim	**3.2**	Middle Sican
		O9B	platform rim exterior	**2**	Moche
		O9C		**2**	Moche
		O9D		**3.2**	Middle Sican
		O9E		**2**	Moche
		O9F		**3.2**	Middle Sican
		O10A		**3.2**	Middle Sican
		O10B		**3.2**	Middle Sican
		O11		**4**	Chimu
CANTARO					
Ca1	vertical neck, slight outcurving rim	**Ca1A**	rounded rim	**3.2**	Middle Sican
		Ca1B	biseled rim	**4**	Chimu
		Ca1C			
Ca2	flaring neck and rim	**Ca2**		**4**	Chimu
Ca3	very flaring neck and rim	**Ca3**		**4**	Chimu
Ca4	vertical neck	**Ca4A**	vertical neck, short	**2**	Moche
		Ca4B	vertical neck, long	**2**	Moche
		Ca4C	everted neck	**2**	Moche
		Ca4D	inverted neck	**2**	Moche
Ca5	vertical neck, flaring rim **Ca22A**	**Ca5A1**	vertical neck, short flaring rim	**3.1**	Early Sican

		Ca5A 2	vertical neck, short flaring rim	**3.2**	Middle Sican
		Ca5A 3		**3.1**	Early Sican
		Ca5A 4		**3.1**	Early Sican
		Ca5A 5		**2**	Moche
		Ca5A 6		**3.1**	Early Sican
		Ca5B 1	vertical neck, long flaring rim	**3.2**	Middle Sican
		Ca5B 2	vertical neck, short flaring rim	**3.3**	Late Sican
		Ca5C	vertical neck, long flaring rim, round lip	**3.2**	Middle Sican
Ca6	sinous neck	**Ca6**		**2**	Moche
Ca7	everted, flaring rim	**Ca7**		**4**	Formativo
Ca8	everted, inflection flaring rim	**Ca8**		**4**	Formativo
Ca9	straight vertical neck	**Ca9A**	rounded rim long	**3.3**	Late Sican
		Ca9B	everted rim long	**4**	Chimu
		Ca9C		**3.1**	Early Sican
		Ca9D	everted rim short	**2**	Moche
		Ca9E	straigth rim short	**2**	Moche
		Ca9F		**2**	Moche
		Ca9G		**2**	Moche
		Ca9H	straight thin	**3.1**	Early Sican
		Ca9I	straight thin	**1**	Formativo
		Ca9J	everted thin	**3.1**	Early Sican
		Ca9K		**2**	Moche
		Ca9L		**3.1**	Early Sican
		Ca9M		**2**	Moche
Ca10A/Bo 3	straight everted neck	**Ca10 A**		**3.3**	Late Sican
		Ca10 B		**3.3**	Late Sican
		Ca10 C		**3.3**	Late Sican
		Ca10 D		**3.3**	Late Sican
Ca11	inverted neck	**Ca11**		**2**	Moche

Ca12	everted neck, thick shoulder	**Ca12**			
		Ca12 A		**4**	Formativo
		Ca12 B		**4**	Formativo
		Ca12 C		**3.3**	Late Sican
		Ca12 D		**4**	Chimu
		Ca12 E		**3**	Sican
Ca13	high neck, incurving rim (ET)	**Ca13**		**2**	Moche
Ca14	vertical neck, biseled everted rim	**Ca14**		**2**	Moche
Ca15	vertical neck, inverted rim	**Ca15**		**3**	Sican
Ca16		**Ca16**		**3.3**	Late Sican
Ca17		**Ca17 A**		**2**	Moche
Ca17		**Ca17 B**		**2**	Moche
Ca18		**Ca18 A**		**3.2**	Middle Sican
		Ca18 B		**2**	Moche
		Ca18 C		**2**	Moche
		Ca18 D		**2**	Moche
		Ca18 E		**2**	Moche
Ca19		**Ca19**		**2**	Moche
Ca20		**Ca20**		**2**	Moche
Ca21		**Ca21**		**2**	Moche
Ca22		**Ca22 A**		**3.2**	Middle Sican
		Ca22 B		**3.2**	Middle Sican
		Ca22 C		**2**	Moche
		Ca22 D		**2**	Moche
BOTELLA					
Bo1	round vertical spout	**Bo1A**	short vertical spout, inverted rim	**3.1**	Early Sican
		Bo1B	vertical spout, inverted rim	**3.2**	Early Sican

		Bo1C	long vertical spout, inverted rim	**3.3**	Early Sican
		Bo1D	vertical soput, vertical rim	**4**	Chimu
Bo2	squared vertical soput	**Bo2**		**4**	Chimu
	base	**BoBA**	flat	**3, 4**	Sican
		BoBB	ring	**3.2**	Middle Sican
		BoBC	low pedestal	**3.2**	Middle Sican
		BoBD	high pedestal	**3.2**	Middle Sican
		BoBE	very high pedestal	**3.3**	Late Sican
		PLATO			
P1	shallow everted	**P1A**	vertical rim	**3.1**	Early Sican
		P1B	incurving rim	**3.1**	Early Sican
		P1C	incurving rim engrosado	**4**	Chimu
P2	more vertical (deeper) incurving rim	**P2**		**3.3**	Late Sican
P3	platform rim	**P3A**	straight	**3.2**	Middle Sican
		P3B	concave	**3.3**	Late Sican
P4	shallow, straight walls	**P4**		**4**	Chimu
	base	**PBA**	concave	**3.2**	Middle Sican
		PBB	flat not clear elbow	**3.3**	Late Sican
		PBC	flat pronounced elbow	**4**	Chimu
		PBD	low ring	**3.3**	Late Sican
		PBE	pedestal	**3.2**	Middle Sican
		TAZON			
T1	shallow everted	**T1A**	simple rim	**4**	Chimu
		T1B	hook in rim	**4**	Chimu
T2	more vertical w flat base & elbow	**T2A**	everted wall	**4**	Chimu
		T2B	concave wall	**4**	Chimu
		T2C		**4**	Chimu
		T2D		**4**	Chimu

T3	incurving	**T3**		**1**	Formativo
T4	concave, everted rim	**T4**		**1**	Formativo
T5A	vertical walls	**T5A**		**1**	Formativo
T5B		**T5B**		**4**	Chimu
		T5C		**3.1**	Early Sican
		T5D		**4**	Chimu
		T5F		**4**	Chimu
T6	everted wall, thick exterior rim	**T6**		**4**	Chimu
T7	carinated rim	**T7**		**1?**	Formativo
T8	everted big, balde	**T8A**		**1**	Formativo
T8B		**T8B**		**3.1**	Early Sican
		T8C		**3.1**	Early Sican
T9	cuenco	**T9**		**1**	Formativo
T10		**T10**		**2**	Moche
T11		**T11**		**4**	Chimu
	base	**TBA**	flat not clear elbow	**3.3**	Late Sican
		TBB	flat pronounced elbow	**4**	Chimu
			TINAJA		
Ti1	vertical rim	**Ti1A**	flat rim	**3.2**	Middle Sican
		Ti1B	rounded rim	**3.2**	Middle Sican
		Ti1C	incurving round hook	**4**	Chimu
		Ti1D	incurving square hook	**3.2**	Middle Sican
Ti2	incurving rim	**Ti2A**	flat rim	**3.2**	Middle Sican
		Ti2B	rounded rim	**4**	Chimu
		Ti2C	incurving round hook	**3.3**	Middle Sican
		Ti2D	incurving square hook	**3.2**	Middle Sican
		Ti2E		**3.2**	Middle Sican
Ti3	short vertical neck	**Ti3**		**3.3**	Late Sican
Ti4	concave incurving wall, long rim	**Ti4**		**3.2**	Middle Sican
Ti5	flat inverted wall, square long rim	**Ti5**		**3.2**	Middle Sican

Ti6	inverted wall, thick biseled rim	**Ti6**		**3.2**	Middle Sican
Ti7	inverted wall, biseled rim	**Ti7A**		**3.1**	Early Sican
		Ti7B		**3.1**	Early Sican
		Ti7C		**3.1**	Early Sican
Ti8	inverted wall, squared thick rim	**Ti8**		**3.2**	Middle Sican
Ti9	concave wall (cuenco)	**Ti9A**		**3.1**	Early Sican
		Ti9B		**3.2**	Middle Sican
		Ti9C		**3.1**	Early Sican
Ti10	concave incurving wall, short rim	**Ti10**		**2**	Moche
Ti11		**Ti11**		**3**	Sican
Ti12		**Ti12**		**2**	Moche
Ti13		**Ti13**		**4**	Chimu
		Ti13B		**4**	Chimu
		Ti13E		**4**	Chimu
Ti14		**Ti14A**		**2**	Moche
		Ti14B		**2**	Moche
		Ti14C		**2**	Moche
		Ti14D		**2**	Moche
Ti15		**Ti15**		**3.1**	Early Sican
Ti16		**Ti16**			
Ti17		**Ti17**		**3.1**	Early Sican
	base	**TiBA**	flat not clear elbow		
		TiBB	flat pronounced elbow	**3.3**	Late Sican

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